

Facility:	VC SUMMER	Scenario No.:	1	Op Test No.:	2009 NRC
Examiners:	_____	Operators:	_____	SRO	
	_____		_____	RO	
	_____		_____	BOP	
Initial Conditions:	<ul style="list-style-type: none"> • IC-7, ~ 2% Power, MOL. • Main Feedwater Pump "A" is running. MFW Pump MASTER Speed Control is in AUTO. • GOP-004A, Step 3.7 is complete. 				
Turnover:	<ul style="list-style-type: none"> • Continue performing GOP-004A, beginning at Step 3.8. 				
Critical Task:	<ol style="list-style-type: none"> 1. Stop any running RCP before the transition to EOP-2.0. 2. Close at least one Phase "A" isolation valve in each unisolated line prior to reporting the completion of EOP-1.0, Attachment 3. 3. Initiate an RCS cooldown prior to reducing SI flow. 				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N - BOP, CRS R - RO	Raise power in preparation for rolling MTG. Swapover from EFW to MFW		
2	CND004B VLVCW007F	C - BOP	CWP "B" trips (with CWP "A" available for start). CWP "B" discharge valve fails to automatically close		
3	RCS008A	TS - CRS	RCS Loop 1 T _{HOT} RTD Fails LO.		
4	CCW001	C - RO	Leak in L/D HX.		
5	OVR- ANNEG017	C - BOP	Unit Auxiliary Transformer High Temperature.		
6	PRS002A	I - RO TS - CRS	PZR Level Channel LT-459 Fails LO.		
7	PCS009AA		Inadvertent Rx Trip (RTB "A" Fails OPEN).		
8	PRS008	M - ALL	850 gpm PZR Steam Space Break (After Transition to EOP-1.1)		
9	RHR001A	C - ALL	RHR Pump "A" breaker trips.		
10	VLVCS042P VLVCS051P VLVIA002P VLVIA003P VLVIA004P	C - RO/BOP	Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure)		
11	RHR001B	C - ALL	RHR Pump "B" trips at transition to EOP-2.0.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>1</u>	Page	<u>5</u>	of	<u>43</u>
Event Description: Raise Power in Preparation For Rolling MTG									
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available:		N/A
Evaluator Note: Do NOT cue any events until Main Feedwater Reg Valves are in AUTO		
	BOP	Transfer Feed from EFW to Main Feed Reg valves per SOP-210, Feedwater System
		For A Steam generator:
		<ul style="list-style-type: none"> • Prove positive control of PVT-478, SG A FWF, by opening PVT-478, SG A FWF, until Feed Pump flow increases on the flow meter, then throttle flow. (Increase Feed Pump flow approximately 200 gpm, then decrease.)
		<ul style="list-style-type: none"> • Adjust PVT-478, SG A FWF, to obtain the desired Feed Pump flow.
		<ul style="list-style-type: none"> • Check feed D/P, adjust the feed pump speed if necessary (20 to 30 rpm per adjustment).
		<ul style="list-style-type: none"> • Throttle close IFV-3531, MD EFP TO SG A.
		<ul style="list-style-type: none"> • When Wide Range and Narrow Range levels both show a slow change, and between 59-62% Narrow Range, place PVT-478, SG A FWF, in AUTO.
Evaluator's Note: The BOP will perform the above actions for each of the Main Feedwater Reg valves		
Evaluator's Note:		<ul style="list-style-type: none"> • The RO will raise power using MANUAL Rod Control. • The RO/CRS should agree on a target power level.

Op Test No.: 1 Scenario # 1 Event # 1 Page 6 of 43

Event Description: Raise Power in Preparation For Rolling MTG

Time	Position	Applicant's Actions or Behavior
<p>Note 3.8</p> <p>RCS TAVG – TREF DEV HI/LO (XCP615 2-5) is expected to alarm as TAVG is increased and TREF remains constant. Compensatory actions should be taken per the ARP for this alarm</p>		
	CREW	When Emergency Feedwater is aligned for power operation, prepare to synchronize and load the Main Generator as follows:
	RO	<ul style="list-style-type: none"> • Slowly raise Reactor Power to between 12% and 15% while continuing with this procedure.
	RO	At 10% Reactor Power, perform the following:
		<ul style="list-style-type: none"> • Verify P10, NIS PR, permissive energizes to bright.
		<ul style="list-style-type: none"> • Verify P7, REACTOR TRIP BLOCKED, permissive de-energizes to dim.
		<ul style="list-style-type: none"> • Verify normal Power Range Channel indication.
		<ul style="list-style-type: none"> • Select the highest indicating Power Range Channel and Delta Flux on NR-45, NIS RECORDER.
		<ul style="list-style-type: none"> • Ensure REGULATOR CORE 1 ALARM and REGULATOR CORE 2 ALARM (XCP-633) are reset.
<p>Lead Evaluator:</p>		
<p>Cue Event 2 (Circulating Water Pump “B” trips) ONLY after all Main Feedwater Regulating Valves have been placed in AUTO</p>		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>2</u>	Page	<u>7</u>	of	<u>43</u>
Event Description:	CWP "B" Trips (With CWP "A" Available for Start)								
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available: XCP-628-3-1, CWP A/B/C TRIP		
	BOP	Responds to alarm XCP-628-3-1, CWP A/B/C TRIP.
	BOP	Reports CWP "B" tripped/not running and discharge valve failure to close.
	BOP	Enters ARP-001-XCP-628-3-1.
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> Pump or motor malfunction causing an overload. Turbine Building flood level.
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> The discharge isolation valve for the tripped pump will close. (NO)
Procedure Note: This alarm has reflash capabilities.		
Evaluator/Booth Operator's Note:		
		<ul style="list-style-type: none"> An operator may be dispatched to verify start conditions are satisfactory. The crew should announce the start of any major equipment.
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> If only two pumps were operating prior to the pump trip, perform the following:
		<ul style="list-style-type: none"> Verify the discharge valve for the operating Circulating Water Pump closes to 30% open while performing the next steps.(NO)

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>2</u>	Page	<u>8</u>	of	<u>43</u>
Event Description: CWP "B" Trips (With CWP "A" Available for Start)									
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Verify the discharge valve for the idle Circulating Water Pump is in AUTO.
		<ul style="list-style-type: none"> Start the idle Circulating Water Pump.
		<ul style="list-style-type: none"> When the discharge valves for the operating Circulating Water Pumps are 30% open, open the discharge valves.
		<ul style="list-style-type: none"> When the discharge valves for the operating Circulating Water Pumps are open, place the discharge valves in AUTO.
		<ul style="list-style-type: none"> Reduce Turbine load as necessary per GOP-4B to maintain the following: (N/A)
		<ul style="list-style-type: none"> Main Condenser vacuum less than 4" Hg absolute.
		<ul style="list-style-type: none"> Aux Condenser vacuum less than 9" Hg absolute.
		<ul style="list-style-type: none"> Circulating Water outlet temperature less than 113°F.
		<ul style="list-style-type: none"> Determine which pump tripped and verify its discharge valve is fully closed.
		SUPPLEMENTAL ACTIONS:
		<ul style="list-style-type: none"> Determine the cause of the pump trip and correct as soon as possible.
		<ul style="list-style-type: none"> Return the Circulating Water System to normal operation as soon as possible per SOP-207.
Booth Operator's Note:		
		<ul style="list-style-type: none"> Report the Circulating Water Pump breaker tripped on overload – cause unknown. Report MVB-802B thermal overloads at 1C2X tripped, remove VLV-CW007F when directed to reset overloads.
	CREW	Dispatches an operator to investigate.
	CRS	Contacts Work Control/Maintenance for assistance.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>2</u>	Page	<u>9</u>	of	<u>43</u>
Event Description:	CWP "B" Trips (With CWP "A" Available for Start)								
Time	Position	Applicant's Actions or Behavior							

Lead Evaluator:		
Event 3 is a TS declaration – no operations are involved. Cue Event 3, RCS Loop 1 T_{HOT} RTD Fails LO, anytime after Circulating Water Pump "A" has been started.		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>10</u>	of	<u>43</u>
Event Description:	RCS Loop 1 T _{HOT} RTD Fails LO								
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:

Indications Available: XCP-615-1-2, RCS TAVG LO; XCP-615-1-2, RCS TAVG LO-LO
XCP-615-1-5, RCS TAVG DEV HI/LO;
XCP-615-3-5, RCS ΔT DEV HI/LO

	RO	Responds to multiple alarms.
	RO	Enters ARP-001-XCP-615-1-2.
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> • Normal heatup or cooldown in progress. • Channel failure or testing. • The Rod Control System is maintaining Tavg at an improper low value. • Failure of a Steam Generator safety or a power operated relief valve.
	RO	Reports Loop 1 That failed LO.

Evaluator note: If RO does not report that That failed low, ask a follow-up question about which failure occurred upon completion of scenario.

		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> • With 2 out of 3 channels tripped and a reactor trip signal present, feedwater isolation will occur.
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> • Monitor TI-412D, TI-422D and TI-432D to determine if a channel failed. • Place Rod Control in MAN and match Tavg to Tref. (N/A)

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>11</u>	of	<u>43</u>
Event Description:	RCS Loop 1 T _{HOT} RTD Fails LO								
Time	Position	Applicant's Actions or Behavior							

		SUPPLEMENTAL ACTIONS:
		<ul style="list-style-type: none"> If a channel has failed, perform the following: <ul style="list-style-type: none"> Refer to AOP-401.2 to trip all bistables associated with that channel. Refer to Technical Specification Table 3.3-3 for minimum channel requirements. If the Rod Control System malfunctioned, refer to AOP-403.4, Failure of Control Rods to Move. (N/A)
	CRS	Refers to AOP-401.2, PROTECTION CHANNEL RCS LOOP RTD FAILURE.
	RO	Determine which RCS loop has a failed RTD by comparing loop ΔT and Tavg indicators.
	RO	Reports Loop 1 Thot.
	RO	Ensure an operable loop is selected on ΔT TR-412 INPUT SEL Switch.
Booth Operator's Note:		
Acknowledge direction to trip bistables and report that you will get it done before the end of the shift. The bistables need not be tripped during the scenario.		
	CRS	Within 72 hours, place the failed channel protection bistables in a tripped condition: <ul style="list-style-type: none"> Identify the associated bistables for the failed channel. REFER TO Attachment 1. <ul style="list-style-type: none"> TB-412-B-1 TB-412-B-2 TB-412-C-1 TB-412-C-2 TB-412-D-1 TB-412E

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>12</u>	of	<u>43</u>
Event Description:	RCS Loop 1 T _{HOT} RTD Fails LO								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Record the following for each associated bistable on SOP-401, REACTOR PROTECTION AND CONTROL SYSTEM, Attachment I: <ul style="list-style-type: none"> Instrument. Associated Bistable. Bistable Location. STPs. Notify the I&C Department to place the identified bistables in trip.
	CRS	Contacts Work Control/I&C for assistance.
	CRS	Determine and correct the cause of the channel failure.
	CRS	<i>Enters TS Table 3.3-1 (Functional Units 7 and 8), Action 6# :</i>
		<i>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:</i>
		<ul style="list-style-type: none"> <i>The inoperable channel is placed in the tripped condition within 72 hours; and</i> <i>The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.</i>
Lead Evaluator cue Event 4, Leak in Letdown HX, after the TS declaration is complete. The bistables need <u>not</u> be tripped to continue the scenario.		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>13</u>	of	<u>43</u>
Event Description:	Leak in L/D HX								
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available:		XCP-644-1-3 CC LOOP A RM-L2A HI RAD; XCP-644-1-4 CC LOOP A RM-L2A TRBL; XCP-643-3-6 CC SRG TK VENT 7096 CLSD HI RAD
	RO	Responds to alarm(s).
	RO	Enters ARP-001-XCP-644-1-3.
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> Radioactive in-leakage into the Component Cooling Water System.
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> IPVV-7096, CC SURGE TK VLV, closes.
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> Verify the Automatic Action has occurred. Verify the alarm is valid by observing RM-L2A and R/R-5 for increasing radiation. Notify Health Physics and request a radiological survey. Notify Chemistry and request a sample of the Component Cooling System. Monitor Component Cooling System flows, temperatures and annunciators for any indications of equipment failure.
Booth Operator: Approximately two minutes after Health Physics and Chemistry are dispatched, report that high activity exists in CCW system		
	CREW	Determines leak is in Letdown HX based on CCW indications, PCV-145 response and VCT level.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>14</u>	of	<u>43</u>
Event Description:	Leak in L/D HX								
Time	Position	Applicant's Actions or Behavior							

		SUPPLEMENTAL ACTIONS:
		<ul style="list-style-type: none"> Isolate the source of in-leakage when confirmed by sample analysis or a radiological survey.
		<ul style="list-style-type: none"> If leakage is from a Reactor Coolant Pump Thermal Barrier, verify adequate seal injection flow and close the associated following valve for the affected pump: (N/A)
		<ul style="list-style-type: none"> If leakage is from the Letdown Heat Exchanger, perform the following: <ul style="list-style-type: none"> Place Excess Letdown in service per SOP-102.
	RO	SOP-102, Section C – Establishing Excess Letdown
		Verifies Initial Conditions:
		<ul style="list-style-type: none"> RCS heatup is in progress or increased Letdown is required.
		<ul style="list-style-type: none"> Component Cooling Water is in operation per SOP-118.
		Procedure Note 2.0: Due to the heat loss generated not being an input to the calorimetric thermal power calculation, Core Power should be maintained at less than or equal to 2898 MWt prior to and during Excess Letdown operations.
	RO	Ensure HCV-137, XS LTDN HX, is closed.
		Procedure Note 2.2: Excess Letdown should normally be directed to the VCT. If required, Excess Letdown may be aligned to the RCDT.
	RO	Place PVM-8143, XS LTDN TO VCT OR RCDT to one of the following as desired: (PEER √)
		<ul style="list-style-type: none"> VCT (preferred).
		<ul style="list-style-type: none"> RCDT (alternate).

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>15</u>	of	<u>43</u>
Event Description:	Leak in L/D HX								
Time	Position	Applicant's Actions or Behavior							

	RO	If required, reset Phase A Isolation by depressing the following: (N/A)
		<ul style="list-style-type: none"> MVT-8100, SEAL WTR RTN ISOL. MVT-8112, SEAL WTR RTN ISOL.
	RO	Ensure MVG-9583, FROM XS LTDN HX, is open.
	RO	Open PVT-8153, XS LTDN ISOL.
	RO	Open PVT-8154, XS LTDN ISOL.
Procedure Note 2.8: When sending Excess Letdown to the RCDT, RCDT level and pump operation should be monitored locally at XPN0007, WASTE PROCESSING/BORON RECYCLE CONT PNL (AB-412).		
	RO	Establish Excess Letdown flow as follows:
		<ul style="list-style-type: none"> Slowly throttle open HCV-137, XS LTDN HX. Monitor TI-139, XS LETDOWN HX OUT TEMP °F, to maintain less than 165°F. Monitor the following to ensure flow between 0.2 gpm and 5.0 gpm: <ul style="list-style-type: none"> FR-154A, RCP SL LKOFF HI RANGE. FR-154B, RCP SL LKOFF LO RANGE.
	RO	Returns to ARP-001-XCP-644-1-3 to complete steps
		<ul style="list-style-type: none"> Close PVT-8149A(B)(C), LTDN ORIFICE A(B)(C) ISOL. Close LCV-460, LTDN LINE ISOL. Close LCV-459, LTDN LINE ISOL. Close PVT-8152, LTDN LINE ISOL. Close PCV-145, LO PRESS LTDN.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>16</u>	of	<u>43</u>
Event Description:	Leak in L/D HX								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> • Close FCV-122, CHG FLOW.
		<ul style="list-style-type: none"> • Adjust HCV-186, INJ FLOW, to maintain 6-13 gpm per pump.
Lead Evaluator cue Event 5, Unit Auxiliary Transformer High Temperature, after HCV-186 has been adjusted or seal injection flow is evaluated as satisfactory.		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>5</u>	Page	<u>17</u>	of	<u>43</u>
Event Description: Unit Auxiliary Transformer High Temperature									
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available:		XCP-633-6-3, UNIT AUX XFMR XTF-2 TRBL
	BOP	Responds to alarm.
	BOP	Enters ARP-001-XCP-633-6-3.
		PROBABLE CAUSE:
		• Transformer N2 pressure high: 8.5 psig
		• Transformer N2 pressure low: -1.5 psig
		• Empty N2 cylinder: 200 psig
		• Winding temperature high: 117 °C
		• High oil temperature: 90 °C
		• Low oil level.
		• Loss of voltage.
		• Mechanical relief: 10 psig
		• Sudden pressure: 5.5 psi/sec
		• Combustible limit: 1%
	CREW	Dispatches AO to investigate.
Booth Operator:		<ul style="list-style-type: none"> • Wait approximately 3 minutes then (as AO) report winding temperature at 120 °C and rising slowly with all fans running. • If contacted as Maintenance or System Engineer, wait 3 minutes then report that the temperature appears to be valid but no reason is apparent.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>5</u>	Page	<u>18</u>	of	<u>43</u>
Event Description: Unit Auxiliary Transformer High Temperature									
Time	Position	Applicant's Actions or Behavior							

		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> If the alarm is caused by a sudden pressure, the 86T2-1, UNIT AUX DIFF LOCK-OUT RELAY, will actuate.
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> If a trip occurs, refer to UNIT AUX DIFF LCKOUT 86T2-1 (XCP-639 3-2).
		<ul style="list-style-type: none"> Dispatch an Operator to XTF0002, UNIT AUXILIARY TRANSFORMER, to determine the cause of the alarm.
		<ul style="list-style-type: none"> Notify the System Controller.
		SUPPLEMENTAL ACTIONS:
		<ul style="list-style-type: none"> If necessary, transfer loads to the Emergency Auxiliary Transformers per SOP-304.
		<ul style="list-style-type: none"> When the cause has been corrected, verify XTF0002, UNIT AUXILIARY TRANSFORMER, auxiliaries are returned to normal operation per SOP-303.
		<ul style="list-style-type: none"> Contact Substation Maintenance for further assistance, if necessary.
	CRS	Directs BOP to transfer loads to Emergency Auxiliary Transformers per SOP-304.
	BOP	Verifies Initial Conditions:
		<ul style="list-style-type: none"> The AUTO-MAN XFER Switch for each Balance of Plant bus is in AUTO.
		<ul style="list-style-type: none"> XTF0031 and XTF0032, EMERGENCY AUXILIARY TRANSFORMER #1 and #2 are in service per SOP-302.
		<ul style="list-style-type: none"> Conditions exist which require removal of normal feed for the buses.
		<ul style="list-style-type: none"> XTF0001, MAIN TRANSFORMER and XTF0002, UNIT AUXILIARY TRANSFORMER are in service per SOP-302.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>5</u>	Page	<u>19</u>	of	<u>43</u>
Event Description: Unit Auxiliary Transformer High Temperature									
Time	Position	Applicant's Actions or Behavior							

Procedure Note 2.1 through 2.3:

When BUS 1A, 1B, or 1C is aligned to its alternate feed, automatic transfer to its normal feed is not available.

	BOP	Manually transfer BUS 1A to alternate feed as follows: <ul style="list-style-type: none"> Place BUS 1A AUTO-MAN XFER Switch in MAN. Close BUS 1A ALT FEED breaker. (PEER ✓) Open BUS 1A NORM FEED breaker. (PEER ✓) Verify BUS 1A potential lights remain energized Place BUS 1A AUTO-MAN XFER Switch in AUTO. (PEER ✓)
	BOP	Manually transfer BUS 1B to alternate feed as follows: <ul style="list-style-type: none"> Place BUS 1B AUTO-MAN XFER Switch in MAN. Close BUS 1B ALT FEED breaker. (PEER ✓) Open BUS 1B NORM FEED breaker. (PEER ✓) Verify BUS 1B potential lights remain energized. Place BUS 1B AUTO-MAN XFER Switch in AUTO. (PEER ✓)
	CREW	Notify the System Controller of the applicable bus voltage limits from Enclosure B. <ul style="list-style-type: none"> Lower 216.9 Higher 239.6
	CREW	If required, adjust the 115KV and/or 230KV alarm setpoints per Attachment VA and/or Attachment VB for the current lineup. <ul style="list-style-type: none"> Complete attachment but do not change setpoints
Evaluator Note: Ask follow-up question – What are the new setpoints and how are the alarm setpoints adjusted?		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>5</u>	Page	<u>20</u>	of	<u>43</u>
Event Description: Unit Auxiliary Transformer High Temperature									
Time	Position	Applicant's Actions or Behavior							

	BOP	Manually transfer BUS 1C to alternate feed as follows:
		• Place BUS 1C AUTO-MAN XFER Switch in MAN.
		• Close BUS 1C ALT FEED breaker. (PEER ✓)
		• Open BUS 1C NORM FEED breaker. (PEER ✓)
		• Verify BUS 1C potential lights remain energized.
		• Place BUS 1C AUTO-MAN XFER Switch in AUTO. (PEER ✓)
Lead Evaluator cue Event 6, Controlling PZR Level Channel fails LO, after all buses have been transferred.		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>6</u>	Page	<u>21</u>	of	<u>43</u>
Event Description:		PZR Level Channel LT-459 fails low							
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:**Indications Available:**

XCP-614 5-1, CHG LINE FLO HI/LO
 XCP-616 1-3, BLCK HTRS ISOL LTDN PZR LCS
 LO XCP-616 1-5, PZR LCS DEV HI/LO
 XCP-616 3-1, PZR HTR CNTRL OR BU GRP 1/2
 TRIP
 XCP-616 4-6 SCR OUTPT LOSS

	RO	Responds to multiple alarms.
	CREW	Recognizes entry conditions for AOP-401.6, PZR LEVEL CONTROL AND PROTECTION CHANNEL FAILURE.
	RO	Performs Immediate actions of AOP-401.6
		<ul style="list-style-type: none"> Place PZR LEVEL CNTRL Switch to the position with two operable channels.
	CRS	Enters AOP-401.6 and verifies immediate action performance.
	RO	Select an operable channel on PZR LEVEL RCDR.
	RO	Control the PZR Heaters as necessary to maintain PZR pressure:
		<ul style="list-style-type: none"> CNTRL GRP Heaters. BU GRP 1 Heaters. BU GRP 2 Heaters.
Evaluator's Note:	If RCS pressure drops below 2206 psig, the crew is required to enter TS 3.2.5, DNBR Parameters (Actions below at end of event)	

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>6</u>	Page	<u>22</u>	of	<u>43</u>
Event Description:		PZR Level Channel LT-459 fails low							
Time	Position	Applicant's Actions or Behavior							

Evaluator's Note: Several steps will be contrary to the pre-event alignment for the Letdown HX leak with letdown isolated and charging minimized. The CRS should make decisions to maintain the pre-event conditions.

	RO	Verify Letdown is in service. (NO)
	RO	Check if PZR LVL MASTER CONTROLLER is responding appropriately: (N/A)
	RO	Place FCV-122, CHG FLOW, in AUTO. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.

Booth Operator/Evaluator's Note:

The bistables do NOT need to be tripped to continue the scenario.

	CRS	Within 72 hours, place the failed channel protection bistables in a tripped condition:
		<ul style="list-style-type: none"> Identify the associated bistables for the failed channel REFER TO Attachment 1.
		<ul style="list-style-type: none"> Record the following for each associated bistable on SOP-401, REACTOR PROTECTION AND CONTROL SYSTEM, Attachment I:
		<ul style="list-style-type: none"> Instrument.
		<ul style="list-style-type: none"> Associated Bistable.
		<ul style="list-style-type: none"> Bistable Location.
		<ul style="list-style-type: none"> STPs.
		<ul style="list-style-type: none"> Notify the I&C Department to place the identified bistables in trip.
	CRS	Determine and correct the cause of the channel failure.
		<ul style="list-style-type: none"> Contacts Work Control/I&C for assistance.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>6</u>	Page	<u>23</u>	of	<u>43</u>
Event Description: PZR Level Channel LT-459 fails low									
Time	Position	Applicant's Actions or Behavior							

	CRS	<i>Enters TS Table 3.3-1, Functional Unit 11 – Action 6</i>
		<i>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:</i>
		<ul style="list-style-type: none"> <i>The inoperable channel is placed in the tripped condition within 72 hours; and</i>
		<ul style="list-style-type: none"> <i>The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.</i>
	CRS	<i>IF RCS Pressure dropped below 2206 psig, enters TS 3.2.5 action</i>
		<i>With any of the above parameters exceeding its limit, restore the parameter to within limits within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours</i>
Lead Evaluator cue Event 7, Inadvertent Reactor Trip,		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>24</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:**Indications Available: FIRST OUT ANNUNCIATOR – MAN RX TRIP**

	CREW	Responds to multiple alarms.
	RO	Reports Reactor Trip. (Notes 1 RTB opened)
	CRS	Enters EOP-1.0.
<p>Procedure Note:</p> <ul style="list-style-type: none"> • Steps 1 through 5 are Immediate Operator Actions. • The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. • Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN. 		
	RO	Verify Reactor Trip: <ul style="list-style-type: none"> • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. • Verify all Rod Bottom Lights are lit. • Verify Reactor Power level is decreasing.
	BOP	Verify Turbine/generator Trip: <ul style="list-style-type: none"> • Verify all Turbine STM Stop VLVs are closed. • Ensure Generator Trip (after 30 second delay): <ul style="list-style-type: none"> • Ensure the GEN BKR is open. • Ensure the GEN FIELD BKR is open. • Ensure the EXC FIELD CNTRL is tripped.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>25</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

	BOP	Verify both ESF buses are energized. (YES)
	RO	Check if SI is actuated:
		<ul style="list-style-type: none"> Check if either:
		<ul style="list-style-type: none"> SI ACT status light is bright on XCP-6107, 1-1. (NO)
		OR
		<ul style="list-style-type: none"> Any red first out SI annunciator is lit on XCP-626 top row. (NO)
	CRS	Go to Step 5.
Evaluator Note: Minimum communication required is parameter value and trend		
	RO	Check if SI is required: (NO)
		<ul style="list-style-type: none"> Check if any of the following conditions exist:
		<ul style="list-style-type: none"> PZR pressure LESS THAN 1850 psig.
		OR
		<ul style="list-style-type: none"> RB pressure GREATER THAN 3.6 psig.
		OR
		<ul style="list-style-type: none"> Steamline pressure LESS THAN 675 psig.
		OR
		<ul style="list-style-type: none"> Steamline differential pressure GREATER THAN 97 psid.
	CRS	Go to EOP-1.1, REACTOR TRIP RECOVERY.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>26</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

Procedure Caution: If SI actuation occurs during this procedure, EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, should be performed to stabilize the plant.

Procedure Note:

- The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.

	CREW	Announce plant conditions over the page system.
	RO	Check FW status: <ul style="list-style-type: none"> Check if RCS Tavg is LESS THAN 564 °F. (YES)
	BOP	Verify FW Isolation: <ul style="list-style-type: none"> Ensure the FW Flow Control Valves, FCV-478(488)(498), are closed. (YES) Ensure the Main FW Isolation Valves, PVG-1611A(B)(C), are closed. (YES) Ensure the FW Flow Control Bypass Valves, FCV-3321(3331)(3341), are closed. (YES)
	BOP	Ensure EFW Pumps are running: <ul style="list-style-type: none"> Ensure both MD EFW Pumps are running. Verify the TD EFW Pump is running if necessary to maintain SG levels.
	BOP	Verify total EFW flow is GREATER THAN 450 gpm. (YES)
	BOP	Trip all Main FW Pumps.
	RO	Check RCS temperature:

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>27</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> With any RCP running, RCS Tavg is stable at OR trending to 557 °F. (YES)
Procedure Note – Step 4: If a transition is made to AOP-112.2, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI, the steps of EOP-1.1 which do NOT conflict with AOP-112.2 should be completed as time allows.		
	CRS	IF EOP-1.0 was entered from AOP-112.2, THEN RETURN TO AOP-112.2, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI, Step 7.
Booth Operator's Note: Insert PZR Steam Space Break after all control rods are verified inserted.		
	RO	Verify all control rods are fully inserted.
	RO	Reports rapidly lowering RCS Pressure/AUTO SI.
	CRS	Returns to EOP-1.0.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>28</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

Evaluator's Note: The EOP-1.0 Reference Page Criteria that applies in this scenario is:

RCP TRIP CRITERIA

- IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs.
- IF both of the following conditions occur, THEN trip all RCPs:
 - SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM AND RCS Wide Range pressure is LESS THAN 1400 psig.

REDUCING CONTROL ROOM EMERGENCY VENTILATION

- Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.

Evaluator's Note: Actions for ATTACHMENT 3, SI EQUIPMENT VERIFICATION, are provided on the final 3 pages of this scenario guide. There is a critical task to close at least one Phase "A" Isolation Valve in two lines that have not properly isolated.

- RB Instrument Air
- RCP Seal Water Return

	BOP	Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.
	CREW	Reports failure of RHR Pump "A"

Evaluator Note: CRS may direct NROATC to start RHR Pump "B".

Booth Operator's Note:

If dispatched wait 2-3 minutes and then report RHR Pump "A" breaker tripped on overcurrent.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>29</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

	CREW	Announce plant conditions over the page system.
	RO	Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen (YES)
	RO	Check RCS temperature:
		<ul style="list-style-type: none"> With any RCP running, RCS Tavg is stable at OR trending to 557°F.
		<ul style="list-style-type: none"> With no RCP running, RCS Tcold is stable at OR trending to 557°F. (NO)
	BOP	IF RCS temperature is LESS THAN 557 °F AND decreasing, THEN stabilize temperature by performing the following as required:
		<ul style="list-style-type: none"> Close IPV-2231, MS/PEGGING STM TO DEAERATOR.
		<ul style="list-style-type: none"> Perform one of the following:
		<ul style="list-style-type: none"> IF Narrow Range SG level is LESS THAN 26% [40%] in all SGs, THEN reduce EFW flow as necessary to stop cooldown, while maintaining total EFW flow GREATER THAN 450 gpm. OR
		<ul style="list-style-type: none"> WHEN Narrow Range SG level is GREATER THAN 26% [40%] in at least one SG, THEN control EFW flow as necessary to stabilize RCS temperature at 557°F.
		<ul style="list-style-type: none"> COMMENCE ATTACHMENT 6, STEAM VALVE ISOLATION, while continuing with this procedure.
		<ul style="list-style-type: none"> IF RCS cooldown continues, THEN close:
		<ul style="list-style-type: none"> MS Isolation Valves, PVM-2801A(B)(C).
		<ul style="list-style-type: none"> MS Isolation Bypass Valves, PVM-2869A(B)(C).
	RO	Check PZR PORVs and Spray Valves:

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>30</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> PZR PORVs are closed. (YES)
		<ul style="list-style-type: none"> PZR Spray Valves are closed. (YES)
		<ul style="list-style-type: none"> Verify power is available to at least one PZR PORV Block Valve: (YES)
		<ul style="list-style-type: none"> MVG-8000A, RELIEF 445 A ISOL.
		<ul style="list-style-type: none"> MVG-8000B, RELIEF 444 B ISOL
		<ul style="list-style-type: none"> MVG-8000C, RELIEF 445 B ISOL.
		<ul style="list-style-type: none"> Verify at least one PZR PORV Block Valve is open. (YES)
Procedure Note:		Seal Injection flow should be maintained to all RCPs.
	RO	Check if RCPs should be stopped:
CRITICAL TASK #1		<ul style="list-style-type: none"> Stop all RCP's before the transition to EOP-2.0.
	BOP	Verify no SG is FAULTED:
		<ul style="list-style-type: none"> No SG pressure is decreasing in an uncontrolled manner. (YES)
		<ul style="list-style-type: none"> No SG is completely depressurized. (YES)
	CREW	Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED: (YES to all)
		<ul style="list-style-type: none"> RM-G19A (B) (C) STMLN HI RNG GAMMA
		<ul style="list-style-type: none"> RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR.
		<ul style="list-style-type: none"> RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR.
		<ul style="list-style-type: none"> RM-L10, SG BLOWDOWN CW DISCHARGE LIQUID MONITOR.
	RO	Check if the RCS is INTACT: (NO to any or all)

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>31</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> RB radiation levels are normal on: <ul style="list-style-type: none"> RM-G7, CONTAINMENT HI RNG GAMMA RM-G18, CNTMNT HI RNG GAMMA. RB Sump levels are normal. RB pressure is LESS THAN 1.5 psig. The following annunciators are NOT lit: <ul style="list-style-type: none"> XCP-606 2-2 (RBCU 1A/2A DRN FLO HI) XCP-607 2-2 (RBCU 1B/2B DRN FLO HI)
	CRS	Transitions to EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT.
		<p>Procedure Note:</p> <ul style="list-style-type: none"> The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. Seal Injection flow should be maintained to all RCPs. Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.
		<p>Booth Operator's Note:</p> <p>Trip RHR Pump "B" as the reading of the first step is in progress. If dispatched to investigate, report the breaker tripped and very hot motor with a smell of burned electrical insulation in the area of the pump.</p>
	RO	Check if RCPs should be stopped (None running).
	BOP	Verify no SG is FAULTED
		<ul style="list-style-type: none"> No SG decreasing in an uncontrolled manner (YES) No SG completely depressurized (YES)

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>32</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

	BOP	Check Intact SG levels
		<ul style="list-style-type: none"> NR level in intact SGs >26% [40%] Control EFW flow to maintain 40 [50%]-60% NR level
	RO	Reset both SI RESET TRAIN A(B) Switches.
	RO	Reset Containment Isolation:
		<ul style="list-style-type: none"> RESET PHASE A - TRAIN A(B) CNTMT ISOL. RESET PHASE B - TRAIN A(B) CNTMT ISOL.
	RO/BOP	Check if Secondary radiation levels are normal: (YES to all)
		<ul style="list-style-type: none"> Check radiation levels normal on: <ul style="list-style-type: none"> RM-G19A(B)(C), STMLN HI RNG GAMMA. RM-A9, CNDSR EXHAUST GAS ' ATMOS MONITOR. RM-L3, STEAM GENERATOR ' BLOWDOWN LIQUID MONITOR. RM-L10, SG BLOWDOWN CW ' DISCHARGE LIQUID MONITOR. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.
	RO	Check PZR PORVs and Block Valves:
		<ul style="list-style-type: none"> Verify power is available to the PZR PORV Block Valves: <ul style="list-style-type: none"> MVG-8000A, B, C (YES) Verify all PZR PORVs are closed. (YES) Verify at least one PZR PORV Block Valve is open. (YES)

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>33</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

	RO/BOP	Place both ESF LOADING SEQ A(B) RESETS to:
		<ul style="list-style-type: none"> • NON-ESF LCKOUTS • AUTO-START BLOCKS
	RO	Establish Instrument Air to the RB:
		<ul style="list-style-type: none"> • Start one Instrument Air Compressor and place the other in Standby. • Open PVA-2659, INST AIR TO RB AIR SERV. • Open PVT-2660, AIR SPLY TO RB.
	RO	Check if SI flow should be reduced:
		<ul style="list-style-type: none"> • RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 30 °F. (NO)
	CRS	GO TO Step 11.
	RO	Check if RB Spray should be stopped:
		<ul style="list-style-type: none"> • Check if any RB Spray Pumps are running. (NO)
	CRS	GO TO Step 12. Observe the CAUTION prior to Step 12.
Evaluator Note: Closely monitor SRO decision at the following steps. SRO should NOT loop back to procedure step 1.		
	RO	Check if RHR Pumps should be stopped: (None running)
	RO	Check if RCS pressure is stable or decreasing. (YES)

Op Test No.: 1 Scenario # 1 Event # 7, 8, & 9 Page 34 of 43

Event Description: Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0

Time	Position	Applicant's Actions or Behavior
	BOP	Check if pressure in all SGs is stable or increasing. (YES)
	BOP	Check if DGs should be stopped:
		<ul style="list-style-type: none"> Verify both ESF buses are energized by offsite power. (YES)
		<ul style="list-style-type: none"> Stop any unloaded DG. REFER TO SOP-306, EMERGENCY DIESEL GENERATOR.
	RO	Verify equipment is available for Cold Leg Recirculation:
		<ul style="list-style-type: none"> Verify power is available for at least one RHR Pump: (NO – both breakers are tripped)
<p>Lead Evaluator may terminate this scenario at his discretion after entry to EOP-2.4 when all critical tasks are addressed.</p>		
	CRS	GO TO EOP-2.4, LOSS OF EMERGENCY COOLANT RECIRCULATION.
<p>Procedure Caution:</p> <ul style="list-style-type: none"> If Emergency Coolant Recirculation capability is restored, further recovery action should continue by RETURNING TO the Procedure and Step in effect, since further actions of this procedure are unnecessary. If the suction source is lost to any SI OR RB Spray Pump, the AFFECTED pump should be stopped to prevent pump damage. 		
<p>Procedure Note: Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.</p>		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>35</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

Procedure Note – Step 1:

RHR Sump blockage is indicated by decreased and unstable pump amps, discharge pressure, OR discharge flow.

	CRS	IF both RHR Pumps are secured due to cavitation, THEN GO TO EOP-2.6, RHR SUMP BLOCKAGE, Step 1. (NO)
	CRS	Try to restore at least one train of Emergency Coolant Recirculation:
		<ul style="list-style-type: none"> Notify TSC personnel of conditions and indications.

Booth Operator's Note:

If contacted, report that the TSC is still manning. You will call back when it is activated.

--	--	--

Procedure Caution – Step 2.b:

Equipment may be in abnormally high radiation areas. Appropriate radiological precautions must be taken to minimize personnel exposure.

	RO	Reset both SI RESET TRAIN A(B) Switches.
	RO	Reset both LATCHED SI RHR SUMP VLV TRAIN A(B) Switches.
	BOP	Ensure two RBCU Fans are running in slow speed (one per train).
	RO	Verify RWST level is GREATER THAN 6%. (YES)

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>36</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

	RO	Check if RB Spray should be aligned for recirculation:
		<ul style="list-style-type: none"> Verify at least one RB Spray Pump is running. (NO)
	CRS	GO TO Step 9.
	RO	Reset Containment Isolation:
		<ul style="list-style-type: none"> RESET PHASE A - TRAIN A(B) CNTMT ISOL. RESET PHASE B - TRAIN A(B) CNTMT ISOL.
	RO/BOP	Place both ESF LOADING SEQ A(B) RESETS to:
		<ul style="list-style-type: none"> NON-ESF LCKOUTS AUTO-START BLOCKS
	RO	Establish Instrument Air to the RB:
		<ul style="list-style-type: none"> Start one Instrument Air Compressor and place the other in Standby. Open PVA-2659, INST AIR TO RB AIR SERV. Open PVT-2660, AIR SPLY TO RB.
Evaluator's Note: The RWST Makeup Initiation steps follow. It is likely that the scenario will be terminated before the makeup terminates. All steps (except field operations) are performed by the RO.		
	RO	Add makeup to the RWST:
		<ul style="list-style-type: none"> REFER TO SOP-106, REACTOR MAKEUP WATER SYSTEM. Place RX COOL SYS MU to STOP. Place RX COOL SYS MU MODE SELECT to MAN. (Peer ✓)

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>37</u>	of	<u>43</u>
Event Description:		Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0							
Time	Position	Applicant's Actions or Behavior							

Procedure Note 2.3:		
Boric Acid flow rate should be set slightly higher than required mixture rate to ensure Boric Acid flow terminates first and lines are flushed with Reactor Makeup Water.		
		<ul style="list-style-type: none"> Adjust FCV-113 A & B, BA FLOW SET PT, for desired flow rate.
		<ul style="list-style-type: none"> Set FIS-113, BA TO BLNDR FLOW, batch integrator for desired quantity. (Peer ✓)
		<ul style="list-style-type: none"> Adjust FCV-168, TOTAL MU FLOW SET PT, for desired flow rate.
		<ul style="list-style-type: none"> Set FIS-168, TOTAL MU FLOW, Batch Integrator for desired quantity. (Peer ✓)
Booth Operator's Note:		
Determine REMOTE functions for the following step during validation.		
	CREW	Open the following (AB-436):
		<ul style="list-style-type: none"> XVD08432-CS, RWST & RHT BA INLET HDR ISOL VALVE.
		<ul style="list-style-type: none"> XVD08434-CS, RWST BORIC ACID INLET HEADER ISOL VALVE.
Procedure Note 2.8:		
Normally open XVD08430-CS, BORIC ACID BLENDER INLET ISOL VALVE, is locked closed in Mode 6 in compliance with Technical Specification surveillance requirement 4.9.1.3.		
		<ul style="list-style-type: none"> If required, unlock and open XVD08430-CS, BORIC ACID BLENDER INLET ISOL VALVE (AB-412). (N/A)

Op Test No.: 1 Scenario # 1 Event # 7, 8, & 9 Page 38 of 43

Event Description: Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> If XVD08430-CS, BORIC ACID BLENDER INLET ISOL VALVE, is open and it is desired to only transfer boric acid to the RWST, place FCV-168B, MU WTR TO BLENDER, in CLOSE.
		<ul style="list-style-type: none"> Place RX COOL SYS MU to START.
		<ul style="list-style-type: none"> If desired, place FCV-113, A&B, BA FLOW, controller in AUTO.
		Verify the following:
		<ul style="list-style-type: none"> Desired flow rate on FR-113, BA TO BLNDR GPM (F-113).
		<ul style="list-style-type: none"> Desired flow rate on FR-113, TOTAL MU GPM (F-168).
		<ul style="list-style-type: none"> RWST level increases.
	BOP	Check Intact SG levels:
		<ul style="list-style-type: none"> NR level in intact SGs >26% [40%] (YES)
		<ul style="list-style-type: none"> Control EFW flow to maintain 40 [50%]-60% NR level
		<p>Procedure Note – Step 5:</p> <ul style="list-style-type: none"> Before the Low Steamline Pressure SI signal is blocked, Main Steam Isolation will occur if the Low Steam Pressure rate setpoint is exceeded. Shutdown margin should be monitored during RCS cooldown.
CRITICAL TASK #3	CRS	<p>Initiate RCS cooldown to Cold Shutdown:</p> <p>Initiate an RCS cooldown prior to taking any action to reduce SI flow.</p>
		<ul style="list-style-type: none"> Maintain the cooldown rate in the RCS Cold Legs LESS THAN 100 °F/hr.
		<ul style="list-style-type: none"> WHEN RCS Tavg is LESS THAN P-12 (552 °F), THEN:

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>39</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Place both STM DUMP INTERLOCK Switches to BYP INTLK.
		<ul style="list-style-type: none"> Place both STMLN SI TRAIN A(B) Switches to BLOCK.
		<ul style="list-style-type: none"> Close the MS Isolation Valves, PVM-2801A(B)(C), for any FAULTED or RUPTURED SGs.
	BOP	Dump steam from each intact SG to the condenser.
		<ul style="list-style-type: none"> Verify permissive C-9 light is bright on XCP-6114-1-3. (YES)
Evaluator's Note:		The crew could elect to leave the MSIVs closed and initiate the cooldown on the Steamline Power Reliefs.
	BOP	Perform the following:
		<ul style="list-style-type: none"> Verify the MS Isolation Valves PVM-2801A, B, C are open for the intact SGs.
	BOP	Place the STM DUMP CNTRL Controller in MAN and closed.
	BOP	Place the STM DUMP MODE SELECT Switch in STM PRESS.
	BOP	Adjust the STM DUMP CNTRL Controller to obtain the desired cooldown rate.
	RO	Check if SI System is in service.
		<ul style="list-style-type: none"> Any Charging Pump is running with flow indicated on FI-940(943), CHG LOOP A(B) CLD/HOT LG FLOW GPM. (YES)
		OR
		<ul style="list-style-type: none"> Any RHR Pump is running in the SI Mode. (NO)

Op Test No.: 1 Scenario # 1 Event # 7, 8, & 9 Page 40 of 43

Event Description: Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0

Time	Position	Applicant's Actions or Behavior
	RO	Establish one train of SI flow to conserve RWST inventory:
		<ul style="list-style-type: none"> • Ensure only one Charging Pump running. Stops one Charging Pump.
		<ul style="list-style-type: none"> • Verify RCS pressure is LESS THAN 250 psig. (NO)
		<ul style="list-style-type: none"> • IF RHR is NOT the suction source for the Charging Pumps, THEN stop both RHR Pumps. (Neither running)
	CRS	GO TO Step 17.
Lead Evaluator: Terminate the scenario when Step 17 (Verify no backflow from the RWST - - -) is started.		

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>41</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

EOP-1.0, ATTACHMENT 3

Evaluator Note:

- **MDEFW Pump "A" and RHR Pump "A" will not be running.**
- **There will be no flow from RHR Pump "B" (until it trips) because RCS pressure will remain above the shutoff head.**
- **There is a critical task for isolating two Phase "A" lines.**

	BOP	Ensure EFW Pumps are running:
		<ul style="list-style-type: none"> • Ensure both MD EFW pumps are running. • Verify the TD EFW Pump is running if necessary to maintain SG levels.
	BOP	Ensure the following EFW valves are open:
		<ul style="list-style-type: none"> • FCV-3531 (3541)(3551), MD EFP TO SG A(B)(C). • FCV-3536(3546)(3556), TD EFP TO SG A(B)(C) • MVG-2802A(B), MS LOOP B(C) TO TD EFP.
	BOP	Verify total EFW flow is GREATER THAN 450 gpm. (YES)
	BOP	Ensure FW Isolation:
		<ul style="list-style-type: none"> • Ensure the following are closed: • FW Flow Control • FW Isolation, PVG-1611A(B)(C). • FW Flow Control Bypass, FCV-3321(3331)(3341). • SG Blowdown, PVG-503A(B)(C). • SG Sample, SVX-9398A(B)(C). • Ensure <u>all</u> Main FW Pumps are tripped.

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>42</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

		Ensure SI Pumps are running:
		<ul style="list-style-type: none"> Two Charging Pumps are running.
		<ul style="list-style-type: none"> Both RHR Pumps are running. (NO – "A" is failed and "B" may trip before Attachment 3 is completed)
	BOP	Ensure two RBCU Fans are running in slow speed (one per train).
	BOP	Verify Service Water to the RBCUs:
		<ul style="list-style-type: none"> Ensure two Service Water Pumps are running.
		<ul style="list-style-type: none"> Ensure both Service Water Booster Pumps A(B) are running.
		<ul style="list-style-type: none"> Verify GREATER THAN 2000 gpm flow for each train on: <ul style="list-style-type: none"> FI-4466, SWBP A DISCH FLOW GPM. FI-4496, SWBP B DISCH FLOW GPM.
	BOP	Verify two CCW Pumps are running.
	BOP	Ensure two Chilled Water Pumps and Chillers are running.
	BOP	Check if Main Steamlines should be isolated: (NO)
		<ul style="list-style-type: none"> Check if any of the following conditions are met: <ul style="list-style-type: none"> RB pressure GREATER THAN 6.35 psig. OR Steamline pressure LESS THAN 675 psig. OR Steamline flow GREATER THAN 1.6 MPPH AND Tavg LESS THAN 552°F.
		<ul style="list-style-type: none"> Ensure ALL the following are closed: <ul style="list-style-type: none"> MS Isolation Valves, PVM-2801A(B)(C). MS Isolation Bypass Valves, PVM-2869A(B)(C).

Op Test No.:	<u>1</u>	Scenario #	<u>1</u>	Event #	<u>7, 8, & 9</u>	Page	<u>43</u>	of	<u>43</u>
Event Description:	Inadvertent Rx Trip (RTB "A" Fails OPEN); 850 gpm PZR Steam Space Break (After Transition to EOP-1.1), RHR Pump "A" Breaker Trips; Containment Isolation Phase A Valves Fail As-Is (Require Manual Closure); RHR Pump "B" Trips at Transition to EOP-2.0								
Time	Position	Applicant's Actions or Behavior							

	BOP	Ensure Excess Letdown Isolation Valves are closed:
		<ul style="list-style-type: none"> PVT-8153, XS LTDN ISOL. PVT-8154, XS LTDN ISOL.
	BOP	Verify ESF monitor lights indicate Phase A and Containment Ventilation Isolation on XCP-6103, 6104, and 6106.
		REFER TO ATTACHMENT 4, CONTAINMENT ISOLATION VALVE MCB STATUS LIGHT LOCATIONS, as needed.
CRITICAL TASK #2		Closes at least one valve in each of the following pairs:
		<ul style="list-style-type: none"> 8100 AND/OR 8112, RCP Seal Water Return Isolations 2662A AND/OR 2662B, RB Instrument Air Isolations
	BOP	Verify proper SI alignment:
		<ul style="list-style-type: none"> Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104. Verify all SAFETY INJECTION monitor lights are dim on XCP-6106. Verify SI flow on FI-943, CHG LOOP B COLD/HOT LG FLOW GPM. Check if RCS pressure is LESS THAN 250 psig. (NO) Verify RHR flow on: (No pumps running).

Facility:	VC SUMMER	Scenario No.:	2	Op Test No.:	2009 NRC
Examiners:	_____	Operators:	_____		SRO
	_____		_____		RO
	_____		_____		BOP
Initial Conditions:	<ul style="list-style-type: none"> IC-10, 100% Power, MOL (IC-232 for 2009) RB Spray Pump "B" is tagged out for cleaning and maintenance of the breaker cubicle. 64 hours remain on TS 3.6.2.1. Radiation Monitor RM-A2, Reactor Building Particulate Monitor failed to ZERO 12 hours ago. Planning and Scheduling is preparing a work package. The Action Statement for TS 3.4.6.1.a is in effect. The National Weather Service has issued a severe weather alert due to a line of heavy thunderstorms moving into the area. 				
Turnover:	<ul style="list-style-type: none"> Maintain 100% power. 				
Critical Task:	<ol style="list-style-type: none"> Initiate manual reactor trip prior to exiting step 1 of EOP-1.0. Isolate affected SG before NR level reaches 100%. Trip all RCP's before exiting EOP-2.0. 				
Event	Malf. No.	Event Type*	Event Description		
1	PMPFW013B	C – BOP R – RO	Feedwater Booster Pump "A" bearing failure. Power Reduction.		
2	NIS003D	I – RO TS – CRS	PRNIS Channel N-44 Fails LO.		
3	EH001 EH002 ANN EH009	C – BOP	EHC Pump Trip Standby EHC Pump AUTO start failure. EHC PP A MOTOR OVERLOAD		
4	RCS002B	C – RO TS – CRS	SG "B" SGTL Not Requiring SI.		
5	FWM023A	C – BOP	SG "A" Feedwater Control Valve (FCV-478) fails to respond in AUTO during power reduction (verify malfunction value matches "value" on far right column of DIRECTOR window.		
6	EPS004C	M – ALL	Loss of Service Bus 1C.		
7	PCS009AB PCS009BB	C – RO	AUTO Reactor Trip Failure		
8	RCS002B VLVRC005P VLVRC013P	M – ALL	SG "B" 600 gpm SGTR After Reactor Trip. PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI.		
9	MSS006B	C – BOP	SG "B" MSIV Fails to Close.		
			Terminate at the transition to EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>6</u>	of	<u>42</u>
Event Description: Feedwater Booster Pump "A" bearing failure, Power Reduction									
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available:		XCP-625-1-3, FWBP A/B/C/D OVRD Computer High Temperature alarms Feedwater Booster Pump "A" amps rising
Evaluator/ Booth Operator Note:		
<p>The crew has pre-briefed on the Initial Conditions. Initiate Event 1, Feedwater Booster Pump Trip, approximately 30-60 seconds after the crew assumes the watch.</p> <p>Report "74" relay flag for amber light (when requested) Report "51" relay if pump trips (when requested) (IF DIRECTED to open warmup valve 1639, set LOA-FWM021=100%)</p>		
	BOP	Responds to alarm XCP-625-1-3, FWBP A/B/C/D OVRD.
	CREW	Enters ARP-001-XCP-625-1-3.
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> Pump or pump motor malfunction.
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> Feedwater Booster Pump trips.
Procedure Note:		This alarm has reflash capabilities.

Op Test No.: 1 Scenario # 2 Event # 1 Page 7 of 42

Event Description: Feedwater Booster Pump "A" bearing failure, Power Reduction

Time	Position	Applicant's Actions or Behavior
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> If the number of Feedwater Booster Pumps in operation is less than the number of Feedwater Pumps in operation, immediately trip the Reactor and enter EOP-1.0, REACTOR TRIP SAFETY INJECTION ACTUATION. (NO - 3/3)
		<ul style="list-style-type: none"> If three Feedwater Booster Pumps and three Feedwater Pumps are in operation, reduce Reactor power to 95% per GOP-4C, RAPID POWER REDUCTION. (YES)
	Crew	Determines the need to manually trip Feedwater Booster Pump A.
	BOP	If available, start a standby Feedwater Booster Pump per SOP-210, FEEDWATER SYSTEM.
	BOP	Ensure Deaerator wide range level is maintained greater than 4' as indicated on LI-3135, DEAER STOR TK WR LVL FEET.
	CRS	Enters GOP-4C.
	CRS	Verifies Initial Conditions:
		<ul style="list-style-type: none"> The plant is in Mode 1. (YES)
		<ul style="list-style-type: none"> Conditions exist that do not require a Reactor Trip but do require the Reactor to be in Mode 2 in less time than would be allowed by performing a normal shutdown. (NO, but the ARP has directed use of GOP-4C)
		Note 3.1 through 3.10 <ul style="list-style-type: none"> If time allows, load reductions should be discussed with the Load Dispatcher. Thermal Power changes of greater than 15% in any one hour require completion of Attachment III.H. of GTP-702.

Op Test No.: 1 Scenario # 2 Event # 1 Page 8 of 42

Event Description: Feedwater Booster Pump "A" bearing failure, Power Reduction

Time	Position	Applicant's Actions or Behavior
	CREW	Informs Load Dispatcher.
		Commence rapid Plant Shutdown as follows:
	RO	<ul style="list-style-type: none"> Energize all Pressurizer Heaters.
Procedure Note 3.1.b		
		<ul style="list-style-type: none"> Setting FCV-113A&B, BA FLOW SET PT to 8.3 will yield 33 gpm Boration flow rate.
		Maintain the following with rod motion or boron concentration changes:
		<ul style="list-style-type: none"> Tavg within 10°F and trending to Tref. ΔI within limits. Control Rods above the rod insertion limit.
Evaluator's Note: The crew may initiate a boration before or after the power reduction. Boration steps are not in GOP-4C but are included for evaluator use following the load reduction steps.		
	BOP	Reduce load by either of the following methods:
		<ul style="list-style-type: none"> By use of the DEC LOAD RATE circuit as follows: <ul style="list-style-type: none"> De-energize LOAD LIMIT circuit. Energize DEC LOAD RATE circuit. Select desired rate on LOAD RATE LMT-% PER MIN, up to 5% per minute. Decrease LOAD SET to the load desired. By use of the load limiter as follows: <ul style="list-style-type: none"> Ensure LOAD LMT light is lit.

Op Test No.: 1 Scenario # 2 Event # 1 Page 9 of 42

Event Description: Feedwater Booster Pump "A" bearing failure, Power Reduction

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

		<ul style="list-style-type: none"> Turn the LOAD LMT SET potentiometer counterclockwise, up to a nominal 5% per minute, until the desired load is reached.
BORATION STEPS (SOP-106, Section IV.D – All steps performed by the RO)		
Evaluator Note:	The RO could elect to borate in accordance with SOP-106, Section IV.D – BORATING THE RCS USING THE EMERGENCY BORATION VALVE. A copy of that procedure page is attached at the end of this scenario guide.	
Procedure Note 2.0	<ul style="list-style-type: none"> Energizing additional Pressurizer Heaters will enhance mixing. LCV-115A, LTDN DIVERT TO HU-TK, will begin to modulate to the HU-TK position at 70% level on LI-115, VCT LEVEL %. 	
	RO	Ensure at least one Reactor Coolant Pump is running.
		Place RX COOL SYS MU Switch to STOP.
		Place RX COOL SYS MU MODE SELECT switch to BOR. (Peer ✓)
		Set FIS-113, BA TO BLNDR FLOW, Batch Integrator to the desired volume (Peer ✓)
		Place RX COOL SYS MU Switch to START.
Procedure Note 2.6	Step 2.6 may be omitted when borating less than 10 gallons.	

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>10</u>	of	<u>42</u>
Event Description:		Feedwater Booster Pump "A" bearing failure, Power Reduction							
Time	Position	Applicant's Actions or Behavior							

		Place FCV-113 A&B, BA FLOW, controller in AUTO.
Procedure Note 2.7	The AUTO setpoint dial for FCV-113A&B, BA FLOW, controller may be adjusted slowly to obtain the desired flow rate.	
		Verify the desired Boric Acid flow rate on FR-113, BA TO BLNDR GPM (F-113).
Evaluator Note:	RO will borate approximately 50 gallons	
		When the preset volume of boric acid has been reached, perform the following:
		<ul style="list-style-type: none"> Place FCV-113A&B, BA flow controller in MAN. Verify boration stops.
		Place RX COOL SYS MU switch to STOP.
Procedure Note 2.10	<ul style="list-style-type: none"> If plant conditions require repeated borations, Step 2.10 may be omitted. The volume in the piping between the blender and the VCT outlet is approximately 3.8 gallons. 	
		Alternate Dilute 4 to 6 gallons of Reactor Makeup Water to flush the line downstream of the blender by performing the following:
		<ul style="list-style-type: none"> Place RX COOL SYS MU MODE SELECT switch to ALT DIL. (Peer ✓) Adjust FCV-168, TOTAL MU FLOW SET PT, to desired flow rate.

Op Test No.: 1 Scenario # 2 Event # 1 Page 11 of 42

Event Description: Feedwater Booster Pump "A" bearing failure, Power Reduction

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> Set FIS-168, TOTAL MU FLOW, batch integrator to desired volume. (Peer ✓)
		<ul style="list-style-type: none"> Place RX COOL SYS MU switch to START.
		<ul style="list-style-type: none"> Verify desired flow rate on FR-113, TOTAL MU GPM (F-168).
		<ul style="list-style-type: none"> Verify alternate dilution stops when preset volume is reached on FIS-168, TOTAL MU FLOW, batch integrator.
		<ul style="list-style-type: none"> Place RX COOL SYS MU switch to STOP.
		Place RX COOL SYS MU MODE SELECT switch to AUTO. (Peer ✓)
		Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm).
		In MAN, adjust FCV-113 A&B, BA FLOW OUTPUT, to the required position which will ensure proper Boric Acid addition for subsequent Automatic Makeup operations.
		Adjust FCV-113A&B, BA FLOW SET PT, to the desired position to ensure proper boric acid addition for subsequent Automatic Makeup operations.
		Place RX COOL SYS MU switch to START.
		Place RX COOL SYS MU switch to START.
		Start XPP-13A(B), BA XFER PP A(B), for the in-service Boric Acid Tank.
		If necessary, start XPP-13A(B), BA XFER PP A(B), for the Boric Acid Tank on recirculation.

Op Test No.: 1 Scenario # 2 Event # 1 Page 12 of 42

Event Description: Feedwater Booster Pump "A" bearing failure, Power Reduction

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

Lead Evaluator:

Cue Event 2 (PRNIS Channel N-44 Fails LO) when power is stabilized at (or below) the required value and the reactivity control evaluation is complete.

--	--	--

Op Test No.: 1 Scenario # 2 Event # 2 Page 13 of 42

Event Description: PRNIS Channel N-44 Fails LO

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

Booth Operator Instructions:**Indications Available:** XCP-620-1-4, PR CHAN DEV

	RO	Responds to alarm XCP-620-1-4, PR CHAN DEV, and/or rod motion.

Evaluator's Note: The crew will likely go directly to AOP-401.10, POWER RANGE CHANNEL FAILURE, rather than to implement the ARP.

	RO	Enters ARP-001-XCP-620-1-4
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> • Dropped Rod.
		<ul style="list-style-type: none"> • Quadrant Power Tilt.
		<ul style="list-style-type: none"> • Power Range channel in test.
		<ul style="list-style-type: none"> • Power Range channel failure.
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> • None
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> • Observe Power Range meters NI-41B, NI-42B, NI-43B, and NI-44B.
		<ul style="list-style-type: none"> • Verify proper Control Rod positions.
		SUPPLEMENTAL ACTIONS:
		<ul style="list-style-type: none"> • If a rod dropped, refer to AOP-403.6, DROPPED CONTROL ROD. (NO)
		<ul style="list-style-type: none"> • Determine if a quadrant power tilt exists by: (NO)
		<ul style="list-style-type: none"> • Display TFMMI on the IPCS.

Op Test No.: 1 Scenario # 2 Event # 2 Page 14 of 42

Event Description: PRNIS Channel N-44 Fails LO

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> If the IPCS is not available, perform STP-108.001, QUADRANT POWER TILT RATIO.
		<ul style="list-style-type: none"> If a Power Range channel is in test, place the COMPARATOR CHANNEL DEFEAT switch to the channel being tested.
		<ul style="list-style-type: none"> If an instrument failure is suspected, refer to AOP-401.10, POWER RANGE FAILURE.
	CRS	Enters AOP-401.10
	RO	Performs immediate actions
		<ul style="list-style-type: none"> Verify normal indication on Power Range Channel N-44. (NO)
		<ul style="list-style-type: none"> IF Power Range Channel N-44 has failed, THEN place the ROD CNTRL BANK SEL Switch in MAN.
		<ul style="list-style-type: none"> Stabilize any plant transients in progress.
	CREW	Maintain stable plant conditions.
	CREW	Verify no testing is in progress on the operable Power Range channels.
Evaluator Note: Prompt the CRS to direct the NROATC to perform the actions below on the NI panels		
	RO	Place ROD STOP BYPASS Switch (on the MISCELLANEOUS CONTROL AND INDICATION PANEL) for the failed Power Range channel in BYPASS.
	BOP	Verify the appropriate Rod Stop Bypass status light is bright:
		<ul style="list-style-type: none"> For N-44, B2 OP ROD STOP BYP (XCP-6111 4-4).
	BOP	Adjust Control Rods to maintain Tavg within 1.0 °F of Tref.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>15</u>	of	<u>42</u>
Event Description:	PRNIS Channel N-44 Fails LO								
Time	Position	Applicant's Actions or Behavior							

	CRS	Notify the I&C Department to record detector currents and status lights on POWER RANGE A and POWER RANGE B drawers.
Procedure Caution – Step 9		
The empty fuse holders should NOT be reinstalled as this will allow a small amount of current flow through the blown fuse indicator.		
Evaluator Note:		
The following are expected alarms when the fuses are pulled in the next step:		
<ul style="list-style-type: none"> • XCP-620-1-1, PR HI SETPT FLUX HI • XCP-620-1-2, PR LO SETPT FLUX HI • XCP-620-1-5, PR UP DET FLUX HI DEV AUTO DEFEAT • XCP-620-1-6, PR LOW DET FLUX HI DEV AUTO DEFEAT • XCP-620-2-1, PR DET VOLT LOSS • XCP-620-2-2, PR FLUX HI RATE SINGLE CHAN ALERT 		
	RO	Deenergize the failed Power Range channel:
		<ul style="list-style-type: none"> • Remove the CONTROL POWER fuses from the POWER RANGE A drawer.
		<ul style="list-style-type: none"> • Remove the INSTR POWER fuses from the POWER RANGE B drawer.
Evaluator Note:		
The following alarms will clear during the next step:		
<ul style="list-style-type: none"> • XCP-620-1-4, PR CHAN DEV • XCP-620-1-5, PR UP DET FLUX HI DEV AUTO DEFEAT • XCP-620-1-6, PR LOW DET FLUX HI DEV AUTO DEFEAT 		
	RO	Align the Power Range channel comparator circuits:

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>16</u>	of	<u>42</u>
Event Description:	PRNIS Channel N-44 Fails LO								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Place the following switches to the failed Power Range channel position: <ul style="list-style-type: none"> COMPARATOR CHANNEL DEFEAT Switch (on the COMPARATOR AND RATE drawer). UPPER SECTION Switch (on the DETECTOR CURRENT COMPARATOR drawer). LOWER SECTION Switch (on the DETECTOR CURRENT COMPARATOR drawer).
	RO	Ensure NR-45 is selected to the appropriate operable channels.
	RO	Check if Reactor power is LESS THAN 75%. (NO) <ul style="list-style-type: none"> Initiate GTP-702, Attachment IV.F. (AFD Monitoring)
	RO	Check if Reactor power is LESS THAN 50%. (NO) <ul style="list-style-type: none"> Initiate GTP-702, Attachment IV.D. (QPTR Monitoring)
	CRS	Within 72 hours, place the failed channel protection bistables in a tripped condition: <ul style="list-style-type: none"> Identify the associated bistables for the failed channel. REFER TO Attachment 1. <ul style="list-style-type: none"> NC-44P NC-44R NC-44U(+) Record the following for each associated bistable on SOP-401, REACTOR PROTECTION AND CONTROL SYSTEM, Attachment I: <ul style="list-style-type: none"> Instrument Associated Bistable. Bistable Location. STPs.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>17</u>	of	<u>42</u>
Event Description:	PRNIS Channel N-44 Fails LO								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Notify the I&C Department to place the identified bistables in trip.
	CRS	Refer to Tech Spec 3.3.1., Table 3.3-1, Functional Unit 3.
		Determines ACTION #2 applies: (3.0.4 provisions N/A)
		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:
		<ul style="list-style-type: none"> The inoperable channel is placed in the tripped condition within 72 hours.
		<ul style="list-style-type: none"> The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.
		<ul style="list-style-type: none"> 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 at least once per 12 hours per Specification 4.2.4.2.
	CRS	Determine and correct the cause of the Power Range channel failure.
Lead Evaluator:		
Cue Event 3 (EHC Pump trip/Standby EHC Pump AUTO start failure) after the TS declaration and the channel is bypassed.		

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>3</u>	Page	<u>18</u>	of	<u>42</u>
Event Description:		EHC Pump Trip/Standby EHC Pump AUTO Start Failure							
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:

- When dispatched to investigate pump failure, report no leaks or apparent reason.

Indications Available:

XCP-631-1-4, EHC PP A MOTOR OVRLD
XCP-631-1-2, EHC FLUID PRESS LO

	BOP	Responds to alarm XCP-631-1-4, EHC PP A MOTOR OVRLD
	BOP	Enters ARP-001-XCP-631-1-4
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> • Excessive flow due to an internal leak within the servo valves.
		<ul style="list-style-type: none"> • Excessive flow due to an external leak.
		<ul style="list-style-type: none"> • Mechanical binding of the pump or motor.
		<ul style="list-style-type: none"> • Breaker XSW1C1 06D, EHC FLUID PUMP A XPT0003-PP1-EH, racked out.
Evaluator's Note:	The BOP may start the standby pump before the automatic start setpoint is reached since no EHC Pump is running.	
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> • The pump may trip if the condition is not corrected.
		<ul style="list-style-type: none"> • If the pump trips, the standby pump starts at 1300 psig.
	BOP	If EHC PUMP A is still running, verify high amps. (NO. Pump tripped)
	BOP	Start EHC PUMP B and observe motor amps.

Op Test No.: 1 Scenario # 2 Event # 3 Page 19 of 42

Event Description: EHC Pump Trip/Standby EHC Pump AUTO Start Failure

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

	BOP	If EHC PUMP A is still running with higher amps than EHC PUMP B, secure EHC PUMP A and continue to monitor EHC PUMP B. (EHC Pump A already tripped)
	CREW	Dispatch an operator to check for EHC System leaks.
	BOP	If EHC PUMP B is drawing high amps with EHC PUMP A tripped, attempt to restart EHC PUMP A and run both pumps until an external leak is located or a low level in the EHC fluid tank alarm is received. (NO)
	BOP	If EHC PUMP B overload annunciator is received after starting, commence a Turbine Runback at 5% per minute per GOP-4C. (N/A)
Evaluator's Note: This step should be completed in its entirety prior to exiting to another procedure.		
Booth operator's Note: Unit 5 reports no obvious EHC leak.		
	BOP	Upon receipt of a low level alarm in the EHC fluid tank, perform the following: (N/A)
		<ul style="list-style-type: none"> If Reactor power is greater than 50% (P-9), perform the following: <ul style="list-style-type: none"> Trip the Reactor and implement EOP-1.0, Reactor Trip/Safety Injection Actuation. Trip the Main Turbine. Place the EHC Pumps in PULL TO LK NON-A.
	CRS	Contacts Work Control and/or Maintenance for assistance.
Lead Evaluator:		
When actions for EHC failure are completed, initiate event 4 (SG "B" SGTL Not Requiring SI)		

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>20</u>	of	<u>42</u>
Event Description:	SG "B" SGTL Not Requiring SI								
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:

- **First entry for this event is the trigger for a 12 GPM tube leak on SG "B"**
- **When directed by the Lead Evaluator, then raise SG "B" Tube leakage to 50 GPM**
- **Fail Feedwater Flow Control Valve FCV-478 at the existing position (AUTO only) when the power reduction associated with the SGTL begins.**

Indications Available:**XCP-642-2-1, MN STM LINE RM-G19 HI RAD**

	CREW	Refer to alarm response procedure.
	RO/BOP	Verify the alarm is valid and identify the Main Steam line affected by observing RM-G19A, B, and C and R/R-8.
	CRS	Request Health Physics perform radiological surveys around Main Steam Lines.
	CRS	Direct Chemistry to sample all SGs for activity.

Booth Operator: When requested, report:

- XVB00110-AR, MN&AUX COND VAC PP CHAR EXH DISCH VALVE, OPEN
- XVB00109-AR, MN&AUX COND VAC PUMP ATMOS DISCH VALVE, CLOSED

	CREW	Align the condenser exhaust to the Auxiliary Building Charcoal exhaust as follows: (Dispatches AO)
		<ul style="list-style-type: none"> • Open XVB00110-AR, MN&AUX COND VAC PP CHAR EXH DISCH VALVE (TB-436). • Close XVB00109-AR, MN&AUX COND VAC PUMP ATMOS DISCH VALVE (TB-436).
	BOP	Reduce all Steam Generator Blowdown Flows to minimum.
	CRS	Enters AOP-112.2, Steam Generator Tube Leak Not Requiring SI.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>21</u>	of	<u>42</u>
Event Description:	SG "B" SGTL Not Requiring SI								
Time	Position	Applicant's Actions or Behavior							

	RO	Check if PZR level can be maintained:
		<ul style="list-style-type: none"> Open FCV-122, CHG FLOW, as necessary to maintain PZR level. Verify PZR level is at or trending to program level (YES)
	RO	Reduce Letdown to one 45 gpm orifice:
		<ul style="list-style-type: none"> Set PCV-145, LO PRESS LTDN, to 70%. Ensure PVT-8149A, LTDN ORIFICE A ISOL, is open. Close both PVT-8149B(C), LTDN ORIFICE B(C) ISOL. Adjust PCV-145, LO PRESS LTDN, to maintain PI-145, LO PRESS LTDN PRESS PSIG, between 300 psig and 400 psig. Place PCV-145, LO PRESS LTDN, in AUTO.
	CRS/RO	Check if SI is required: (NO)
		<ul style="list-style-type: none"> Check if any of the following criteria are met: <ul style="list-style-type: none"> Charging maximized with Letdown isolated
		OR
		<ul style="list-style-type: none"> PZR level is approaching 12%, OR PZR pressure is approaching 1870 psig
	CRS	Go to Step 3.
	RO	Verify VCT level is being maintained between 20% and 40%.
	CRS/RO	IF Steam Generator primary to secondary tube leakage has not been determined, THEN perform the following:
		<ul style="list-style-type: none"> Estimate the RCS leak rate refer to IPCS CHG_{NET}. Calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAK TEST.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>22</u>	of	<u>42</u>
Event Description:	SG "B" SGTL Not Requiring SI								
Time	Position	Applicant's Actions or Behavior							

Evaluator Note: Direct the booth operator to raise leak rate to 50 gpm following leak rate determination		
		<ul style="list-style-type: none"> Comply with the applicable Tech Spec 3.4.6.2 action statement a. (N/A)
Evaluator's Note:	The AOP shutdown requirement is more restrictive than the TS requirement in that it specifies a rate of power reduction. The CRS should enter the TS action statement (a) but implement the AOP-112.2, Step 5 table requirement for ≥ 150 GPD.	
	CRS	<i>Determines SGTL exceeds TS 3.4.6.2.c (150 GPD)</i>
		<i>Action a:</i>
		<ul style="list-style-type: none"> <i>With any PRESSURE BOUNDARY LEAKAGE or with primary-to-secondary leakage not within limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.</i>
Procedure Note – Step 5		
		<ul style="list-style-type: none"> Rate of plant shutdown must be evaluated based on magnitude of RCS leak rate (Steam Generator primary to secondary tube leakage). Steam Generator primary to secondary tube leakage rate, and rate of increase, is represented by the following IPCS Computer points: <ul style="list-style-type: none"> UR1019, S/G LEAK RATE FROM RMA9 (in gpd). UR1019-R, S/G LEAKAGE FROM RMA9-RATE (in gpd/hr). Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>23</u>	of	<u>42</u>
Event Description:	SG "B" SGTL Not Requiring SI								
Time	Position	Applicant's Actions or Behavior							

	CRS	IF RCS leak rate (Steam Generator primary to secondary tube leakage) is GREATER THAN OR EQUAL TO 75 gpd (.05 gpm), THEN initiate a plant shutdown per the following table using GOP-4B, POWER OPERATION (MODE 1 DESCENDING).
		<ul style="list-style-type: none"> Be in Mode 3 within 2 hours.
Booth Operator:	If crew requests that Chemistry provide determination of leak rate, inform them that the isotopic analysis calculator is not functioning at this time and they will be unable to provide a leak rate.	
Evaluator's Note:	Feedwater Flow Control Valve FCV-478 will fail at the existing position (in AUTO only) when the power reduction begins. Allow the BOP/CREW to deal with that malfunction then the Lead Evaluator can cue Event 6 (Loss of Service Bus 1C).	
	CREW	Based on control panel indications of steam generator leak rate, the CRS will direct a unit shutdown
	CRS	Initiate a Reactor shutdown: REFER TO GOP-5, REACTOR SHUTDOWN FROM STARTUP TO HOT STANDBY (MODE 2 TO MODE 3), while continuing with this procedure.
	RO	Commence RCS boration to commence load reduction
	BOP	Commence load reduction by decreasing Main Turbine load in accordance with GOP-4B
Booth operator's Note:	Insert MAL FWM023A Feedwater Flow Control Valve FCV-478 will fail at the existing position (in AUTO only) when the power reduction begins.	

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>5</u>	Page	<u>24</u>	of	<u>42</u>
Event Description:		SG "A" Feedwater control Valve (FCV-478) Fails to Respond in AUTO During Power Reduction							
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available:		XCP-624-1-5, SG A LVL DEV
	BOP	Responds to SG LVL DEV alarms and/or observation of different FCV/SG response.
	BOP	Enters ARP-001-XCP-624-1-5.
Evaluator's Note:		The BOP may take MANUAL control of FCV-478 before an alarm setpoint is reached in accordance with management expectations for operator response.
PROBABLE CAUSE:		
		<ul style="list-style-type: none"> Step load increase or decrease. Steam Generator A level control system malfunction. FCV-478, A FCV, malfunction. Testing in progress. Instrument failure.
AUTOMATIC ACTIONS:		
		<ul style="list-style-type: none"> FCV-478, A FCV, will modulate to restore level to 61.6%.
	BOP	Reports FCV-478 appears to not be tracking the AUTO signal.
		<ul style="list-style-type: none"> Evaluate SG A Narrow Range level indicators LI-474, LI-475, and LI-476. If required, restore Steam Generator A level to between 60% and 65% by performing either or both of the following: <ul style="list-style-type: none"> Manually control PVT-478, SG A FWF, as required.
Lead Evaluator:		
Cue Event 6 (Loss of Service Bus 1C) when SG A level is under control.		

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>25</u>	of	<u>42</u>
Event Description:		PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close							
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available:		Multiple Alarms; FLOW LO P-8 PERMSV
	CREW	Responds to multiple alarms.
	RO	Reports Reactor Trip demand signal.
CRITICAL TASK #1	RO	Initiates a MANUAL Reactor trip.
Booth Operator:		Coincident with the MANUAL Reactor Trip, ramp the SG "B" SGTL to 600 GPM over 10 minutes.
	CRS	Enters EOP-1.0.
Procedure Note:	<ul style="list-style-type: none"> • Steps 1 through 5 are Immediate Operator Actions. • The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. • Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN. 	
	RO	Verify Reactor Trip: <ul style="list-style-type: none"> • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. • Verify all Rod Bottom Lights are lit. • Verify Reactor Power level is decreasing.
	BOP	Verify Turbine/Generator Trip: <ul style="list-style-type: none"> • Verify all Turbine STM Stop VLVs are closed.

Op Test No.: 1 Scenario # 2 Event # 8 & 9 Page 26 of 42

Event Description: PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> Ensure Generator Trip (after 30 second delay):
		<ul style="list-style-type: none"> Ensure the GEN BKR is open.
		<ul style="list-style-type: none"> Ensure the GEN FIELD BKR is open.
		<ul style="list-style-type: none"> Ensure the EXC FIELD CNTRL is tripped.
	BOP	Verify both ESF buses are energized. (YES)
	RO	Check if SI is actuated:
		<ul style="list-style-type: none"> Check if either:
		<ul style="list-style-type: none"> SI ACT status light is bright on XCP-6107 1-1. (NO)
		OR
		<ul style="list-style-type: none"> Any red first out SI annunciator is lit on XCP-626 top row. (NO)
	CRS	Go to Step 5.
	RO	Check if SI is required: (NO)
		<ul style="list-style-type: none"> Check if any of the following conditions exist:
		<ul style="list-style-type: none"> PZR pressure LESS THAN 1850 psig.
		OR
		<ul style="list-style-type: none"> RB pressure GREATER THAN 3.6 psig.
		OR
		<ul style="list-style-type: none"> Steamline pressure LESS THAN 675 psig.
		OR
		<ul style="list-style-type: none"> Steamline differential pressure GREATER THAN 97 psid.
	CRS	Go to EOP-1.1, REACTOR TRIP RECOVERY.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>27</u>	of	<u>42</u>
Event Description:	PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close								
Time	Position	Applicant's Actions or Behavior							

Procedure Caution:	If SI actuation occurs during this procedure, EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, should be performed to stabilize the plant.	
Procedure Note:	<ul style="list-style-type: none"> • Main Turbine vibration should be monitored during coastdown. • The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. 	
Evaluator's Note:	<ul style="list-style-type: none"> • The SG "B" SGTR symptoms will become evident during the conduct of EOP-1.1. It is likely that the crew will initiate a MANUAL SI before an AUTO setpoint is reached. Several EOP-1.1 steps are included in the scenario guide. • The EOP Reference Page action to be monitored in EOP-1.1 is: <u>SI ACTUATION CRITERIA</u> IF either of the following conditions occurs, THEN actuate SI and GO TO EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, Step 1: <ul style="list-style-type: none"> • RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 30 °F. OR • PZR level can NOT be maintained GREATER THAN 12%. 	
	CREW	Announce plant conditions over the page system.
		Check FW status:
	RO	<ul style="list-style-type: none"> • Check if RCS Tavg is LESS THAN 564 °F. (YES)
	BOP	<ul style="list-style-type: none"> • Verify FW Isolation:
		<ul style="list-style-type: none"> • Ensure the FW Flow Control Valves, FCV-478(488)(498), are closed. (YES)

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>28</u>	of	<u>42</u>
Event Description:	PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Ensure the Main FW Isolation Valves, PVG-1611A(B)(C), are closed. (YES)
		<ul style="list-style-type: none"> Ensure the FW Flow Control Bypass Valves, FCV-3321(3331)(3341), are closed. (YES)
	BOP	Ensure EFW Pumps are running: <ul style="list-style-type: none"> Ensure both MD EFW Pumps are running. (YES) Verify the TD EFW Pump is running if necessary to maintain SG levels. (NOT required)
	BOP	Verify total EFW flow is GREATER THAN 450 gpm. (YES)
	BOP	Trip all Main FW Pumps.
	RO	Check RCS temperature: <ul style="list-style-type: none"> With any RCP running, RCS Tavg is stable at OR trending to 557 °F. (YES)
	Evaluator's Note:	<ul style="list-style-type: none"> At some point early in EOP-1.1, SGTR symptoms will be evident from lowering PZR level and pressure. The CRS should direct a MANUAL SI when it is clear that the Reference Page SI Initiation criteria will be met. When SI is initiated a PZR PORV will fail OPEN and will not close or isolate.
	CRS	MAY direct a MANUAL SI.
	RO	Initiates a MANUAL SI if directed.
	CRS	Returns to EOP-1.0.

Op Test No.: 1 Scenario # 2 Event # 8 & 9 Page 29 of 42

Event Description: PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close

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

Evaluator's Note: The EOP-1.0 Reference Page Criteria that applies in this scenario is:

RCP TRIP CRITERIA

- IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs.
- IF both of the following conditions occur, THEN trip all RCPs:
 - SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM AND RCS Wide Range pressure is LESS THAN 1400 psig.

REDUCING CONTROL ROOM EMERGENCY VENTILATION

- Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.

Evaluator's Note:

- Actions for ATTACHMENT 3, SI EQUIPMENT VERIFICATION, are provided on the final 3 pages of this scenario guide.
- Adverse containment values will be reached during the scenario.

	BOP	Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.
	CREW	Announce plant conditions over the page system.
	RO	Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen. (YES)
	RO	Check RCS temperature: <ul style="list-style-type: none"> • With any RCP running, RCS Tavg is stable at OR trending to 557°F. (YES)

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>30</u>	of	<u>42</u>
Event Description:		PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close							
Time	Position	Applicant's Actions or Behavior							

	RO	Check PZR PORVs and Spray Valves:
		<ul style="list-style-type: none"> PZR PORVs are closed. (NO PCV-455B OPEN)
		<ul style="list-style-type: none"> PZR Spray Valves are closed. (YES)
		<ul style="list-style-type: none"> Verify power is available to at least one PZR PORV Block Valve: (YES)
		<ul style="list-style-type: none"> MVG-8000A, RELIEF 445 A ISOL.
		<ul style="list-style-type: none"> MVG-8000B, RELIEF 444 B ISOL
		<ul style="list-style-type: none"> MVG-8000C, RELIEF 445 B ISOL.
		<ul style="list-style-type: none"> Verify at least one PZR PORV Block Valve is open. (YES)
	RO	Attempts to close PCV-455B and reports it will not close.
	RO	Attempts to close MVG-8000C and reports it will not close.
Booth Operator:		The crew may direct local closure of the PORV isolation valve. If so, wait 5 minutes and then report that the clamp on ammeter has broken and you are searching for another.
	CRS	IF the Block Valve can NOT be closed, THEN GO TO EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	CRS	Transitions to EOP-2.0.
Procedure Note:		<ul style="list-style-type: none"> The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. Seal Injection flow should be maintained to all RCPs. Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>31</u>	of	<u>42</u>
Event Description:	PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close								
Time	Position	Applicant's Actions or Behavior							

Evaluator's Note:	The EOP-2.0 Reference Page Criteria that applies in this scenario is:	
	<u>RCP TRIP CRITERIA</u>	
	<ul style="list-style-type: none"> IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs. IF both of the following conditions occur, THEN trip all RCPs: <ul style="list-style-type: none"> SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM AND RCS Wide Range pressure is LESS THAN 1400 psig. 	
	<u>TUBE RUPTURE TRANSITION CRITERIA</u>	
	<ul style="list-style-type: none"> IF any SG level increases in an uncontrolled manner OR if any SG has abnormal radiation, THEN start Charging Pumps and operate valves as necessary, and GO TO EOP-4.0, STEAM GENERATOR TUBE RUPTURE, Step 1. 	
CRITICAL TASK #3	RO	Stops all running RCP's before exiting EOP-2.0.
Evaluator's Note:	The crew may perform some steps in EOP-2.0 but should transition to EOP-4.0, STEAM GENERATOR TUBE RUPTURE, on the Reference Page Criteria shortly after entering EOP-2.0.	
	CRS	Transitions to EOP-4.0.
Evaluator's Note:	The only EOP-4.0 Reference Page Criteria that applies is a continuation of the requirement to reduce control room ventilation that started with the implementation of EOP-1.0.	
Procedure Note:	<ul style="list-style-type: none"> The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. Seal Injection flow should be maintained to all RCPs. 	

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>32</u>	of	<u>42</u>
Event Description:		PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close							
Time	Position	Applicant's Actions or Behavior							

- **Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.**

	RO	Check if RCPs should be stopped (None running)
--	----	--

Procedure Caution – Step 2

Radiation levels may have increased in steamlines. Proper radiological precautions must be taken when obtaining samples to minimize personnel exposure.

	CREW	Identify the RUPTURED SG(s):
--	------	------------------------------

- Narrow Range level in any SG increasing in an uncontrolled manner. (SG "B")
- As determined by Chemistry sample analysis for abnormal activity using a frisker.

Procedure Caution – Step 3

At least one SG must be maintained available for RCS cooldown.

CRITICAL TASK #2	BOP	Isolate flow from each RUPTURED SG:
------------------	-----	-------------------------------------

- Place the Steamline PWR RELIEF B SETPT Controller(s) in MAN and closed.

- Adjust the PWR RELIEF B SETPT Controller(s) to 8.85 (1150 psig).

- Place the Steamline Power Relief B Mode Switch(s) in PWR RLF.

- Place the PWR RELIEF B SETPT Controller(s) in AUTO.

- WHEN RCS Tavg is LESS THAN P-12 (552 °F), THEN place both STM DUMP INTERLOCK Switches to BYP INTLK.

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>33</u>	of	<u>42</u>
Event Description:	PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Verify the Steamline PORV (B) closed.
Procedure Caution: If the TD EFW Pump is the only available source of feed flow, the steam supply to the TD EFW Pump must be maintained from at least one SG, to maintain a secondary heat sink.		
Procedure Note – Step 3.g If the TD EFW Pump is tripped, it should be reset as time permits.		
Booth operator: LOA MSS0032 to open breaker 1DA2X 05EH and VLV-MS008P to close MVG 2802A.		
	BOP	IF SG B OR SG C is RUPTURED, THEN perform the following:
CRITICAL TASK #2	BOP	<ul style="list-style-type: none"> IF at least one MD EFW Pump is running, THEN isolate the TD EFW Pump by placing PVG-2030, STM SPLY TO TD EFP TRN A(B), to CLOSE prior to performing EOP-4.0, Step 6 – Determine required core exit - - - .
		<ul style="list-style-type: none"> Notify operators to perform Alternative Action Step 3.g while continuing with this procedure.
CRITICAL TASK #2	BOP	Close the following for each RUPTURED SG:
		<ul style="list-style-type: none"> SG Blowdown, PVG-503B
		<ul style="list-style-type: none"> MS Drain Isolation, PVT-2843B
CRITICAL TASK #2	BOP	Close the following for each ruptured SG:
		<ul style="list-style-type: none"> MS Isolation Valves, PVM-2801B
		<ul style="list-style-type: none"> MS Isolation Bypass Valves, PVM-2869B
	BOP	Reports MS Isolation Valve, PVM-2801B, will not close
CRITICAL TASK #2	BOP	Close the following:

Op Test No.: 1 Scenario # 2 Event # 8 & 9 Page 34 of 42

Event Description: PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> All remaining MS Isolation AND MS Isolation Bypass Valves.
		<ul style="list-style-type: none"> PCV-2058, MS TO AUX STM.
		<ul style="list-style-type: none"> MVG-1701, STEAM SEAL FEED VLV.
		<ul style="list-style-type: none"> MVG-2896A, SV-1 BSD.
		<ul style="list-style-type: none"> MVG-2896B, SV-2 BSD.
		<ul style="list-style-type: none"> MVG-2896C, SV-3 BSD.
		<ul style="list-style-type: none"> MVG-2896D, SV-4 BSD.
		<ul style="list-style-type: none"> IPV-2231, MS/PEGGING STM TO DEAERATOR.
		<ul style="list-style-type: none"> At the Digital Control Station for the MSRs, ensure the following are closed:
		<ul style="list-style-type: none"> MVG-2811.
		<ul style="list-style-type: none"> XVG-2807.
		<ul style="list-style-type: none"> Place the STM DUMP CNTRL Controller in MAN and close.
		<ul style="list-style-type: none"> Place the ST DUMP MODE SELECT Switch in STM PRESS.
		<ul style="list-style-type: none"> Place the following in AUTO and ensure the valves are closed (REFER TO ATTACHMENT 1, ALTERNATE ISOLATION OF RUPTURED STEAM GENERATORS, if necessary to locally isolate valves):
		<ul style="list-style-type: none"> PVT-2870, TO MSR A & B DRN.
		<ul style="list-style-type: none"> PVT-2875, TO MSR A & B DRN.
		<ul style="list-style-type: none"> PVT-2851A, B, C, D, MS LINES TO TURB DRN.
		<ul style="list-style-type: none"> PVT-2713A, B, C, D, STM DUMP DRN BYP.
		<ul style="list-style-type: none"> PVT-2838A, B, HDR DRNS.
		<ul style="list-style-type: none"> Direct the Turbine Building Operator to complete ATTACHMENT 1, ALTERNATE ISOLATION OF RUPTURED STEAM GENERATORS
		<ul style="list-style-type: none"> Use INTACT SG(s) Steamline PORV(s) as needed in subsequent steps to dump steam.

Op Test No.: 1 Scenario # 2 Event # 8 & 9 Page 35 of 42

Event Description: PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	CRS	IF any RUPTURED SG can NOT be isolated from at least one INTACT SG, THEN GO TO EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED, Step 1. (N/A)
	BOP	Check level in each RUPTURED SG:
		Verify Narrow Range level in each RUPTURED SG is GREATER THAN 26% [40%].
		<ul style="list-style-type: none"> Stop EFW flow to each RUPTURED SG:
CRITICAL TASK #2		<ul style="list-style-type: none"> Close FCV-3541, MD EFP TO SG B before indicated level reaches 100%.
		<ul style="list-style-type: none"> Close FCV-3546, TD EFP TO SG B.
		<ul style="list-style-type: none"> Maintain Narrow Range level in each RUPTURED SG GREATER THAN 40% [50%].
Procedure Caution – Step 5		
<p>The major flowpaths from each RUPTURED SG (MSIV and the TD EFW Pump) must be isolated before performing Step 5, to minimize radiological releases and ensure RCS subcooling is maintained.</p>		
	BOP	Verify each RUPTURED SG pressure is GREATER THAN 350 psig. (YES)
	CRS	Determine the required core exit TC temperature for RCS cooldown from the table below:
		<ul style="list-style-type: none"> Determines _____ as target temperature.
	RO/CRS	Check if any RCP is running. (NO)

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>36</u>	of	<u>42</u>
Event Description:		PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close							
Time	Position	Applicant's Actions or Behavior							

	CRS	With no RCP running, RCS cooldown and depressurization may cause RUPTURED loop Tcold to falsely indicate a transition to EOP-16.0, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, is required. Disregard the RUPTURED loop Tcold indication prior to performing Step 34.
Procedure Note – Step 8		
The RCP trip criteria does NOT apply after a controlled cooldown is initiated. Before the Low Steamline Pressure SI signal is blocked, Main Steam Isolation will occur if the Low Steam Pressure rate setpoint is exceeded.		
	BOP	Dump steam from each INTACT SG:
		WHEN RCS Tavg is LESS THAN P-12 (552°F), THEN: <ul style="list-style-type: none"> Place both STM DUMP INTERLOCK Switches to BYP INTLK. Place both STMLN SI TRAIN A(B) Switches to BLOCK.
		Dump steam from each INTACT SG to the Condenser:
		<ul style="list-style-type: none"> Verify PERMISV C-9 status light is bright on XCP-6114 1-3.
		<ul style="list-style-type: none"> Verify the MS Isolation Valves, PVM-2801A(B)(C) are open for the INTACT SGs <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Open MS Isolation Bypass Valves, PVM-2869A(B)(C), for only the INTACT SGs
		<ul style="list-style-type: none"> Place the STM DUMP CNTRL Controller in MAN and closed
		<ul style="list-style-type: none"> Place the STM DUMP MODE SELECT Switch in STM PRESS
		<ul style="list-style-type: none"> Adjust the STM DUMP CNTRL Controller to fully open the Bank 1 Steam Dump Valves

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>37</u>	of	<u>42</u>
Event Description:		PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close							
Time	Position	Applicant's Actions or Behavior							

Evaluator Note:		
If crew determines that SG PORVs will be used to commence cooldown, steps are listed below.		
	BOP	Dump steam from each INTACT SG using SG PWR RELIEFS in MANUAL: (If crew assumes Steam Dump not available with unaffected MSIVs closed)
	BOP	Dump steam from each INTACT SG using the Steamline PORVs:
		<ul style="list-style-type: none"> Place the Steamline Power Relief A(C) Mode Switch(s) in PWR RLF.
		<ul style="list-style-type: none"> Adjust the PWR RELIEF A(C) SETPT Controller(s) to open
Procedure Note – Step 9		
Steps 11 through 18 should be performed as time permits, while the cooldown is in progress.		
Evaluator's Note:		
The crew will continue in the procedure and return to the cooldown isolation step when the target temperature is reached.		
	RO	Verify core exit TC temperature is LESS THAN the value determined in Step 6. (NO)
	CREW	WHEN core exit TC temperature is LESS THAN the value determined in Step 6, then complete Step 10. Go to Step 11
	BOP	Check intact SG levels:
		<ul style="list-style-type: none"> Verify Narrow Range level in intact SGs is greater than 26% [40%].

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>38</u>	of	<u>42</u>
Event Description:		PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close							
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> Control EFW flow to maintain narrow range level in intact SGs between 40% [50%] and 60%.
	RO	<p>Check PZR PORVs and Block Valves:</p> <ul style="list-style-type: none"> Verify power is available to PZR PORV Block Valve: (YES) <ul style="list-style-type: none"> MVG-8000A, RELIEF 445 A ISOL. MVG-8000B, RELIEF 444 B ISOL MVG-8000C, RELIEF 445 B ISOL.
<p>Procedure Caution – Step 12.b</p> <p>If any PZR PORV opens because of high PZR pressure, Step 12.b should be repeated after pressure decreases to LESS THAN 2300 psig, to ensure the PORV recloses.</p>		
	BOP	<p>Verify all PZR PORVs are closed. (NO)</p> <ul style="list-style-type: none"> IF PZR pressure is LESS THAN 2300 psig, THEN close the PZR PORV. IF any PZR PORV can NOT be closed, THEN close its Block Valve. IF the Block Valve can NOT be closed, THEN GO TO EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED, Step 1.
<p>Evaluator Note: If crew transitions to EOP-4.2 prior to terminating the maximum cooldown rate to target temperature, followup questions should be asked to determine applicant knowledge of the cooldown requirements.</p>		
	CRS	<p>Transitions to EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.</p>
<p>Lead Evaluator: Terminate the scenario at the transition to EOP-4.2.</p>		

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>39</u>	of	<u>42</u>
Event Description:	PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close								
Time	Position	Applicant's Actions or Behavior							

EOP-1.0, ATTACHMENT 3		
Evaluator Note:		
<ul style="list-style-type: none"> • There will be no RHR flow indicated because RCS pressure will remain above the discharge head of the pumps. • All other equipment should be in the design condition unless pre-emptive actions have been taken based on accident diagnosis. 		
	BOP	Ensure EFW Pumps are running:
		<ul style="list-style-type: none"> • Ensure both MD EFW pumps are running. • Verify the TD EFW Pump is running if necessary to maintain SG levels.
	BOP	Ensure the following EFW valves are open:
		<ul style="list-style-type: none"> • FCV-3531 (3541)(3551), MD EFP TO SG A(B)(C). • FCV-3536(3546)(3556), TD EFP TO SG A(B)(C). • MVG-2802A(B), MS LOOP B(C) TO TD EFP.
	BOP	Verify total EFW flow is GREATER THAN 450 gpm. (YES)
		Ensure FW Isolation:
		<ul style="list-style-type: none"> • Ensure the following are closed: • FW Flow Control • FW Isolation, PVG-1611A(B)(C). • FW Flow Control Bypass, FCV-3321(3331)(3341). • SG Blowdown, PVG-503A(B)(C). • SG Sample, SVX-9398A(B)(C). • Ensure <u>all</u> Main FW Pumps are tripped.

Op Test No.: 1 Scenario # 2 Event # 8 & 9 Page 40 of 42

Event Description: PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close

Time	Position	Applicant's Actions or Behavior
		Ensure SI Pumps are running:
		<ul style="list-style-type: none"> Two Charging Pumps are running.
		<ul style="list-style-type: none"> Both RHR Pumps are running.
	BOP	Ensure two RBCU Fans are running in slow speed (one per train).
	BOP	Verify Service Water to the RBCUs:
		<ul style="list-style-type: none"> Ensure two Service Water Pumps are running.
		<ul style="list-style-type: none"> Ensure both Service Water Booster Pumps A(B) are running.
		<ul style="list-style-type: none"> Verify GREATER THAN 2000 gpm flow for each train on: <ul style="list-style-type: none"> FI-4466, SWBP A DISCH FLOW GPM. FI-4496, SWBP B DISCH FLOW GPM.
	BOP	Verify two CCW Pumps are running.
	BOP	Ensure two Chilled Water Pumps and Chillers are running.
	BOP	Check if Main Steamlines should be isolated:
		<ul style="list-style-type: none"> Check if any of the following conditions are met: <ul style="list-style-type: none"> RB pressure GREATER THAN 6.35 psig. OR Steamline pressure LESS THAN 675 psig. OR Steamline flow GREATER THAN 1.6 MPPH AND Tavg LESS THAN 552°F.
		<ul style="list-style-type: none"> Ensure ALL the following are closed: <ul style="list-style-type: none"> MS Isolation Valves, PVM-2801A(B)(C). MS Isolation Bypass Valves, PVM-2869A(B)(C).
	BOP	Ensure Excess Letdown Isolation Valves are closed:

Op Test No.:	<u>1</u>	Scenario #	<u>2</u>	Event #	<u>8 & 9</u>	Page	<u>42</u>	of	<u>42</u>
Event Description:		PZR PORV 445B Fails OPEN/PORV Isolation Valve Fails to Close Coincident with SI: SG "B" MSIV Fails to Close							
Time	Position	Applicant's Actions or Behavior							

SOP-106, Section IV. D. BORATING THE RCS USING THE EMERGENCY BORATE VALVE		
		2.1 Open MVT-8104, EMERG BORATE. 2.2 Ensure XPP-13A(B), BA XFER PP A(B), is running. 2.3 Verify greater than 30 gpm flow on FI-110, EMERG BORATE FLOW GPM. 2.4 When boration is no longer required, perform the following: a. Close MVT-8104, EMERG BORATE. b. Verify no flow on FI-110, EMERG BORATE FLOW GPM.

Facility:	VC SUMMER	Scenario No.:	3	Op Test No.:	2009 NRC
Examiners:	_____	Operators:	_____		SRO
	_____		_____		RO
	_____		_____		BOP
Initial Conditions:	<ul style="list-style-type: none"> IC-11, 75% Power, MOL (IC-231 for 2009) RB Spray Pump "B" is tagged out for cleaning and maintenance of the breaker cubicle. 64 hours remain on TS 3.6.2.1. Radiation Monitor RM-A2, Reactor Building Particulate Monitor failed to ZERO 12 hours ago. Planning & Scheduling is preparing a work package. The Action Statement for TS 3.4.6.1.a is in effect. The National Weather Service has issued a severe weather alert due to a line of heavy thunderstorms moving into the area. 				
Turnover:	<ul style="list-style-type: none"> Start Condensate Pump "C" and shutdown Condensate Pump "B" then raise power to 100% at ½% per minute per GOP-4A. GOP-4A, Step 3.16.e is in effect. 				
Critical Task:	<ol style="list-style-type: none"> Energize ESF Bus 1DB prior to performing EOP-6.0, Step 8. Start the TDEFW Pump before WR level in any two SGs is less than 15%. Open MVG-8801B before reporting the completion of EOP-1.0, Attachment 3. 				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N – BOP, CRS R – RO	Shift operating Condensate Pumps. Raise power.		
2	CVC010B	I – RO	VCT Level Channel LT-115 Fails LO.		
3	ANN DG014	TS – CRS	Emergency Diesel Generator (DG) "A" Low Lube Oil Temperature Alarm.		
4	PRS001B	I – RO TS – CRS	PZR Pressure Transmitter PT-444 Fails LO.		
5	FWM012	C – BOP	Condensate Flow to Dearator Flow controller fails HI.		
6	XMTFW017O	I – BOP	MFP Discharge Header Pressure Transmitter PT-508 Fails LO.		
7	EPS001	M – Crew	Loss of Off-site Power.		
8	EPS006B	C – Crew	DG "B" Fails to Start Automatically (EOP-6.0 implementation).		
9	FWM003B MSS0017A	C – BOP	MDEFW Pump "B" Breaker Trip. TDEFW Pump Fails to Start Automatically.		
10	RCS006A	M – Crew	600 gpm SBLOCA after Bus 1DB Recovery.		
11	VLVSI004P	C – RO/BOP	MVG-8801B (HI HEAD CL INJECTION MOV) fails to OPEN.		
			Terminate when cooldown is initiated in EOP-2.1.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Op Test No.: 1 Scenario # 3 Event # 1 Page 6 of 46

Event Description: Shift Operating Condensate Pumps; Raise Power

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

Booth Operator Instructions: When/if contacted, report "C" Condensate Pump ready for start. When/if contacted post-start, report that conditions are normal.

Indications Available: N/A

Evaluator's Note: The crew assumes the watch with power at 75% and an escalation on hold to facilitate a swap from Condensate Pump "B" to Condensate Pump "C". After the Condensate Pumps are swapped the crew will begin raising power to 100%.

	BOP	Enters SOP-208, CONDENSATE SYSTEM, Section III.B.
--	-----	---

	BOP	Determines INITIAL CONDITIONS (Section 1.0) are met.
--	-----	--

Evaluator's Note: Expected alarms when pump is started:

- XCP-6271-3, FW HTR 5,6 LVL HI HI
- XCP-625-1-4 (2-4, 3-4), FWP A (B, C) SL WTR TEMP HI
- The BOP should make an announcement prior to the start of the pump

	BOP	Ensure the discharge valve for the pump to be started is closed:
--	-----	--

- XVB-614C, C DISCH ISOL.

	BOP	Start one of the following: (PEER ✓)
--	-----	--------------------------------------

- XPP-0042C, CO PUMP C.

	BOP	Open the associated pump discharge valve: (PEER ✓)
--	-----	--

- XVB-614C, C DISCH ISOL.

Op Test No.: 1 Scenario # 3 Event # 1 Page 7 of 46

Event Description: Shift Operating Condensate Pumps; Raise Power

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

	BOP	Enters SOP-208, CONDENSATE SYSTEM, Section III.C.
	BOP	Verifies INITIAL CONDITIONS are met (two pumps running)
	BOP	Stop one of the following: <ul style="list-style-type: none"> • XPP-0042B, CO PUMP B.
	BOP	Verify the associated pump discharge valve closes: <ul style="list-style-type: none"> • XVB-614B, B DISCH ISOL.
	BOP	Reports completion of the Condensate Pump swap.
	CRS	Returns to GOP-4A, POWER OPERATION (MODE 1 – ASCENDING).
ALTERNATE DILUTE STEPS (SOP-106, Section E)		
Procedure Note:		
		<ul style="list-style-type: none"> • Energizing additional Pressurizer Heaters will enhance mixing. • LCV-115A, LTDN DIVERT TO HU-TK, will begin to modulate to the HU-TK position at 70% level on LI-115, VCT LEVEL %.
	RO	Verify at least one Reactor Coolant Pump is running.
	RO	Place RX COOL SYS MU switch to STOP.
		Place RX COOL SYS MU MODE SELECT switch to ALT DIL. (Peer ✓)
	RO	Adjust FCV-168, TOTAL MU FLOW SET PT, to desired flow

Op Test No.: 1 Scenario # 3 Event # 1 Page 8 of 46

Event Description: Shift Operating Condensate Pumps; Raise Power

Time	Position	Applicant's Actions or Behavior
		rate.
	RO	Set FIS-168, TOTAL MU FLOW, batch integrator to desired volume. (Peer ✓)
	RO	Place RX COOL SYS MU switch to START.
	RO	Verify desired flow rate on FR-113, TOTAL MU GPM (F-168).
	RO	Verify dilution stops when preset volume is reached on FIS-168, TOTAL MU FLOW, batch integrator.
	RO	Place RX COOL SYS MU switch to STOP.
	RO	Place RX COOL SYS MU MODE SELECT switch to AUTO. (Peer ✓)
	RO	Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm).
	RO	Place RX COOL SYS MU switch to START.
	BOP	Select 1/2 on LOAD RATE LMT-% PER MIN.
	BOP	Slowly raise LOAD SET to attain 80% Reactor Power while continuing with this procedure.
	BOP	At 80% Reactor Power, align Control Valve drain valves as follows:
		<ul style="list-style-type: none"> • Ensure PVG-2898B, DV-4, is open as follows: <ul style="list-style-type: none"> • Verify Control Valve #4 is closed. • Verify PVG-2898B, DV-4, is open.

Op Test No.: 1 Scenario # 3 Event # 1 Page 9 of 46

Event Description: Shift Operating Condensate Pumps; Raise Power

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

		<ul style="list-style-type: none"> If both PVG-2898B, DV-4, and Control Valve #4 are closed, open PVG-2898B, DV-4, by opening MVG-2898D, STM LEAD DRN FOR CV-1.
		<ul style="list-style-type: none"> Open MVG-2897, COMB CNTRL VLV BSD.
	BOP	When Control Valve #4 indicates greater than 5% open, perform the following:
		<ul style="list-style-type: none"> Ensure PVG-2898B, DV-4, is CLOSED.
		<ul style="list-style-type: none"> Ensure PVG-2898B, DV-4, is CLOSED.
Lead Evaluator: Cue Event 2, VCT Level Channel LT-115 Fails LO (CVC010B), when desired but not during a dilution operation.		

Op Test No.:	<u>1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>10</u>	of	<u>46</u>
Event Description:		VCT Level Channel LT-115 Fails LO							
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		On cue from the Lead Evaluator, activate trigger for VCT Level XMTR LT-115 fails LO
Indications Available:		XCP-613-3-1, VCT LVL HI/LO
	RO	Responds to and reports alarm XCP-613-3-1, VCT LVL HI/LO
	CREW	Enters ARP-001-XCP-613-3-1
Evaluator's Note:		The RO may immediately recognize the failure of LT-115 and place the RX Cool SYS MU Switch to STOP to terminate the unwarranted automatic makeup.
		ARP-613-3-1
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> • Makeup flow in excess of Charging flow. • Makeup system not armed for automatic makeup. • Failure of ILT00115, VOLUME CONTROL TANK LEVEL TRANSMITTER. • Failure of ILT00112, VOLUME CONTROL TANK LEVEL TRANSMITTER.
	RO	Reports failure of LT-115.
		ARP-613-3-1
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> • Automatic makeup should start at 20% and stop at 40%. • At 70%, LCV-115A, LTDN DIVERT TO HU-TK, will position to begin diverting letdown to the Recycle Holdup Tank. • At 80%, LCV-115A, LTDN DIVERT TO HU-TK, will position to full divert. • At 5%, the Charging Pump suction will align to the RWST.

Op Test No.: 1 Scenario # 3 Event # 2 Page 11 of 46

Event Description: VCT Level Channel LT-115 Fails LO

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

	RO	Places the RX COOL SYS MU Switch to STOP.
		ARP-613-3-1
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> Verify the appropriate automatic action.
		<ul style="list-style-type: none"> Verify VCT level on LI-112A, LEVEL %, if ILT00115, VOLUME CONTROL TANK LEVEL TRANSMITTER, has failed.
		<ul style="list-style-type: none"> Verify VCT level on LI-115, LEVEL %, if ILT00112, VOLUME CONTROL TANK LEVEL TRANSMITTER, has failed.
	RO	Determines LT-112A must be used for VCT level indication.
		ARP-613-3-1
		SUPPLEMENTAL ACTIONS
		<ul style="list-style-type: none"> If auto makeup control is lost, refer to SOP-106.
		<ul style="list-style-type: none"> If necessary, attempt to makeup to the VCT manually per SOP-106.
		<ul style="list-style-type: none"> If makeup flow is high, reduce makeup flow.
		<ul style="list-style-type: none"> If Charging Pump suction swaps to RWST, 2300 ppm boron may be injected into RCS. Reduce load and trip the turbine, if necessary, to establish control.
	RO	Acknowledges that use of MANUAL Makeup in accordance with SOP-106 may be required.
	CRS	Contacts Work control and/or I&C for assistance.

Booth Operator Note: If contacted, remove the failed channel from service but do not repair the channel before the scenario is terminated. Report that it appears that the D/P Cell needs to be replaced

Op Test No.: 1 Scenario # 3 Event # 2 Page 12 of 46

Event Description: VCT Level Channel LT-115 Fails LO

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

and a work plan will be required.

Lead Evaluator:

Cue Event 3, Emergency Diesel Generator (DG) "A" Low Lube Oil Temperature Alarm, when desired.

Op Test No.:	<u>1</u>	Scenario #	<u>3</u>	Event #	<u>3</u>	Page	<u>13</u>	of	<u>46</u>
Event Description: Emergency Diesel Generator (DG) "A" Low Lube Oil Temperature Alarm									
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		
Indications Available:		XCP-636-6-3, DG A ENG TEMP TRBL
	BOP	Responds to/reports alarm XCP-636-6-3, DG A ENG TEMP TRBL
	BOP	Enters ARP-001-XCP-636-6-3
		ARP-001-XCP-636-6-3
		PROBABLE CAUSE:
		High/Low lube oil temperature:
		<ul style="list-style-type: none"> • Lube Oil Heater failure.
		<ul style="list-style-type: none"> • Lube Oil Filter Pump not running.
		<ul style="list-style-type: none"> • Loss of Service Water to Lube Oil Cooler.
		High/Low coolant temperature:
		<ul style="list-style-type: none"> • Coolant Heater failure.
		<ul style="list-style-type: none"> • Jacket Water Pump not running.
		<ul style="list-style-type: none"> • Loss of Service Water to Jacket Water Cooler.
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> • The diesel will trip at 195°F (coolant high temp.) or 175°F (lube oil high temp.), unless it was started by an Emergency Start signal, in which case PVG-3105A, FS TO DG A, will open to cool the diesel.
	BOP	Automatic action N/A – DG not running.
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> • Dispatch an operator to identify the cause of the alarm.
		<ul style="list-style-type: none"> • Ensure AUTOMATIC ACTIONS have occurred if the alarm

Op Test No.: 1 Scenario # 3 Event # 3 Page 14 of 46

Event Description: Emergency Diesel Generator (DG) "A" Low Lube Oil Temperature Alarm

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

		is due to High Temp.
		<ul style="list-style-type: none"> Perform Corrective Actions per ARP-004-XCX-5201.
	CREW	Dispatches AO to DG "A" to investigate.
<p>Booth Operator Note: Wait 3-5 minutes then report: Local alarm ARP-004-XCX-5201-1-3, LOW LUBE OIL TEMPERATURE, is actuated. Lube Oil Temperature is 108 °F and the heater will not energize from the switch.</p> <p>Operator reports that local ARPs are missing at BOTH EDGs.</p>		
		ARP-001-XCP-636-6-3
		SUPPLEMENTAL ACTIONS:
		<ul style="list-style-type: none"> Perform Supplemental Actions per ARP-004-XCX-5201.
	CRS	<ul style="list-style-type: none"> When lube oil temperature or jacket water temperature is low, monitor and record the applicable temperature on a generic log once every two hours.
		<ul style="list-style-type: none"> If the diesel generator is inoperable, refer to Tech Spec 3.8.1.
<p>Evaluator's Note: Per a note in ARP-004-XCX-5201-1-3, the DG is inoperable when LO temperature is less than 110 °F.</p>		
	CRS	<i>Enters TS 3.8.1.1.b, Action b.</i>
		1. <i>Demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1 within 1 hour and at least once per 8 hours thereafter, and</i>
		2. <i>If the EDG became inoperable due to any cause other than preplanned preventive maintenance or testing:</i>
		a) <i>determine the OPERABLE EDG is not inoperable due to a common cause failure within 24 hours, or</i>

Op Test No.: 1 Scenario # 3 Event # 3 Page 15 of 46

Event Description: Emergency Diesel Generator (DG) "A" Low Lube Oil Temperature Alarm

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

b) demonstrate the OPERABILITY of the remaining EDG by performing Surveillance Requirement 4.8.1.1 .2.a.3 within 24 hours, and

Evaluator Note: The CRS should identify a Shutdown LCO due to EDG inoperability with RB Spray Pump out of service.

3. Within 4 hours, verify that required systems, subsystems, trains, components and devices that depend on the remaining EDG as a source of emergency power are also OPERABLE and in MODE 1, 2, or 3, that the Turbine Driven Emergency Feed Pump is OPERABLE. If these conditions are not satisfied within 4 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

4. Restore the EDG to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, unless the following condition exists:

a) The requirement for restoration of the EDG to OPERABLE status within 72 hours may be extended to 14 days if the Alternate AC (AAC) power source is or will be available within 1 hour, as specified in the Bases, and

b) If at any time the AAC availability cannot be met, either restore the AAC to available status within the remainder of the 72 hours in 4.a (not to exceed 14 days from the time the EDG originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the next 30 hours.

Lead Evaluator:

Cue Event 4 (PZR Pressure Transmitter PT-444 fails LOW) after the CRS Evaluator has completed his/her evaluation of the TS entry and/or elects to follow up after the scenario is terminated.

Op Test No.: 1 Scenario # 3 Event # 4 Page 16 of 46

Event Description: PZR Pressure Transmitter PT-444 Fails LO

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

Booth Operator Instructions:**Indications Available: XCP-616-3-6, PZR PCS LO BU HTRS ON**

	RO	Responds to alarm.
	RO	Reports PZR Pressure channel failure.
	RO	Performs immediate actions of AOP-401.5, PRESSURIZER PRESSURE CONTROL CHANNEL FAILURE.
IMMEDIATE ACTION STEP 1		Verify the PZR PORV's are closed (YES)
IMMEDIATE ACTION STEP 2		Compare the PZR control channel indication to the protection channel indications: <ul style="list-style-type: none"> • PI-455, PRESS PSIG. • PI-456, PRESS PSIG. • PI-457, PRESS PSIG.
	RO	Reports PI-444 reading lower than any protection channel.
IMMEDIATE ACTION STEP 3	RO	Check if PI-444, CNTRL CHAN PRESS PSIG, indication is normal (NO)
		Ensure the spray valves are closed: <ul style="list-style-type: none"> • PCV-44C, PZR SPRAY • PCV-44D, PZR SPRAY
		Control PZR PRESS MASTER CONTROL IN MAN
		Operate the PZR Heaters and Spray Valves in manual to control RCS pressure between 2220 and 2250 psig.
		Within ONE hour, close MVG-8000B, RELIEF 444B ISOL.

Op Test No.: 1 Scenario # 3 Event # 4 Page 17 of 46

Event Description: PZR Pressure Transmitter PT-444 Fails LO

Time	Position	Applicant's Actions or Behavior
	CRS	Enters AOP-401.5
Procedure Note:		Throughout this procedure, "AFFECTED" refers to any PZR PORV that has actuated as the result of the instrument failure.
Step 2 Note:		PZR PRESS control channels PI-444 and PI-445 connect to the same reference leg as protection channel PI-457.
	CRS	Reads immediate actions.
	RO	Verifies immediate actions.
	RO	Check if PI-445, CNTRL CHAN PRESS PSIG, indication is normal (YES)
	RO	Ensure ROD CNTRL BANK SEL Switch is in AUTO.
	RO	Maintain RCS pressure between 2220 psig and 2250 psig.
	CRS	Determine and correct the cause of the channel failure.
	CRS	Contacts I&C and/or Work Control for assistance.
Evaluator's Note:		<ul style="list-style-type: none"> While the following TS-related action has already been directed by the AOP, the CRS must still enter TS 3.4.4.a.
	CRS	Enters TS 3.4.4.a.
		<ul style="list-style-type: none"> With one or more PORV(s) inoperable and capable of being manually cycled, within 1 hour

Op Test No.: 1 Scenario # 3 Event # 4 Page 18 of 46

Event Description: PZR Pressure Transmitter PT-444 Fails LO

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • <i>restore the PORV(s) to OPERABLE status or</i>
		<ul style="list-style-type: none"> • <i>close the associated block valve(s) and maintain power to the block valve; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.</i>
<p>Lead Evaluator: Cue Event 5 (Condensate Flow to Dearator Flow controller Fails HI) when the TS actions are complete.</p>		

Op Test No.: 1 Scenario # 3 Event # 5 Page 19 of 46

Event Description: Condensate Flow to Dearator Flow controller Fails HI

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

Booth Operator Instructions:

Indications Available: XCP-627-2-1, CNDSR HOTWELL LVL LO
XCP-627-1-3, CO PP DISCH HDR PRESS HI/HI HI

	BOP	Responds to alarm XCP-627-2-1, CNDSR HOTWELL LVL LO, or change in indicated Deaerator flow/Hotwell level
	BOP	Enters ARP-001-XCP-627-2-1

Evaluator's Note: The ARP will NOT lead the crew directly to the problem. The problem must be diagnosed by looking at Deaerator Tank and Hotwell level. While it is unlikely, failure to act in a timely manner will result in a Condensate Pump trip on HI-HI DA Tank level and implementation of AOP-208.1, CONDENSATE PUMP TRIP.

		ARP-001-XCP-627-2-1
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> Hotwell level control system malfunction.
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> None
		CORRECTIVE ACTIONS:
		<ul style="list-style-type: none"> Verify flow from the CST to the Condenser Hotwell as indicated on FR-3009.
	BOP	Verifies flow on FR-3009.
		ARP-001-XCP-627-2-1
		SUPPLEMENTAL ACTIONS:
		<ul style="list-style-type: none"> Dispatch an operator to verify proper operation of the

Op Test No.: 1 Scenario # 3 Event # 5 Page 20 of 46

Event Description: Condensate Flow to Dearator Flow controller Fails HI

Time	Position	Applicant's Actions or Behavior
		hotwell level control system.
		<ul style="list-style-type: none"> Open XVT00655-CO, COND A HOTWELL EMER MU CONT VLV BYPASS (TB-412), to bypass ILV03011-CO, COND A HOTWELL EMER MAKE-UP CONT VLV (TB-412), to regain normal hotwell level.
		<ul style="list-style-type: none"> Check operation of ILV03000-CO, COND REJECT TO COND STG TK CONTROL VLV (TB-412).
	CREW	Dispatches AO to investigate problem/check valve lineup.
Booth Operator Note: If dispatched, wait 3 minutes then report that the hotwell level control system appears to be operating properly but level is not recovering. ILV03011-CO, COND A HOTWELL EMER MAKE-UP CONT VLV, is OPEN and ILV03000-CO, COND REJECT TO COND STG TK CONTROL VLV, is SHUT.		
	BOP	Reports IFK-3136, CONDENSATE FLOW TO DEAERATOR FLOW CONTROL VALVE, is 100% OPEN
	BOP	Places IFK-3136 in MANUAL and lowers flow to re-establish normal DA Tank and Hotwell levels.
	CRS	Contacts Work Control/I&C for assistance.
Lead Evaluator: Cue Event 6 (MFP discharge Header Pressure Transmitter PT-508 Fails LO) when secondary-side conditions have stabilized and corrective actions will not be jeopardized by the alarm.		

Op Test No.: 1 Scenario # 3 Event # 6 Page 21 of 46

Event Description: MFP discharge Header Pressure Transmitter PT-508 Fails LO

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

Booth Operator Instructions: On cue from the Lead Evaluator, activate the trigger for MFP Discharge Header Pressure Transmitter PT-508 Fails LO (180 second ramp)

Indications Available: XCP-624-1-5; 2-5; 3-5, SG LVL DEV

	BOP	Responds to multiple SG LVL DEV alarms and/or change in feedwater flow.
Evaluator's Note:		<ul style="list-style-type: none"> • The crew may first enter an ARP but could go directly to AOP-210.3, FEEDWATER PUMP MALFUNCTION, based on multiple alarms or early diagnosis. The scenario guide is conservatively written as if an ARP will be entered. • At some point prior to or during procedure implementation the BOP should diagnose the problem as a Feedwater Header Pressure instrument (PT-508) failure.
	BOP	Enters ARP-001-XCP-624-1-5 or 2-5 or 3-5
		ARP-001-XCP-624-1-5
		PROBABLE CAUSE:
		<ul style="list-style-type: none"> • Step load increase or decrease. • Steam Generator A level control system malfunction. • FCV-478, A FCV, malfunction. • Testing in progress. • Instrument failure.
	BOP	Determines all SG's are responding in the same manner.
		ARP-001-XCP-624-1-5
		AUTOMATIC ACTIONS:
		<ul style="list-style-type: none"> • FCV-478, A FCV, will modulate to restore level to 61.6%.

Op Test No.: 1 Scenario # 3 Event # 6 Page 22 of 46

Event Description: MFP discharge Header Pressure Transmitter PT-508 Fails LO

Time	Position	Applicant's Actions or Behavior
	BOP	Determines all FCV's are responding the same way.
		ARP-001-XCP-624-1-5
		CORRECTIVE ACTIONS:
	BOP	<ul style="list-style-type: none"> Evaluate SG A Narrow Range level indicators LI-474, LI-475, and LI-476.
		<ul style="list-style-type: none"> If required, restore Steam Generator A level to between 60% and 65% by performing either or both of the following: <ul style="list-style-type: none"> Manually control PVT-478, SG A FWF, as required. Manually control Feedwater Pump speed as follows: <ul style="list-style-type: none"> Place the Feedwater Pump MASTER SPEED CNTRL in MAN. Adjust the differential pressure between Feedwater Pump discharge header pressure and Main St
		<ul style="list-style-type: none"> If FCV-478, A FCV, malfunctioned go to AOP-210.1, Feedwater Flow Control Valve Failure.
		<ul style="list-style-type: none"> If a Main Feedwater Pump has tripped or is malfunctioning go to AOP-210.3, Feedwater Pump Malfunction.
		<ul style="list-style-type: none"> If an instrument channel failed, go to AOP-401.11, Steam Generator Level Control and Protection Channel Failure.
	BOP	Places Feedwater Pump MASTER SPEED CNTRL in MAN and adjusts to restore SG levels
	CRS	Enters AOP-210.3, FEEDWATER PUMP MALFUNCTION.
	BOP	Performs Immediate Actions <ul style="list-style-type: none"> Verify at least one Feedwater Pump is running (YES) Check if a Feedwater Pump trip occurred (NO)
	CRS	GO TO Step 13

Op Test No.: 1 Scenario # 3 Event # 6 Page 23 of 46

Event Description: MFP discharge Header Pressure Transmitter PT-508 Fails LO

Time	Position	Applicant's Actions or Behavior
	BOP	Manually control Feedwater Pump speed using MCB MASTER SPEED CONTROL
		<ul style="list-style-type: none"> Place the Feedwater Pump MASTER SPEED CNTRL in MAN.
		<ul style="list-style-type: none"> Adjust Feedwater Pump speed to maintain discharge header pressure 150 to 250 PSIG greater than Main Steam Header Pressure on:
		<ul style="list-style-type: none"> PI-508, FW PP DISCH HDR PRESS PSIG.
		<ul style="list-style-type: none"> PI-464C, MS HDR PRESS PSIG.
		<ul style="list-style-type: none"> Adjust PUMP A(B)(C) SPEED CNTRL (MCB M/A Stations) setpoint potentiometers, as necessary to balance all operating Feedwater Pumps speed to within 120 rpm of each other.
	CRS	Determine and correct the cause of the Feedwater Pump speed control malfunction.
	Evaluator's Note:	The previous AOP-210.3 step remains in effect until the malfunction is repaired. The channel will NOT be repaired prior to the end of the scenario.
	CRS	Contacts I&C and/or Work Control for assistance.
	Lead Evaluator:	
	Cue Event 7 when SG levels are under control, channel repair actions have been initiated, and the degrading weather report is made to the control room.	

Op Test No.:	<u>1</u>	Scenario #	<u>3</u>	Event #	<u>7, 8, & 9</u>	Page	<u>24</u>	of	<u>46</u>
Event Description:	Loss of Off-site Power; DG "B" Fails to Start Automatically (EOP-6.0 Implementation); MDEFW Pump "B" Breaker Trip, TDEFW Pump Fails to Start Automatically								
Time	Position	Applicant's Actions or Behavior							

Booth Operator Instructions:		On cue from the Lead Evaluator, activate the trigger for the Loss of Offsite power.
Indications Available:		Multiple reactor trip and electrical lockout related alarms and lighting shifts. Initially a loss of Bus 1DB will occur B DG will fail to auto start this will be followed by a loss of BOP power resulting in a Reactor Trip. This will be followed shortly by the loss of Bus 1DA.
Evaluator Note:		Because the loss of power occurs sequentially beginning with loss of Bus 1DB, the crew may briefly refer to AOP-304.1B prior to entering EOP-1.0.
		The CRS may also direct manual emergency start of "B" EDG.
	CRS	Enters EOP-1.0, Step 1.
Procedure Note:		<ul style="list-style-type: none"> • Steps 1 through 5 are Immediate Operator Actions. • The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. • Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.
Booth Operator Note:		When/if the Electrical System Controller is contacted regarding the availability of off-site power, report the following: There is a major problem on the grid that is still being analyzed. I will contact you when a projected return time becomes available.
	RO	Verify Reactor Trip:
		<ul style="list-style-type: none"> • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. (YES)

Op Test No.: 1 Scenario # 3 Event # 7, 8, & 9 Page 25 of 46

Event Description: Loss of Off-site Power; DG "B" Fails to Start Automatically (EOP-6.0 Implementation); MDEFW Pump "B" Breaker Trip, TDEFW Pump Fails to Start Automatically

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> Verify all Rod Bottom Lights are lit. (YES)
		<ul style="list-style-type: none"> Verify Reactor Power level is decreasing. (YES)
	BOP	Verify Turbine/Generator Trip:
		<ul style="list-style-type: none"> Verify all Turbine STM Stop VLVs are closed. (YES)
		<ul style="list-style-type: none"> Ensure Generator Trip (after 30 second delay): <ul style="list-style-type: none"> Ensure the GEN BKR is open. (YES) Ensure the GEN FIELD BKR is open. (YES) Ensure the EXC FIELD CNTRL is tripped. (YES)
Evaluator Note: CRS may direct MSIV closure in accordance with OAP-103.4		
	BOP	Verify both ESF buses are energized. (NO)
	BOP	Perform the following:
		<ul style="list-style-type: none"> Verify at least one ESF bus is energized: (NO. Unless manual EDG Start has already been performed) <ul style="list-style-type: none"> 7.2 KV BUS 1DA is energized.
		OR
		<ul style="list-style-type: none"> 7.2 KV BUS 1DB is energized.
		IF no ESF bus is energized, THEN try to restore power to at least one ESF bus using the DG.
		IF power can NOT be restored to at least one ESF bus, THEN GO TO EOP-6.0, LOSS OF ALL ESF AC POWER, Step 1. (See note below)

Op Test No.: 1 Scenario # 3 Event # 7, 8, & 9 Page 26 of 46

Event Description: Loss of Off-site Power; DG "B" Fails to Start Automatically (EOP-6.0 Implementation); MDEFW Pump "B" Breaker Trip, TDEFW Pump Fails to Start Automatically

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

Evaluator Note: The crew may avoid EOP-6.0 entry if the crew manually starts EDG "B" in accordance with management expectations for compensatory actions relative to automatic failures. This scenario guide reflects those actions. If EOP-6.0 is entered, steps that will be performed are at the end of this guide beginning with page 42

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 27 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
	Booth Operator:	Ramp in the SBLOCA from 0 to 600 GPM over 5 minutes when the crew transitions to EOP-1.1.
	CRS	If EOP-6.0 was entered, returns to EOP-1.0, RNO Step 3.b
CRITICAL TASK #1		<ul style="list-style-type: none"> Try to restore power to the deenergized bus while continuing with this procedure. REFER TO AOP-304.1, LOSS OF BUS 1DA (1DB) WITH THE DIESEL NOT AVAILABLE. (Critical Task criteria listed on page 44)
	Booth Operator/Evaluator Note:	
	<ul style="list-style-type: none"> If the crew has dispatched operator(s) to investigate the EDG "A" failure then wait until EOP-1.0 – Attachment 3 has been completed, call the control room indicating controls have been reset and specify that a start attempt can be made. The scenario guide assumes that the crew power will restore power to Bus 1DA. 	
	RO	Check if SI is actuated: (NO)
		<ul style="list-style-type: none"> Check if either: <ul style="list-style-type: none"> SI ACT status light is bright on XCP-6107 1-1. (NO) OR Any red first out SI annunciator is lit on XCP-626 top row. (NO)
	CRS	Go to Step 5.
	RO	Check if SI is required: (NO)
		<ul style="list-style-type: none"> Check if any of the following conditions exist: <ul style="list-style-type: none"> PZR pressure LESS THAN 1850 psig. OR RP pressure GREATER THAN 3.6 psig.

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 28 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
		OR
		<ul style="list-style-type: none"> Steamline pressure LESS THAN 675 psig.
		OR
		<ul style="list-style-type: none"> Steamline differential pressure GREATER THAN 97 psid.
	CRS	Transitions to EOP-1.1, REACTOR TRIP
Procedure CAUTION: If SI actuation occurs during this procedure, EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, should be performed to stabilize the plant.		
Procedure NOTE: <ul style="list-style-type: none"> Main Turbine vibration should be monitored during coastdown. The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. 		
Evaluator's Note: <ul style="list-style-type: none"> The crew will go to EOP-1.1, REACTOR TRIP, begin performing steps then determine that PZR level cannot be maintained greater than 12%, initiate a MANUAL SI and return to EOP-1.0. Adverse Containment values will be reached during the scenario. 		
	CREW	Announce plant conditions over the page system.
	BOP	Check FW status:
		a. Check if RCS Tavg is LESS THAN 564 °F. (YES)
		b. Verify FW Isolation:

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 29 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • Ensure the FW Flow Control Valves, FCV-478(488)(498), are closed. (YES) • Ensure the Main FW Isolation Valves, PVG-1611A(B)(C), are closed. (YES) • Ensure the FW Flow Control Bypass Valves, FCV-3321(3331)(3341), are closed. (YES)
	BOP	Ensure EFW Pumps are running:
		1) Ensure both MD EFW Pumps are running. (NO)
CRITICAL TASK #2		2) Verify the TD EFW Pump is running if necessary to maintain SG levels. (Evaluators: Critical task criteria is also on page 42) <ul style="list-style-type: none"> • Open PVG-2030, STM SPLY TO TD EFP TRN A(B) before wide range level in any two SGs is less than 15%.
	BOP	Verify total EFW flow is GREATER THAN 450 gpm.
	BOP	Trip all Main FW Pumps.
	RO	Check RCS temperature: <ul style="list-style-type: none"> • With any RCP running, RCS Tavg is stable at OR trending to 557 °F. (N/A) • With no RCP running, RCS Tcold is stable at OR trending to 557°F. (YES)
	CRS	If EOP-1.0 was entered from AOP-112.2, then return to AOP-112., STEAM GENERATOR TUBE LEAK NOT REQUIRING SI, Step 7 (NO)
	RO	Verify ALL control rods fully inserted (YES)
	BOP	Check DA level control

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 30 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> Open LCV-3235, DEAER START UP ' DRAIN CNTRL, as necessary to maintain DA level LESS THAN 10.5 ft as indicated on LI-3135, DEAER STOR TK WR LVL FEET.
		<ul style="list-style-type: none"> Locally adjust ITV-3062A(B)(C), BD COOLER A(B)(C) CDSTE OUT TEMP, to 90% (XPN-0029, NUCLEAR BLOWDOWN PROCESSING PANEL, AB-436).
	RO	Check PZR level control
		<ul style="list-style-type: none"> Verify PZR level is greater than 17% (Maybe) Verify Charging and letdown are in service (YES) Verify PZR level is trending to 25% (NO)
Evaluator Note:		The Scenario Guide assumes that the EOP-1.1 REFERENCE PAGE for SI Initiation has been met at this time or the CRS has made a conservative decision to manually initiate.
	RO	Actuate SI using either SI ACTUATION Switch.
Evaluator's Note:		Actions for ATTACHMENT 3, SI EQUIPMENT VERIFICATION, are provided on pages 39-41 of this scenario guide.
	BOP	Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.
	CREW	Announce plant conditions over the page system.
	RO	Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen (YES)
	RO	Check RCS temperature:

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 31 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> With any RCP running, RCS Tavg is stable at OR trending to 557°F.
		<ul style="list-style-type: none"> With no RCP running, RCS Tcold is stable at OR trending to 557°F. (YES)
	RO	Check PZR PORVs and Spray Valves:
		<ul style="list-style-type: none"> PZR PORVs are closed. (YES)
		<ul style="list-style-type: none"> PZR Spray Valves are closed. (YES)
		<ul style="list-style-type: none"> Verify power is available to at least one PZR PORV Block Valve: (YES)
		<ul style="list-style-type: none"> MVG-8000A, RELIEF 445 A ISOL.
		<ul style="list-style-type: none"> MVG-8000B, RELIEF 444 B ISOL
		<ul style="list-style-type: none"> MVG-8000C, RELIEF 445 B ISOL.
		<ul style="list-style-type: none"> Verify at least one PZR PORV Block Valve is open. (YES)
Procedure Note: Seal Injection flow should be maintained to all RCPs.		
	RO	Check if RCPs should be stopped: (None running)
	BOP	Verify no SG is FAULTED:
		<ul style="list-style-type: none"> No SG pressure is decreasing in an uncontrolled manner. (YES)
		<ul style="list-style-type: none"> No SG is completely depressurized. (YES)
	CREW	Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED: (YES to all)
		<ul style="list-style-type: none"> RM-G19A (B) (C) STMLN HI RNG GAMMA
		<ul style="list-style-type: none"> RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR.
		<ul style="list-style-type: none"> RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR.

Op Test No.:	<u>1</u>	Scenario #	<u>3</u>	Event #	<u>10 & 11</u>	Page	<u>32</u>	of	<u>46</u>
Event Description:	600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> RM-L10, SG BLOWDOWN CW DISCHARGE LIQUID MONITOR.
	RO	Check if the RCS is INTACT: (NO to any or all)
		<ul style="list-style-type: none"> RB radiation levels are normal on: <ul style="list-style-type: none"> RM-G7, CONTAINMENT HI RNG GAMMA RM-G18, CNTMNT HI RNG GAMMA. RB Sump levels are normal. (NO. Levels rising) RB pressure is LESS THAN 1.5 psig. (Maybe but rising)
Evaluator Note:		Adverse Containment conditions exist when Reactor Building pressure exceeds 3.6 psig.
		<ul style="list-style-type: none"> The following annunciators are NOT lit: <ul style="list-style-type: none"> XCP-606 2-2 (RBCU 1A/2A DRN FLO HI) XCP-607 2-2 (RBCU 1B/2B DRN FLO HI)
	CRS	Transitions to EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT.
Procedure Note:		<ul style="list-style-type: none"> The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. Seal Injection flow should be maintained to all RCPs. Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.
	RO	Check if RCPs should be stopped (NONE running).
	BOP	Verify no SG is FAULTED: <ul style="list-style-type: none"> No SG decreasing in an uncontrolled manner (YES) No SG completely depressurized (YES)

Op Test No.:	<u>1</u>	Scenario #	<u>3</u>	Event #	<u>10 & 11</u>	Page	<u>33</u>	of	<u>46</u>
Event Description:		600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN							
Time	Position	Applicant's Actions or Behavior							

Time	Position	Applicant's Actions or Behavior
	BOP	Check Intact SG levels: <ul style="list-style-type: none"> NR level in intact SGs >30% [50%] Control EFW flow to maintain 40 [50%]-60% NR level
	RO	Reset both SI RESET TRAIN A(B) Switches.
	RO	Reset Containment Isolation: <ul style="list-style-type: none"> RESET PHASE A - TRAIN A(B) CNTMT ISOL. RESET PHASE B - TRAIN A(B) CNTMT ISOL.
	RO/BOP	Check if Secondary radiation levels are normal: (YES to all) <ul style="list-style-type: none"> Check radiation levels normal on: <ul style="list-style-type: none"> RM-G19A(B)(C), STMLN HI RNG GAMMA. RM-A9, CNDSR EXHAUST GAS ' ATMOS MONITOR. RM-L3, STEAM GENERATOR ' BLOWDOWN LIQUID MONITOR. RM-L10, SG BLOWDOWN CW ' DISCHARGE LIQUID MONITOR. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.
	RO	Check PZR PORVs and Block Valves: <ul style="list-style-type: none"> Verify power is available to the PZR PORV Block Valves: MVG-8000A, B, C (NO – power has been lost to MVG-8000B) Verify all PZR PORVs are closed. (YES) Verify at least one PZR PORV Block Valve is open. (YES)

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 34 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Place both ESF LOADING SEQ A(B) RESETS to:
		<ul style="list-style-type: none"> • NON-ESF LCKOUTS • AUTO-START BLOCKS
	RO	Establish Instrument Air to the RB:
		<ul style="list-style-type: none"> • Start one Instrument Air Compressor and place the other in Standby. (NO) • Open PVA-2659, INST AIR TO RB AIR SERV. • Open PVT-2660, AIR SPLY TO RB.
	RO	Check if SI flow should be reduced:
		<ul style="list-style-type: none"> • RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 30 °F. (YES) • Secondary Heat Sink is adequate (YES) • RCS Pressure is stable or increasing (NO)
	CRS	GO TO Step 11.
	RO	Check if RB Spray should be stopped:
		<ul style="list-style-type: none"> • Check if any RB Spray Pumps are running. (NO)
	CRS	GO TO Step 12. Observe the CAUTION prior to Step 12.
		Procedure Caution: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to LESS THAN 250 psig, the RHR Pumps must be manually restarted to supply water to the RCS.
	RO	Check if RHR Pumps should be stopped:
		<ul style="list-style-type: none"> • Check RCS pressure:

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 35 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> RCS pressure is GREATER THAN 250 psig. (YES)
		<ul style="list-style-type: none"> Check if RCS Pressure is stable or increasing (NO)
	CRS	GO TO Step 13.
	RO	Check if RCS pressure is stable or decreasing. (YES)
	BOP	Check if pressure in all SGs is stable or increasing. (YES)
	BOP	Check if DGs should be stopped: <ul style="list-style-type: none"> Verify both ESF buses are energized by offsite power. (NO) Restore offsite power to both ESF buses. REFER TO the appropriate procedure, based on existing plant conditions: <ul style="list-style-type: none"> SOP-304, 7.2 KV SWITCHGEAR. SOP-306, EMERGENCY DIESEL GENERATOR. AOP-304.1, LOSS OF BUS 1DA(1DB) WITH THE DIESEL NOT AVAILABLE. IF offsite power is NOT available, THEN REFER TO AOP-304.3, LOSS OF ALL BALANCE OF PLANT BUSES, to supply necessary BOP loads from ESF buses. Stop any unloaded DG. REFER TO SOP-306, EMERGENCY DIESEL GENERATOR. (N/A)
	RO	Verify equipment is available for Cold Leg Recirculation: <ul style="list-style-type: none"> Verify power is available for at least one RHR Pump: <ul style="list-style-type: none"> PUMP A. (YES) PUMP B. (YES) Open both MVB-9503A(B), CC TO RHR HX A(B).

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 36 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

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

Procedure Caution:

- If the swing CCW Pump is NOT available, the running pump should NOT be secured to shift it to fast speed, to prevent damage to the Charging Pump on that train.
- If CCW can NOT be shifted to fast speed, this procedure should be continued. CCW alignment will be addressed in EOP-2.2, TRANSFER TO COLD LEG RECIRCULATION.

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • Shift the CCW Train to fast speed in the Active Loop. REFER TO SOP-118, COMPONENT COOLING WATER.
		<ul style="list-style-type: none"> • Consult with TSC personnel to determine if equipment required for Cold Leg Recirculation is available.

Procedure Note – Step 17

Presence of abnormally high levels of radioactivity in the AB indicates that a Containment breach may be in progress. Conditions for upgrading the Emergency status should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.

Time	Position	Applicant's Actions or Behavior
	RO	Check the AB for evidence of ECCS leakage: (No leakage indicated because all questions will be answered YES)
		<ul style="list-style-type: none"> • Verify AB radiation levels are normal on: <ul style="list-style-type: none"> • RM-A3 • RM-A13 • RM-A11 • Local area monitors. • Verify annunciator XCP-631 6-1 is NOT lit (AB SMP LVL HI). • Verify annunciators XCP-606 3-4 and XCP-607 3-4 are NOT lit (LD TRBL AB SMP/FLDRN LVL HI).
	RO	Obtain necessary Chemistry samples:
		<ul style="list-style-type: none"> • Ensure all RCS sample valves are in AUTO:

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 37 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> SVX-9364B and SVX-9365B, RCS LP B SMPL ISOL.
		<ul style="list-style-type: none"> SVX-9364C and SVX-9365C, RCS LP C SMPL ISOL.
		<ul style="list-style-type: none"> Notify Chemistry to sample the following:
		<ul style="list-style-type: none"> RCS.
		<ul style="list-style-type: none"> All SGs for isotopic activity.
	BOP	Shut down and stabilize the Secondary Plant. REFER TO AOP-214.1, TURBINE TRIP.
	RO	Check if RCS cooldown and depressurization is required: <ul style="list-style-type: none"> RCS pressure is GREATER THAN 250 psig. (YES)
	CRS	GO TO EOP-2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION, Step 1.
<p>The Lead Evaluator may terminate this scenario at his discretion after all 3 critical tasks have been addressed.</p>		
<p>Procedure Note:</p> <ul style="list-style-type: none"> The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN. 		
	BOP	Verify all AC buses are energized by offsite power. (NO)
	CRS	Restore offsite power to all AC buses. Refer to the appropriate procedure based on existing plant conditions. <ul style="list-style-type: none"> SOP-304, 115KV/7.2KV OPERATIONS. SOP-306, EMERGENCY DIESEL GENERATOR.

Op Test No.:	<u>1</u>	Scenario #	<u>3</u>	Event #	<u>10 & 11</u>	Page	<u>38</u>	of	<u>46</u>
Event Description:	600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> AOP-304.1, LOSS OF BUS 1DA(1DB) WITH THE DIESEL NOT AVAILABLE.
		<ul style="list-style-type: none"> AOP-304.3, LOSS OF ALL BALANCE OF PLANT BUSES.
		<ul style="list-style-type: none"> AOP-304.3A(B)(C), LOSS OF BALANCE OF PLANT BUS 1A(1B)(1C).
		IF offsite power can NOT be restored to BOP buses, THEN REFER TO AOP-304.3, LOSS OF ALL BALANCE OF PLANT BUSES, to supply necessary BOP loads from ESF buses.
Procedure Caution – Step 2		
PZR Heaters should NOT be energized until PZR water level is GREATER THAN the minimum level recommended by TSC personnel to ensure the heaters are covered.		
	RO	Deenergize PZR Heaters:
		<ul style="list-style-type: none"> Place both BU GRP 1(2) Switches in PULL TO LK NON-A.
		<ul style="list-style-type: none"> Secure the CNTRL GRP Heaters.
		<ul style="list-style-type: none"> Consult TSC personnel for a minimum indicated PZR water level that will ensure heaters are covered.
Procedure Caution: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to LESS THAN 250 psig, the RHR Pumps must be manually restarted to supply water to the RCS.		
Evaluator Note: If RCS Pressure has stabilized when the next step is read then the crew will stop both RHR Pumps.		
	CRS	Check if RHR Pumps should be stopped.
		<ul style="list-style-type: none"> Check if any RHR Pump is running with suction aligned to the RWST (YES)
		Check RCS Pressure:
		<ul style="list-style-type: none"> RCS Pressure is greater than 250 PSIG (YES)

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 39 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> RCS Pressure is stable or increasing (NO)
	BOP	Check Intact SG levels:
		<ul style="list-style-type: none"> NR level in intact SGs greater 40% [50%]
		<ul style="list-style-type: none"> Control EFW flow to maintain 40 [50%] - 60% NR level
Procedure Note – Step 5		
		<ul style="list-style-type: none"> Before the Low Steamline Pressure SI signal is blocked, Main Steam Isolation will occur if the Low Steam Pressure rate setpoint is exceeded. Shutdown margin should be monitored during RCS cooldown.
	CRS	Initiate RCS cooldown to Cold Shutdown:
		<ul style="list-style-type: none"> Maintain the cooldown rate in the RCS Cold Legs LESS THAN 100 °F/hr.
		<ul style="list-style-type: none"> Use the RHR System if it is in service. REFER TO SOP-115, RESIDUAL HEAT REMOVAL.
		<ul style="list-style-type: none"> WHEN RCS Tavg is LESS THAN P-12 (552 °F), THEN: Place both STM DUMP INTERLOCK Switches to BYP INTLK. Place both STMLN SI TRAIN A(B) Switches to BLOCK.
		<ul style="list-style-type: none"> Close the MS Isolation Valves, PVM-2801A(B)(C), for any FAULTED or RUPTURED SGs.
	BOP	Dump steam from each intact SG to the condenser.
		<ul style="list-style-type: none"> Verify permissive C-9 light is bright on XCP-6114-1-3. (NO)
	BOP	Dump steam from each intact SG using the Steamline PORVs:
		<ul style="list-style-type: none"> Place the Steamline Power Relief A(B)(C) Mode Switch(s) in PWR RLF.
		<ul style="list-style-type: none"> Adjust the PWR RELIEF A(B)(C) SETPT Controller(s) to establish the desired cooldown rate.

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 40 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

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

LEAD EVALUATOR: Terminate the scenario anytime after the cooldown is started.		

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 41 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

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

EOP-1.0, ATTACHMENT 3

Evaluator's Note:

- Only equipment powered from Bus 1DB will have power available when Attachment 3 is performed.
- There will be no flow indicated from RHR because RCS Pressure will remain above the shutoff head.

	BOP	Ensure EFW Pumps are running: <ul style="list-style-type: none"> • Ensure both MD EFW pumps are running. (NO) • Verify the TD EFW Pump is running if necessary to maintain SG levels. (AUTO start is blocked)
	BOP	Ensure the following EFW valves are open: (YES) <ul style="list-style-type: none"> • FCV-3531 (3541)(3551), MD EFP TO SG A(B)(C). • FCV-3536(3546)(3556), TD EFP TO SG A(B)(C) • MVG-2802A(B), MS LOOP B(C) TO TD EFP.
	BOP	Verify total EFW flow is GREATER THAN 450 gpm.
	BOP	Ensure FW Isolation: <ul style="list-style-type: none"> • Ensure the following are closed: (YES) <ul style="list-style-type: none"> • FW Flow Control • FW Isolation, PVG-1611A(B)(C). • FW Flow Control Bypass, FCV-3321(3331)(3341). • SG Blowdown, PVG-503A(B)(C). • SG Sample, SVX-9398A(B)(C). • Ensure <u>all</u> Main FW Pumps are tripped.

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 42 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
	BOP	Ensure SI Pumps are running: (Only B Train available)
		<ul style="list-style-type: none"> Two Charging Pumps are running. Both RHR Pumps are running.
	BOP	Ensure two RBCU Fans are running in slow speed (one per train) (Only B Train available)
	BOP	Verify Service Water to the RBCUs: (Only B Train available)
		<ul style="list-style-type: none"> Ensure two Service Water Pumps are running. Ensure both Service Water Booster Pumps A(B) are running. Verify GREATER THAN 2000 gpm flow for each train on: <ul style="list-style-type: none"> FI-4466, SWBP A DISCH FLOW GPM. FI-4496, SWBP B DISCH FLOW GPM.
	BOP	Verify two CCW Pumps are running. (Only B Train available)
	BOP	Ensure two Chilled Water Pumps and Chillers are running. (Only B Train available)
	BOP	Check if Main Steamlines should be isolated: (NO)
		<ul style="list-style-type: none"> Check if any of the following conditions are met: <ul style="list-style-type: none"> RB pressure GREATER THAN 6.35 psig. OR Steamline pressure LESS THAN 675 psig. OR Steamline flow GREATER THAN 1.6 MPPH AND Tavg LESS THAN 552°F. Ensure ALL the following are closed: <ul style="list-style-type: none"> MS Isolation Valves, PVM-2801A(B)(C). MS Isolation Bypass Valves, PVM-2869A(B)(C).

Op Test No.: 1 Scenario # 3 Event # 10 & 11 Page 43 of 46

Event Description: 600 GPM SBLOCA After Bus 1DB Recovery; MVG-8801B (HI HEAD CL INJECTION MOV) Fails to OPEN

Time	Position	Applicant's Actions or Behavior
	BOP	Ensure Excess Letdown Isolation Valves are closed: (YES)
		<ul style="list-style-type: none"> PVT-8153, XS LTDN ISOL.
		<ul style="list-style-type: none"> PVT-8154, XS LTDN ISOL.
	BOP	Verify ESF monitor lights indicate Phase A and Containment Ventilation Isolation on XCP-6103, 6104, and 6106. (YES)
		REFER TO ATTACHMENT 4, CONTAINMENT ISOLATION VALVE MCB STATUS LIGHT LOCATIONS, as needed.
	BOP	Verify proper SI alignment:
CRITICAL TASK #3		<ul style="list-style-type: none"> Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104. (NO - Opens MVG-8801B, HI HEAD TO CL INJECTION VALVE, before reporting the completion of this Attachment)
		<ul style="list-style-type: none"> Verify all SAFETY INJECTION monitor lights are dim on XCP-6106.
		<ul style="list-style-type: none"> Verify SI flow on FI-943, CHG LOOP B COLD/HOT LG FLOW GPM.
		<ul style="list-style-type: none"> Check if RCS pressure is LESS THAN 250 psig.
		<ul style="list-style-type: none"> Verify RHR flow on: <ul style="list-style-type: none"> FI-605A, RHR DISCHARGE PUMP A FLOW GPM
		AND
		<ul style="list-style-type: none"> FI-605B, RHR DISCHARGE PUMP B FLOW GPM.

Op Test No.: 1 Scenario # 3 Event # NA Page 44 of 46

Event Description: EOP-6.0 Actions

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

	CRS	Enters EOP-6.0, LOSS OF ALL ESF AC POWER.
Procedure Notes: <ul style="list-style-type: none"> • Steps 1 and 2 are Immediate Operator Actions. • The EOP REFERENCE PAGE should be monitored throughout the use of this procedure. • Critical Safety Function status trees should be monitored for information only. Procedures referenced from the status trees should NOT be used during this procedure. • Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN. 		
	RO	Verify reactor Trip: <ul style="list-style-type: none"> • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. • Verify Reactor Power level is decreasing.
	BOP	Verify Turbine/Generator Trip: <ul style="list-style-type: none"> • Verify all Turbine STM Stop VLVs are closed. • Ensure Generator Trip (after 30 second delay): <ul style="list-style-type: none"> • Ensure the GEN BKR is open. • Ensure the GEN FIELD BKR is open. • Ensure the EXC FIELD CNTRL is tripped.
	RO	Isolate the RCS.
	RO	Verify all PZR PORVs are closed (YES) .
	RO	Ensure all Letdown Isolation Valves are closed:

Op Test No.: 1 Scenario # 3 Event # NA Page 45 of 46

Event Description: EOP-6.0 Actions

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

		<ul style="list-style-type: none"> PVT-8149A(B)(C), LTDN ORIFICE A(B)(C) ISOL. (CLOSES)
		<ul style="list-style-type: none"> LCV-459 and LCV-460, LTDN LINE ISOL. (CLOSES)
		<ul style="list-style-type: none"> PVT-8153 and PVT-8154, XS LTDN ISOL. (YES)
	CREW	Ensure all PZR AND RCS sample valves are closed:
		<ul style="list-style-type: none"> SVX-9364B and SVX-9365B, RCS LP B SMPL ISOL.
		<ul style="list-style-type: none"> SVX-9364C and SVX-9365C, RCS LP C SMPL ISOL.
		<ul style="list-style-type: none"> SVX-9356A, PZR STM SMPL ISOL.
		<ul style="list-style-type: none"> SVX-9356B, PZR LIQ SMPL ISOL.
		<ul style="list-style-type: none"> SVX-9357, PZR SMPL ISOL.
	BOP	Verify total EFW flow to INTACT SGs is GREATER THAN 450 gpm. (NO)
		Perform the following:
		<ul style="list-style-type: none"> Ensure all TD EFW Flow Control Valves FCV-3536(3546)(3556), TD EFP TO SG A(B)(C) are open. (YES)
		Start the TD EFW Pump:
CRITICAL TASK #2		<ul style="list-style-type: none"> Open PVG-2030, STM SPLY TO TD EFP TRN A(B) before wide range level in any two SGs is less than 15%.
		ENSURE AT LEAST ONE OF THE FOLLOWING safety injection MONITOR LIGHTS IS DIM:
		<ul style="list-style-type: none"> XCP-6103 3-5 (MS LOOP C TO TDEFP 2802B)
		<ul style="list-style-type: none"> XCP-6103 4-16 (MS LOOP B TO TDEF 2802A).

Procedure Caution Step 5:

- If power can NOT be restored to at least one ESF bus within ten minutes, all RCPs should be stopped to prevent RCP damage.

Op Test No.:	<u>1</u>	Scenario #	<u>3</u>	Event #	<u>NA</u>	Page	<u>46</u>	of	<u>46</u>
Event Description:		EOP-6.0 Actions							
Time	Position	Applicant's Actions or Behavior							

- **When a DG is running, the Service Water System must be in operation OR PVG-3105A(B), FS TO DG A(B), must be open to supply cooling water.**

	BOP	Try to restore power to any ESF bus:
		<ul style="list-style-type: none"> • Attempt to start any DG from the Main Control Board (starts "B")
CRITICAL TASK #1		<ul style="list-style-type: none"> • Energize ESF bus 1DB from the running DG before performing Step 8 of EOP-6.0
		<ul style="list-style-type: none"> • Verify the energized ESF Bus voltage is normal and frequency is stable.
Procedure Note – Step 5.d		
Procedures referenced in EOP-12.0, MONITORING OF CRITICAL SAFETY FUNCTIONS, may now be implemented.		
	CRS	RETURN TO the Procedure and Step in effect.