

Facility: VC SUMMER Scenario No.: 1 Op Test No.: **NRC ILO 11-01**

Examiners: _____ Operators: CRS: _____
 _____ RO: _____
 _____ BOP: _____

Initial Conditions:

- 100% MOL
- Alternate Seal Injection is OOS
- "B" Train workweek
- Severe thunderstorms have been reported in the area

Turnover:

- Reduce power to < 90% to allow for Turbine valve testing by the next shift.

Critical Task:

- Isolate "B" SG PORV prior to "B" SG Pressure less than 460 psig.
- Terminate SI before SG level reaches EOP SG level for steam line (87% NR).
- Stop RCPs if RCS pressure is < 1418 psig and before WR 33% RVLIS.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N - BOP, CRS R - RO	Lower Power IAW GOP-4B for Turbine Valve Testing
2	PCS003B	I - BOP, CRS TS - CRS	"B" SG Level Inst Failure LT-486 Fails HIGH
3	TUR012A	I - RO, BOP, CRS TS - CRS	PT-446 (Controlling turbine first stage pressure transmitter) fails to 0 over 15 seconds
4	TUR011A	C - BOP	EHC Pump trips (BU does not auto-start and must be manually started)
5	RCS002A	C-RO, CRS TS-CRS	SGTL on "A" SG (12 gpm leak - greater than TS leakage limit)
6	RCS002A	M - ALL	"A" SG SGTR (a ramp increase in the SGTL until a SGTR is apparent and large enough to cause a Safety Injection Actuation)
7	MS035O		SG "B" Pressure Transmitter PT-2010 Fails HIGH resulting in the opening of a "B" Steam Generator PORV.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

**** Additional Critical Task:**

Maintain "B" SG level following LT-486 failure such that an unnecessary reactor trip is NOT required.

The following notation is used in the ES-D-2 form "Time" column:

IOA designates **Immediate Operator Action** steps
***** designates **Continuous Action** steps

The crew will assume the watch having been pre-briefed on the Initial Conditions, the plan for this shift and any related operating procedures.

EVENT 1: Lower Power to Conduct Turbine Valve Testing

The crew will lower power from 100% to less than 90% in accordance with GOP-4B, Power Operation MODE 1 – Descending.

EVENT 2: "B" SG Level Transmitter Fails HIGH

On cue from the Examiner, "B" SG level transmitter will fail HIGH, requiring manual control of the "B" SG Feedwater Regulating Valve to maintain/restore SG level to between 60% and 65% and prevent a reactor trip.

The crew will enter AOP-401.11, Steam Generator Level Control and Protection Channel Failure, and remove the channel from service.

The CRS will refer to Tech Specs 3.3-1, Item 13 (Action 6) and 3.3-3, Items 5, 6c (Action 24) to determine that the protection bistables for the failed channels must be placed in the TRIPPED condition with 72 hours.

EVENT 3: Turbine 1st Stage Pressure Transmitter Fails LOW

On cue from the Examiner, PT-446 (Selected turbine first stage pressure transmitter) will fail LOW. The failure causes a Tave - Tref mismatch resulting in rods inserting at the maximum speed.

The crew will enter AOP-401.7, Turbine First Stage Pressure Channel Failure.

The RO will place rod control in manual and maintain Tave within 1 degree of Tref. The RO will then select the operable 1st stage pressure channel for control. The RO may restore automatic rod control after the operable channel is selected.

The BOP will control "B" Steam Generator NR level and change the Steam Dump Mode to Steam Pressure.

EVENT 4: Running EHC pump trips on overload (Backup pump does not start in auto)

On cue from the Examiner, the running EHC pump will trip and the backup pump will not start in auto.

The BOP will recognize the condition from annunciator XCP-631 1-4, EHC PP A Motor Ovrlid, or determine the cause of the event, and take corrective action by starting the backup EHC pump to prevent turbine stop valves from closing.

EVENT 5: "A" SGTL

On cue from the Examiner, a steam generator tube leak will begin. The tube leak on the SG "A" will initiate and stabilize at 12 GPM. The crew will respond to indications of RCS inventory loss/rising secondary-side radiation and enter AOP-112.2, Steam Generator Tube Leak Not Requiring SI. The crew will estimate SGTL as greater than the TS limit and the CRS will enter TS 3.4.6.2.c. The RO will stabilize PZR level by increasing charging and minimizing letdown. The CRS will direct a shutdown to HOT STANDBY in accordance with the requirements of AOP-112.2 since the shutdown rate specified by that procedure is greater than that specified by the TS.

EVENT 6: "A" SGTR

On cue from the Examiner, a steam generator tube rupture will occur. The crew will recognize the increase in tube leakage greater than the capacity of the charging pumps. The crew will trip the reactor/turbine and implement EOP-1.0 (E-0), Reactor Trip/Safety Injection Actuation. The crew will transition to EOP-4.0 (E-3), Steam Generator Tube Rupture. In EOP-4.0 (E-3), isolate the "A" SG and cool down and depressurize the RCS to terminate break flow.

EVENT 7: "B" SG Pressure Transmitter PT-2010 Fails HI

Event 7 is triggered automatically after the reactor trip. The BOP may identify the PT-2010 indicates 1300 psig and/or the "B" SG Power Operated Relief Valve (PORV) indicates open. The operator will place the controller to manual and close the PORV.

If the failure is not identified the crew may transition to EOP 3.0 (E-2), Faulted Steam Generator Isolation, to isolate the SG.

CRITICAL TASKS:

It is a critical task to Isolate "B" SG PORV prior to "B" SG Pressure less than 460 psig.

It is critical to terminate Safety Injection prior to the "A" steam generator reaching the level of the steamline to preclude failure of the steam line. This level, including tolerances, is 87% NR in the EOP network.

It is a critical task to stop RCPs if RCS pressure is < 1418 psig and before WR 33% RVLIS.

TERMINATION:

The scenario can be terminated after the crew has closed the SG PORV and Safety Injection has been terminated.

SIMULATOR SCENARIO SETUP**Initial Conditions:**

- 100% power MOL, IC set 320 is main snap.
- Prior to the scenario, crew should pre-brief on conditions and expectations for the Shift (maintain power, repairs estimated to be complete well before LCO action time expires).
- Rod Position = 230 steps withdrawn
- Boron = 1000 ppm
- FCV113 Pot Setting = 4.29
- Xe = - 2700 pcm
- Burnup = 10010 MWD/MTU = 226 EFPD
- Prior to the scenario, crew should pre-brief on conditions and expectations for the Shift (maintain power, repairs estimated to be complete well before LCO action time expires).

VC Summer 2013 NRC Scenario 1 Simulator Setup (SNAP 320)

- Conduct two-minute drill
- Mark up procedures in use with "Circle and slash" as applicable

Pre-Exercise:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.)
- TQP-801 Booth Operator checklist, has been completed
- Hang Red Tags for equipment out of service

PRE-LOAD:**Standard Simulator Setup**

- PMP-LD003P XPP0138 LEAK DETECTION SUMP PMP LOSS OF POWER
- VLV-FW028W XVG01676-FW FW HDR RECIRC ISOL VLV LOSS OF POWER
- VLV-FW029W XVG01679-FW FW HTR RECIRC ISO VLV LOSS OF POWER
- VLV-CS052W XVT08141A-CS RCP A SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS054W XVT08141C-CS RCP C SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS053W XVT08141B-CS RCP B SEAL LEAKOFF VLV LOSS OF POWER

Scenario Related**P12 Overrides**

- BST-RC068 LL TA P12 Fail to: INHIBITED Delay=0 Delete=0
- BST-RC075 LL TA P12 Fail to: INHIBITED Delay=0 Delete=0

EVENT 1: Lower Power IAW GOP-4B for Turbine Valve Testing

- NO Trigger

This is a Normal/Reactivity evolution.

EVENT 2: "B" SG Level Inst Failure LT-486 Fails HIGH

- TRIGGER 2
 - MAL-PCS003B: STEAM GENERATOR CONTROL FAILURE (CHANNEL 486)
Final=100

It takes about 1 minute without operator action to cause trip without a ramp. Annunciators come in immediately and should not be a problem.

EVENT 3: PT-446 (Controlling Turbine 1st Stage Pressure Transmitter) Fails Low

- TRIGGER 3
 - MAL-TUR012A: TURBINE IMPULSE PRESSURE TRANSMITTER PT-446 FAILURE
Ramp=15 sec, Final=0

It takes about 40 seconds to get to LO-LO limit and plant will trip at about 1 min 45 seconds.

Booth Operator: When called as I&C to place AMSAC in bypass. Reply that I&C will place AMSAC in bypass. Wait 5 minutes. Call the control room and report you are ready to BYPASS AMSAC (the control room will receive a trouble alarm when AMSAC is bypassed. Insert TRIGGER 10.

- TRIGGER 10
 - ANN-MI007 AMSAC GENERAL WARNING
Final=ON

EVENT 4 : EHC Pump trips (BU does not auto-start and must be manually started)

- TRIGGER 4
 - MAL-TUR011A: LOSS OF EHC HYDRAULIC FLUID PUMP A
Final=Active
 - PMP-EH002F: XPP0003-PP2 HFM PMP B FAIL TO START
Final=Active

Trip occurs after 1 min 30 seconds if not mitigated.

EVENT 5: SGTL on “A” SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control)

- TRIGGER 5
 - MAL-RCS002A: STEAM GENERATOR A TUBE LEAK
Final =12

Booth Operator: XCP-646 2-1 will have HP do survey of steam lines; Report elevated readings on “A” steam line after 10 minutes. Chemistry sample of steam generators will show elevated on “A” activity after 30 minutes (frisker results if desired will take 10 min).

If asked to put condenser exhaust to AB exhaust report after 5 min that aligned to AB charcoal exhaust.

EVENT 6: “A” SG SGTR (a ramp increase in the SGTL until a SGTR is apparent and large enough to cause a Safety Injection Actuation)

- TRIGGER 6
 - MAL-RCS002A: STEAM GENERATOR A TUBE LEAK
Ramp=2 min, Initial=12 Final=600

EVENT 7: SG “B” Pressure Transmitter PT-2010 Fails HIGH resulting in the opening of a Steam Generator PORV.

- EVENT 7: Power Indication N-42 < 10% “FNISPR(2)”<10
- TRIGGER 7
 - XMT-MS036O: IPT02010 MS LINE B PRESS PI-2010 FAIL TO POSN
Final=1300

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Event Description: Lower Power IAW GOP-4B for Turbine Valve Testing

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR:

No triggers are required for Event 1

Indications Available: N/A**EVALUATOR NOTE:****This is a Normal evolution – After it has been determined that the operators have demonstrated their competencies the next event can be triggered**

CRS

Implement GOP-4B, POWER OPERATION (MODE 1 - DESCENDING) to reduce power to 90% for Turbine Valve Testing.

GOP-4B

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Event Description: Lower Power IAW GOP-4B for Turbine Valve Testing

Time	Position	Applicant's Actions or Behavior
<p style="text-align: center;"><u>GENERAL NOTES</u></p> <p>A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.</p> <p>B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.</p> <p>C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.</p> <p>D. If time allows, all load changes should be discussed with the Load Dispatcher prior to commencing the load change.</p> <p>E. If Reactor Power is stabilized during this procedure for the purpose of raising power per GOP-4A, a Power Range Heat Balance shall be performed.</p> <p style="text-align: center;"><u>REACTOR CONTROL</u></p> <p>A. During operation with a positive Moderator Temperature Coefficient:</p> <ol style="list-style-type: none"> 1) Power and temperature changes should be slow and will require constant operator attention. 2) All power and load changes should be performed in small increments. <p>B. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.</p> <p>C. If at any time, power decreases unexpectedly below 0.1% on any Power Range NI (computer indication available) OR below 1.0% on any Power Range NI control board indication (computer not available):</p> <ol style="list-style-type: none"> 1) No positive reactivity will be added by rods or dilution. 2) A complete reactor shutdown shall be performed per GOP-5. 3) A controlled reactor startup may be commenced per GOP-3 once the event has been reviewed by Reactor Engineering. <p style="text-align: center;"><u>TURBINE CONTROL</u></p> <p>A. If during power descension plant stabilization is required, Use the EHC HMI: Control/Load screen, select HOLD.</p> <p>B. To resume power descension select the recommended Load Ramp Rate</p> <p>C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.</p> <p>D. The load limit "ramp rate" buttons only affect how fast the Load Limit Ref. moves to the new Load Limit Setpoint. Load reductions made using the limiter will always occur at 30% per minute.</p> <p>E. The load limiter will reduce turbine load if it is set more than 2% below the current Load Reference value. Load will only be shed until the Load Reference value is once again within 2% of Load Limit Ref.</p> <p style="text-align: center;"><u>MSR CONTROL</u></p> <p>A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.</p> <p>B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.</p>		

GOP-4B

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Event Description: Lower Power IAW GOP-4B for Turbine Valve Testing		
Time	Position	Applicant's Actions or Behavior
<p align="center"><u>CAUTION 3.1 through 3.12</u></p> <p>a. Thermal Power changes of greater than 15% in any one-hour period requires completion of GTP-702 Attachment III.H.</p> <p>b. VCS PID Report, POWER CHANGE SEARCH, should be periodically performed to ensure a thermal power change of greater than 15% in any one-hour period is detected.</p>		GOP-4B
<p align="center"><u>NOTE 3.1 through 3.12</u></p> <p>a. Step 3.1 lowers Reactor Power from 100% to 90%.</p> <p>b. If the RCS will be opened for maintenance during the shutdown, degassing of the RCS should be initiated per SOP-102, Chemical And Volume Control System.</p> <p>c. The setpoint for IFK3136, FLOW TO DEAERATOR, should be adjusted during power changes to maintain LI-3136, DEAER STOR TK NR LVL, between 2.5 and 5.0 feet.</p>		GOP-4B
	CREW	Reduce Reactor Power to 90% as follows:
<p>EVALUATOR NOTE: Applicable portions of SOP-214, MAIN TURBINE AND CONTROLS, are attached (Page 45).</p>		
	BOP	Using the EHC HMI, Control/Load screen, reduce load per SOP-214 at a rate of 1% per minute or less.
<p align="center"><u>NOTE 3.1.b</u></p> <p>The System Controller should be notified prior to manually changing MVARs by more than 50 MVARs in a five minute period, unless the change is needed to prevent equipment damage.</p>		GOP-4B
	BOP	As load decreases, adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A).
	RO	Maintain Tavg within the control band by Control Rod motion or boron concentration changes.
<p>EVALUATOR NOTE: Applicable portions of SOP-106, DILUTION OPERATIONS, are attached (Page 43).</p>		
	RO	<p>Borate or dilute per SOP-106, Reactor Makeup Water System, to maintain the following parameters:</p> <ol style="list-style-type: none"> 1) ΔI within limits. 2) Control Rods above the Rod Insertion Limit.

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Event Description: Lower Power IAW GOP-4B for Turbine Valve Testing		
Time	Position	Applicant's Actions or Behavior
	BOP	Monitor Steam Generator Blowdown Condensate return temperature for proper operation as DA temperature is lowered.
	BOP	Ensure MSR's are in Temp Ramp mode.
	BOP	Monitor MSR temperatures and Main Turbine vibration levels closely as Main Turbine load is reduced.
		CAUTION 3.1.h To minimize stress in the Low Pressure Turbines, Hot Reheat Steam temperature changes must be limited to 125°F/hr.
	BOP	If necessary, manually control MSRs per SOP-204, Extraction Steam, Reheat Steam, Heater Vents And Drains, maintaining MSR temperatures on program
	CREW	If desired, stabilize at 90% Reactor Power, otherwise proceed to Step 3.2.
EVALUATOR NOTE: The next event may be triggered after a significant power change has been observed.		

GOP-4B

GOP-4B

GOP-4B

GOP-4B

GOP-4B

GOP-4B

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Event Description: "B" SG Level Inst Failure LT-486 Fails HIGH

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: Initiate Event 2 (TRIGGER 2) when directed.			
Indications Available: XCP-624 2-5, SG B LVL DEV XCP-624 2-1, SG B LVL HI-HI			
	BOP	Enters ARP-001-XCP-624 2-5 SG B LVL DEV	XCP-624 2-5
		CORRECTIVE ACTIONS:	XCP-624 2-5
	BOP	<p>If required, restore Steam Generator B level to between 60% and 65% by performing either or both of the following:</p> <ol style="list-style-type: none"> Manually control PVT-488, SG B FWF, as required. Manually control Feedwater Pump speed as follows: <ol 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 Steam header pressure, as required, to restore Steam Generator water level. 	XCP-624 2-5
	BOP	Evaluate SG B Narrow Range level indicators LI-484, LI-485, and LI-486:	XCP-624 2-5
	BOP	<p>For decreasing level:</p> <ol style="list-style-type: none"> At 45% Narrow Range level: <ol style="list-style-type: none"> Manually control PVT-488, SG B FWF, as required. Ensure feed flow is greater than steam flow by 200 kbh to 400 kbh. At 40% Narrow Range level: <ol style="list-style-type: none"> Trip the reactor. Ensure both Motor Driven Emergency Feed pumps are in service to deliver full system flow. 	XCP-624 2-5
	BOP	If FCV-488, B FCV, malfunctioned go to AOP-210.1, Feedwater Flow Control Valve Failure. [NO]	XCP-624 2-5

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Event Description: "B" SG Level Inst Failure LT-486 Fails HIGH

Time	Position	Applicant's Actions or Behavior	
	BOP	If a Main Feedwater Pump has tripped or is malfunctioning go to AOP-210.3, Feedwater Pump Malfunction. [NO]	XCP-624 2-5
	CRS	If an instrument channel has failed, go to AOP-401.11, Steam Generator Level Control And Protection Channel Failure.	XCP-624 2-5
	CRS	Implement AOP-401.11, STEAM GENERATOR LEVEL CONTROL AND PROTECTION CHANNEL FAILURE	AOP-401.11
IOA	BOP	Adjust the Feedwater Flow Control Valve as necessary to restore Narrow Range level in the AFFECTED SG to between 60% and 65%.	AOP-401.11
	CRS	Within 72 hours, place the failed channel protection bistables in a tripped condition:	AOP-401.11
	CRS	a. Identify the associated bistables for the failed channel. REFER TO Attachment 1.	AOP-401.11

Excerpt from AOP-401.11 Attachment 1

STEAM GENERATOR LEVEL PROTECTION CHANNELS

INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT	TECH SPECS	STPS
LT-486	LB-486A LB-486C	C3-730-BS-1 C3-730-BS-2	CHAN III SG B LB-486A CHAN III SG B LB-486C	TABLE 3.3-1 ITEM 13 TABLE 3.3-3 ITEMS 5, 6.c	302.025 345.028

AOP-401.11

EVALUATOR NOTE: Attachment excerpt from Table 3.3-1

TABLE 3.3-1 (Continued)
REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
13. Steam Generator Water Level--Low-Low	3/loop	2/loop in any operating loops	2/loop in each operating loop	1, 2	6 [#]

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

- The inoperable channel is placed in the tripped condition within 72 hours; and
- 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.

The provisions of Specification 3.0.4 are not applicable.

Op Test No.: **NRC ILO 11-01** Scenario # 1 Event # 2 Page 13 of 48
 Event Description: "B" SG Level Inst Failure LT-486 Fails HIGH

Time	Position	Applicant's Actions or Behavior
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EVALUATOR NOTE: Attachment excerpt from Table 3.3-3

TABLE 3.3-3 (Continued)
ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
5. TURBINE TRIP & FEEDWATER ISOLATION					
a. Steam Generator Water Level-High-High	3/loop	2/loop in any operating loop	2/loop in each operating loop	1, 2	24*
b. Automatic Actuation Logic and Actuation Relay	2	1	2	1, 2	25
6. EMERGENCY FEEDWATER					
c. Stm. Gen. Water Level-Low-Low					
i. Start Motor-Driven Pumps	3/stm. gen.	2/stm. gen. any stm gen.	2/stm. gen.	1, 2, 3	24*
ii. Start Turbine-Driven Pump	3/stm. gen.	2/stm. gen. any 2 stm. gen.	2/stm. gen.	1, 2, 3	24*

* The provisions of Specification 3.0.4 are not applicable.

ACTION 24 - 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:

- The inoperable channel is placed in the tripped condition within 72 hours.
- 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 4.3.2.1.

ACTION 25 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable Channel to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1, provided the other channel is OPERABLE.

CRS

Refers to Technical Specification Table 3.3-1 and Table 3.3-3. Determines that the inoperable channel must be placed in a tripped condition within 72 hours.

TECH SPEC
3.3.1 and
3.3.2

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Event Description: "B" SG Level Inst Failure LT-486 Fails HIGH

Time	Position	Applicant's Actions or Behavior	
	CRS	b. 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 	SOP-401
	CRS	Complete SOP-401 Attachment I.	SOP-401
BOOTH OPERATOR: Acknowledge requests for assistance and inform the crew that support personnel will be assigned.			
EVALUATOR NOTE: The next event may be initiated after Technical Specifications have been addressed.			

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Event Description: PT-446 (Controlling turbine first stage pressure transmitter) fails to 0 over 15 second period		
Time	Position	Applicant's Actions or Behavior
BOOTH OPERATOR: Initiate Event 3 (TRIGGER 3) when directed.		
Indications available: Uncontrolled Rod Motion XCP-615, 2-5, RCS TAVG-TREF HI/LO; XCP-624-4-2, 5-2, 6-2; SG A, B, C STM FLO HI		
EVALUATORS NOTE: The crew could enter the ARP but it is likely that they will recognize the entry condition for AOP-401.7, TURBINE FIRST STAGE PRESSURE CHANNEL FAILURE. The BOP will control steam generator level during this event as a result of the previous failure.		
	CRS	Enters AOP-401.7, Turbine First Stage Pressure Channel Failure
EVALUATORS NOTE: If XCP-621 1-1 CRB INSERT LMT LO-LO is received the RO will immediately Emergency Borate per AOP-106.1, Emergency Boration until Shutdown Margin is restored.		
IOA	RO	Place Rod Control Bank Select Switch to MANUAL
	RO	Ensure TREF 1 ST STG PRESS switch is positioned to the operable channel: P446, CH III. (FAILED) OR PT-447, CH IV
	RO	Adjust Control Rods until Tav _g is within 1.0° F of Tref.
	BOP	Check if Main Turbine load is greater than 10%
	CRS	Within one hour, verify the following permissives are dim: <ul style="list-style-type: none"> • P-13, 1st STG PRESS • P-7, REACTOR TRIP BLOCKED
EVALUATOR NOTE: Due to the windup (integral) characteristic of the Rod Control function, the crew may not immediately place rods back in automatic.		

AOP-401.7

AOP-401.7

AOP-401.7

AOP-401.7

AOP-401.7

AOP-401.7

Op Test No.: **NRC ILO 11-01** Scenario # 1 Event # 3 Page 16 of 48
 Event Description: PT-446 (Controlling turbine first stage pressure transmitter) fails to 0 over 15 second period

Time	Position	Applicant's Actions or Behavior													
	RO	Restore automatic rod control.	AOP-401.7												
	BOP	Place Steam Dump Mode Select Switch in STM PRESS.	AOP-401.7												
BOOTH OPERATOR: <ul style="list-style-type: none"> Acknowledge requests for support. Wait 3 minutes Call for permission to proceed. Use TRIGGER 10 to place AMSAC in BYPASS Report completion. 															
	CRS	Notify I&C to place AMSAC in BYPASS.	AOP-401.7												
	CRS	Within 72 hours, place the failed channel protection bistables in a tripped condition:	AOP-401.7												
	CRS	Identify the associated bistables for the failed channel. REFER TO Attachment 1.	AOP-401.7												
EVALUATOR NOTE: Attachment excerpt for reference TURBINE FIRST STAGE PRESSURE PROTECTION CHANNELS <table border="1"> <thead> <tr> <th>INSTRUMENT</th> <th>ASSOCIATED BISTABLE</th> <th>BISTABLE LOCATION</th> <th>TRIP STATUS LIGHT</th> <th>TECH SPECS</th> <th>STPS</th> </tr> </thead> <tbody> <tr> <td>PT-446</td> <td>FB-474A FB-484A FB-494A</td> <td>C3-741-BS-1 C3-746-BS-1 C3-748-BS-1</td> <td>CHAN III LPA FB-474A CHAN III LPB FB-484A CHAN III LPC FB-494A</td> <td>TABLE 3.3-1 ITEMS 19.B, E TABLE 3.3-3 ITEM 4.d</td> <td>302.052 345.034</td> </tr> </tbody> </table>				INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT	TECH SPECS	STPS	PT-446	FB-474A FB-484A FB-494A	C3-741-BS-1 C3-746-BS-1 C3-748-BS-1	CHAN III LPA FB-474A CHAN III LPB FB-484A CHAN III LPC FB-494A	TABLE 3.3-1 ITEMS 19.B, E TABLE 3.3-3 ITEM 4.d	302.052 345.034
INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT	TECH SPECS	STPS										
PT-446	FB-474A FB-484A FB-494A	C3-741-BS-1 C3-746-BS-1 C3-748-BS-1	CHAN III LPA FB-474A CHAN III LPB FB-484A CHAN III LPC FB-494A	TABLE 3.3-1 ITEMS 19.B, E TABLE 3.3-3 ITEM 4.d	302.052 345.034										
	CRS	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. 	AOP-401.7												

Op Test No.: **NRC ILO 11-01** Scenario # **1** Event # **3** Page **17** of **48**
 Event Description: PT-446 (Controlling turbine first stage pressure transmitter) fails to 0 over 15 second period

Time	Position	Applicant's Actions or Behavior
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EVALUATOR NOTE: Attachment excerpt from TS Table 3.3-1

TABLE 3.3-1 (Continued)
REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
19. Reactor Trip System Interlocks					
B. Low Power Reactor Trips Block, P-7	P-10 Input 4 P-13 Input 2	2 1	3 2	1 1	7 7
E. Turbine First Stage Pressure, P-13	2	1	2	1	7

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

EVALUATOR NOTE: Attachment excerpt from TS Table 3.3-3

TABLE 3.3-3 (Continued)
ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. STEAM LINE ISOLATION					
d. Steam Flow in Two Steam Lines--High	2/steam line	1/steam line any 2 steam lines	1/steam line	1, 2, 3 ^{***}	24*
COINCIDENT WITH T _{avg} --Low-Low	1 T _{avg} /loop	1 T _{avg} any 2 loops	1 T _{avg} any 2 loops	1, 2, 3 ^{***}	24*

* The provisions of Specification 3.0.4 are not applicable.

ACTION 24 - 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:

- The inoperable channel is placed in the tripped condition within 72 hours.
- 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 4.3.2.1.

CRS

Table 3.3-1 Action 7

Refers to Technical Specification Table 3.3-1 and within one hour determines by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition.

Tech Spec
3.3.1

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>3</u> Page <u>18</u> of <u>48</u>		
Event Description: PT-446 (Controlling turbine first stage pressure transmitter) fails to 0 over 15 second period		
Time	Position	Applicant's Actions or Behavior
	CRS	Table 3.3-3 Action 24 Refers to Technical Specification Table 3.3-3 and determines that the inoperable channel must be placed in a tripped condition within 72 hours.
BOOTH OPERATOR: Acknowledge requests for assistance and inform the crew that support personnel will be assigned.		
	CRS	Notify I&C to place the failed channel protection bistables in a tripped condition within 72 hours: <ul style="list-style-type: none"> • FB-474A • FB-484A • FB-494A
EVALUATOR NOTE: The next event may be initiated after I&C is called to trip the bistables.		

Tech Spec 3.3.2

AOP-401.7

Op Test No.: NRC ILO 11-01		Scenario # <u>1</u>	Event # <u>4</u>	Page <u>19</u> of <u>48</u>
Event Description: EHC Pump trips (BU does not auto-start and must be manually started)				
Time	Position	Applicant's Actions or Behavior		
BOOTH OPERATOR: Initiate Event 4 (TRIGGER 4) when directed.				
Indications available: Control Switch Red and Green lights XCP-631, 1-4, EHC PP A MOTOR OVRLD XCP-631, 1-2, EHC FLUID PRESS LO				
	BOP	Enters ARP-001-XCP-631 1-4		XCP-631 1-4
	BOP	AUTOMATIC ACTIONS: 1. The pump may trip if the condition is not corrected. 2. If the pump trips, the standby pump starts at 1300 psig.		XCP-631 1-4
		CORRECTIVE ACTIONS:		XCP-631 1-4
	BOP	If EHC PUMP A is still running, verify high amps. [NO] (EHC Pump A has tripped)		XCP-631 1-4
	BOP	Start EHC PUMP B and observe motor amps.		XCP-631 1-4
	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 [NO] (N/A A Pump tripped)		XCP-631 1-4
BOOTH OPERATOR: <ul style="list-style-type: none"> If called to investigate the EHC pump failure – report no fault is apparent. If called to investigate the EHC system for leaks – report no EHC leaks. 				
	BOP	Dispatch an operator to check for EHC System leaks.		XCP-631 1-4
EVALUATOR NOTE: The failure of the backup EHC pump to auto-start results in EHC pressure continuing to decrease. The Low Pressure alarm will alert operators to the failure – if not previously discovered – however this alarm provides no additional operator actions				
	BOP	Respond to alarm EHC FLUID PRESS LO (XCP-631, 1-2)		XCP-631 1-4
EVALUATOR NOTE: The next event may be initiated after the B EHC pump is started.				

Op Test No.: NRC ILO 11-01			Scenario # <u>1</u>	Event # <u>5</u>	Page <u>20</u> of <u>48</u>	
Event Description: SGT on "A" SG (12 gpm leak - greater than TS leakage limit)						
Time	Position	Applicant's Actions or Behavior				
BOOTH OPERATOR: Initiate Event 5 (TRIGGER 5) when directed.						
Indications available: XCP-646, 2-1, MN STM LINE RM-G19 HI RAD						
	BOP	Respond to alarm XCP-646, 2-1, MN STM LINE RM-G19 HI RAD				XCP-646 2-1
		CORRECTIVE ACTIONS:				XCP-646 2-1
	BOP	Verify the alarm is valid and identify the Main Steam line affected by observing RM-G19A, B, and C and R/R-8.				XCP-646 2-1
	CRS	Request Health Physics perform radiological surveys around the Main Steam lines.				XCP-646 2-1
	CRS	Direct Chemistry to sample all Steam Generators for activity.				XCP-646 2-1
	BOP	Align the condenser exhaust to the Auxiliary Building Charcoal Exhaust as follows: a. Open XVB00110-AR, MN&AUX COND VAC PP CHAR EXH DISCH VALVE (TB-436). b. Close XVB00109-AR, MN&AUX COND VAC PUMP ATMOS DISCH VALVE (TB-436).				XCP-646 2-1
	BOP	Reduce all Steam Generator blowdown flows to minimum.				XCP-646 2-1
	BOP	If in service, secure the Condensate Polishing System per SOP-203.				XCP-646 2-1
	CRS	SUPPLEMENTAL ACTIONS: 1. If the alarm is valid, refer to AOP-112.2. (YES) 2. If the alarm is invalid, remove RM-G19A, B or C from service per SOP-124. [NO] 3. Refer to Technical Specification 3.3.3.1.				XCP-646 2-1

Op Test No.: **NRC ILO 11-01** Scenario # 1 Event # 5 Page 21 of 48

Event Description: SGTL on "A" SG (12 gpm leak - greater than TS leakage limit)

Time	Position	Applicant's Actions or Behavior
BOOTH OPERATOR: <ul style="list-style-type: none"> Acknowledge request for HP to perform surveys around the Main Steam lines. <ul style="list-style-type: none"> Wait 10 min and then report elevated background activity on 'A' SG. Acknowledge request for Chemistry to sample all SGs for activity. <ul style="list-style-type: none"> Wait 30 min and then report elevated activity on 'A' SG. Report in 10 minutes if requested to use a frisker. Acknowledge request to put condenser exhaust to AB exhaust. <ul style="list-style-type: none"> Wait 5 min to report that the condenser exhaust is aligned to Auxiliary Building Charcoal Exhaust 		
	CRS	Implement AOP-112.2, Steam Generator Tube Leak Not Requiring SI
*	RO	1. 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
*	CRS/RO	Check if SI is required: Check if any of the following criteria are met: (NO) <ul style="list-style-type: none"> PZR level is decreasing with Charging maximized and Letdown isolated. OR <ul style="list-style-type: none"> PZR level is approaching 8%. OR <ul style="list-style-type: none"> PZR pressure is approaching 1870 psig. ALTERNATIVE ACTION GO TO step 3
*	RO	Verify VCT level is being maintained between 20% and 40%.

AOP-112.2

AOP-112.2

AOP-112.2

AOP-112.2

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>5</u> Page <u>22</u> of <u>48</u>		
Event Description: SGTL on "A" SG (12 gpm leak - greater than TS leakage limit)		
Time	Position	Applicant's Actions or Behavior
	CRS	<p>IF Steam Generator primary to secondary tube leakage has not been determined, THEN perform the following:</p> <ul style="list-style-type: none"> a. Estimate the RCS leak rate. refer to IPCS CHGNET . b. Calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAK TEST. c. Comply with the applicable Tech Spec 3.4.6.2 action statement.
<p>Excerpt from TS 3.4.6.2</p> <p><u>REACTOR COOLANT SYSTEM</u> <u>OPERATIONAL LEAKAGE</u> <u>LIMITING CONDITION FOR OPERATION</u></p> <hr/> <p>3.4.6.2 Reactor Coolant System operational leakage shall be limited to:</p> <ul style="list-style-type: none"> c. 150 gallons per day primary-to-secondary leakage through any one steam generator, <p><u>APPLICABILITY:</u> MODES 1, 2, 3 and 4</p> <p><u>ACTION:</u></p> <ul style="list-style-type: none"> a. 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. 		
	CRS	Refers to Technical Specification 3.4.6.2 and determines that leakage exceeding 150 gallons per day primary-to-secondary leakage through any one steam generator requires the unit be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
BOOTH OPERATOR: Acknowledge request to sample all SG secondary sides for activity.		
	CRS	Notify Chemistry to sample all SG secondary sides for activity.

AOP-112.2

Tech Spec
3.4.6.2

AOP-112.2

Op Test No.: **NRC ILO 11-01** Scenario # 1 Event # 5 Page 23 of 48

Event Description: SGT on "A" SG (12 gpm leak - greater than TS leakage limit)

Time	Position	Applicant's Actions or Behavior
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NOTE - Step 6

AOP-112.2

- 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:
 - UR1019, S/G LEAKAGE 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.
- Due to N-16 gamma radiation effects, RM-G19A(B)(C), STMLN HI RNG GAMMA, will display elevated readings and should not be used for classification of EAL while the Reactor is critical.

		<p>IF RCS leak rate (Steam Generator primary to secondary tube leakage) is GREATER THAN OR EQUAL TO 75 gpd (YES) (.05 gpm), THEN initiate a plant shutdown per the following table using GOP-4B, POWER OPERATION (MODE 1 DESCENDING).</p> <table><tr><td></td><td>RM-A9</td></tr><tr><td>LEAKAGE</td><td>ACTION</td></tr><tr><td>≥ 75 gpd <u>AND</u> increasing ≥ 30 gpd/hr</td><td>Be $\leq 50\%$ power within 1 hour at 1% or 3% per minute, <u>AND</u> in Mode 3 within the next 2 hours (≤ 3 hours total).</td></tr><tr><td>≥ 150 gpd</td><td>Be in Mode 3 within 6 hours at 1/2% or 1% per minute.</td></tr><tr><td>≥ 75 gpd for > 1 hour <u>AND</u> increasing < 30 gpd/hr</td><td>Be in Mode 3 within 24 hours at 1/2% or 1% per minute.</td></tr><tr><td></td><td>STEAM GENERATOR <u>OR</u> BLOWDOWN ANALYSIS</td></tr><tr><td>LEAKAGE</td><td>ACTION</td></tr><tr><td>≥ 75 gpd</td><td>Be in Mode 3 within 6 hours at 1/2% or 1% per minute.</td></tr></table>		RM-A9	LEAKAGE	ACTION	≥ 75 gpd <u>AND</u> increasing ≥ 30 gpd/hr	Be $\leq 50\%$ power within 1 hour at 1% or 3% per minute, <u>AND</u> in Mode 3 within the next 2 hours (≤ 3 hours total).	≥ 150 gpd	Be in Mode 3 within 6 hours at 1/2% or 1% per minute.	≥ 75 gpd for > 1 hour <u>AND</u> increasing < 30 gpd/hr	Be in Mode 3 within 24 hours at 1/2% or 1% per minute.		STEAM GENERATOR <u>OR</u> BLOWDOWN ANALYSIS	LEAKAGE	ACTION	≥ 75 gpd	Be in Mode 3 within 6 hours at 1/2% or 1% per minute.
	RM-A9																	
LEAKAGE	ACTION																	
≥ 75 gpd <u>AND</u> increasing ≥ 30 gpd/hr	Be $\leq 50\%$ power within 1 hour at 1% or 3% per minute, <u>AND</u> in Mode 3 within the next 2 hours (≤ 3 hours total).																	
≥ 150 gpd	Be in Mode 3 within 6 hours at 1/2% or 1% per minute.																	
≥ 75 gpd for > 1 hour <u>AND</u> increasing < 30 gpd/hr	Be in Mode 3 within 24 hours at 1/2% or 1% per minute.																	
	STEAM GENERATOR <u>OR</u> BLOWDOWN ANALYSIS																	
LEAKAGE	ACTION																	
≥ 75 gpd	Be in Mode 3 within 6 hours at 1/2% or 1% per minute.																	
	CRS	Determines that leakage is ≥ 150 gpd and directs actions to be in Mode 3 within 6 hours at 1/2% or 1% per minute.																
	CRS	Initiate a Reactor shutdown: REFER TO GOP-4B POWER OPERATION (MODE 1 - DESCENDING) while continuing with this procedure.																

EVALUATOR NOTE: The next event may be initiated after the decision is made to shut down the unit IAW GOP-4B POWER OPERATION (MODE 1 - DESCENDING)

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>24</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
BOOTH OPERATOR: Initiate Event 6 (TRIGGER 6) when directed.		
Indications available: XCP-616 1-5, PZR LS HI/LO		
EVALUATOR NOTE: The SG Tube Leak will increase to a 600 gpm Tube Rupture over 2 minutes.		
EVALUATOR NOTE: TS 3.2.5, DNB Parameters, requires PZR Pressure > 2206 psig in Mode 1.		
	RO	Responds to annunciator XCP-616 1-5, PZR LS HI/LO
EVALUATOR NOTE: The CRS will recognize the change in plant conditions and direct action IAW the continuous action step in AOP-112.2 to check if SI is required.		
BOOTH OPERATOR: If called to check the CCW Pump after start report; <ul style="list-style-type: none"> Good start RML-2B flow is greater than 5 gpm. 		

XCP-616
1-5

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>25</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
*	RO	<p>* 1 Check if PZR level can be maintained:</p> <ol 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. <p>ALTERNATIVE ACTION</p> <ol style="list-style-type: none"> Perform the following: <ol style="list-style-type: none"> Reduce Letdown to one 45 gpm orifice: <ol style="list-style-type: none"> Place PCV-145, LO PRESS LTDN, in MANUAL. 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. IF PZR level continues to decrease, THEN perform the following: <ol style="list-style-type: none"> Close PVT-8149A, LTDN ORIFICE A ISOL. IF PZR level continues to decrease, THEN perform the following: <ol style="list-style-type: none"> Start a second CCW pump. Start a second Charging Pump.
*	RO	<p>* 2 Check if SI is required:</p> <ol style="list-style-type: none"> Check if any of the following criteria are met: <ul style="list-style-type: none"> PZR level is decreasing with Charging maximized and Letdown isolated. OR <ul style="list-style-type: none"> PZR level is approaching 8%. OR <ul style="list-style-type: none"> PZR pressure is approaching 1870 psig. Perform the following: <ol style="list-style-type: none"> Trip the Reactor. GO TO EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION. WHEN EOP-1.0 Immediate Actions are complete, THEN actuate SI.

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>26</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
	CRS	<p>CRS directs the RO to:</p> <ul style="list-style-type: none"> • Trip the Reactor. • GO to EOP-1.0 REACTOR TRIP/SAFETY INJECTION <ul style="list-style-type: none"> ◦ When EOP-1.0 Immediate Actions are completed THEN actuate SI.
<p align="center"><u>REFERENCE PAGE FOR EOP-1.0</u></p> <p>RCP TRIP CRITERIA</p> <p>a. IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs.</p> <p>b. IF both of the following conditions occur, THEN trip all RCPs:</p> <ul style="list-style-type: none"> • SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. <li align="center">AND • RCS Wide Range pressure is LESS THAN 1418 psig. <p>REDUCING CONTROL ROOM EMERGENCY VENTILATION</p> <p>Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.</p> <p>MONITOR SPENT FUEL COOLING</p> <p>Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery:</p> <ul style="list-style-type: none"> • Spent Fuel Pool level. • Spent Fuel Pool temperature. 		
<p align="center"><u>NOTE</u></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. 		
IOA	RO	<p>1. Verify Reactor Trip:</p> <ul style="list-style-type: none"> • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open (YES) • Verify all Rod Bottom Lights are lit. (YES) • Verify Reactor Power level is decreasing. (YES)

AOP-112.2

EOP-1.0

EOP-1.0

EOP-1.0

Op Test No.: NRC ILO 11-01 Scenario # 1 Event # 6 & 7 Page 27 of 48		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
IOA	BOP	2. Verify Turbine/Generator Trip: <ul style="list-style-type: none"> a. Verify all Turbine STM STOP VLVs are closed. b. Ensure Generator Trip (after 30 second delay): <ul style="list-style-type: none"> 1) Ensure the GEN BKR is open. 2) Ensure the GEN FIELD BKR is open. 3) Ensure the EXC FIELD CNTRL is tripped.
IOA	BOP	3. Verify both ESF buses are energized.
IOA	RO	4. Check if SI is actuated: <ul style="list-style-type: none"> a. Check if either: <ul style="list-style-type: none"> • SI ACT status light is bright on XCP-6107 1-1. OR • Any red first-out SI annunciator is lit on XCP-626 top row. b. Actuate SI using either SI ACTUATION Switch
IOA	RO	5. Check if SI is required: <ul style="list-style-type: none"> a. Check if any of the following conditions exist: <ul style="list-style-type: none"> • PZR pressure LESS THAN 1850 psig. OR • RB pressure GREATER THAN 3.6 psig. OR • Steamline pressure LESS THAN 675 psig. OR • Steamline differential pressure GREATER THAN 97 psid. b. Actuate SI using either SI ACTUATION Switch.
EVALUATOR NOTE: There are no failures associated with the Attachment 3 which is attached as page 46.		
	CRS	6. Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.
	CREW	7. Announce plant conditions over the page system.
*	RO	8. Verify RB pressure has remained LESS THAN 12 psig on PR-951 RB PSIG (P-951) red pen.

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>28</u> of <u>48</u>			
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.			
Time	Position	Applicant's Actions or Behavior	
*	RO	9. Check RCS temperature: <ul style="list-style-type: none"> With any RCP running, RCS Tavg is stable at OR trending to 557°F 	EOP-1.0
	RO	10. Check PZR PORVs and Spray Valves: <ol style="list-style-type: none"> PZR PORVs are closed. PZR Spray Valves are closed. Verify power is available to at least one PZR PORV Block Valve: <ul style="list-style-type: none"> MVG-8000A, RELIEF 445 A ISOL. MVG-8000B, RELIEF 444 B ISOL. MVG-8000C, RELIEF 445 B ISOL. Verify at least one PZR PORV Block Valve is open. 	EOP-1.0
NOTE - Step 11 Seal Injection flow should be maintained to all RCPs. EOP-1.0			EOP-1.0
EVALUATOR NOTE: The Critical Step of stopping RCPs is an EOP-1.0 Reference Page item and is repeated in EOP-4.0 at which time the criteria should be met.			
CRITICAL STEP	RO	11. Check if RCPs should be stopped: <ol style="list-style-type: none"> Check if either of the following criteria is met: <ul style="list-style-type: none"> Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR <ul style="list-style-type: none"> RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. 	EOP-1.0
EVALUATOR NOTE: If the SG PORV failure has not been previously detected, the crew may determine that a faulted generator exists and transition to EOP-3.0 first.			
EVALUATOR NOTE: It is a critical Task to Isolate "B" SG PORV prior to SG Pressure less than 460 psig.			

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>29</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>12. Verify no S/G is FAULTED:</p> <ul style="list-style-type: none"> No S/G pressure is decreasing in an uncontrolled manner. No S/G is completely depressurized.
<p>EVALUATOR NOTE: The crew will determine that a SGTR is in progress based on secondary plant radiation monitor readings and will go to EOP-4.0 SGTR</p> <p>If radiation levels are not high enough to indicate a SGTR is in progress the candidates may continue with EOP-1.0 until Step 21 when SG increasing NR level will direct them to EOP-4.0 SGTR.</p>		
	RO	<p>13. Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED:</p> <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. <p>ALTERNATIVE ACTION</p> <p>13. GO TO EOP-4.0, STEAM GENERATOR TUBE RUPTURE, Step 1.</p>
	CRS	Direct transition to EOP-4.0, STEAM GENERATOR TUBE RUPTURE, Step 1.

EOP-1.0

EOP-1.0

Op Test No.: **NRC ILO 11-01** Scenario # 1 Event # 6 & 7 Page 30 of 48
 Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.

Time

Position

Applicant's Actions or Behavior

REFERENCE PAGE FOR EOP-4.0

EOP-4.0

1 SI REINITIATION CRITERIA

IF either of the following conditions occurs, THEN start Charging Pumps and operate valves as necessary:

- RCS subcooling on TI-499A(B), A(B) TEMP °F, can NOT be maintained GREATER THAN 52.5°F [67.5°F].
- OR
- PZR level can NOT be maintained GREATER THAN 10% [28%].

IF SI Reinitiation occurs after Step 27, THEN GO TO EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED, Step 1.

2 SECONDARY INTEGRITY TRANSITION CRITERIA

IF any unisolated SG pressure is decreasing in an uncontrolled manner OR is completely depressurized, THEN GO TO EOP-3.0, FAULTED STEAM GENERATOR ISOLATION, Step 1, unless it is needed for RCS cooldown.

3 COLD LEG RECIRCULATION TRANSITION CRITERION

IF RWST level decreases to LESS THAN 18%, THEN GO TO EOP-2.2, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

4 MULTIPLE TUBE RUPTURE CRITERIA

IF any INTACT SG level increases in an uncontrolled manner OR any INTACT SG has abnormal radiation, THEN stop any cooldown or depressurization in progress and RETURN TO EOP-4.0, STEAM GENERATOR TUBE RUPTURE, Step 1.

5 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

NOTE:

- 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.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>31</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
* CRITICAL TASK	RO	1. Check if RCPs should be stopped: a. Check if either of the following criteria is met: <ul style="list-style-type: none"> Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. b. Stop all RCPs.
		<p style="text-align: center;"><u>CAUTION - Step 2</u></p> <p>Radiation levels may have increased in steamlines. Proper radiological precautions must be taken when obtaining samples to minimize personnel exposure</p>
	CREW	2. Identify the RUPTURED SG(s): <ul style="list-style-type: none"> Narrow Range level in any SG increasing in an uncontrolled manner. OR High Radiation on any of the following: <ul style="list-style-type: none"> a. RM-G19A(B)(C), STMLN HI RNG GAMMA. b. Local hand held radiation monitor readings taken by Health Physics on the blowdown lines at the following penetrations: <ul style="list-style-type: none"> XRP0326, SG A Blowdown Line (AB-412 West Pen). XRP0224, SG B Blowdown Line (IB-412 East Pen). XRP0219, SG C Blowdown Line (IB-412 East Pen). OR As determined by Chemistry sample analysis for abnormal activity using a frisker.
EVALUATOR NOTE: If the Ruptured SG cannot be identified at this time the ALTERNATE ACTIONS will be performed.		
BOOTH OPERATOR: If called to screen sample for activity wait 5 minutes and report elevated activity on the sample from the 'A' SG.		

EOP-4.0

EOP-4.0

EOP-4.0

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>32</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>2. ALTERNATIVE ACTIONS</p> <p>Sample all SGs:</p> <p>a) Reset both SI RESET TRAIN A(B) Switches.</p> <p>IF either train of SI does NOT reset, THEN REFER TO SOP-112, SAFETY INJECTION SYSTEM, OFF NORMAL Section, to manually reset relays.</p> <p>b) Reset Containment Isolation:</p> <ul style="list-style-type: none"> • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL. <p>IF either train of Phase A or Phase B does NOT reset, THEN REFER TO SOP-112, SAFETY INJECTION SYSTEM, OFF NORMAL Section, to manually reset relays.</p> <p>c) Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO.</p> <p>d) Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.</p> <p>WHEN the RUPTURED SG(s) is identified, THEN COMPLETE Steps 3 through 10. Observe the CAUTION prior to Step 3.</p> <p>CONTINUE WITH Steps 11 through 17.</p>

EOP-4.0

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>33</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>3. Isolate flow from each RUPTURED SG:</p> <ul style="list-style-type: none"> a. Place the Steamline PWR RELIEF 'A(B)(C) SETPT Controller(s) in MAN and closed. b. Adjust the PWR RELIEF A(B)(C) SETPT Controller(s) to 8.85 (1150 psig). c. Place the Steamline Power 'Relief A(B)(C) Mode Switch(s) in PWR RLF. d. Place the PWR RELIEF A(B)(C) 'SETPT Controller(s) in AUTO. e. WHEN RCS Tavg is LESS THAN P-12 (552°F), THEN place both STM DUMP INTERLOCK Switches to BYP INTLK. f. Verify the Steamline PORV closed.

EOP-4.0

Op Test No.: NRC ILO 11-01 Scenario # 1 Event # 6 & 7 Page 34 of 48		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
<p align="center"><u>CAUTION - Step 3.g</u></p> <p>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.</p>		
<p align="center"><u>NOTE - Step 3.g</u></p> <p>If the TD EFW Pump is tripped, it should be reset as time permits.</p>		
	BOP	3.g. IF SG B OR SG C is RUPTURED, THEN perform the following: ... (NO)
	BOP	3.h. Close the following for each RUPTURED SG: <ul style="list-style-type: none"> • SG Blowdown, PVG-503A(B)(C). • MS Drain Isolation, PVT-2843A(B)(C). • MS Drain Isolation, PVT-2877A for SG A, PVT-2877B for SG C.
	BOP	i. Close the following for each RUPTURED SG: <ul style="list-style-type: none"> • MS Isolation Valve, PVM-2801A(B)(C). • MS Isolation Bypass Valve, PVM-2869A(B)(C).
*	BOP	4. Check level in each RUPTURED SG: <ol style="list-style-type: none"> a. Verify Narrow Range level in each RUPTURED SG is GREATER THAN 40%. b. Stop EFW flow to "A" SG: <ol style="list-style-type: none"> 1) Close FCV-3531, MD EFP TO SG A 2) Close FCV-3536, TD EFP TO SG A 3) Maintain Narrow Range level in each RUPTURED SG GREATER THAN 40%.
<p align="center"><u>CAUTION - Step 5</u></p> <p>The major flowpaths from each RUPTURED SG (MSIV, TD EFW Pump, and PORV) must be isolated before performing Step 5, to minimize radiological releases and ensure RCS subcooling is maintained.</p>		
	BOP	5. Verify each RUPTURED SG pressure is GREATER THAN 460 psig.

EOP-4.0

EOP-4.0

EOP-4.0

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EOP-4.0

Op Test No.: **NRC ILO 11-01** Scenario # **1** Event # **6 & 7** Page **35** of **48**
 Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.

Time	Position	Applicant's Actions or Behavior																									
	CRS	<p>6. Determine the required core exit TC temperature for RCS cooldown from the table below:</p> <table><thead><tr><th>LOWEST RUPTURED SG PRESS (PSIG)</th><th>CORE EXIT TC TEMP (°F)</th><th>CONTROLLER SETPOINT</th></tr></thead><tbody><tr><td>1101-1200</td><td>494 [478]</td><td>4.9</td></tr><tr><td>1001-1100</td><td>482 [466]</td><td>4.4</td></tr><tr><td>901-1000</td><td>469 [453]</td><td>3.8</td></tr><tr><td>801-900</td><td>455 [439]</td><td>3.4</td></tr><tr><td>701-800</td><td>439 [423]</td><td>2.8</td></tr><tr><td>601-700</td><td>421 [405]</td><td>2.3</td></tr><tr><td>460-600</td><td>392 [376]</td><td>1.6</td></tr></tbody></table>	LOWEST RUPTURED SG PRESS (PSIG)	CORE EXIT TC TEMP (°F)	CONTROLLER SETPOINT	1101-1200	494 [478]	4.9	1001-1100	482 [466]	4.4	901-1000	469 [453]	3.8	801-900	455 [439]	3.4	701-800	439 [423]	2.8	601-700	421 [405]	2.3	460-600	392 [376]	1.6	EOP-4.0
LOWEST RUPTURED SG PRESS (PSIG)	CORE EXIT TC TEMP (°F)	CONTROLLER SETPOINT																									
1101-1200	494 [478]	4.9																									
1001-1100	482 [466]	4.4																									
901-1000	469 [453]	3.8																									
801-900	455 [439]	3.4																									
701-800	439 [423]	2.8																									
601-700	421 [405]	2.3																									
460-600	392 [376]	1.6																									
	RO	7. Check if any RCP is running. (NO)	EOP-4.0																								
	CRS	<p>7. ALTERNATE ACTION:</p> <p>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.</p>	EOP-4.0																								
<p><u>NOTE - Step 8</u></p> <ul style="list-style-type: none">• 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.			EOP-4.0																								

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>36</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>8. Dump steam from each INTACT SG:</p> <p>a. WHEN RCS Tav_g is LESS THAN P-12 (552°F), THEN:</p> <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. <p>b. Dump steam from each INTACT SG to the Condenser:</p> <p>1) Verify PERMISV C-9 status light is bright on XCP-6114 1-3.</p> <p>2) Perform the following:</p> <ul style="list-style-type: none"> Verify the MS Isolation Valves, PVM-2801A(B)(C), are open for the INTACT SGs. OR Open MS Isolation Bypass Valves: <p>a) Depress both MAIN STEAM ISOL VALVES RESET TRAIN A(B).</p> <p>b) Open MS Isolation Bypass Valves, PVM-2869A(B)(C), for only the INTACT SGs.</p> <p>3) Place the STM DUMP CNTRL Controller in MAN and closed.</p> <p>4) Place the STM DUMP MODE SELECT Switch in STM PRESS.</p> <p>5) Adjust the STM DUMP CNTRL Controller to fully open the Bank 1 Steam Dump Valves.</p>
EVALUATOR NOTE: P-12 cannot be blocked due to a P-12 failure so the MSIVs will close requiring the alternate actions of step 8b.		

EOP-4.0

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>37</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
		<p>ALTERNATIVE ACTION</p> <p>8 b. Dump steam from each INTACT SG using the Steamline PORVs:</p> <p>1) Place the Steamline Power Relief A(B)(C) Mode Switch(s) in PWR RLF.</p> <p>2) Adjust the PWR RELIEF A(B)(C) SETPT Controller(s) to 100% open.</p>
<p style="text-align: center;"><u>NOTE - Step 9</u></p> <p>Steps 11 through 18 should be performed as time permits, while the cooldown is in progress.</p>		
	RO	9. Verify core exit TC temperature is LESS THAN the value determined in Step 6.
<p style="text-align: center;"><u>NOTE - Step 10</u></p> <p>With no RCPs running, it may be necessary to manually open steam dumps to maintain desired TC temperature.</p>		

EOP-4.0

EOP-4.0

EOP-4.0

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>38</u> of <u>48</u>			
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.			
Time	Position	Applicant's Actions or Behavior	
	BOP	<p>10. Stop the RCS cooldown to the Condenser:</p> <p>ALTERNATIVE ACTIONS</p> <p>10 Stop the RCS cooldown using the Steamline PORVs:</p> <ul style="list-style-type: none"> a) Adjust the PWR RELIEF A(B)(C) SETPT Controller(s) to closed. b) Adjust the setpoints to maintain core exit TC temperature per Step 6. c) Place the PWR RELIEF A(B)(C) SETPT Controller(s) in AUTO 	
	BOP	<p>11. Check INTACT SG levels:</p> <ul style="list-style-type: none"> a. Verify Narrow Range level in INTACT SGs is GREATER THAN 26% [41%]. b. Control EFW flow to maintain Narrow Range level in INTACT SGs between 40% and 60%. 	EOP-4.0
	RO	<p>12. Check PZR PORVs and Block Valves:</p> <ul style="list-style-type: none"> a. Verify power is available to the PZR PORV Block Valves: <ul style="list-style-type: none"> 1) MVG-8000A, RELIEF 445 A ISOL. 2) MVG-8000B, RELIEF 444 B ISOL. 3) MVG-8000C, RELIEF 445 B ISOL. 	EOP-4.0
<p style="text-align: center;"><u>CAUTION - Step 12.b</u></p> <p>If any PZR PORV opens because of high PZR pressure, Step 12.b should be repeated after pressure decreases to LESS THAN 2330 psig, to ensure the PORV recloses.</p>			EOP-4.0
	RO	b. Verify all PZR PORVs are closed.	EOP-4.0
	RO	c. Verify at least one PZR PORV Block Valve is open.	EOP-4.0
	BOP	13. Reset both SI RESET TRAIN A(B) Switches.	EOP-4.0

Op Test No.: <u> NRC ILO 11-01 </u> Scenario # <u> 1 </u> Event # <u> 6 & 7 </u> Page <u> 39 </u> of <u> 48 </u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
	BOP	14. Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.
	BOP	15. Place both ESF LOADING SEQ A(B) RESETS to: a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS.
	BOP	16. Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Open PVA-2659, INST AIR TO RB AIR SERV. c. Open PVT-2660, AIR SPLY TO RB.
<u>CAUTION - Step 17</u> RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to LESS THAN 325 psig, the RHR Pumps must be manually restarted to supply water to the RCS		
*	BOP	17. Check if RHR Pumps should be stopped: a. Check if any RHR Pump is running with suction aligned to the RWST. b. Verify RCS pressure is GREATER THAN 325 psig. c. Stop any RHR Pump which is running with suction aligned to the RWST and place in Standby.
	BOP	18. Verify core exit TC temperature is LESS THAN the value determined in Step 6.
	BOP	19. Stop the RCS cooldown: a. Ensure Step 10 is completed. b. Adjust steam dump setpoints as necessary to maintain desired core exit TC temperature.

Op Test No.: NRC ILO 11-01 Scenario # 1 Event # 6 & 7 Page 40 of 48			
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.			
Time	Position	Applicant's Actions or Behavior	
	BOP	20. Verify each RUPTURED SG pressure is stable OR increasing.	
<p align="center">NOTE - Step 21</p> <p>Subcooling may have been temporarily lost during the RCS cooldown, but should quickly increase when the cooldown is complete. If subcooling increases sufficiently after stopping the cooldown, the transition to EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED, is NOT required.</p>			EOP-4.0
	RO	21. Verify RCS subcooling on TI-499A(B), A(B) TEMP !F, is GREATER THAN 72.5°F [87.5°F].	
EVALUATOR NOTE: Step 22 depressurizes the RCS with Normal PZR Spray if RCPs are running. Step 23 depressurizes the RCS with one PZR PORV.			
	RO	<p>22. Depressurize the RCS using Normal PZR Spray at the maximum rate:</p> <p>a. Establish Normal PZR Spray:</p> <ul style="list-style-type: none"> Using RCP A: <ol style="list-style-type: none"> Open PCV-444D, PZR SPRAY. Close PCV-444C, PZR SPRAY, if RCP C is NOT running. Using RCPs B and C: <ol style="list-style-type: none"> Open PCV-444C, PZR SPRAY. Close PCV-444D, PZR SPRAY, if RCP A is NOT running <p>ALTERNATIVE ACTION:</p> <p>a. GO TO Step 23. Observe the CAUTION and NOTE prior to Step 23.</p> <p>b. Use maximum available spray until any one of the following criteria is met:</p> <ul style="list-style-type: none"> PZR level is GREATER THAN 76% [69%]. OR RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 52.5°F [67.5°F]. OR RCS pressure is LESS THAN RUPTURED SG(s) pressure AND PZR level is GREATER THAN 10% [28%]. <p>c. Stop RCS depressurization:</p> <ol style="list-style-type: none"> Close both PCV-444C(D), PZR SPRAY. Close PVT-8145, PZR SPRAY FR CVCS. <p>d. GO TO Step 25. Observe the CAUTION prior to Step 25.</p>	

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>41</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
<u>CAUTION - Step 23</u>		
<ul style="list-style-type: none"> When using a PZR PORV to depressurize the RCS, the PRT Rupture Disc may rupture resulting in Adverse Containment Conditions. Cycling of the PZR PORV should be minimized to reduce the discharge to the PRT and to minimize the potential for PORV failure. 		
<u>NOTE - Step 23</u>		
If no RCP is running, the Reactor Vessel Head Upper Plenum may void during depressurization resulting in a rapidly increasing PZR level.		
	RO	23. Depressurize the RCS using one PZR PORV: <ul style="list-style-type: none"> a. Verify at least one PZR PORV is available. b. Open one PZR PORV until any one of the following criteria is met: <ul style="list-style-type: none"> PZR level is GREATER THAN 76% [69%]. OR RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 52.5°F [67.5°F]. OR RCS pressure is LESS THAN RUPTURED SG(s) pressure AND PZR level is GREATER THAN 10% [28%]. c. Close the PZR PORV.
	RO	24. Verify RCS pressure is increasing.
<u>CAUTION - Step 25</u>		
When SI termination criteria are met, SI must be terminated to prevent overfilling the RUPTURED SG(s).		

EOP-4.0

EOP-4.0

EOP-4.0

EOP-4.0

EOP-4.0

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>6 & 7</u> Page <u>42</u> of <u>48</u>		
Event Description: SGTR on "A" SG (Leak is initially greater than TS leakage limits increasing until operator action is required to maintain Pressurizer level control) with PT-2010 Failed HIGH.		
Time	Position	Applicant's Actions or Behavior
	RO	<p>25. Check if SI flow should be terminated:</p> <p>a. RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 52.5°F [67.5°F].</p> <p>b. Secondary Heat Sink is adequate:</p> <ul style="list-style-type: none"> Total EFW flow available to INTACT SGs is GREATER THAN 450 gpm. <p>OR</p> <ul style="list-style-type: none"> Narrow Range SG level is GREATER THAN 26% [41%] in at least one INTACT SG. <p>c. RCS pressure is stable OR increasing.</p> <p>d. PZR level is GREATER THAN 10% [28%].</p>
EVALUATOR NOTE: The caution for step 25 requires that SI be terminated prior to overfilling the SG. The critical task is to terminate SI before SG level reaches EOP SG level for steam line (87% NR).		
CRITICAL TASK	RO	26. Stop all but one Charging Pump and place in Standby.
EVALUATOR NOTE: The scenario may be terminated after SI flow is terminated.		

EOP-4.0

EOP-4.0

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>1</u> Page <u>43</u> of <u>48</u>		
Event Description: SOP-106, DILUTION OPERATIONS		
Time	Position	Applicant's Actions or Behavior
EVALUATOR NOTE: This procedure section is to perform BORATE OPERATIONS.		
<u>NOTE 2.0</u>		
1. Energizing additional Pressurizer Heaters will enhance mixing. 2. 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	2.1 Ensure at least one Reactor Coolant Pump is running.
	RO	2.2 Place RX COOL SYS MU switch to STOP.
	RO	2.3 Place RX COOL SYS MU MODE SELECT switch to BOR. (Peer ✓)
	RO	2.4 Set FIS-113, BA TO BLNDR FLOW, batch integrator to the desired volume. (Peer ✓)
	RO	2.5 Place RX COOL SYS MU switch to START.
<u>NOTE 2.6</u>		
Step 2.6 may be omitted when borating less than 10 gallons.		
	RO	2.6 Place FCV-113 A&B, BA FLOW, controller in AUTO.
<u>NOTE 2.7</u>		
The AUTO setpoint dial for FCV-113A&B, BA FLOW, controller may be adjusted slowly to obtain the desired flow rate.		
	RO	2.7 Verify the desired Boric Acid flow rate on FR-113, BA TO BLNDR GPM (F-113).
	RO	2.8 When the preset volume of boric acid has been reached, perform the following: a. Place FCV-113A&B, BA flow controller in MAN. b. Verify boration stops.
	RO	2.9 Place RX COOL SYS MU switch to STOP.
<u>NOTE 2.10</u>		
a. If plant conditions require repeated borations, Step 2.10 may be omitted. b. The volume in the piping between the blender and the VCT outlet is approximately 3.8 gallons.		

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>1</u> Page <u>44</u> of <u>48</u>		
Event Description: SOP-106, DILUTION OPERATIONS		
Time	Position	Applicant's Actions or Behavior
		<p>2.10 Alternate Dilute 4 to 6 gallons of Reactor Makeup Water to flush the line down stream of the blender by performing the following:</p> <ul style="list-style-type: none"> a. Place RX COOL SYS MU MODE SELECT switch to ALT DIL. (Peer ✓) b. Adjust FCV-168, TOTAL MU FLOW SET PT, to desired flow rate. c. Set FIS-168, TOTAL MU FLOW, batch integrator to desired volume. (Peer ✓) d. Place RX COOL SYS MU switch to START. e. Verify desired flow rate on FR-113, TOTAL MU GPM (F-168). f. Verify alternate dilution stops when preset volume is reached on FIS-168, TOTAL MU FLOW, batch integrator. g. Place RX COOL SYS MU switch to STOP.
		2.11 Place RX COOL SYS MU MODE SELECT switch to AUTO. (Peer ✓)
		2.12 Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm).
		2.13 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.
		2.14 Adjust FCV-113A&B, BA FLOW SET PT, to the desired position to ensure proper boric acid addition for subsequent Automatic Makeup operations.
		2.15 Place RX COOL SYS MU switch to START.
		<p>2.16 Perform the following:</p> <ul style="list-style-type: none"> a. Start XPP-13A(B), BA XFER PP A(B), for the in-service Boric Acid Tank. b. If necessary, start XPP-13A(B), BA XFER PP A(B), for the Boric Acid Tank on recirculation.
EVALUATOR NOTE: END OF SOP-106		

SOP-106

SOP-106

SOP-106

SOP-106

SOP-106

SOP-106

SOP-106

Op Test No.: NRC ILO 11-01			Scenario # <u>1</u>	Event # <u>1</u>	Page <u>45</u> of <u>48</u>	
Event Description: SOP-214, MAIN TURBINE AND CONTROLS						
Time	Position	Applicant's Actions or Behavior				
EVALUATOR NOTE: This procedure section is to perform a normal Turbine Load Reduction/Shutdown.						
	BOP	2.1 Ensure the Control/Load screen is selected.				SOP-214
<p style="text-align: center;"><u>NOTE 2.2</u></p> <p>The turbine will come off the limiter and turbine load will lower once Load Set Reference is less than Load Limit Reference.</p> <p>Acknowledging dialog boxes is "skill of the Craft".</p>						SOP-214
	BOP	2.2 To lower Turbine Load using Load Set, perform the following:				SOP-214
	BOP	a. If directed by Operations Management, disable the Turbine Vibration Trips per Section III.				SOP-214
	BOP	b. Select (or enter) the desired Rate %/min on Load Set.				SOP-214
	BOP	c. Select Load on Load Set (a dialog box will open).				SOP-214
	BOP	d. Enter the desired load and confirm.				SOP-214
	BOP	e. Verify proper system response.				SOP-214
	BOP	f. If during a load reduction, it is desired to stop the load reduction, perform the following: 1) Select Hold on Load Set. 2) Select the desired Rate %/min to resume load reduction. 3) If desired, place LOAD LIMIT in service per Section III.				SOP-214

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>1</u> Page <u>46</u> of <u>48</u>		
Event Description: EOP-1.0 Attachment 3		
Time	Position	Applicant's Actions or Behavior
EVALUATOR NOTE: This attachment is to verify equipment status after Safety Injection has been initiated and is run concurrently with the main body of EOP-1.0.		
	BOP	Ensure EFW Pumps are running: a. Ensure both MD EFW Pumps are running. b. Verify the TD EFW Pump is running if necessary to maintain SG levels.
	BOP	Ensure the following EFW valves are open: 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: a. Ensure the following are closed: FW Flow Control, FCV-478(488)(498). 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). b. Ensure all Main FW Pumps are tripped.
	BOP	Ensure SI Pumps are running: Two Charging Pumps are running. Both RHR Pumps are running.
	BOP	Ensure two RBCU Fans are running in slow speed (one per train).

EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>1</u> Page <u>47</u> of <u>48</u>		
Event Description: EOP-1.0 Attachment 3		
Time	Position	Applicant's Actions or Behavior
	BOP	Verify Service Water to the RBCUs: a. Ensure two Service Water Pumps are running. b. Verify both Service Water Booster Pumps A(B) are running. c. Verify GREATER THAN 2000 gpm flow for each train on: 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	Verify both trains of Control Room Ventilation are running in Emergency Mode.
	BOP	Check if Main Steamlines should be isolated: a. Check if any of the following conditions are met: 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. b. Ensure all the following are closed: MS Isolation Valves, PVM-2801A(B)(C). MS Isolation Bypass Valves, PVM-2869A(B)(C).
	BOP	Ensure Excess Letdown Isolation Valves are closed: PVT-8153, XS LTDN ISOL. PVT-8154, XS LTDN ISOL.

EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3

Op Test No.: NRC ILO 11-01 Scenario # <u>1</u> Event # <u>1</u> Page <u>48</u> of <u>48</u>		
Event Description: EOP-1.0 Attachment 3		
Time	Position	Applicant's Actions or Behavior
	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.
	BOP	Verify proper SI alignment: a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104.
	BOP	Verify proper SI alignment: ALTERNATIVE ACTION a. Ensure proper SI valve alignment: 1) Open MVG-8801A(B), HI HEAD TO COLD LEG INJ. 2) Close MVG-8107 and MVG-8108, CHG LINE ISOL. 3) Open LCV-115B(D), RWST TO CHG PP SUCT. 4) Close LCV-115C(E), VCT OUTLET ISOL. 5) Open MVG-8809A(B), RWST TO RHR PP A(B). 6) Open MVG-8888A(B), RHR LP A(B) TO COLD LEGS.
	BOP	b. Verify all SAFETY INJECTION monitor lights are dim on XCP-6106.
	BOP	c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM
	BOP	d. Check if RCS pressure is LESS THAN 325 psig.
	BOP	e. Verify RHR flow on: FI-605A, RHR DISCHARGE PUMP A FLOW GPM. AND FI-605B, RHR DISCHARGE PUMP B FLOW GPM.
EVALUATOR NOTE: END OF EOP-1.0 ATTACHMENT 3		

Facility:	VC SUMMER	Scenario No.:	2	Op Test No.:	NRC ILO 11-01
Examiners:	_____	Operators:	CRS:	_____	
	_____		RO:	_____	
	_____		BOP	_____	
Initial Conditions:	<ul style="list-style-type: none"> 40% MOL. Alternate Seal Injection is OOS. "B" Train workweek. Severe thunderstorms have been reported in the area. 				
Turnover:	<ul style="list-style-type: none"> 40% MOL – Increase power to 48% at 0.5%/minute. Chemistry is in spec for power accession. The A and B MFP are running - B MFP was recently started. 				
Critical Task:	<ul style="list-style-type: none"> Trip the 2 remaining RCPs <1418 WR RCS Pressure with SI Flow and before 33% WR RVLIS. Establish SI by opening MVG-8801 (A or B) prior to NR RVLIS < 34% or CETs > 725°F. 				

Event No.	Malf. No.	Event Type	Event Description
1	N/A	N - BOP, CRS R – RO	Increase power IAW GOP-4A (Step 3.13b).
2	NIS003D	I – RO, BOP, CRS TS – CRS	PRNIS Channel N-44 Fails HIGH.
3	EF017O	TS- CRS	Emergency Feedwater Pump suction pressure transmitter PT-3635 Fails LOW.
4	FWM14D	C – BOP, CRS	Feedwater Pump Master Speed Controller Fails LOW.
5	RCS007A	C – RO, CRS	A RCP Vibration Ramp to Trip criteria
6	RCS006A	M – ALL	SBLOCA
7	SI003P SI004P		MVG -8801A, MVG -8801B fail to open on the SI signal.
8	PCS015A7		DG load sequencer fails to complete (Train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.

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

The following notation is used in the ES-D-2 form "Time" column:

IOA designates **Immediate Operator Action** steps
***** designates **Continuous Action** steps

The crew will assume the watch having been pre-briefed on the Initial Conditions, the plan for this shift and any related operating procedures.

The turbine startup has been stabilized at 39% and GOP-4A, Power Operation (Mode 1 - Ascending) has been completed to Step 3.12.k.

EVENT 1: Increase Power

Power has been stabilized at 40% power and a second Main Feedwater Pump has been placed in service by the off-going crew. The turnover directs the crew to increase power to 48% in accordance with GOP-4A continuing at step 3.13b. (0.5%/minute)

EVENT 2: PRNIS Channel N-44 Fails HIGH

On cue from the Examiner, PRNIS Channel N-44 fails High. The RO will respond to alarms and uncontrolled rod motion by performing the immediate actions of AOP-401.10, Power Range Channel Failure; placing rod control in MANUAL. The crew should restore Tave if necessary. The BOP will remove the channel from service and the CRS will enter Technical Specification 3.3.1.

EVENT 3: Emergency Feedwater Pump Suction Pressure Transmitter PT-3635 Fails LOW

On cue from the Examiner PT-3635 fails Low. The RO will respond to the alarm. The CRS will diagnose the problem as the failure of PT-3635. He will refer to Tech Specs and determine the failed channel must be placed in Bypass and restored to service within 72 hours.

EVENT 4: Feedwater Pump Master Speed Controller Fails LOW

On cue from the Examiner, the Feedwater Pump Master Speed Controller will fail low causing main feed pump speed to decrease. The BOP will respond to alarms and lowering SG level by controlling FWP Speed IAW AOP-210.3, Feedwater Pump Malfunction and/or Main Control Board Annunciators, SG A(B)(C) STF>FWF Mismatch (XCP-624 4-3(5-3)(6-3)) or SG A (B) (C) LVL DEV XCP-624 1-5(2-5)(3-5).

EVENT 5: RCP A Vibration

On cue from the Examiner, RCP "A" vibration will begin. The crew will respond to alarms/indication and enter XCP-617 1-3. The Crew will trip the reactor and stop the RCP based on shaft vibration greater than or equal to 20 mils or greater than or equal to 15 mils and increasing at greater than one mil per hour. The Crew will then implement EOP-1.0.

EVENT 6: Small-Break LOCA

After EOP-1.0 (E-0) the crew will enter EOP 1.1 (ES-0.1), Reactor Trip Recovery. A LOCA will be initiated from the RCP seal package. When SI actuates automatically or manually (PZR level can't be maintained > 8% or loss of adequate subcooling) the crew will transition back to EOP-1.0 (E-0).

After the Safety Injection Actuation MVG- 8801A and MVG-8801B will fail to open causing a complete loss of the high head injection function. The "A" SW Booster Pumps will also fail to start. The crew will perform the alternative actions of manually opening MVG- 8801 A and B and manually starting the "A" Service Water Booster Pump.

The crew will implement EOP-2.0 (E-1), Loss of Reactor or Secondary Coolant. When RCS pressure is less than 1418 psig and SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM then ALL running RCPs will be stopped.

CRITICAL TASKS:

It is critical that the two remaining RCPs be secured after RCS pressure lowers to less than 1418 psig and high head injection is established to lower the rate of inventory loss. They must be tripped before WR RVLIS level indicates 33% (50% void fraction for 2 RCPs). At this level significant core uncover would occur upon tripping the RCPs.

It is critical that high head Safety Injection be established by opening MVG-8801 (A or B) prior to NR RVLIS < 34% or CETs > 725°F.

TERMINATION:

The scenario will terminate when EOP-2.0 (E-1) is complete and the crew transitions to EOP-2.1 (ES-1.2), Post-LOCA Cooldown and Depressurization or at the discretion of the Examiner.

VC Summer 2013 NRC Scenario 2 Simulator Setup

Initial Conditions:

- IC-13, 40% (IC-322 for 2013)
- Reactivity Management Plan/Turnover sheet for IC Set
- Boron Concentration = 1298 ppm
- FCV 113 Pot setting = 5.56
- Xe = -1409 pcm
- Burnup = 10008 MWD/MTU = 226 EFPD
- Prior to the scenario, crew should pre-brief on conditions and expectations for the Shift (maintain power, repairs estimated to be complete well before LCO action time expires).

VC Summer 2013 NRC Scenario 2 Simulator Setup (SNAP 322)

- Conduct two-minute drill
- Mark up procedures in use with "Circle and slash" as applicable

Pre-Exercise:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.)
- TQP-801 Booth Operator checklist, has been completed
- Hang Red Tags for equipment out of service

PRE-LOAD:

Standard Simulator Setup

- PMP-LD003P XPP0138 LEAK DETECTION SUMP PMP LOSS OF POWER
- VLV-FW028W XVG01676-FW FW HDR RECIRC ISOL VLV LOSS OF POWER
- VLV-FW029W XVG01679-FW FW HTR RECIRC ISO VLV LOSS OF POWER
- VLV-CS052W XVT08141A-CS RCP A SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS054W XVT08141C-CS RCP C SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS053W XVT08141B-CS RCP B SEAL LEAKOFF VLV LOSS OF POWER

Scenario Related

- VLV-SI003P XVG08801A-SI HI HEAD INJ FAIL POSITION
Delay=0, Ramp=0, Final=0
- VLV-SI004P XVG08801B-SI HI HEAD INJ FAIL POSITION
Delay=0, Ramp=0, Final=0
- MAL-PCS015A7 DG LOAD SEQUENCER FAILS TO COMPLETE (TRAIN A STEP 7) Delay=0,
Ramp=0, Final=0

EVENT 1: Increase power IAW GOP-4A

NORMAL - No malfunctions

EVENT 2: PRNIS Channel N-44 fails HIGH

- TRIGGER 2
 - MAL-NIS003D, POWER RANGE CHANNEL 44 FAILURE
Delay=0, Ramp=0, Final=200.
 - XCP-620 1:1 immediate leads to AOP.
 - Booth Operator: When called as I&C to record detector currents wait 5 min and report that currents have been recorded.

EVENT 3: Emergency Feedwater Pump suction pressure transmitter PT-3635 fails LOW

- TRIGGER 3
 - XMT-EF017O
IPT03635 EFP SUC PRESS CH IV FAIL TO POSN
Delay=0, Delete=0, Ramp=00:01:00, FINAL=0

EVENT 4: Feedwater Pump Master Speed Controller fails LOW

- TRIGGER 4
 - FWM014D, FWP MASTER (SC-509A) AUTO CONTROL FAILURE
Delay=0, Ramp=00:00:45, Final =20.

EVENT 5: Increasing RCP "A" vibration requires tripping the unit, stopping the "A" RCP

- TRIGGER 5
 - MAL-RCP007A, RCP VIBRATION
INITIAL =11 FINAL=21 RAMP=03:00
- LOA TRIGGER 10:
Energizes RCP A Seal Leakoff Valve
 - VLV-CS052W XVT08141A-CS RCP A SEAL LEAKOFF VLV LOSS OF POWER
- LOA TRIGGER 11:
Locally adjust ITV-3062A(B)(C) BD COOLER A(B)(C) CDSTEOUT TEMP TO 90%
 - LOA CND047 COND TO S/G BD TV-3062A MANUAL POSITION
Delay = 0 Ramp = 20 Sec Final = 0.9
 - LOA CND048 COND TO S/G BD TV-3062B MANUAL POSITION
Delay = 01:00 Ramp = 20 Sec Final = 0.9
 - LOA CND049 COND TO S/G BD TV-3062C MANUAL POSITION
Delay = 02:00 Ramp = 20 Sec Final = 0.9

EVENT 6: SBLOCA

- TRIGGER 6
 - MAL-CVC004A, RCP 1 NUMBER 1 SEAL FAILURE
Delay=0, Ramp=00:00:00, Final=100.
 - MAL-RCS006A REAC TOR COOLANT SYSTEM LEAK COLD LEG (LOOP 1)
Delay=0, Ramp=0, Final=600.

EVENT 7: MVG -8801A and MVG-8801 fail to open on the SI signal

- EVENT 7
X031085O==1
Triggered when MVG08801A Control Switch is taken to OPEN
 - TRIGGER 7
 - VLV-SI003P XVG08801A-SI HI HEAD INJ FAIL POSITION
Delay=0, Ramp=0, Final=0, Delete in : 00:00:01
- EVENT 8
X031086O==1
Triggered when MVG08801 Control Switch is taken to OPEN
 - TRIGGER 8
 - VLV-SI004P XVG08801B-SI HI HEAD INJ FAIL POSITION
Delay=0, Ramp=0, Final=0, Delete in : 00:00:01

EVENT 8: DG Load Sequencer Fails To Complete (Train “A” Step 7) XPP-45A, Service Water Booster Pump Fails To Start.

- No action necessary – Failure is installed in the scenario pre-load.

Op Test No.: **NRC ILO 11-01** Scenario # **2** Event # **1** Page **8** of **44**

Event Description: Increase Power to 48%

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR: No trigger is required.**Indications available:** N/A**EVALUATOR NOTE:****The turnover instructs the crew in raise power to 48% IAW GOP-4A Step 3.13.b**

GOP- 4A REFERENCE PAGE

GOP-4A

GENERAL NOTES

- A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.
- B. Axial Flux Difference, ΔI , should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.
- C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.
- D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

- A. During operation with a positive Moderator Temperature Coefficient:
 - 1) Power and temperature changes should be slow and will require constant operator attention.
 - 2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.
 - 3) All power and load changes should be performed in small increments.
- B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.
- C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

- A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.
- B. To resume power ascension select the recommended Load Ramp Rate.
- C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

MSR CONTROL

- A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.
- B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 1 Page 9 of 44

Event Description: Increase Power to 48%

Time	Position	Applicant's Actions or Behavior	
<p align="center"><u>NOTE 3.10 through 3.18</u></p> <p>IFK3136, FLOW TO DEAERATOR, AUTO setpoint should be adjusted during power changes to maintain LI-3136, DEAER STOR TK NR LVL, between 2.5 feet and 5.0 feet as LCV 3235, DEAR START UP DRAIN CNTRL, is closed.</p>			GOP-4A
	BOP	Raise Turbine load to attain 48% Reactor Power as follows:	GOP-4A
	BOP	1) Select Ramp Rate and enter the recommended Load Ramp Rate.	GOP-4A
	BOP	2) Raise Turbine Load by one of the following methods:	GOP-4A
		<p>a. Slowly Raise Turbine load automatically as follows preferred method):</p> <p>(1) Select the Load pushbutton (a dialog box opens).</p> <p>(2) Enter 39.5.%</p> <p>(3) Confirm setpoint.</p> <p>(4) Verify proper plant response.</p> <p>b. Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)</p> <p>c. Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)</p>	
	BOP	When Turbine Load is greater than 40% (385 MWe), verify C20, 1st STG PRESS, de-energizes to dim.	GOP-4A
	BOP	<p>Monitor the following for proper operation:</p> <p>1) Stator Water Cooling.</p> <p>2) Hydrogen Seal Oil.</p>	GOP-4A
<p>BOOTH OPERATOR: Acknowledge requests to align the 2A and 2B FW Heater Drains. This valve is not modeled.</p>			

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>1</u> Page <u>10</u> of <u>44</u>		
Event Description: Increase Power to 48%		
Time	Position	Applicant's Actions or Behavior
	BOP	Between 400 MWe and 450 MWe, open the following valves to align the 2A and 2B Heaters to the DA (TB-412): 1) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. 2) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION.
	BOP	Secure the Condensate Polishing per SOP-203, Condensate Polishing System.
EVALUATOR NOTE: Applicable portions of SOP-106 are attached (Page 39) for performing Alternate Dilution.		
	BOP	Borate or dilute per SOP-106, Reactor Makeup Water System, to maintain the following parameters (Refer to SOP-401): 1) ΔI within limits. 2) Control Rods above the Rod Insertion Limit.
<p style="text-align: center;"><u>NOTE 3.13.h</u></p> Above 40% Turbine load MSR 4th pass drains to the Condenser close and the MSR 4th pass drains to the #1 Feedwater Heaters open.		
	BOP	Using the DCS Computer Graphic Screens 101 and 102, verify MSR 4th pass drain valves have repositioned: 1) XVT-2071A indicates closed. 2) XVT-2071B indicates closed. 3) XVT-02068A indicates open. 4) XVT-02068B indicates open.
EVALUATOR NOTE: The next event may be triggered after a significant power change (5%) has been observed.		

Op Test No.:	NRC ILO 11-01	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>11</u>	of	<u>44</u>	
Event Description: PRNIS Channel N-44 Fails HIGH										
Time	Position	Applicant's Actions or Behavior								
BOOTH OPERATOR: Initiate Event 2 (TRIGGER 2) when directed.										
Indications Available: XCP-620-1-1, PR HI SETPT FLUX HI XCP-620-1-4, PR CHAN DEV XCP-620-2-2, PR FLUX HI RATE SINGLE CHAN ALERT XCP-621-1-1, CRB INSRT LMT LO-LO XCP-621-1-2, CRB INSRT LMT LO XCP-621-1-4, PR FLUX HI ROD STP										
	RO	Responds to multiple Annunciators								
EVALUATOR NOTE: The crew may directly implement AOP-401.10, POWER RANGE CHANNEL FAILURE										
	RO	Enters ARP-001- XCP-620-1-1, PR HI SETPT FLUX HI								XCP-620 1-1
		CORRECTIVE ACTIONS:								XCP-620 1-1
	RO	1. Check for a failed instrument on the Main Control Board Power Range channels.								XCP-620 1-1
		2. If the reactor trips, implement EOP-1.0, Reactor Trip/Safety Injection Actuation.								XCP-620 1-1
		3. Verify that Control Rods are not being withdrawn by observing the RODS OUT light on the Main Control Board.								XCP-620 1-1
		SUPPLEMENTAL ACTIONS:								XCP-620 1-1
	RO	Refer to AOP-401.10, Power Range Failure.								XCP-620 1-1
	CRS	Enters AOP-401.10, POWER RANGE CHANNEL FAILURE								AOP-401.10
IOA	RO	Verify normal indication on Power Range Channel N-44. (NO) Place the ROD CNTRL BANK SEL Switch in MAN.								AOP-401.10
IOA	RO	Stabilize any plant transients in progress.								AOP-401.10
*	CREW	Maintain stable plant conditions.								AOP-401.10
	CRS	Verify no testing is in progress on the operable Power Range channels.								AOP-401.10

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>2</u> Page <u>12</u> of <u>44</u>		
Event Description: PRNIS Channel N-44 Fails HIGH		
Time	Position	Applicant's Actions or Behavior
	BOP	Place ROD STOP BYPASS Switch (on the MISCELLANEOUS CONTROL AND INDICATION PANEL) for the failed Power Range channel in BYPASS.
	RO	Verify the appropriate Rod Stop Bypass status light is bright: For N-44, B2 OP ROD STOP BYP (XCP-6111 4-4).
	RO	Adjust Control Rods to maintain Tavg within 1.0 °F of Tref.
BOOTH OPERATOR: <ul style="list-style-type: none"> Acknowledge request to record detector information. Wait one minute THEN go to the floor to record the detector information. Notify the CRS when detector collection has been completed. 		
	CRS	Notify the I&C Department to record detector currents and status lights on POWER RANGE A and POWER RANGE B drawers.
<p style="text-align: center;"><u>CAUTION – Step 9</u></p> <p>The empty fuse holders should NOT be reinstalled as this will allow a small amount of current flow through the blown fuse indicator.</p>		
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 		
	BOP	Deenergize the failed Power Range channel: <ol style="list-style-type: none"> Remove the CONTROL POWER fuses from the POWER RANGE A drawer. Remove the INSTR POWER fuses from the POWER RANGE B drawer.

AOP-401.10

AOP-401.10

AOP-401.10

AOP-401.10

AOP-401.10

AOP-401.10

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 2 Page 13 of 44

Event Description: PRNIS Channel N-44 Fails HIGH

Time	Position	Applicant's Actions or Behavior
EVALUATOR NOTE: The following alarms should 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 		
	BOP	Align the Power Range channel comparator circuits: a. Place the following switches to the failed Power Range channel position: <ol style="list-style-type: none"> 1) COMPARATOR CHANNEL DEFEAT Switch (on the COMPARATOR AND RATE drawer). 2) UPPER SECTION Switch (on the DETECTOR CURRENT COMPARATOR drawer). 3) 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%.
	RO	Check if Reactor power is LESS THAN 50%.
	CRS	Within 72 hours, place the failed channel protection bistables in a tripped condition:
	CRS	a. Identify the associated bistables for the failed channel. REFER TO Attachment 1.
	CRS	b. 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.

AOP-401.10

AOP-401.10

AOP-401.10

AOP-401.10

AOP-401.10

AOP-401.10

AOP-401.10

Op Test No.: **NRC ILO 11-01** Scenario # **2** Event # **2** Page **14** of **44**

Event Description: PRNIS Channel N-44 Fails HIGH

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR:

- Acknowledge requests for support.
- Report that I&C will assign a crew to place the bistables in trip.

CRS

c. Notify the I&C Department to place the identified bistables in trip.

AOP-401.10

CRS

Refer to Tech Spec 3.3.1, REACTOR TRIP SYSTEM INSTRUMENTATION

AOP-401.10

EVALUATOR NOTE: The CRS will determine that the failed channel must be placed in the tripped condition within 72 hours. The following Tech Spec excerpts are for reference.

CRS

3.3.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE with RESPONSE TIMES as shown in Table 3.3-2.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

TECH SPEC 3.3.1

Excerpt from TECH SPEC Table 3.3-1

**TABLE 3.3-1
REACTOR TRIP SYSTEM INSTRUMENTATION**

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
2. Power Range, Neutron Flux					
A. High Setpoint	4	2	3	1, 2	2 [#]
B. Low Setpoint	4	2	3	1 [#] , 2	2 [#]
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2 [#]

TABLE NOTATION

The provisions of Specification 3.0.4 are not applicable.

ACTION STATEMENTS

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

- The inoperable channel is placed in the tripped condition within 72 hours.
- 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.
- 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.

TECH SPEC 3.3.1

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>2</u> Page <u>15</u> of <u>44</u>		
Event Description: PRNIS Channel N-44 Fails HIGH		
Time	Position	Applicant's Actions or Behavior
	CRS	<p>ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:</p> <ul style="list-style-type: none"> a. The inoperable channel is placed in the tripped condition within 72 hours. b. 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. c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2. <p># The provisions of Specification 3.0.4 are not applicable.</p>
	CRS	Determine and correct the cause of the Power Range channel failure.
<p>EVALUATOR NOTE: The next event may be initiated after the Technical Specifications and required actions have been addressed.</p>		

TECH SPEC
3.3.1

AOP-401.10

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 3 Page 16 of 44

Event Description: Emergency Feedwater Pump suction pressure transmitter PT-3635 Fails LOW

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR: Initiate Event 3 (TRIGGER 3) when directed.**Indications Available:**

ARP-001-XCP-621, 3-5 EFP SUCT HDR PRESS LO XFER TO SW

	RO	Responds to annunciator XCP-621, 3-5 EFP SUCT HDR PRESS LO XFER TO SW.	XCP-621 3-5
	RO	<p>CORRECTIVE ACTIONS:</p> <ul style="list-style-type: none"> Verify the low suction pressure condition exists by checking level on LI-3621A (3631A), CST LEVEL FEET. (NO) Refer to SOP-211 for operation using Service Water for Emergency Feedwater. <p>Ensure Emergency Feedwater supply transfers to Service Water when required by decreasing level. (NO)</p>	XCP-621 3-5
	CRS	<p>SUPPLEMENTAL ACTIONS:</p> <ul style="list-style-type: none"> Determine the cause of the low suction pressure and correct as soon as possible. If the alarm is due to an instrument failure, bypass the associated bistable per SOP-401 Attachment I. 	XCP-621 3-5
BOOTH OPERATOR: Acknowledge requests for support.			
	CRS	Request support for I&C to place the associated bistable in bypass.	XCP-621 3-5
EVALUATOR NOTE: The following excerpts are for reference. The failed channel must be placed in Bypass and must be restored to service with 72 hours.			

Op Test No.: **NRC ILO 11-01** Scenario # **2** Event # **3** Page **17** of **44**

Event Description: Emergency Feedwater Pump suction pressure transmitter PT-3635 Fails LOW

Time

Position

Applicant's Actions or Behavior

Excerpt from SOP-401 Attachment 1

TRIPPED BISTABLE STATUS

INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION

R&R#

TRIP

APPLICABLE STPS	STP # USED TO TRIP BISTABLE	TRIP STATUS LIGHT ON	TRIPPED BY	VERIFIED BY

RESTORATION

APPLICABLE STP(S) COMPLETED	STP # USED TO RESTORE BISTABLE	TRIP STATUS LIGHT OFF	RESTORED BY	VERIFIED BY

REVIEWED BY: _____ /
SHIFT SUPERVISOR DATE

Excerpt from SOP-401 Enclosure B

INSTRUMENT FAILURE REFERENCE MANUAL

SYSTEM FUNCTION	INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT	TECH SPECS	STPS
EFP SUCTION PRESSURE	PT-3635	PB-3635	C4-445-BS-1	CHAN IV EFP SUCT PRESS LO	TABLE 3.3-3 ITEM 6.h	396.010 396.014

SOP-401

Excerpt from Technical Specification Table 3.3-3

TABLE 3.3-3 (Continued)ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
6. EMERGENCY FEEDWATER					
h. Suction Transfer on Low Pressure	4	2	3	1, 2, 3	16

ACTION 16 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may continue provided the inoperable channel is placed in bypass and the Minimum Channels OPERABLE requirement is met. Restore the inoperable channel to OPERABLE status within 72 hours otherwise;

Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

One additional channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.2.1.

Tech Spec
Table 3.3-3

EVALUATOR NOTE: The next event may be initiated after the CRS has referenced the Technical Specifications.

Op Test No.: NRC ILO 11-01			Scenario # 2	Event # 4	Page 18 of 44	
Event Description: Feedwater Pump Master Speed Controller Fails LOW						
Time	Position	Applicant's Actions or Behavior				
Booth Operator: Initiate Event 4 (TRIGGER 4) when directed.						
Indications Available: 624-1-5, SG A LVL DEV 624-2-5, SG B LVL DEV 624-3-5, SG C LVL DEV						
	RO	Responds to multiple annunciators				
EVALUATOR NOTE: Annunciator XCP624 1-5 actions are detailed below for SG A but they are similar to the actions for SG B and C.						
		CORRECTIVE ACTIONS:				XCP 624 1-5
	BOP	1. 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"> a. Manually control PVT-478, SG A FWF, as required. b. Manually control Feedwater Pump speed as follows: <ul style="list-style-type: none"> 1) Place the Feedwater Pump MASTER SPEED CNTRL in MAN. 2) Adjust the differential pressure between Feedwater Pump discharge header pressure and Main Steam header pressure, as required, to restore Steam Generator water level. 				XCP 624 1-5
	BOP	2. Evaluate SG A Narrow Range level indicators LI-474, LI-475, and LI-476: <ul style="list-style-type: none"> b. For decreasing level: <ul style="list-style-type: none"> 1) At 45% Narrow Range level: <ul style="list-style-type: none"> (a) Manually control PVT-478, SG A FWF, as required. (b) Ensure feed flow is greater than steam flow by 200 kbh to 400 kbh. 2) At 40% Narrow Range level: <ul style="list-style-type: none"> (a) Trip the reactor. (b) Ensure both Motor Driven Emergency Feed pumps are in service to deliver full system flow. 				XCP 624 1-5
	BOP	3. Determines if FCV-478, A FCV, malfunctioned go to AOP-210.1, Feedwater Flow Control Valve Failure.				XCP 624 1-5

Op Test No.:		NRC ILO 11-01	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>19</u>	of	<u>44</u>	
Event Description: Feedwater Pump Master Speed Controller Fails LOW											
Time	Position	Applicant's Actions or Behavior									
	BOP	4. If a Main Feedwater Pump has tripped or is malfunctioning go to AOP-210.3, Feedwater Pump Malfunction.									XCP 624 1-5
	BOP	5. If an instrument channel has failed, go to AOP-401.11, Steam Generator Level Control And Protection Channel Failure.									XCP 624 1-5
	CRS	Implement AOP-210.3, Feedwater Pump Malfunction.									AOP-210.3
IOA	BOP	1. Verify at least one Feedwater Pump is running.									AOP-210.3
IOA	BOP	2. Check if a Feedwater Pump trip occurred. (NO) ALTERNATE ACTION: GO TO Step 13.									AOP-210.3
	BOP	13. Manually control Feedwater Pump speed using MCB MASTER SPEED CONTROL: a. Place the Feedwater Pump MASTER SPEED CNTRL in MAN. b. Adjust Feedwater Pump speed to maintain pump discharge header pressure 150 to 250 psi GREATER THAN Main Steam header pressure on: <ul style="list-style-type: none">PI-508, FW PP DISCH HDR PRESS PSIG.PI-464C, MS HDR PRESS PSIG. c. 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.									AOP-210.3
	BOP	14. Determine and correct the cause of the Feedwater Pump speed control malfunction.									AOP-210.3
	BOP	15. Check if MCB MASTER SPEED CONTROL is in AUTO.									AOP-210.3
	BOP	16. Ensure all operating Feedwater Pump speed controller(s) (MCB M/A Stations) are in AUTO. REFER TO SOP-210, FEEDWATER SYSTEM.									AOP-210.3
	BOP	17. Verify Narrow Range SG levels are stable at OR trending to 60%.									AOP-210.3
	CRS	18. RETURN TO the Procedure and Step in effect.									AOP-210.3

Op Test No.: NRC ILO 11-01 Scenario # 2 Event # 4 Page 20 of 44

Event Description: Feedwater Pump Master Speed Controller Fails LOW

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR: Acknowledge all requests for support.**EVALUATOR NOTE:**

When the BOP has restored control of SG levels the CRS will exit this procedure. The CRS may elect to maintain power pending repairs or continue with the power increase. The next event may be triggered when the plant has been stabilized following the failure.

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>5</u> Page <u>21</u> of <u>44</u>			
Event Description: "A" RCP Vibration Ramp to Trip criteria			
Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: Initiate Event 5 (TRIGGER 5) when directed.			
Indications available: XCP-617 1-3, RCP A VIBRATION HI			
	RO	Responds to alarm XCP-617 1-3, RCP A VIBRATION HI.	
<p style="text-align: center;">CAUTION</p> <p>Reactor Coolant Pump shaft and frame vibrations should increase simultaneously on actual Reactor Coolant Pump high vibration. Channel failure is indicated by the associated shaft or frame bar graph going to zero on the Yokogawa DX 1000 recorder.</p>		XCP-617 1-3	
<p style="text-align: center;">NOTE</p> <p>a. This alarm has reflash capabilities. b. This alarm causes XCP-606 3-5, REACTOR BUILDING FANS VIBRATION MON FLT/WARN to annunciate.</p>		XCP-617 1-3	
	RO	<p>CORRECTIVE ACTIONS:</p> <ol style="list-style-type: none"> 1. Monitor Reactor Coolant Pump A vibration indicators to determine the source and severity of the vibration. 2. Monitor RCS temperature and pressure to verify they are within limits for Reactor Coolant Pump operation. 3. Determine if a single phasing event is in progress by diagnosis of any combination of the following symptoms: <ol style="list-style-type: none"> a. Vibration Alarms are received for other equipment. b. MCB Potential Lights are not lit. c. MCB Amber Overload lights are lit for running equipment or Motor Overload Alarms are received. d. MCB Undervoltage Alarms. e. Affected bus local 7.2 KV Bus ammeters. 	XCP-617 1-3
	RO	<p>SUPPLEMENTAL ACTIONS:</p> <ol style="list-style-type: none"> 1. With Reactor Coolant Pump A shaft vibration greater than or equal to 20 mils or greater than or equal to 15 mils and increasing at greater than one mil per hour, perform one of the following: <ol style="list-style-type: none"> a. If Reactor Power is greater than 38%, trip the Reactor and secure Reactor Coolant Pump A per SOP-101. 	XCP-617 1-3
	Crew	Check if Reactor power is GREATER THAN 38% (Reactor Permissive P-8, REACTOR TRIP BLOCKED, is dim).	XCP-617 1-3
	RO	Trip the Reactor.	XCP-617 1-3

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 5 Page 22 of 44

Event Description: "A" RCP Vibration Ramp to Trip criteria

Time	Position	Applicant's Actions or Behavior	
	RO	Stop the affected Reactor Coolant Pump.	
	CRS	Enters EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION	EOP-1.0
<p style="text-align: center;">REFERENCE PAGE FOR EOP-1.0</p> <p>1 RCP TRIP CRITERIA</p> <p>a. <u>IF</u> Phase B Containment Isolation has actuated (XCP-612 4-2), <u>THEN</u> trip <u>all</u> RCPs.</p> <p>b. <u>IF both</u> of the following conditions occur, <u>THEN</u> trip <u>all</u> RCPs:</p> <ul style="list-style-type: none"> SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. <p style="text-align: center;"><u>AND</u></p> <ul style="list-style-type: none"> RCS Wide Range pressure is LESS THAN 1418 psig. <p>2 REDUCING CONTROL ROOM EMERGENCY VENTILATION</p> <p>Reduce Control Room Emergency Ventilation to <u>one</u> train in operation within 30 minutes of actuation. REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.</p> <p>3 MONITOR SPENT FUEL COOLING</p> <p>Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery:</p> <ul style="list-style-type: none"> Spent Fuel Pool level. Spent Fuel Pool temperature. 			EOP-1.0
<p style="text-align: center;"><u>NOTE</u></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. 			EOP-1.0

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>5</u> Page <u>23</u> of <u>44</u>		
Event Description: "A" RCP Vibration Ramp to Trip criteria		
Time	Position	Applicant's Actions or Behavior
IOA	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.
IOA	BOP	Verify Turbine/Generator Trip: <ul style="list-style-type: none"> a. Verify all Turbine STM Stop VLVs are closed. b. Ensure Generator Trip (after 30 second delay): <ul style="list-style-type: none"> 1) Ensure the GEN BKR is open. 2) Ensure the GEN FIELD BKR is open. 3) Ensure the EXC FIELD CNTRL is tripped.
IOA	BOP	Verify both ESF buses are energized.
	CRS	Go to Step 5.
IOA	RO	Check if SI is required: <p>Check if any of the following conditions exist:</p> <ul style="list-style-type: none"> • PZR pressure LESS THAN 1850 psig. OR • RB pressure GREATER THAN 3.6 psig. OR • Steamline pressure LESS THAN 675 psig. OR • Steamline differential pressure GREATER THAN 97 psid.
EVALUATOR NOTE: It is a Critical Task for the RCPs to be tripped when SI flow is indicated and RCS pressure is less than 1418 psig WR and before 33% WR RVLIS.		
	CRS	Go to EOP-1.1, REACTOR TRIP RECOVERY.

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 5 Page 24 of 44

Event Description: "A" RCP Vibration Ramp to Trip criteria

Time

Position

Applicant's Actions or Behavior

REFERENCE PAGE FOR EOP-1.1

EOP-1.1

1 SI ACTUATION CRITERIA

IF either of the following conditions occurs, THEN actuate SI and GO TO EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, Step 1:

- PZR level can NOT be maintained GREATER THAN 8%.
- OR
- RCS subcooling on TI-499A(B), A(B) TEMP "F, is LESS THAN the value listed in the table below:

RCS PRESSURE (psig)	RCS SUBCOOLING (°F)
1576-3075	42.5
876-1575	45
576-875	47.5
476-575	50
375-475	52.5

CAUTION:

EOP-1.1

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

NOTE:

EOP-1.1

- Main Turbine vibration should be monitored during coastdown.
- The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.

CREW

Announce plant conditions over the page system.

EOP-1.1

EVALUATOR NOTE:

The next event (SBLOCA) may be cued after EOP1.1 is implemented. The following steps are only applicable until the effect of the next event is observed.

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>5</u> Page <u>25</u> of <u>44</u>		
Event Description: "A" RCP Vibration Ramp to Trip criteria		
Time	Position	Applicant's Actions or Behavior
	CREW	Check FW status:
	RO	a. Check if RCS Tavg is LESS THAN 564 °F.
	BOP	b. Verify FW Isolation: <ul style="list-style-type: none"> Ensure the FW Flow Control Valves, FCV-478(488)(498), are closed. Ensure the Main FW Isolation Valves, PVG-1611A(B)(C), are closed. Ensure the FW Flow Control Bypass Valves, FCV-3321(3331)(3341), are closed.
		c. Ensure EFW Pumps are running:
		1) Ensure both MD EFW Pumps are running.
		2) Verify the TD EFW Pump is running if necessary to maintain SG levels. (NOT required)
		d. Verify total EFW flow is GREATER THAN 450 gpm.
		e. Trip <u>all</u> Main FW Pumps.
*	RO	Check RCS temperature: With any RCP running, RCS Tavg is stable at OR trending to 557°F.
<p align="center">NOTE - Step 4</p> <p>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.</p>		
	RO	Verify all Control Rods are fully inserted.
<p>BOOTH OPERATOR: When contacted to adjust ITV-3062A(B)(C), BD COOLER A(B)(C) CDSTE OUT TEMP to 90%</p> <p>Insert TRIGGER 11. This will adjust the valves to 90% over 2 min 20 sec.</p>		

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>5</u> Page <u>26</u> of <u>44</u>		
Event Description: "A" RCP Vibration Ramp to Trip criteria		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Check DA level control:</p> <p>a. 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.</p> <p>b. Locally adjust ITV-3062A(B)(C), BD COOLER A(B)(C) CDSTE OUT TEMP, to 90% (XPN-0029, NUCLEAR BLOWDOWN PROCESSING PANEL, AB-436).</p>
	RO	<p>Check PZR level control:</p> <p>a. Verify PZR level is GREATER THAN 17%.</p> <p>b. Verify Charging and Letdown are in service.</p> <p>c. Verify PZR level is trending to 25%.</p>
		<p>Check PZR pressure control:</p> <p>a. Verify PZR pressure is GREATER THAN 1850 psig.</p> <p>b. Verify PZR pressure is stable at OR trending to 2230 psig (2220 psig to 2250 psig).</p>
*	BOP	<p>Check SG levels:</p> <p>a. Verify Narrow Range level in all SGs is GREATER THAN 26%.</p> <p>b. Control EFW flow to maintain Narrow Range SG level between 40% and 60%.</p>
*	BOP	<p>Verify all AC buses are energized by offsite power:</p> <ul style="list-style-type: none"> • ESF AC buses. • BOP AC buses.

EOP-1.1

EOP-1.1

EOP-1.1

EOP-1.1

EOP-1.1

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>5</u> Page <u>27</u> of <u>44</u>			
Event Description: "A" RCP Vibration Ramp to Trip criteria			
Time	Position	Applicant's Actions or Behavior	
	BOP	<p>Transfer Condenser Steam Dumps to the Steam Pressure Mode:</p> <ol style="list-style-type: none"> Verify PERMISV C-9 status light is bright on XCP-6114 1-3. WHEN RCS Tavg is LESS THAN P-12 (552°F), THEN place both STM DUMP INTERLOCK Switches to BYP INTLK. Perform the following: <ul style="list-style-type: none"> Verify the MS Isolation Valves, PVM-2801A(B)(C), are open. OR Open MS Isolation Bypass Valves: <ol style="list-style-type: none"> Depress both MAIN STEAM ISOL VALVES RESET TRAIN A(B). Open MS Isolation Bypass Valves, PVM-2869A(B)(C). Place the STM DUMP CNTRL Controller in MAN and closed. Ensure the STM DUMP CNTRL Controller is set to 8.4. Place the STM DUMP MODE SELECT Switch in STM PRESS. Place the STM DUMP CNTRL Controller in AUTO. 	EOP-1.1
<p align="center"><u>NOTE - Step 12</u></p> <ul style="list-style-type: none"> Priority should be given to running RCP A to supply Normal PZR Spray. Since a time lag is expected after increasing steam flow before natural circulation parameters can be verified, this procedure should be continued concurrently with the establishment of natural circulation. 			EOP-1.1
	RO	<p>Verify RCP A is running.</p> <p>NOTE: Crew determines the RCP A cannot be started.</p>	EOP-1.1
	BOP	Shut down and stabilize the Secondary Plant. REFER TO AOP-214.1, TURBINE TRIP.	EOP-1.1

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>5</u> Page <u>28</u> of <u>44</u>		
Event Description: "A" RCP Vibration Ramp to Trip criteria		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Maintain stable plant conditions:</p> <ul style="list-style-type: none"> a. Maintain PZR pressure at 2230 psig (2220 psig to 2250 psig). b. Maintain PZR level at 25%. c. Maintain Narrow Range SG levels between 40% and 60%. d. Maintain RCS temperature: <ul style="list-style-type: none"> • With any RCP running, Tavg at 557°F. OR • With no RCP running, Tcold at 557°F. e. REFER TO GOP-5, REACTOR SHUTDOWN FROM STARTUP TO HOT STANDBY (MODE 2 TO MODE 3).
	BOP	COMPLETE Attachment I of SAP-116, PLANT TRIP/SAFETY INJECTION PLANT RECOVERY.

EOP-1.1

EOP-1.1

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6,7,8 Page 29 of 44
 Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR: Initiate Event 6 (TRIGGER 6) when directed.

Indications:

Rapidly decreasing Pressurizer Pressure and Level

EVALUATOR NOTE: When the symptoms of the SBLOCA are observed the crew will initiate SI and implement EOP-1.0.

	Crew	Respond to alarms and degrading RCS condition.	EOP-1.1
	CRS	Direct SI Actuation.	EOP-1.1
	CRS	Implement EOP-01 REACTOR TRIP/SAFETY INJECTION ACTUATION.	EOP-1.1

REFERENCE PAGE FOR EOP-1.0

EOP-1.0

1 RCP TRIP CRITERIA

- a. IF Phase B Containment Isolation has actuated (XCP-612 4-2),
THEN trip all RCPs.
- b. 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 1418 psig.

2 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.**

3 MONITOR SPENT FUEL COOLING

Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery:

- Spent Fuel Pool level.
- Spent Fuel Pool temperature.

Op Test No.: NRC ILO 11-01 Scenario # 2 Event # 6,7,8 Page 30 of 44		
Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.		
Time	Position	Applicant's Actions or Behavior
<p style="text-align: center;"><u>Note:</u></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. 		
IOA	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.
IOA	BOP	Verify Turbine/Generator Trip: <ol style="list-style-type: none"> Verify all Turbine STM Stop VLVs are closed. Ensure Generator Trip (after 30 second delay): <ol 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.
IOA	BOP	Verify both ESF buses are energized.
IOA	RO	Check if SI is actuated: <ol 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. OR Any red first out SI annunciator is lit on XCP-626 top row. Actuate SI using either SI ACTUATION Switch. GO TO Step 6.
EVALUATOR NOTE: ATTACHMENT 3, SI EQUIPMENT VERIFICATION is attached (Page 40). Failure of MVG-8801A/B will be addressed in EOP-1.0 Attachment 3.		
	BOP	Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.
	Crew	Announce plant conditions over the page system.

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>6,7,8</u> Page <u>31</u> of <u>44</u>			
Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.			
Time	Position	Applicant's Actions or Behavior	
*	BOP	Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen.	EOP-1.0
*	RO	Check RCS temperature: <ul style="list-style-type: none"> • With any RCP running, RCS Tav_g is stable at OR trending to 557°F. OR • With no RCP running, RCS T_{cold} is stable at OR trending to 557°F. 	EOP-1.0
	RO	Check PZR PORVs and Spray Valves: <ol style="list-style-type: none"> PZR PORVs are closed. PZR Spray Valves are closed. Verify power is available to at least one PZR PORV Block Valve: <ul style="list-style-type: none"> • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL. • MVG-8000C, RELIEF 445 B ISOL. Verify at least one PZR PORV Block Valve is open. 	EOP-1.0
	RO	Check if RCPs should be stopped: <ol style="list-style-type: none"> Check if either of the following criteria is met: <ul style="list-style-type: none"> • Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR • RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. Stop all RCPs. 	EOP-1.0
	BOP	Verify no SG is FAULTED: <ul style="list-style-type: none"> • No SG pressure is decreasing in an uncontrolled manner. • No SG is completely depressurized. 	EOP-1.0

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>6,7,8</u> Page <u>32</u> of <u>44</u>		
Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED:</p> <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.
	BOP	<p>Check if the RCS is INTACT:</p> <p>a. RB radiation levels are normal on:</p> <ul style="list-style-type: none"> • RM-G7, CNTMT HI RNG GAMMA. • RM-G18, CNTMT HI RNG GAMMA. <p>b. RB Sump levels are normal.</p> <p>c. RB pressure is LESS THAN 1.5 psig.</p> <p>d. The following annunciators are NOT lit:</p> <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). <p>ALTERNATIVE ACTION</p> <p>GO TO EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.</p>

EOP-1.0

EOP-1.0

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6,7,8 Page 33 of 44
 Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.

Time	Position	Applicant's Actions or Behavior
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REFERENCE PAGE FOR EOP-2.0

EOP-2.0

1. SI REINITIATION CRITERIA

IF either of the following conditions occurs, THEN start Charging Pumps and operate valves as necessary:

- RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 52.5°F [67.5°F].
- PZR level can NOT be maintained GREATER THAN 10% [28%].

2. RCP TRIP CRITERIA

IF either of the following criteria is met, THEN trip all RCPs:

- Annunciator XCP-612 4-2 is lit (PHASE B ISOL).
- RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.

3. SECONDARY INTEGRITY TRANSITION CRITERIA

IF any unisolated SG pressure is decreasing in an uncontrolled manner OR is completely depressurized, THEN GO TO EOP-3.0, FAULTED STEAM GENERATOR ISOLATION, Step 1.

4. TUBE RUPTURE TRANSITION CRITERIA

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.

5. COLD LEG RECIRCULATION TRANSITION CRITERION

IF RWST level decreases to LESS THAN 18%, THEN GO TO EOP-2.2, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

6. LOSS OF EMERGENCY COOLANT RECIRCULATION TRANSITION CRITERION

IF Emergency Coolant Recirculation is established and subsequently lost, THEN GO TO EOP-2.4, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

7. 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

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6,7,8 Page 34 of 44
 Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.

Time	Position	Applicant's Actions or Behavior
<p style="text-align: center;">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 		
	RO	Check if RCPs should be stopped:
		a. Check if either of the following criteria is met: <ul style="list-style-type: none"> Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.
EVALUATOR NOTE: This is a Critical Task but it may have been performed earlier as a Reference Page requirement.		
CRITICAL TASK	RO	b. Stop all RCPs.
	BOP	Verify no SG is FAULTED: <ul style="list-style-type: none"> No SG pressure is decreasing in an uncontrolled manner. No SG is completely depressurized.
*	BOP	Check INTACT SG levels: <ul style="list-style-type: none"> a. Verify Narrow Range level in INTACT SGs is GREATER THAN 26% [41%]. b. Control EFW flow to maintain Narrow Range level in each INTACT SG between 40% and 60%.
	BOP	Reset both SI RESET TRAIN A(B) Switches.
	BOP	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.

EOP-2.0

EOP-2.0

EOP-2.0

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EOP-2.0

EOP-2.0

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>6,7,8</u> Page <u>35</u> of <u>44</u>		
Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.		
Time	Position	Applicant's Actions or Behavior
	BOP	Check if Secondary radiation levels are normal:
	BOP	a. 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.
	BOP	b. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO.
BOOTH OPERATOR: Acknowledge requests for support. Report no activity after 10 minutes.		
	BOP	c. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.
<u>NOTE - Step 10.d</u> If PZR level is LESS THAN 10% [28%], the PZR should refill from SI flow after pressure is stabilized.		
*	RO	d. PZR level is GREATER THAN 10% [28%]. e. GO TO EOP-1.2, SAFETY INJECTION TERMINATION, Step 1.
*	BOP	Check if RB Spray should be stopped: <ul style="list-style-type: none"> a. Check if any RB Spray Pumps are running. b. Verify RB pressure is LESS THAN 11 psig. c. Depress both RESET TRAIN A(B) RB SPRAY.
<u>NOTE - Step 11.d</u> <ul style="list-style-type: none"> • RB Spray must run for a minimum of four hours. • Anytime RB Spray Pumps are stopped, MVG-3003A(B), SPRAY HDR ISOL LOOP A(B), should be closed for containment isolation 		

EOP-2.0

EOP-2.0

EOP-2.0

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EOP-2.0

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>6,7,8</u> Page <u>36</u> of <u>44</u>		
Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.		
Time	Position	Applicant's Actions or Behavior
*	CRS	d. Consult with TSC personnel concerning RB Spray System operation.
*	BOP	Check if RHR Pumps should be stopped: a. Check RCS pressure: 1) RCS pressure is GREATER THAN 325 psig. 2) RCS pressure is stable OR increasing. b. Check if any RHR Pump is running with suction aligned to the RWST. c. Stop any RHR Pump which is running with suction aligned to the RWST and place in Standby.
	RO	Check if RCS pressure is stable OR decreasing.
	BOP	Check if pressure in all SGs is stable OR increasing.
CAUTION - Step 15 The DGs should NOT be run at a minimum load or unloaded for extended periods of time, to prevent carbon fouling.		
	BOP	Check if DGs should be stopped: a. Verify both ESF buses are energized by offsite power. b. Stop any unloaded DG. REFER TO SOP-306, EMERGENCY DIESEL GENERATOR.
	BOP	Verify equipment is available for Cold Leg Recirculation: a. Verify power is available for at least one RHR Pump: 1) PUMP A. 2) PUMP B. b. Open both MVB-9503A(B), CC TO RHR HX A(B).

EOP-2.0

EOP-2.0

EOP-2.0

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EOP-2.0

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EOP-2.0

Op Test No.: NRC ILO 11-01 Scenario # <u>2</u> Event # <u>6,7,8</u> Page <u>37</u> of <u>44</u>		
Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.		
Time	Position	Applicant's Actions or Behavior
<p style="text-align: center;">CAUTION - Step 16.c</p> <ul style="list-style-type: none"> 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. 		
	BOP	<p>c. Shift the CCW Train to fast speed in the Active Loop. REFER TO SOP-118, COMPONENT COOLING WATER.</p> <p>d. Consult with TSC personnel to determine if equipment required for Cold Leg Recirculation is available.</p>
<p style="text-align: center;">NOTE - Step 17</p> <p>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.</p>		
	BOP	<p>Check the AB for evidence of ECCS leakage:</p> <p>a. Verify AB radiation levels are normal on:</p> <ul style="list-style-type: none"> RM-A3, MAIN PLANT VENT EXH ATMOS MONITOR: PARTICULATE, IODINE, GAS. RM-A13, PLANT VENT HI RANGE. RM-A11, AB VENT GAS ATMOS MONITOR. Local area monitors. <p>b. Verify annunciator XCP-631 6-1 is NOT lit (AB SMP LVL HI).</p> <p>c. Verify annunciators XCP-606 3-4 and XCP-607 3-4 are NOT lit (LD TRBL AB SMP/FLDRN LVL HI).</p>
	BOP	<p>Obtain necessary Chemistry samples:</p> <p>a. Ensure all RCS sample valves are in AUTO:</p> <ul style="list-style-type: none"> SVX-9364B and SVX-9365B, RCS LP B SMPL ISOL. SVX-9364C and SVX-9365C, RCS LP C SMPL ISOL. <p>b. Notify Chemistry to sample the following:</p> <ul style="list-style-type: none"> RCS. All SGs for isotopic activity.

EOP-2.0

EOP-2.0

EOP-2.0

EOP-2.0

EOP-2.0

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6,7,8 Page 38 of 44
 Event Description: SBLOCA, MVG -8801A, MVG -8801B fail to open on the SI signal, DG load sequencer fails to complete (train "A" step 7) XPP-45A, Service Water Booster Pump fails to start.

Time	Position	Applicant's Actions or Behavior
	BOP	Shut down and stabilize the Secondary Plant. REFER TO AOP-214.1, TURBINE TRIP.
	BOP	Check if RCS cooldown and depressurization is required: a. RCS pressure is GREATER THAN 325 psig. b. GO TO EOP-2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION, Step 1.
EVALUATOR NOTE: This scenario may be terminated when the actions of EOP-2.0 are completed and the decision is made to transition to EOP-2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION		

EOP-2.0

EOP-2.0

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 1 Page 39 of 44

Event Description: SOP-106 DILUTION OPERATIONS

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: This procedure section is to perform an Alternate RCS dilution.			
<u>NOTE 2.0</u>			
1. Energizing additional Pressurizer Heaters will enhance mixing. 2. 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.	SOP-106
	RO	Place RX COOL SYS MU switch to STOP.	SOP-106
	RO	Place RX COOL SYS MU MODE SELECT switch to ALT DIL. (Peer✓)	SOP-106
	RO	Adjust FCV-168, TOTAL MU FLOW SET PT, to desired flow rate.	SOP-106
	RO	Set FIS-168, TOTAL MU FLOW, batch integrator to desired volume. (Peer ✓)	SOP-106
	RO	Place RX COOL SYS MU switch to START.	SOP-106
	RO	Verify desired flow rate on FR-113, TOTAL MU GPM (F-168).	SOP-106
	RO	Verify alternate dilution stops when preset volume is reached on FIS-168, TOTAL MU FLOW, batch integrator.	SOP-106
	RO	Place RX COOL SYS MU switch to STOP.	SOP-106
	RO	Place RX COOL SYS MU MODE SELECT switch to AUTO. (Peer ✓)	SOP-106
	RO	Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm).	SOP-106
	RO	Place RX COOL SYS MU switch to START.	SOP-106
EVALUATOR NOTE: END OF SOP-106			

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6, 7, 8 Page 40 of 44

Event Description: EOP-1.0 Attachment 3

Time

Position

Applicant's Actions or Behavior

EVALUATOR NOTE: This attachment is to verify equipment status after Safety Injection has been initiated and is run concurrently with the main body of EOP-1.0.

	BOP	<p>Ensure EFW Pumps are running:</p> <ol 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. 	EOP-1.0 Attachment 3
	BOP	<p>Ensure the following EFW valves are open:</p> <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. 	EOP-1.0 Attachment 3
	BOP	Verify total EFW flow is GREATER THAN 450 gpm.	EOP-1.0 Attachment 3
	BOP	<p>Ensure FW Isolation:</p> <ol style="list-style-type: none"> Ensure the following are closed: <ul style="list-style-type: none"> FW Flow Control, FCV-478(488)(498). 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 all Main FW Pumps are tripped. 	EOP-1.0 Attachment 3
	BOP	<p>Ensure SI Pumps are running:</p> <ul style="list-style-type: none"> Two Charging Pumps are running. Both RHR Pumps are running. 	EOP-1.0 Attachment 3
	BOP	Ensure two RBCU Fans are running in slow speed (one per train).	EOP-1.0 Attachment 3

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6, 7, 8 Page 41 of 44

Event Description: EOP-1.0 Attachment 3

Time	Position	Applicant's Actions or Behavior	
	BOP	<p>Verify Service Water to the RBCUs:</p> <ol style="list-style-type: none"> Ensure two Service Water Pumps are running. Verify both Service Water Booster Pumps A(B) are running. <p>ALTERNATIVE ACTION</p> <ol style="list-style-type: none"> Perform the following: <ol style="list-style-type: none"> IF XVB-3107A(B), RBCU 64A(B)/65A(B) RTN TO SW PND, for the non-running pump is closed, THEN start Service Water Booster Pump A(B). IF XVB-3107A(B), RBCU 64A(B)/65A(B) RTN TO SW PND, for the non-running pump is NOT closed, THEN perform the following: <ol style="list-style-type: none"> Place the non-running Service Water Booster Pump A(B) in PULL TO LK NON-A. Close XVB-3107A(B), RBCU 64A(B)/65A(B) RTN TO SW PND, for the non-running pump. WHEN XVB-3107A(B), RBCU 64A(B)/65A(B) RTN TO SW PND, for the non-running pump is closed, THEN refill Train A(B) RBCUs with the Service Water Booster Pump A(B) tripped per SOP-117, SERVICE WATER SYSTEM. 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. 	EOP-1.0 Attachment 3
	BOP	Verify two CCW Pumps are running.	EOP-1.0 Attachment 3
	BOP	Ensure two Chilled Water Pumps and Chillers are running.	EOP-1.0 Attachment 3
	BOP	Verify both trains of Control Room Ventilation are running in Emergency Mode.	EOP-1.0 Attachment 3

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6, 7, 8 Page 42 of 44

Event Description: EOP-1.0 Attachment 3

Time	Position	Applicant's Actions or Behavior	
	BOP	<p>Check if Main Steamlines should be isolated:</p> <p>a. Check if any of the following conditions are met:</p> <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. <p>b. Ensure all the following are closed:</p> <ul style="list-style-type: none"> • MS Isolation Valves, PVM-2801A(B)(C). • MS Isolation Bypass Valves, PVM-2869A(B)(C). 	EOP-1.0 Attachment 3
	BOP	<p>Ensure Excess Letdown Isolation Valves are closed:</p> <ul style="list-style-type: none"> • PVT-8153, XS LTDN ISOL. • PVT-8154, XS LTDN ISOL. 	EOP-1.0 Attachment 3
	BOP	<p>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.</p>	EOP-1.0 Attachment 3
	BOP	<p>Verify proper SI alignment:</p> <p>a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104.</p>	EOP-1.0 Attachment 3
<p>EVALUATOR NOTE: Valves MVG-8801A(B), HI HEAD TO COLD LEG INJ have failed to open on SI.</p> <p>It is a Critical Task to establish SI by opening MVG-8801 (A or B) prior to NR RVLIS < 34% or CET > 725°F.</p>			

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6, 7, 8 Page 43 of 44

Event Description: EOP-1.0 Attachment 3

Time	Position	Applicant's Actions or Behavior	
CRITICAL TASK	BOP	Verify proper SI alignment: ALTERNATIVE ACTION a. Ensure proper SI valve alignment: 1) Open MVG-8801A(B), HI HEAD TO COLD LEG INJ. 2) Close MVG-8107 and MVG-8108, CHG LINE ISOL. 3) Open LCV-115B(D), RWST TO CHG PP SUCT. 4) Close LCV-115C(E), VCT OUTLET ISOL. 5) Open MVG-8809A(B), RWST TO RHR PP A(B). 6) Open MVG-8888A(B), RHR LP A(B) TO COLD LEGS.	EOP-1.0 Attachment 3
	BOP	b. Verify all SAFETY INJECTION monitor lights are dim on XCP-6106.	EOP-1.0 Attachment 3
	BOP	c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM	EOP-1.0 Attachment 3

Op Test No.: **NRC ILO 11-01** Scenario # 2 Event # 6, 7, 8 Page 44 of 44

Event Description: EOP-1.0 Attachment 3

Time	Position	Applicant's Actions or Behavior
	BOP	d. Check if RCS pressure is LESS THAN 325 psig.
	BOP	e. Verify RHR flow on: <ul style="list-style-type: none">• FI-605A, RHR DISCHARGE PUMP A FLOW GPM. AND• FI-605B, RHR DISCHARGE PUMP B FLOW GPM.
EVALUATOR NOTE: END OF EOP-1.0 ATTACHMENT 3.		

EOP-1.0
Attachment 3EOP-1.0
Attachment 3

Facility:	VC SUMMER	Scenario No.: 5	Op Test No.: NRC ILO 11-01
Examiners:	_____	Operators:	CRS: _____
	_____		RO: _____
	_____		BOP: _____
Initial Conditions:	<ul style="list-style-type: none"> Reactor Critical at 10^{-3} % MOL following a short maintenance outage. The fuel has been pre-conditioned during previous operation. The Main Steam system has being warmed and the MSIVs are open. GOP-3 is complete to step 3.14. A and B CWP running, C CWP will be returned to service on next shift. 		
Turnover:	<ul style="list-style-type: none"> Increase power to approximately 1 - 3%. 		
Critical Task:	<ul style="list-style-type: none"> Establish high head injection prior to NR RVLIS <34% or CETs > 725°F. Failure of phase A (Valve 9312A and B do not close) - at least one valve must be closed in that line prior to finishing Attachment III. 		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R – RO, N – BOP, CRS	Perform Reactor Start-up IAW GOP-3 Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2)
2	EF001T	C – BOP, CRS TS – CRS	“A” MDEFW trip, Throttle flow with “B” MDEFW
3	RCS008H	TS – CRS	RCS Loop C T _{HOT} RTD Fails LOW.
4	TB001T	C-BOP	B CWP Bearing Failure (A and B CWP running) Temperatures increase until it is tripped by the crew or it auto trips
5	CS004S	C – RO, CRS	“A” Charging Pump sheared shaft.
6	CRF004D4 CRF004K2	C – RO, CRS	2 Dropped Rods – Trip reactor (D4) (K2) Staggered rod drop - 1 minute apart.
7	PRS008	M - ALL	PZR Steam Space LOCA (Auto-Trigger on reactor Trip).
8	SS003P SS004P		Containment penetration valves PVA-9312 A & B fail to close on Phase A.
9	CVC017B CVC017C		The running Charging Pump will trip on the SI and will not restart. The Non-running Charging Pp does not start on SI but will start manually

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

The following notation is used in the ES-D-2 form “Time” column:

IOA designates **Immediate Operator Action** steps
***** designates **Continuous Action** steps

The crew will assume the watch having been pre-briefed on the Initial Conditions, the plan for this shift and any related operating procedures.

The scenario involves a plant startup so GOP-3, Reactor Startup from Hot Standby to Startup (Mode 3 to Mode 2), is being implemented. Step 3.13 has been completed and the reactor is critical in Mode 2. The secondary plant has been warmed with the turbine on turning gear.

The scenario starts on step 3.14. Power will be raised to the Point of Adding Heat.

EVENT 1: Normal Power Increase

The RO will increase Reactor Power to the Point of Adding Heat and the crew will transition to GOP-4A, Power Operation (Mode 1 - Ascending). GTP-702 Attachment II G, Operational Mode Change Plant Startup - Entering Mode 1, is complete.

EVENT 2: “A” MDEFW Pump Trip

On cue from the Examiner at approximately 1-3% power the “A” MDEFW will trip.

In accordance with XCP-622 1-3, MD EFP A Trip” EFW flow must be reduced to below 400 gpm. The EFW flow requirement is approximately 180 gpm/percent so power is limited to approximately 2% using the “B” MDEFW unless the crew decides to use the TDEFW Pump.

The BOP will throttle EFW flow to the S/Gs using the “B” MDEFW IAW SOP-211, Emergency Feedwater System.

The CRS will evaluate the failure and determine that the A MSEFW Pump is inoperable and Tech Spec 3.7.1.2 applies. The action statement requires that be returned to operable status within 72 hours.

EVENT 3: T_{Hot} RTD Fails LOW.

On cue from the Examiner 2 Loop C T_{Hot} RTDs will fail Low. The crew will respond in accordance with the ARP(s). The crew will implement AOP-401.2, Protection Channel RCS Loop RTD Failure, to identify the failed RTD and ensuring an operable loop is selected on ΔT TR-412 Input Switch.

The CRS should enter the applicable TS for Reactor Trip Instrumentation and ESF Instrumentation to determine that the failed channel protection bistables must be placed in the tripped condition within 72 hours.

EVENT 4: “B” CWP Bearing Failure (A and B CWP running) Temperatures increase until it is tripped by the crew or it auto trips

On cue from the Examiner the “B” CWP bearing will fail. Bearing temperatures will increase until the pump is stopped or an auto trip occurs. The operators will start the “C” CWP and verify proper operation.

EVENT 5: Charging Pump Sheared Shaft

NOTE: The BOP will be called to the HVAC so the RO will perform the required actions.

The “A” Charging Pump shaft will shear. The RO will align and start the “C” Charging pump on the A Header. Permission to start the Charging Pump will be granted by a SS role player in the booth.

EVENT 6: Two Dropped Rods

On cue from the Examiner, one rod will drop to the fully inserted position. The RO will take immediate actions IAW AOP-403.6, Dropped Control Rod. A second rod will drop 60 seconds after the first. IAW AOP-403.6, Dropped Control Rod, the RO will trip the Reactor and implement EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation.

EVENT 7: Steam Space LOCA

A steam space LOCA will be automatically triggered on the Reactor Trip. Safety Injection will initiate on Low RCS Pressure. The crew will transition from EOP-1.0 (E-0) to EOP-2.0 (E-1).

EVENT 8: Containment penetration valves XVA9312 A & B fail to close on Phase “A”

This event is the result of the Safety Injection Actuation. The BOP must close at least one Phase “A” isolation valve in the unisolated line (RMA-2 Sample Isolation Valves) during the conduct of EOP-1.0, Attachment 3 – SI Equipment Verification.

EVENT 9: The running Charging Pump will trip on the SI and will not restart

This event is the result of the Safety Injection Actuation. One Charging pump was previously faulted. The running charging pump will trip on the SI and cannot be restarted. The sequence to restore charging flow is dependent on previous actions:

If the “B” Charging pump was running, the “C” charging pump must be racked-up and started. If the “C” Charging pump was running, the “B” charging pump can be manually started from the MCB.

The crew will transition to EOP-2.0 (E-1), Loss of Reactor or Secondary Coolant, based on containment conditions. The crew will later transition to EOP-2.1 (ES-1.2), Post-LOCA Cooldown and Depressurization.

CRITICAL TASKS:

- Establish high head injection prior to NR RVLIS <34% or CETs > 725°F.
- Failure of phase A (Valve 9312A and B do not close) - at least one valve must be closed in that line prior to finishing Attachment III.

TERMINATION:

The scenario can be terminated after EOP-2.1, Post-LOCA Cooldown and Depressurization is implemented or at the discretion of the Examiner.

VC Summer 2013 NRC Scenario '5' Simulator Setup

Initial Conditions:

- IC-6, 10^{-3} % power MOL, (IC-328 for 2013)
- Reactivity Management Plan/Turnover sheet for IC Set
- Rod Position = Bank D at 100 steps
- Boron Concentration = 1507 ppm
- FCV113 Pot Setting = 6.46
- Xe = 0 pcm
- Burnup = 10002 MWD/MTU = 226 EFPD
- Prior to the scenario, crew should pre-brief on conditions and expectations for the Shift (maintain power, repairs estimated to be complete well before LCO action time expires).

VC Summer 2013 NRC Scenario '5' Simulator Setup (SNAP 328)

- Conduct two-minute drill
- Mark up procedures in use with "Circle and slash" as applicable

Pre-Exercise:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.)
- TQP-801 Booth Operator checklist, has been completed
- Hang Red Tags for equipment out of service
- Complete Critical Data for GOP-3 Step 3.13 using the following data
 - RCS Pressure 2240
 - Bank D at 100 steps
 - Tavg 558.5
 - Time: Current time minus 1 hour
 - Stable power $10e^{-3}$
- Need Copies of procedure because not laminated in simulator (both GOP3 and SOP-201)
- Need to have booth operator put NI-45 in fast speed prior to turnover so crew can return it to slow speed (this is not part of the snap).
- May need GOP-3 ATTACHMENT I Sign-off Identification List
- GOP-4A must be signed off through step 3.6.

PRE-LOAD:**Standard Simulator Setup**

- PMP-LD003P XPP0138 LEAK DETECTION SUMP PMP LOSS OF POWER
- VLV-FW028W XVG01676-FW FW HDR RECIRC ISOL VLV LOSS OF POWER
- VLV-FW029W XVG01679-FW FW HTR RECIRC ISO VLV LOSS OF POWER
- VLV-CS052W XVT08141A-CS RCP A SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS054W XVT08141C-CS RCP C SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS053W XVT08141B-CS RCP B SEAL LEAKOFF VLV LOSS OF POWER

Scenario Related

- VLV-SS003P
XVA09312A-SS RMA2 CNMT ISO VLV FAIL POSITION
Delay=0, Ramp=0, Final=100
- VLV-SS004P
XVA09312B-SS RMA2 CNMT ISO VLV FAIL POSITION
Delay=0, Ramp=0, Final=100

EVENT 1: Perform Reactor Start-up IAW GOP-3 Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2)

- No triggers needed
- Need Copies of procedure because not laminated in simulator (both GOP3 and SOP-201)
- Need to have booth operator put NI-45 in fast speed prior to turnover so crew can return it to slow speed (this is not part of the snap).

EVENT 2: "A" MDEFW trip, Throttle flow with "B" MDEFW

- TRIGGER #2
 - PMP-EF001T
XPP021A MOTOR DRIVEN EFW PMP A TRIP ON COMMAND

EVENT 3: RCS Loop 3 T-HOT RTDs Fails LOW.

- TRIGGER 3
 - MAL-RCS008H
 - MAL-RCS008G
RCS RTD FAILURE (LOOP 3 – HOT LEG) 432B1, 432B2
Delay=0, Ramp=0, Final=530

EVENT 4: “B” CWP Bearing Failure (A and B CWP running) Temperatures increase until it is tripped by the crew or it auto trips

- TRIGGER 4
 - PMP-CW002B
XPP0006B CW PMP B BRG FAILURE
Initial = 2.25 Final = 3.25 Ramp = 05:00

EVENT 5: “A” Charging Pump sheared shaft.

- TRIGGER 5
 - PMP-CS004S
XPP0043A CHRG/SI PMP A SHEARED SHAFT
Delay=0, Ramp=0, Final=Active
- TRIGGER 15
 - LOA-CVC043
CHARGING PUMP C SUPPLY BRKR TRAIN A
POSITION TO: RACKED OUT
- TRIGGER 16
 - LOA-CVC041
CHARGING PUMP A SUPPLY BRKR
POSITION TO: RACKED IN

EVENT 6: 2 Dropped Rods – Trip reactor (D4) (K2)

- TRIGGER 6
 - MAL-CRF004D4
DROPPED ROD D4,
Delay=0, Ramp=0, Final=STATIONARY
 - MAL-CRF004K2
DROPPED ROD K2,
Delay=00:01:00, Ramp=0, Final=STATIONARY

EVENT 7: PZR Steam Space LOCA

- EVENT 7 TRIGGER
 - X06O013A == 1 or X06O013D == 1
Either RTB Green Light lit

- TRIGGER 7
 - MAL-PRS008
PRESSURIZER STEAM SPACE LEAK
Delay=0, Ramp=0, Final=500

EVENT 8: Containment penetration valves PVA-9312 A & B fail to close on Phase A.

Loaded as pre-event. These triggers cause them to close.

- EVENT 17
"X02I398C"==1
 - TRIGGER 17
 - VLV-SS003P
XVA09312A-SS RMA2 CNMT ISO VLV FAIL POSITION
Delay=0, Ramp=00:00:01, Final=0
- EVENT 18
"X02I399C"==1
 - TRIGGER 18
 - VLV-SS004P
XVA09312B-SS RMA2 CNMT ISO VLV FAIL POSITION
Delay=0, Ramp=00:00:01, Final=0

EVENT 9: The running Charging Pump will trip on the SI and will not restart automatically or manually.

EVENT 9 TRIGGER – Determines Pressure Approaching SI, the B CHG Pump is running and the C CHG Pump has not tripped.

- PT_457<1860
- X04O058R==1 (CHG PUMP B RED LAMP)
- JMLCVC17C!=1 (CHG PUMP C TRIP NOT TRIPPED)

- TRIGGER 9
- MAL-CVC017B
CHARGING PUMP B TRIP
Delay=0, Ramp=0, Final=Active

EVENT 10 TRIGGER – Determines Pressure Approaching SI, the C CHG Pump is running and the B CHG Pump has not tripped.

- PT_457<1860
- X04O056R==1 | X04O057R==1 (CHG PUMP C RED LAMP ON A) (CHG PUMP C RED LAMP ON B)
- JMLCVC17B!=1 CHG PUMP B NOT TRIPPED

- TRIGGER 10
- MAL-CVC017C
CHARGING PUMP C TRIP
Delay=0, Ramp=0, Final=Active

Op Test No.: NRC ILO 11-01 Scenario # 5 Event # 1 Page 10 of 42

Event Description: Perform Reactor Start-up IAW GOP-3 Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2).

Time	Position	Applicant's Actions or Behavior
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BOOTH OPERATOR: No trigger necessary

GOP-3

EVALUATOR NOTE:

The Unit is stable in Mode 3 at turnover with all surveillances completed for a Mode change to Mode 2. GOP-3 Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2).

GOP-3 is complete to step 3.14. The RO will bring the Reactor to the POAH and transition to GOP-4A Power Operation (Mode 1 – Ascending).

GOP-4A is complete through step 3.6.

GOP-3

GOP 3 REFERENCE PAGE1. GENERAL NOTES

- A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.
- B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

- A. Shutdown Bank Control:
 - 1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg} , or control rods unless one of the following conditions exists:
 - a) The RCS is borated to Cold Shutdown concentration and verified by sample.
 - b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.
 - 2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.
- B. Source Range Control:
 - 1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.
 - 2) While in the Source Range, positive reactivity may be changed by only one controlled method.
- C. Anticipate criticality anytime:
 - 1) During rod motion.
 - 2) Boron dilution is in progress.

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 1 Page 11 of 42

Event Description: Perform Reactor Start-up IAW GOP-3 Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2).

Time	Position	Applicant's Actions or Behavior	
<u>NOTE 3.14</u>			GOP-3
Ensure sufficient Emergency Feedwater Flow exists prior to raising power			
	RO	Increase Reactor Power to between 1% and 3%.	GOP-3
	BOP	Maintain Narrow Range Steam Generator level between 60% and 65% using Emergency Feedwater.	
	RO	At the Point of Adding Heat, if NR-45, NIS RECORDER, had previously been selected to HI speed place the recorder in LO speed.	GOP-3
<u>CAUTION 3.16</u>			GOP-3
a. Adjustment of Tav _g with the Rod Control System must not be attempted with the ROD CNTRL BANK SEL Switch in any position other than MAN.			
b. Manual rod control is required to establish equilibrium conditions, since C-5 blocks automatic rod withdrawal.			
	RO	Maintain Tav _g between 555°F and 559°F.	GOP-3
	N/A	Complete Attachment II.G, Operational Mode Change / Plant Startup - Entering Mode 1, of GTP-702.	GOP-3
	CRS	Proceed to GOP-4A, Power Operation (Mode 1 - Ascending).	GOP-3
EVALUATOR NOTE: GOP-4A POWER OPERATION (MODE 1 - ASCENDING) has several line-up verifications. GOP-4A is complete through step 3.6			

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 1 Page 12 of 42

Event Description: Perform Reactor Start-up IAW GOP-3 Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2).

Time	Position	Applicant's Actions or Behavior
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GOP- 4A REFERENCE PAGE

GOP-4A

GENERAL NOTES

- A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.
- B. Axial Flux Difference, ΔI , should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.
- C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.
- D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

- A. During operation with a positive Moderator Temperature Coefficient:
 - 1) Power and temperature changes should be slow and will require constant operator attention.
 - 2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.
 - 3) All power and load changes should be performed in small increments.
- B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.
- C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

- A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.
- B. To resume power ascension select the recommended Load Ramp Rate.
- C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

MSR CONTROL

- A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.
- B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

NOTE 3.1 through 3.11

GOP-4A

Steps 3.1 through 3.11 raise Reactor Power from 1% to 25%.

EVALUATOR NOTE: The next event may be initiated after GOP-4A is entered.

Op Test No.: **NRC ILO 11-01** Scenario # **5** Event # **2** Page **13** of **42**

Event Description: "A" MDEFW Trip

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: Event 2 should be initiated on entry into EOP-4A, Power Operation (Mode 1 - Ascending).			
Power should be between 2.5 - 3% when this event is triggered. If power is maintained too low direct the Booth Operator to require the CRS to raise power to 2.5 - 3%.			
BOOTH OPERATOR: If directed by the Evaluator – contact the CRS and direct power to be raised to between 2.5 and 3%.			
BOOTH OPERATOR: Initiate Event 2 (TRIGGER 2) when directed.			
Indications Available: XCP-622 1-3, MD EFP A TRIP			
	BOP	Enters ARP-001-XCP-622, 1-3	XCP-622 1-3
EVALUATOR NOTE: The CRS could direct the RO to reduce power to ensure MD EFW Pump "B" is sufficient and/or for the BOP to start the TD EFW Pump. The TD EFW Pump is not normally used for SG level control during heatup/cooldown.			
		CORRECTIVE ACTIONS:	XCP-622 1-3
	BOP	1. Start Motor Driven Emergency Feedwater Pump B if necessary to maintain Steam Generator levels.	XCP-622 1-3
	BOP	2. Reduce feedwater demand to less than 400 gpm.	XCP-622 1-3
	CRS	3. Refer to SOP-211.	XCP-622 1-3
		SUPPLEMENTAL ACTIONS:	XCP-622 1-3
	BOP	1. If Steam Generator levels cannot be maintained with one motor driven pump, start the Turbine Driven Emergency Feedwater Pump.	XCP-622 1-3
	BOP	2. Place PUMP A control switch in NORMAL-AFTER-STOP to clear the alarm.	XCP-622 1-3
	CRS	3. Determine the cause of the trip and correct as soon as possible.	XCP-622 1-3
	CRS	4. If the pump is inoperable, refer to Tech Spec 3.7.1.2.	XCP-622 1-3

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 2 Page 14 of 42

Event Description: "A" MDEFW Trip

Time	Position	Applicant's Actions or Behavior
	CREW	Dispatches an AO to investigate
BOOTH OPERATOR: Wait 2 minutes then report MD EFW Pump "A" breaker tripped and the overcurrent relay actuated.		
	CRS	Contacts Work Control and/or Maintenance for assistance.
	CRS	Enters TS 3.7.1.2, Action a:
	CRS	<ul style="list-style-type: none"> With one emergency feedwater pump inoperable, restore the required emergency feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
EVALUATOR NOTE: When SG levels are under control and the TS entry is complete, cue Event 3, RCS Loop C T_{HOT} RTD Fails Low.		

TECH SPEC

TECH SPEC

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 3 Page 15 of 42Event Description: RCS Loop C T_{HOT} RTDs Fails LOW (432B1, 432B2)

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR: Initiate Event 3 (TRIGGER 3) when directed.**Indications Available:**

XCP-615-1-2, RCS TAVG LO;
 XCP-615-1-3, 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.	XCP-615 1-2
		CORRECTIVE ACTIONS:	XCP-615 1-2
	RO	1. Monitor TI-412D, TI-422D and TI-432D to determine if a channel failed.	XCP-615 1-2
	RO	2. Place Rod Control in MAN and match Tavg to Tref.	XCP-615 1-2
		SUPPLEMENTAL ACTIONS:	XCP-615 1-2
	CRS	1. If a channel has failed, perform the following: a. Refer to AOP-401.2 to trip all bistables associated with that channel. b. Refer to Technical Specification Table 3.3-3 for minimum channel requirements.	XCP-615 1-2
	CRS	2. If the Rod Control System malfunctioned, refer to AOP-403.4, Failure of Control Rods to Move.	
	CRS	Refers to AOP-401.2, PROTECTION CHANNEL RCS LOOP RTD FAILURE.	AOP-401.2
	RO	Determine which RCS loop has a failed RTD by comparing loop ΔT and Tavg indicators.	AOP-401.2

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 3 Page 16 of 42Event Description: RCS Loop C T_{HOT} RTDs Fails LOW (432B1, 432B2)

Time	Position	Applicant's Actions or Behavior	
	RO	Reports Loop 3C That has failed.	
	RO	Ensure an operable loop is selected on ΔT TR-412 INPUT SEL Switch.	AOP-401.2
BOOTH OPERATOR: 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:	AOP-401.2
	CRS	a. Identify the associated bistables for the failed channel. REFER TO Attachment 1.	AOP-401.2
	CRS	b. 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. 	AOP-401.2
BOOTH OPERATOR: Acknowledge request for assistance.			
	CRS	c. Notify the I&C Department to place the identified bistables in trip.	AOP-401.2
	CRS	Contacts Work Control/I&C for assistance.	
	CRS	Determine and correct the cause of the channel failure.	AOP-401.2

Op Test No.: **NRC ILO 11-01** Scenario # **5** Event # **3** Page **17** of **42**Event Description: RCS Loop C T_{HOT} RTDs Fails LOW (432B1, 432B2)

Time

Position

Applicant's Actions or Behavior

Excerpt from 401.2, PROTECTION CHANNEL RCS LOOP RTD FAILURE

PROTECTION CHANNEL RCS LOOP RTD
INSTRUMENTATION CHANNELS

INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT	TECH SPECS	STPS
<u>LOOP C</u>	TB-432-B-1	C3-721-BS-1	CHAN III LP C OPΔT	TABLE 3.3-1 ITEMS 7, 8	302.003
ITE00432-B1	TB-432-B-2	C3-721-BS-2	CHAN III W/DRWL ROD BLCK	TABLE 3.3-3 ITEMS 4.d, 9.b	345.003
ITE00432-B2	TB-432-C-1	C3-721-BS-3	CHAN III LP C OTΔT		
ITE00432-B3	TB-432-C-2	C3-721-BS-4	CHAN III W/DRWL ROD BLCK		
ITE00432-D	TB-432-D-1	C3-722-BS-2	CHAN III RCS LP C TAVG LO		
	TB-432E	C3-722-BS-1	CHAN III LP C P-12		

Excerpt from Table 3.3-1

TECH SPEC

TABLE 3.3-1
REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
7. Overtemperature ΔT					
Three Loop Operation	3	2	2	1,2	6 [#]
Two Loop Operation	****	****	****	****	****
8. Overpower ΔT					
Three Loop Operation	3	2	2	1,2	6 [#]
Two Loop Operation	****	****	****	****	****

**** Values left blank pending NRC approval of 2 loop operation.

The provisions of Specification 3.0.4 are not applicable.

ACTION 6 - 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:

- The inoperable channel is placed in the tripped condition within 72 hours; and
- 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.

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 3 Page 18 of 42Event Description: RCS Loop C T_{HOT} RTDs Fails LOW (432B1, 432B2)

Time

Position

Applicant's Actions or Behavior

Excerpt from Table 3.3-3

TECH SPEC

TABLE 3.3-3 (Continued)
ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
4. STEAM LINE ISOLATION					
d. Steam Flow in Two Steam Lines--High	2/steam line	1/steam line any 2 steam	1/steam line	1, 2, 3 ^{***}	24*
COINCIDENT WITH T _{avg} --Low-Low	1 T _{avg} /loop	1 T _{avg} any 2 loops	1 T _{avg} any 2 loops	1, 2, 3 ^{***}	24*

* The provisions of Specification 3.0.4 are not applicable.

ACTION 24 - 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:

- The inoperable channel is placed in the tripped condition within 72 hours.
- 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 4.3.2.1.

CRS

Enters TS Table 3.3-1 (Functional Units 7 and 8), Action 6# and Table 3.3-3 4d

TECH SPEC

CRS

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:

TECH SPEC

CRS

- The inoperable channel is placed in the tripped condition within 72 hours; and

TECH SPEC

CRS

- 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.

TECH SPEC

EVALUATOR NOTE: The next event may be initiated after all actions are completed and the applicable Tech Spec have been identified.

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 4 Page 19 of 42

Event Description: "B" CWP Bearing Failure

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR: Initiate Event 4 (TRIGGER 4) when directed.**Indications Available:**

XCP-628-3-2, CWP OVRLD

	BOP	Responds to alarm XCP-628-3-2, CWP OVRLD	
	BOP	Enters ARP-001-XCP-628-3-2	XCP-628 3-2
		CORRECTIVE ACTIONS:	XCP-628 3-2
	BOP	<ol style="list-style-type: none"> 1. Determine which pump is overloaded by monitoring CIRC WTR PUMP AMPS and amber lights. 2. If only two Circulating Water Pumps are running, start an additional Circulating Water Pump per SOP-207 if available. 3. Determine if a single phasing event is in progress by diagnosis of any combination of the following symptoms: <ol style="list-style-type: none"> a. Vibration Alarms are received for other equipment. b. MCB Potential Lights are not lit. c. MCB Amber Overload lights are lit for running equipment or Motor Overload Alarms are received. d. MCB Undervoltage Alarms. e. Affected bus local 7.2 KV Bus ammeters. 	XCP-628 3-1

EVALUATOR NOTE: The following steps are to start the C CWP**BOOTH OPERATOR:**

- If the CWP trips report the Circulating Water Pump breaker tripped on overload – cause unknown.
- If called to be stationed at the CWP Breaker with safety gear;
 - WAIT 1 MIN.
 - Report you are standing by at the supply breaker.

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 4 Page 20 of 42

Event Description: "B" CWP Bearing Failure

Time	Position	Applicant's Actions or Behavior	
<p style="text-align: center;"><u>CAUTION 2.1</u></p> <p>a. An Operator with the required ISP-027 safety gear in place should be stationed at the supply breaker for the Circulating Water Pump to be started should local tripping of the breaker be required.</p> <p>b. Circulating Water Pump operation is limited to prevent exceeding the CW Pump House electrical duct bank design current rating when XSW1C2 is aligned to emergency feed as follows:</p> <ol style="list-style-type: none"> 1) Only two Circulating Water Pumps may be in operation for the first 48 hours. 2) Only Circulating Water Pump A or Circulating Water Pump C may be in operation following 48 hours. 			
	BOP	Start one of the following: (PEER ✓) c. XPP-0006C, CWP C.	SOP-207
	BOP	Verify the discharge isolation valve for the started Circulating Water Pump, MVB-802A(B)(C), A(B)(C) DISCH ISOL, is 30% open and the red indicator light is illuminated.	SOP-207
	BOP	Place MVB-802A(B)(C), A(B)(C) DISCH ISOL, for the started Circulating Water Pump to OPEN.	SOP-207
	BOP	When MVB-802A(B)(C), A(B)(C) DISCH ISOL, is full open, return MVB-802A(B)(C), A(B)(C) DISCH ISOL, to AUTO.	SOP-207
<p>BOOTH OPERATOR: Acknowledge request to check the Traveling Screen wash supply valves.</p>			
	BOP	Ensure the Traveling Screen wash supply valves are open for the Circulating Water Pump placed in service (CW-436): c. XVG00813E(F)-CW, TRAVELING SCREEN 5E(F) SUPPLY VALVE.	SOP-207

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 4 Page 21 of 42

Event Description: "B" CWP Bearing Failure

Time	Position	Applicant's Actions or Behavior
	BOP	If XPP-0006C, CWP C, is the pump restored to service, close breaker APN4016 01-03-05, XST0012 SCREEN WASH PP DISCH TRAINER, to re-enable screen wash strainer backwash.
	BOP	Align the Screen Wash System for normal operation per Section III.

SOP-207

SOP-207

EVALUATOR NOTE: The next event may be initiated after the C CWP has been started.

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 5 Page 22 of 42

Event Description: "A" Charging Pump sheared shaft.

Time

Position

Applicant's Actions or Behavior

EVALUATOR NOTE: Direct the Booth Operator to call the CRS.**BOOTH OPERATOR:** Call the CRS and direct that the BOP go to the HVAC panel to check the Control Room Emergency Ventilation lineup.**EVALUATOR NOTE: Hold the BOP at the HVAC panel until notified by the Lead Examiner that the BOP may be released.****BOOTH OPERATOR:** Initiate Event 5 (TRIGGER 5) when directed.Indications Available:
XCP-614, 5-1, CHG LINE FLO HI/LO**CORRECTIVE ACTIONS:**

XCP-614, 5-1

RO

1. If the running Charging Pump suction flowpath has become isolated, secure the Charging Pump and go to AOP-102.2, Loss of Charging.

XCP-614, 5-1

RO

2. If the PUMP A(B) or PUMP C TRAIN A(B) ammeter indication is abnormal for the running Charging Pump and the pump must be tripped, go to AOP-102.2, Loss of Charging. **(YES)**

XCP-614, 5-1

CRS

Directs entry to AOP-102.2, Loss of Charging.

RO

3. Monitor LT-112A and LT-115, % LEVEL, to verify proper VCT level.

XCP-614, 5-1

RO

4. Monitor FI-122A, CHG FLOW GPM.

XCP-614, 5-1

RO

5. Verify the Charging header valve lineup:

a. Verify the following valves are open:

- 1) FCV-122, CHG FLOW.
- 2) MVG-8107, CHG LINE ISOL.
- 3) MVG-8108, CHG LINE ISOL.
- 4) Either of the following:
 - a) PVT-8146, NORM CHG TO RCS LP B.
 - b) PVT-8147, ALT CHG TO RCS LP A.

b. If the Charging header has isolated go to AOP-102.2, Loss of Charging.

XCP-614, 5-1

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 5 Page 23 of 42

Event Description: "A" Charging Pump sheared shaft.

Time	Position	Applicant's Actions or Behavior
	RO	<p>6. If Charging flow has NOT been lost but a loss of automatic control of FCV-122, CHG FLOW, is suspected perform the following:</p> <ol style="list-style-type: none"> Place FCV-122, CHG FLOW, in MAN and adjust, as required, to maintain TI-140, REGEN HX OUT TEMP °F, between 250°F and 350°F while maintaining Pressurizer level. If FCV-122, CHG FLOW, fails to respond in MAN, perform SOP-102, Off Normal, Response To Malfunction Of FCV-122, to bypass FCV00122-CS, XCP-614, 5-1CHARGING HEADER FLOW CONTROL VALVE (AB-412 West Pen).
	CRS	Implement AOP-102.2, Loss of Charging.
<p style="text-align: center;"><u>CAUTION</u></p> <p>Seal water injection should be maintained any time the RCS is pressurized.</p>		
<p style="text-align: center;"><u>NOTE</u></p> <p>The Alternate Seal Injection System should deliver 20 gpm of borated water from the RWST to the RCS.</p>		
	RO	<p>1. Check if Charging Pump flow is normal:</p> <ul style="list-style-type: none"> FI-122A, CHG FLOW GPM, between 30 gpm and 115 gpm. Pump amps between 30 amps and 50 amps. PI-121, CHG PRESS PSIG, between 2650 psig and 2850 psig.

XCP-614, 5-1

AOP-102.2

AOP-102.2

AOP-102.2

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 5 Page 24 of 42

Event Description: "A" Charging Pump sheared shaft.

Time	Position	Applicant's Actions or Behavior
	RO	<p>ALTERNATIVE ACTION</p> <p>IF Charging Pump has tripped or flow is abnormal, THEN perform the following:</p> <ul style="list-style-type: none"> a) Ensure the Charging Pump is secured. b) Close all Letdown Isolation Valves: <ul style="list-style-type: none"> 1) PVT-8149A(B)(C), LTDN ORIFICE A(B)(C) ISOL. 2) PVT-8152, LTDN LINE ISOL. 3) LCV-459, LTDN LINE ISOL. 4) LCV-460, LTDN LINE ISOL. c) Close FCV-122, CHG FLOW. d) Verify CCW flow to the RCP Thermal Barriers is GREATER THAN 90 gpm on FI-7273A(B), THERM BARR FLOW GPM. e) Display Dedicated Display ZZRCPBRG on the IPCS to monitor RCP temperatures. f) Determine if Alternate Seal Injection is in service as indicated by both the following annunciators are lit: <ul style="list-style-type: none"> 1) XCP-614 2-1 (ALT SL INJ PUMP RUN). 2) XCP-614 2-2 (ALT SL INJ DSL GEN RUN).
BOOTH OPERATOR: Acknowledge requests for support		
BOOTH OPERATOR: If directed to check the A charging pump while it is running – report the motor is running with no pump discharge pressure.		
	CRS	<ul style="list-style-type: none"> g) Contact Electrical and Mechanical Maintenance to investigate. h) GO TO Step 3.
	RO	<p>3. Verify Charging System valve lineup:</p> <ul style="list-style-type: none"> a. IF Charging Pump suction is aligned to the VCT, THEN ensure both LCV-115C(E), VCT OUTLET ISOL, are open.

AOP-102.2

AOP-102.2

AOP-102.2

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 5 Page 25 of 42

Event Description: "A" Charging Pump sheared shaft.

Time	Position	Applicant's Actions or Behavior	
	RO	<p>b. Ensure the following valves are open:</p> <ol style="list-style-type: none"> 1) MVG-8106, CHG PP. 2) MVT-8109A(B)(C), CHG PP A(B)(C). 3) MVG-8130A(B), LP A SUCT TO CHG PP C. 4) MVG-8131A(B), LP B SUCT TO CHG PP C. 5) MVG-8132A(B), CHG PP C TO LP A DISCH. 6) MVG-8133A(B), CHG PP C TO LP B DISCH. 	AOP-102.2
BOOTH OPERATOR: When dispatched to check pressures, report that all gauges read ~ 57 psig.			
BOOTH OPERATOR: The following triggers will allow operation of the C Charging Pump on the A Header. Trigger 15 – Racks Up Charging Pump C on the A Header. Trigger 16 – Racks Down Charging Pump A.			
	RO	<p>c. Check the Charging header valve lineup as follows:</p> <ol style="list-style-type: none"> 1) Ensure MVG-8107, CHG LINE ISOL, is open. 2) Ensure MVG-8108, CHG LINE ISOL, is open. 3) Ensure FCV-122, CHG FLOW, is in MAN and CLOSE. 4) Ensure one of the following valves is open: <ul style="list-style-type: none"> • PVT-8146, NORM CHG TO RCS LP B. OR • PVT-8147, ALT CHG TO RCS LP A. 5) Verify VCT level is GREATER THAN 20%. 6) Locally verify Charging Pump suction pressure is between 50 psig and 100 psig as indicated on the following (AB-388): <ul style="list-style-type: none"> • PI-151A, SUCTION PRESS, for Charging Pump A. • PI-152A, SUCTION PRESS, for Charging Pump B. • PI-153A, SUCTION PRESS, for Charging Pump C. 	AOP-102.2
BOOTH OPERATOR: NOTE: The CRS may assume authority for making the decision to start a Charging Pump. If the CRS calls the Shift Supervisor for permission to start the pump as stated in the procedure, grant permission.			
	RO	<p>4. With Shift Supervisor's permission, start a Charging Pump, while monitoring RCP temperatures. Refer To SOP-102, Chemical And Volume Control System.</p>	AOP-102.2

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 5 Page 26 of 42

Event Description: "A" Charging Pump sheared shaft.

Time

Position

Applicant's Actions or Behavior

EVALUATOR NOTE: The Operator will ensure the following as per SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM:

- Breaker Racked Up
- Aux Oil Pump Running
- CCW Operating
- Chill water is Operating
- Suction Pressure > 15 psig (Local)
- Miniflow isol open

RO

5. When a Charging Pump is operating THEN perform the following. Refer To SOP-102, Chemical And Volume Control System.

AOP-102.2

- Place Charging and Normal Letdown in service.
- Secure Alternate Seal Injection.

CRS

6. RETURN TO the Procedure and Step in effect.

AOP-102.2

EVALUATOR NOTE: The next event may be initiated after the a Charging Pump has been started.

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 6 Page 27 of 42

Event Description: 2 Dropped Rods (D4 – K2 Staggered by 1 minute) – Trip Reactor

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: Initiate Event 6 (TRIGGER 6) when directed.			
EVALUATOR NOTE: 1 dropped rod – annunciators and rod drive to manual.			
Indication Available: XCP-621 3-1 ONE ROD ON BOTTOM			
		CORRECTIVE ACTIONS:	XCP-621 3-1
	RO	If a shutdown or control group rod has dropped and the Reactor did not trip, implement AOP-403.6, Dropped Control Rod.	XCP-621 3-1
EVALUATOR NOTE: The second rod drops 1 minute after the first so only the Immediate Operator Actions are detailed.			
IOA	RO	Verify only one Control Rod has dropped.	AOP-403.6
IOA	RO	Place ROD CNTRL BANK SEL Switch in MAN.	AOP-403.6
EVALUATOR NOTE: The following steps occur after the 2nd rod drops.			
Indications Available: XCP-621, 3-2 RODS ON BOTTOM			
		CORRECTIVE ACTIONS:	XCP-621 3-2
	RO	1. If two or more rods have dropped, manually trip the Reactor and implement EOP-1.0, Reactor Trip/Safety Injection Actuation.	XCP-621 3-2
	CRS	Directs a manual Reactor trip and EOP-1.0 entry.	
EVALUATOR NOTE: The next event is automatically inserted on the Reactor Trip.			

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 7, 8 & 9 Page 28 of 42

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time

Position

Applicant's Actions or Behavior

BOOTH OPERATOR: Event 7 (TRIGGER 7) is automatically triggered on the Reactor Trip.

REFERENCE PAGE FOR EOP-1.0

EOP-1.0

1 RCP TRIP CRITERIA

- a. IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs.
- b. 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 1418 psig.

2 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.

3 MONITOR SPENT FUEL COOLING

Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery:

- Spent Fuel Pool level.
- Spent Fuel Pool temperature.

EVALUATOR NOTE: Failures 8 and 9 are preloaded.
The B or C Charging pump started in the previous event will trip and the Backup pump will not auto-start.

Indications Available: Multiple annunciates including:

XCP 616, 2-2 PZR PRESS LO
 XCP 616, 2-3 PZR PRESS HI/LO
 First Out - XCP-626 5-3 PZR PRESS LO
 First Out - XCP-626 5-3 PZR SI

AUTOMATIC ACTIONS:

1. Reactor Trip.
2. Turbine Trip.
3. Generator Trip (after 30 second delay).

XCP-626 5-1
XCP-626 5-3

CRS

CORRECTIVE ACTIONS:

1. Trip the Reactor and go to EOP-1.0, Reactor Trip/Safety Injection Actuation.

XCP-626 5-1
XCP-626 5-3

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 7, 8 & 9 Page 29 of 42

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
	CRS	Direct EOP-1.0 entry	
IOA	Crew	1 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. 	EOP-1.0
IOA	BOP	2 Verify Turbine/Generator Trip: <ul style="list-style-type: none"> a. Verify all Turbine STM STOP VLVs are closed. 	EOP-1.0
IOA	BOP	b. Ensure Generator Trip (after 30 second delay): <ul style="list-style-type: none"> 1) Ensure the GEN BKR is open. 2) Ensure the GEN FIELD BKR is open. 3) Ensure the EXC FIELD CNTRL is tripped. 	EOP-1.0
IOA	BOP	3 Verify both ESF buses are energized.	EOP-1.0
IOA	BOP	4 Check if SI is actuated: <ul style="list-style-type: none"> a. Check if either: <ul style="list-style-type: none"> • SI ACT status light is bright on XCP-6107 1-1. OR • Any red first-out SI annunciator is lit on XCP-626 top row. b. Actuate SI using either SI ACTUATION Switch. c. GO TO Step 6. 	EOP-1.0
EVALUATOR NOTE: Attachment 3 is included as page 38.			
	BOP	6 Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.	EOP-1.0
	BOP	7 Announce plant conditions over the page system.	EOP-1.0
*	BOP	8 Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen.	EOP-1.0

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 7, 8 & 9 Page 30 of 42

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
*	BOP	<p>9 Check RCS temperature:</p> <ul style="list-style-type: none"> With any RCP running, RCS Tavg is stable at OR trending to 557°F. <p>OR</p> <ul style="list-style-type: none"> With no RCP running, RCS Tcold is stable at OR trending to 557°F. 	EOP-1.0
	RO	<p>10 Check PZR PORVs and Spray Valves:</p> <ol style="list-style-type: none"> PZR PORVs are closed. PZR Spray Valves are closed. Verify power is available to at least one PZR PORV Block Valve: <ul style="list-style-type: none"> MVG-8000A, RELIEF 445 A ISOL. MVG-8000B, RELIEF 444 B ISOL. MVG-8000C, RELIEF 445 B ISOL. Verify at least one PZR PORV Block Valve is open. 	EOP-1.0
<p style="text-align: center;"><u>NOTE - Step 11</u></p> <p>Seal Injection flow should be maintained to all RCPs.</p>			
	RO	<p>11 Check if RCPs should be stopped:</p> <ol style="list-style-type: none"> Check if either of the following criteria is met: <ul style="list-style-type: none"> Annunciator XCP-612 4-2 is lit (PHASE B ISOL). <p>OR</p> <ul style="list-style-type: none"> RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. Stop all RCPs. 	EOP-1.0

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 7, 8 & 9 Page 31 of 42

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
	BOP	12 Verify no SG is FAULTED: <ul style="list-style-type: none"> No SG pressure is decreasing in an uncontrolled manner. No SG is completely depressurized. 	EOP-1.0
	BOP	13 Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED: <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. 	EOP-1.0
	BOP	14 Check if the RCS is INTACT: <p>a. RB radiation levels are normal on:</p> <ul style="list-style-type: none"> RM-G7, CNTMT HI RNG GAMMA. RM-G18, CNTMT HI RNG GAMMA. <p>b. RB Sump levels are normal.</p> <p>c. RB pressure is LESS THAN 1.5 psig.</p> <p>d. The following annunciators are NOT lit:</p> <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). 	EOP-1.0
	CRS	15 GO TO EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.	EOP-1.0

Op Test No.: NRC ILO 11-01 Scenario # 5 Event # 7, 8 & 9 Page 32 of 42

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time

Position

Applicant's Actions or Behavior

1 SI REINITIATION CRITERIA

IF either of the following conditions occurs, THEN start Charging Pumps and operate valves as necessary:

- RCS subcooling on TI-499A(B), A(B) TEMP°F, is LESS THAN 52.5°F [67.5°F].
- PZR level can NOT be maintained GREATER THAN 10% [28%].

2 RCP TRIP CRITERIA

IF either of the following criteria is met, THEN trip all RCPs:

- Annunciator XCP-612 4-2 is lit (PHASE B ISOL).
- RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.

3 SECONDARY INTEGRITY TRANSITION CRITERIA

IF any unisolated SG pressure is decreasing in an uncontrolled manner OR is completely depressurized, THEN GO TO EOP-3.0, FAULTED STEAM GENERATOR ISOLATION, Step 1.

4 TUBE RUPTURE TRANSITION CRITERIA

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.

5 COLD LEG RECIRCULATION TRANSITION CRITERION

IF RWST level decreases to LESS THAN 18%, THEN GO TO EOP-2.2, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

6 LOSS OF EMERGENCY COOLANT RECIRCULATION TRANSITION CRITERION

IF Emergency Coolant Recirculation is established and subsequently lost, THEN GO TO EOP-2.4, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

7 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.

EOP-2.0

Op Test No.: **NRC ILO 11-01** Scenario # **5** Event # **7, 8 & 9** Page **33** of **42**

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
<p style="text-align: center;"><u>NOTE</u></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. 			EOP-2.0
	BOP	Check if RCPs should be stopped: a. Check if either of the following criteria is met: <ul style="list-style-type: none"> Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR <ul style="list-style-type: none"> RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. 	EOP-2.0
EVALUATOR NOTE: The RCPs should not be stopped until SI flow is established.			
	BOP	b. Stop all RCPs.	EOP-2.0
	BOP	Verify no SG is FAULTED: <ul style="list-style-type: none"> No SG pressure is decreasing in an uncontrolled manner. No SG is completely depressurized. 	EOP-2.0
*	BOP	Check INTACT SG levels: <ul style="list-style-type: none"> Verify Narrow Range level in INTACT SGs is GREATER THAN 26% [41%]. Control EFW flow to maintain Narrow Range level in each INTACT SG between 40% and 60%. 	EOP-2.0
	BOP	Reset both SI RESET TRAIN A(B) Switches.	EOP-2.0
	BOP	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. 	EOP-2.0

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Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
	BOP	<p>Check if Secondary radiation levels are normal:</p> <p>a. Check radiation levels normal on:</p> <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. <p>b. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO.</p> <p>c. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.</p>	EOP-2.0
*	BOP	<p>Check PZR PORVs and Block Valves:</p> <p>a. Verify power is available to the PZR PORV Block Valves:</p> <ol style="list-style-type: none"> 1) MVG-8000A, RELIEF 445 A ISOL. 2) MVG-8000B, RELIEF 444 B ISOL. 3) MVG-8000C, RELIEF 445 B ISOL. 	EOP-2.0
<p align="center"><u>CAUTION - Step 7.b</u></p> <p>If any PZR PORV opens because of high PZR pressure, Step 7.b should be repeated after pressure decreases to LESS THAN 2330 psig, to ensure the PORV recloses.</p>			EOP-2.0
	BOP	b. Verify all PZR PORVs are closed.	EOP-2.0
	BOP	c. Verify at least one PZR PORV Block Valve is open.	EOP-2.0
	BOP	<p>Place both ESF LOADING SEQ A(B) RESETS to:</p> <ol style="list-style-type: none"> a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS. 	EOP-2.0

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Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
	BOP	Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Open PVA-2659, INST AIR TO RB AIR SERV. c. Open PVT-2660, AIR SPLY TO RB.	EOP-2.0
*	BOP	Check if SI flow should be reduced: a. RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 52.5°F [67.5°F]. b. Secondary Heat Sink is adequate: <ul style="list-style-type: none"> Total EFW flow to INTACT SGs is GREATER THAN 450 gpm. OR Narrow Range level is GREATER THAN 26% [41%] in at least one INTACT SG. c. RCS pressure is stable OR increasing.	EOP-2.0
	BOP	ALTERNATIVE ACTION GO TO Step 11	EOP-2.0
*	BOP	Check if RB Spray should be stopped: a. Check if any RB Spray Pumps are running. b. Verify RB pressure is LESS THAN 11 psig. c. Depress both RESET TRAIN A(B) RB SPRAY.	EOP-2.0
<u>NOTE - Step 11.d</u> <ul style="list-style-type: none"> RB Spray must run for a minimum of four hours. Anytime RB Spray Pumps are stopped, MVG-3003A(B), A(B), should be closed for containment isolation. 			EOP-2.0
	CRS	d. Consult with TSC personnel concerning RB Spray System operation.	EOP-2.0

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 7, 8 & 9 Page 36 of 42

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
CAUTION - Step 12			EOP-2.0
RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to LESS THAN 325 psig, the RHR Pumps must be manually restarted to supply water to the RCS.			
	BOP	Check if RHR Pumps should be stopped: <ol style="list-style-type: none"> Check RCS pressure: <ol style="list-style-type: none"> RCS pressure is GREATER THAN 325 psig. RCS pressure is stable OR increasing. Check if any RHR Pump is running with suction aligned to the RWST. Stop any RHR Pump which is running with suction aligned to the RWST and place in Standby. 	EOP-2.0
	BOP	Check if RCS pressure is stable OR decreasing.	EOP-2.0
	BOP	Check if pressure in all SGs is stable OR increasing.	EOP-2.0
	BOP	Check if DGs should be stopped: <ol style="list-style-type: none"> Verify both ESF buses are energized by offsite power. Stop any unloaded DG. REFER TO SOP-306, EMERGENCY DIESEL GENERATOR. 	EOP-2.0
	BOP	Verify equipment is available for Cold Leg Recirculation: <ol style="list-style-type: none"> Verify power is available for at least one RHR Pump: <ol style="list-style-type: none"> PUMP A. PUMP B. Open both MVB-9503A(B), CC TO RHR HX A(B). 	EOP-2.0
CAUTION - Step 16.c <ul style="list-style-type: none"> 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. 			EOP-2.0

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Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
	BOP	c. Shift the CCW Train to fast speed in the Active Loop. REFER TO SOP-118, COMPONENT COOLING WATER. d. Consult with TSC personnel to determine if equipment required for Cold Leg Recirculation is available.	EOP-2.0
	BOP	Check the AB for evidence of ECCS leakage: a. Verify AB radiation levels are normal on: <ul style="list-style-type: none"> • RM-A3, MAIN PLANT VENT EXH ATMOS MONITOR: PARTICULATE, IODINE, GAS. • RM-A13, PLANT VENT HI RANGE. • RM-A11, AB VENT GAS ATMOS MONITOR. • Local area monitors. b. Verify annunciator XCP-631 6-1 is NOT lit (AB SMP LVL HI). c. Verify annunciators XCP-606 3-4 and XCP-607 3-4 are NOT lit (LD TRBL AB SMP/FLDRN LVL HI).	EOP-2.0
	BOP	Obtain necessary Chemistry samples: a. Ensure all RCS sample valves are in AUTO: <ul style="list-style-type: none"> • SVX-9364B and SVX-9365B, RCS LP B SMPL ISOL. • SVX-9364C and SVX-9365C, RCS LP C SMPL ISOL. b. Notify Chemistry to sample the following: <ul style="list-style-type: none"> • RCS. • All SGs for isotopic activity. 	EOP-2.0
	BOP	Shut down and stabilize the Secondary Plant. REFER TO AOP-214.1, TURBINE TRIP.	EOP-2.0
	CRS	Check if RCS cooldown and depressurization is required: a. RCS pressure is GREATER THAN 325 psig. b. GO TO EOP-2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION, Step 1.	EOP-2.0

EVALUATOR NOTE:

The scenario may be terminated after the crew transitions to EOP-2.1

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Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time

Position

Applicant's Actions or Behavior

EVALATORS NOTE: This attachment is to verify equipment status after Safety Injection has been initiated and is run concurrently with the main body of EOP-1.0.

	BOP	<p>Ensure EFW Pumps are running:</p> <ul style="list-style-type: none"> a. Ensure both MD EFW Pumps are running. b. Verify the TD EFW Pump is running if necessary to maintain SG levels. 	EOP-1.0 Attachment 3
	BOP	<p>Ensure the following EFW valves are open:</p> <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. 	EOP-1.0 Attachment 3
	BOP	<p>Verify total EFW flow is GREATER THAN 450 gpm.</p>	EOP-1.0 Attachment 3
	BOP	<p>Ensure FW Isolation:</p> <ul style="list-style-type: none"> a. Ensure the following are closed: <ul style="list-style-type: none"> • FW Flow Control, FCV-478(488)(498). • 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). b. Ensure all Main FW Pumps are tripped. 	EOP-1.0 Attachment 3

EVALUATOR NOTE: The failure of the Back-up Charging Pump to Auto-Start may have been addressed earlier.

It is a Critical Task to start a Charging Pump prior to NR RVLIS <34% or CETs > 725°F.

BOOTH OPERATOR:

The following triggers will allow operation of the C Charging Pump on the A Header.

Trigger 15 – Racks Up Charging Pump C on the A Header.

Trigger 16 – Racks Down Charging Pump A.

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Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
CRITICAL TASK	BOP	Ensure SI Pumps are running: <ul style="list-style-type: none"> Two Charging Pumps are running. Both RHR Pumps are running. 	EOP-1.0 Attachment 3
	BOP	Ensure two RBCU Fans are running in slow speed (one per train).	EOP-1.0 Attachment 3
	BOP	Verify Service Water to the RBCUs: <ol style="list-style-type: none"> Ensure two Service Water Pumps are running. Verify 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. 	EOP-1.0 Attachment 3
	BOP	Verify two CCW Pumps are running.	EOP-1.0 Attachment 3
	BOP	Ensure two Chilled Water Pumps and Chillers are running.	EOP-1.0 Attachment 3
	BOP	Verify both trains of Control Room Ventilation are running in Emergency Mode.	EOP-1.0 Attachment 3

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Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Check if Main Steamlines should be isolated:</p> <p>a. Check if any of the following conditions are met:</p> <ul style="list-style-type: none"> • RB pressure GREATER THAN 6.35 psig. <p>OR</p> <ul style="list-style-type: none"> • Steamline pressure LESS THAN 675 psig. <p>OR</p> <ul style="list-style-type: none"> • Steamline flow GREATER THAN 1.6 MPPH AND Tav_g LESS THAN 552°F. <p>b. Ensure all the following are closed:</p> <ul style="list-style-type: none"> • MS Isolation Valves, PVM-2801A(B)(C). • MS Isolation Bypass Valves, PVM-2869A(B)(C).
	BOP	<p>Ensure Excess Letdown Isolation Valves are closed:</p> <ul style="list-style-type: none"> • PVT-8153, XS LTDN ISOL. • PVT-8154, XS LTDN ISOL.
<p>EVALUATOR NOTE: The Safety Injection Phase A Isol panel will indicate the 9312A and B are open.</p> <p>It is a Critical Task for an operator to close at least 1 of the valves prior to completing Attachment 3.</p>		
CRITICAL TASK	BOP	<p>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.</p>

EOP-1.0
Attachment 3EOP-1.0
Attachment 3EOP-1.0
Attachment 3

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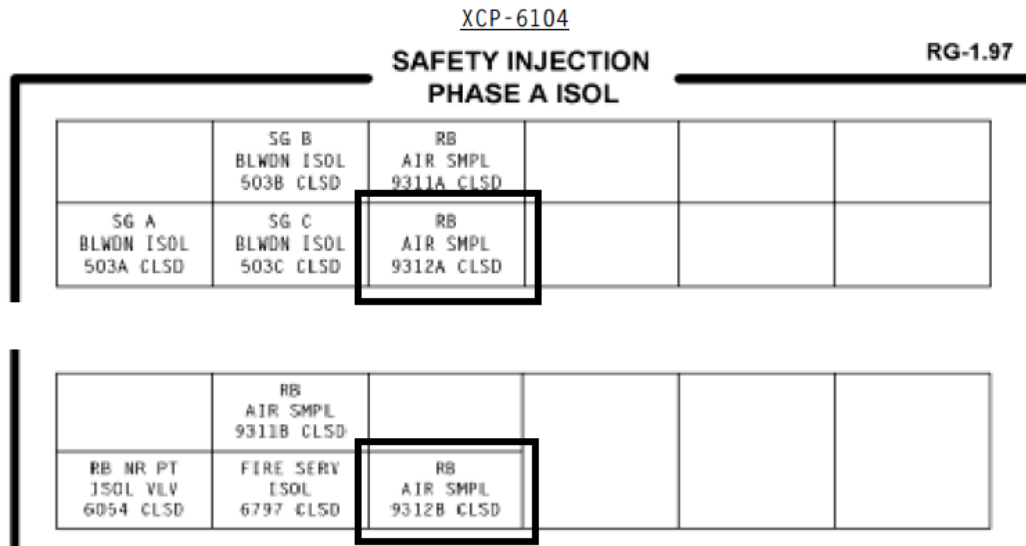
Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time

Position

Applicant's Actions or Behavior

Excerpt from Attachment 4 showing relative positions of the affected windows.

EOP-1.0
Attachment 4

- NOTES:
1. Lights should be BRIGHT.
 2. Only the windows indicated are Phase A Isolation Valves.

BOP

Verify proper SI alignment:

a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104.

EOP-1.0
Attachment 3

BOP

Verify proper SI alignment:

ALTERNATIVE ACTION

a. Ensure proper SI valve alignment:

EOP-1.0
Attachment 3

- 1) Open MVG-8801A(B), HI HEAD TO COLD LEG INJ.
- 2) Close MVG-8107 and MVG-8108, CHG LINE ISOL.
- 3) Open LCV-115B(D), RWST TO CHG PP SUCT.
- 4) Close LCV-115C(E), VCT OUTLET ISOL.
- 5) Open MVG-8809A(B), RWST TO RHR PP A(B).
- 6) Open MVG-8888A(B), RHR LP A(B) TO COLD LEGS.

BOP

b. Verify all SAFETY INJECTION monitor lights are dim on XCP-6106.

EOP-1.0
Attachment 3

Op Test No.: **NRC ILO 11-01** Scenario # 5 Event # 7, 8 & 9 Page 42 of 42

Event Description: PZR Steam Space LOCA, Running Charging Pump Trips on SI, PVA-9312 A & B fails to close on Phase A

Time	Position	Applicant's Actions or Behavior	
	BOP	c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM	EOP-1.0 Attachment 3
	BOP	d. Check if RCS pressure is LESS THAN 325 psig.	EOP-1.0 Attachment 3
	BOP	e. 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. 	EOP-1.0 Attachment 3
	BOP	Reports completion of EOP-1.0 Attachment 3 to the CRS	
EVALUATOR NOTE: END OF EOP-1.0 ATTACHMENT 3			