

Facility:	VC SUMMER	Scenario #:	#1
Scenario Source:	New	Op. Test #:	ILO 22-01 NRC-2023
Examiners:	Applicants/ Operators:		
_____	_____		
_____	_____		
_____	_____		
Initial Conditions:	- Reactor power is 100%. "B" train work week. - XFN-0065B RBCU is OOS.		
Turnover:	Perform stroke test of PZR Block valves.		
Critical Tasks:	- Start at least one RHR pump in injection mode prior to RVLIS Narrow Range Level decreasing to less than 34%. - Realign any running ECCS pump to the RHR Sump prior to RWST level lowering below 10%.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP, US	STP-127.001, PZR PORV Block valve stroke test.
2#	MAL-FWM006B	C-BOP, US R-RO	FW Booster pump "B" trip requiring power reduction. (2019 NRC Scenario #2)
3	MAL-CCW007A PMP-CC003F	C/MC-RO, US TS-US	"A" CCW pump trip, "C" CCW pump fails to Auto start.
4	VLV-RC004L VLV-RC011W OVR-PR035B	C-RO, US TS-US	Pressurizer Power Operated Relief valve develops seat leakage.
5	MAL-MSS001E	I/MC-BOP, US TS-US	Controlling Steam Generator Pressure Channel (PT-485) fails low on "B" Steam Generator, Feed flow lowers.

Form 3.3-1 Scenario Outline

6	MAL- RCS005A	M-ALL	Large Break LOCA with failures.
	PMP-SW006F		XPP-45B, Service Water Booster Pump “B” fails to start. The pump cannot be started.
	PMP-RH001F PMP-RH002F		Both RHR pumps will fail to autostart.
	VLV-SI010F VLV-SI011F VLV-SI012F VLV-SI013F		Reactor Building sump suction isolation valves to RHR fail to auto open at 18% RWST level.
TERMINATE: The scenario may be terminated when the crew has aligned RHR Pumps for Cold Leg Recirculation in EOP-2.2 or at the discretion of the Lead Examiner.			
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Used on previous two NRC Exams.

The following notation is used in the Form 3.3-2 "Time" column:

IOA designates Immediate Operator Action steps.

***** designates Continuous Action steps.

Form 3.3-1 Scenario Outline

TURNOVER:

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

Train "B" RBCU, XFN-0065B is tagged out for breaker maintenance and is to be returned to service next shift.

The Unit is at 100% power MOL.

The crew will be instructed to perform STP-127.001, Pressurizer Block Valve Operability Test as soon as they take the shift.

Phoenix display monitor is out of service. The Shift Engineer is tracking all necessary actions in Work Control.

Current RCS Boron concentration by chemistry is 1032 ppm.

Pre-loaded Items

- OVR-AH022A
CS-AH280 RBCU FAN 65B FAST SPEED GREEN L
FINAL: OFF
- OVR-AH023A
CS-AH279 RBCU FAN 65B SLOW SPEED GREEN L
FINAL: OFF

EVENT 1: STP-127.001, Pressurizer Block Valve Operability Test

The crew will perform STP-127.001, Pressurizer Block Valve Operability Test as soon as they take the shift. They will perform the test and record the appropriate data for all three Pressurizer Block valves. Once this is complete, the next event may be inserted.

EVENT 2: FW Booster pump "B" trip requiring power reduction

- **TRIGGER 2**
 - o MAL-FWM006B
FW BOOSTER PUMP B TRIP

On cue from the examiner, the "B" Feedwater Booster Pump will trip and the BOP will refer to XCP-625, 1-2 FWBP A/B/C/D TRIP which will require the crew to reduce Reactor power to 95% per GOP-4C, RAPID POWER REDUCTION. Once the crew has stabilized the plant after the power reduction, the next event may be inserted.

EVENT 3: “A” CCW pump trips, “C” fails to autostart

- **TRIGGER 3**
 - o VLV- MAL-CCW007A
CCW PUMP 1 TRIP
 - o PMP-CC003F
XPP0001CAL CCW PMP C TRAIN A FAIL TO START
- **TRIGGER 16**
 - o LOA-CCW042
CELL SWITCH OF CCW PUMP A
FINAL: RACK OUT

On cue from the Examiner, the “A” CCW pump will trip. The “C” CCW pump will fail to automatically start. The OATC will manually start the “C” CCW pump. The US will use ARP-601 1-3, CCP A/C TRIP FAIL for corrective actions. Once the “C” CCW pump has been started and Tech Specs reviewed, can move on to the next event.

The US will review Tech Specs and enter into 3.7.3. With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

EVENT 4: Pressurizer Power Operated Relief valve develops seat leakage

- **TRIGGER 4**
 - o VLV-RC004L
PCV00445A-RC PZR PWR REL VLV LEAKAGE
FINAL: 1.5%
RAMP: 30 sec
- **TRIGGER 15**
 - o VLV-RC011W
XVG08000A-RC PZR REL ISO VLV LOSS OF POWER

On cue from the Chief Examiner, Pressurizer Power Operated Relief valve PCV-445A will commence leaking past its seat. The PCV-445A position indication will show red light off and green light on. Charging flow will begin increasing. PRT Pressure and Level will begin increasing and the Pressurizer relief line temperature will begin increasing. The RO will take action as directed by the US in accordance with annunciators XCP-616, 4-2 PZR RLF LINE TEMP HI, XCP-616, 4-4 PRT LVL LO/ TEMP/LVL/ PRESS HI and XCP-616, 3-6 PZR PCS LO BU HTRS ON. The US may refer to SOP-101, Reactor Coolant System. The RO will close MVG-8000B, RELIEF 445A ISOL to isolate the leakage.

The US will apply Tech Spec 3.4.4, Reactor Coolant System – Relief Valves action b, which requires with one PORV inoperable and not capable of being manually cycled, within 1 hour: 1) restore the PORV(s) to OPERABLE status or to a condition where it may be manually cycled or 2) close its associated block valve and remove power from the block valve.

EVENT 5: PT-485, Control SG pressure transmitter fails low.

- **TRIGGER 5**
 - o MAL-MSS001E
STEAM GENERATOR PRESSURE TRANSMITTER 485 FAILURE
FINAL: 0 psig
RAMP: 5 sec

On cue from the Examiner, the controlling Steam Generator Pressure channel on Steam Generator "B" will fail low. Controlling Steam Flow channel will lower and the Steam Generator Water level control system will respond by lowering feed water flow and Steam Generator level. The BOP responds to annunciator XCP- 624, 4-1 SG A STMLN Δ P HI and XCP- 624, 6-1 SG C STMLN Δ P HI and determines the cause of the event is an instrument failure. The BOP takes corrective action by swapping the controlling channels in accordance with immediate actions of AOP-401.3, Steam Flow - Feedwater Flow Protection Channel Failure. The US will implement AOP-401.3.

The US applies Tech Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 14; Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level - Action 6. The inoperable channel must be placed in the tripped condition within 72 hours.

The US also applies Tech Spec 3.3.2 Engineered Safety Feature Actuation System Instrumentation Table 3.3-3, Function 1.e; Differential Pressure between Steam Lines - High - Action 24. This Tech Spec also requires the inoperable channel must be placed in the tripped condition within 72 hours.

Once the crew has stabilized SG level and Tech Specs have been addressed, the next event may be inserted.

EVENT 6: Large Break LOCA with failures.

- **PRELOAD**
 - o PMP-SW006F
XPP0045B SW BOOSTER PMP B FAIL TO START
 - o MAL-AUX005B
SERVICE WATER BOOSTER PUMP (XPP-45B) TRIP
 - o PMP-RH001F
XPP0031A RHR PMP A FAIL TO START
 - o PMP-RH002F
XPP0031B RHR PMP B FAIL TO START
 - o VLV-SI010F
XVG08811A-SI RECIRC SUMP TO RHR PMP A FAIL AS IS
 - o VLV-SI011F
XVG08811B-SI RECIRC SUMP TO RHR PMP B FAIL AS IS
 - o VLV-SI012F
XVG08812A-SI RECIRC SUMP TO RHR PMP A FAIL AS IS
 - o VLV-SI013F
XVG08812B-SI RECIRC SUMP TO RHR PMP B FAIL AS IS
- **TRIGGER 6**
 - o MAL-RCS005A
DBA LOCA LOOP 1 (COLD LEG)
- **AUTO-TRIGGER 17** x03i060o (MVG-8811A SWITCH TO OPEN)
 - o VLV-SI010F (NEW)
XVG08811A-SI RECIRC SUMP TO RHR PMP A FAIL AS IS
DELETE IN: 1 sec
- **AUTO-TRIGGER 18** x03i061o (MVG-8811B SWITCH TO OPEN)
 - o VLV-SI011F (NEW)
XVG08811B-SI RECIRC SUMP TO RHR PMP B FAIL AS IS
DELETE IN: 1 sec
- **AUTO-TRIGGER 19** x03i360o (MVG-8812A SWITCH TO OPEN)
 - o VLV-SI012F (NEW)
XVG08812A-SI RECIRC SUMP TO RHR PMP A FAIL AS IS
DELETE IN: 1 sec

Form 3.3-1 Scenario Outline

- **AUTO-TRIGGER 20** x03i361o (MVG-8812B SWITCH TO OPEN)
 - o VLV-SI013F (NEW)
XVG08812B-SI RECIRC SUMP TO RHR PMP B FAIL AS IS
DELETE IN: 1 sec

On cue from the Examiner, a Large Break LOCA will be initiated. The reactor will trip and operators will take immediate actions of EOP-1.0. Both RHR pumps will fail to auto start. "B" Service Water Booster pump will fail to auto start. The crew will then transition to EOP-2.0. Once RWST level reaches 18%, the automatic swap of RHR pump suction to the Recirc sump will not occur. The crew will transition to EOP-2.2, ES-1.3 Transfer to Cold Leg Recirc. When the operator attempts to manually open the RHR sump suctions, the valves will open.

CRITICAL TASKS:

- Start at least one RHR pump in injection mode prior to RVLIS Narrow Range Level decreasing to less than 34%.
- Realign any running ECCS pump to the RHR Sump prior to RWST level lowering below 10%.

TERMINATION:

The scenario may be terminated when the crew has aligned Charging Pumps for Cold Leg Recirculation in EOP-2.2 or at the discretion of the Lead Examiner.

Form 3.3-1 Scenario Outline

2023 NRC #1

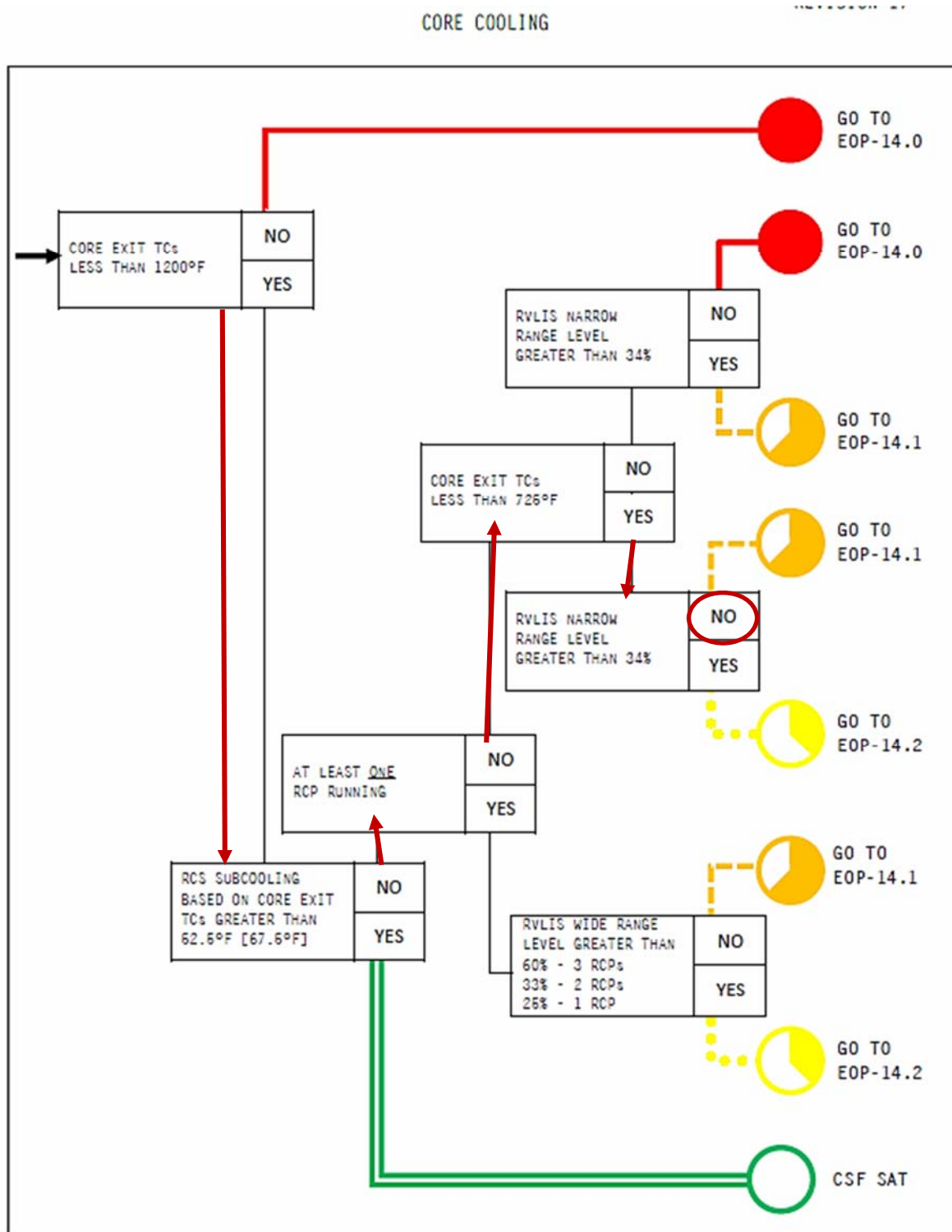
Scenario Attributes		Events
Events after EOP entry (1-2)	2	• Sump Recirc Auto Swap Fail • Both RHR Pumps Fail to auto start
Abnormal Events (2-4)	4	• FW Booster pump "B" trip (2019 NRC #2) • "A" CCW pump trip, "C" CCW pump fails to Auto start. TS • Pressurizer PORV develops seat leakage. TS • Controlling Steam Generator Pressure Channel (PT-485) fails low on "B" Steam Generator.
Major Transients (1-2)	1	• Large Break LOCA
EOPs Entered (1-2)	2	• EOP-2.0, E-1 LOSS OF REACTOR OR SECONDARY COOLANT • EOP-2.2, ES-1.3 TRANSFER TO COLD LEG RECIRCULATION
EOP Contingencies (0-2)	0	• N/A
Preidentified CTs (≥ 2)	2	• Start at least one RHR pump in injection mode prior to RVLIS Narrow Range Level decreasing to less than 34%. • Realign any running ECCS pump to the RHR Sump prior to RWST level lowering below 10%.

Explanation of Critical Task Basis is below:

Critical Task 1: Start at least one RHR pump in injection mode prior to RVLIS Narrow Range Level decreasing to less than 34%.

The major event is a Large Break LOCA. This will cause the RCS to rapidly depressurize and lose water volume. Without the low head, high flow RHR pumps, reactor vessel level will continue to lower. If the RHR pumps are not started, reactor vessel level will lower to <34%, resulting in an orange path on the critical safety function status trees, which will require entry into EOP-14.1, FR-C.2, RESPONSE TO DEGRADED CORE COOLING. This meets the critical task methodology of NUREG 1021 because starting the RHR pumps is a task with one or more actions that would prevent a challenge to plant safety such as preventing the following: conditions that result in orange or red path critical safety functions (Westinghouse and AP1000). See CSFST flow path below.

Form 3.3-1 Scenario Outline



Form 3.3-1 Scenario Outline

Critical Task 2: Realign any running ECCS pump to the RHR Sump prior to RWST level lowering below 10%.

10% is when the RWST empty alarm comes in and this is the value that VC Summer deems the RWST is empty. When RWST reaches this level and ESF pumps are still taking suction from the RWST, the ESF pumps are required to be secured so they don't lose suction. Approximately 30-45 minutes after the Large Break LOCA goes in, RWST level will reach 18% and suction sources to the RHR pumps automatically swap over to taking a suction from the sump for cold leg recirculation. There is a failure that prevents this swapover from happening. Operators will be required to open the RHR Suction isolation valves from the RB Sump to maintain long term core cooling. Without doing this, operators will be required to secure the RB Spray pumps, RHR pumps and SI pumps when RWST level reaches 10%. This meets the critical task methodology of NUREG 1021 because opening of the RHR pump suction valves from the RB Sump are EOP-directed actions that are essential to an event's overall mitigative strategy. Below is a picture from EOP-2.2 that shows if we cannot align one train of RHR to the sumps, a transition to EOP-2.4, ECA-1.1 LOSS OF EMERGENCY COOLANT RECIRCULATION is required.

6 Verify at least one train of RHR ☐
has been aligned to the RHR Sumps.

6 IF at least one flow path from the ☐
RHR Sump to the RCS can NOT be
established OR maintained, THEN GO
TO EOP-2.4, ECA-1.1, LOSS OF
EMERGENCY COOLANT RECIRCULATION,
Step 1.

Form 3.3-1 Scenario Outline

SIMULATOR SCENARIO SETUP

INITIAL CONDITIONS:

- IC Set 256
- 100% Power, MOL
- Burnup = 10,000 MWD/MTU
- Current Core Cycle = 28
- RCS Boron Concentration = 1032 ppm
- FCV-113 Pot Setting = 4.47
- Rod Position: Group D = 226 steps
- Tavg = 587.4°F

PRE-EXERCISE:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.).
- Complete VCS-TQP-0807 Attachment I-A, Unit 1 Booth Instructor Checklist.
- Verify plant aligned for "B1" work week IAW PTP-101.004, Safety Related Train Swap Checklist.
- Verify red Placard on "A" CCW Pump and "B" Charging Pump.
- Verify the Hard Card for Turbine operation is in its proper storage location and cleaned.
- Verify the Hard Card for borating via MVT-8104 is in its proper storage location and cleaned.
- Ensure no NI's are removed from service, on SIPCS type in "add/omit" to verify.
- Verify Rod Bank Update set correctly: 226 steps on all Banks.
- Place HOLD Tag on RBCU 65B NORM and SLOW Speed Switches.
- Ensure Phoenix computer screen is turned off.
- Ensure you have the following pre-marked up procedures:
 - STP-127.001, PRESSURIZER BLOCK VALVE OPERABILITY TEST.
- Ensure you have a turnover sheet for each position.
- Conduct two-minute drill.

COMMUNICATIONS NOTE:

The following are the Unit Numbers for Building Operators for communication from the Control Room:

- Unit 4 – Control Building Operator
- Unit 5 – Turbine Building Operator
- Unit 6 Upper – Auxiliary Building Upper Operator
- Unit 6 Lower – Auxiliary Building Lower Operator
- Unit 7 – Intermediate Building Operator

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 1	Event # 1	Page: 12 of 52
Event Description: STP-127.001 PRESSURIZER BLOCK VALVE OPERABILITY TEST			
Time/ Position	Applicant's Actions or Behavior		

EVALUATOR NOTE:	Crew will pre-brief and perform PZR Block Valve Test in accordance with STP-127.001.		
BOOTH OPERATOR:	NO TRIGGER		
US	NOTE 5.0 through 8.0 An asterisk (*) preceding a step indicates that data or a signoff is required on the attachment identified within the step. 5.0 INITIAL CONDITIONS 5.1 All Pressurizer Power Operated Relief Valves are CLOSED.		STP-127.001
	<u>6.0 PROCEDURE</u> 6.1 Record all calibration data on Attachment I as required.		STP-127.001
RO	*6.2 Perform an AS FOUND equipment lineup per Attachment II.		STP-127.001
	<u>NOTE 6.3, 6.4, 6.5</u> To prevent preconditioning, the Block Valves open and closed exercises may be performed out of sequence.		STP-127.001
RO	6.3 Stroke test XVG08000A-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, as follows: a. Verify PCV-445A, PWR RELIEF, is closed. (PEER ✓) b. Close MVG-8000A, RELIEF 445A ISOL, and measure the stroke time to the nearest 0.1 second, from switch actuation until the closed light is lit and the open light goes out. *c. Record the stroke time for XVG08000A-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, on Attachment I. d. Open MVG-8000A, RELIEF 445A ISOL, and measure the stroke time to the nearest 0.1 second, from switch actuation until the open light is lit and the closed light goes out. *e. Record the stroke time for XVG08000A-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, on Attachment I.		STP-127.001
	<u>NOTE 6.3, 6.4, 6.5</u> To prevent preconditioning, the Block Valves open and closed exercises may be performed out of sequence.		STP-127.001

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 1	Event # 1	Page: 13 of 52
Event Description: STP-127.001 PRESSURIZER BLOCK VALVE OPERABILITY TEST			
Time/ Position	Applicant's Actions or Behavior		

RO	6.4 Stroke test XVG08000B-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, as follows: a. Verify PCV-444B, PWR RELIEF, is closed. (PEER ✓) b. Close MVG-8000B, RELIEF 444B ISOL, and measure the stroke time to the nearest 0.1 second, from switch actuation until the closed light is lit and the open light goes out. *c. Record the stroke time for XVG08000B-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, on Attachment I. d. Open MVG-8000B, RELIEF 444B ISOL, and measure the stroke time to the nearest 0.1 second, from switch actuation until the open light is lit and the closed light goes out. *e. Record the stroke time for XVG08000B-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, on Attachment I.	STP-127.001
	<u>NOTE 6.3, 6.4, 6.5</u> To prevent preconditioning, the Block Valves open and closed exercises may be performed out of sequence.	STP-127.001
RO	6.5 Stroke test XVG08000C-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, as follows: a. Verify PCV-445B, PWR RELIEF, is closed. (PEER ✓) b. Close MVG-8000C, RELIEF 445B ISOL, and measure the stroke time to the nearest 0.1 second, from switch actuation until the closed light is lit and the open light goes out. *c. Record the stroke time for XVG08000C-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, on Attachment I. d. Open MVG-8000C, RELIEF 445B ISOL, and measure the stroke time to the nearest 0.1 second, from switch actuation until the open light is lit and the closed light goes out. *e. Record the stroke time for XVG08000C-RC, PRZ PWR OPER RELIEF INLET ISOL VLV, on Attachment I.	STP-127.001
EVALUATOR NOTE:	The next event may be inserted at the discretion of the Lead Evaluator.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 2 Page: 14 of 52
 Event Description: FW Booster pump "B" trips requiring power reduction

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner, the "B" Feedwater Booster pump will trip. This failure results in 3 Main Feedwater Pumps and 3 Feedwater Booster pumps in service at 100% power. The crew will refer to XCP-625 1-2 FWBP A/B/C/D TRIP, which will require a reduction of Reactor Power to 95%. The US will implement GOP-4C, Rapid Power Reduction to direct actions needed to accomplish the power reduction. The RO and BOP will perform actions necessary to reduce power from 100% to 95%.
BOOTH OPERATOR:	When directed – initiate Event 2 (TRIGGER 2).
Symptoms/ Cues:	XCP-625 1-2, FWBP A/B/C/D TRIP
US/BOP	Enters XCP-625 1-2, FWBP A/B/C/D TRIP
US	<u>NOTE</u> This alarm has reflash capabilities.
BOP	CORRECTIVE ACTIONS: 1. If the number of Feedwater Booster Pumps in operation is less than the number of Feedwater Pumps in operation, immediately trip the Reactor and enter EOP-1.0, REACTOR TRIP SAFETY INJECTION ACTUATION. (3 FW PUMPS AND 3 BOOSTER PUMPS ARE IN SERVICE NO TRIP REQUIRED) (NO) 2. If three Feedwater Booster Pumps and three Feedwater Pumps are in operation, reduce Reactor power to 95% per GOP-4C, RAPID POWER REDUCTION. 3. If available, start a standby Feedwater Booster Pump per SOP-210, FEEDWATER SYSTEM. (NO STANDBY BOOSTER PUMP AVAILABLE) (NO) 4. If only two Feedwater Booster Pumps are in operation, reduce Reactor power to less than 48% per GOP-4C, RAPID POWER REDUCTION. (3 BOOSTER PUMPS ARE IN SERVICE) (NO) 5. Ensure Deaerator wide range level is maintained greater than 4' as indicated on LI-3135, DEAER STOR TK WR LVL FEET..
BOOTH OPERATOR:	If requested to check status of the "B" Feedwater Booster Pump and breaker, wait 1 minute and report no obvious problem with pump and that the breaker is tripped.

XCP 625, 1-2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 2 Page: 15 of 52
 Event Description: FW Booster pump "B" trips requiring power reduction

Time/ Position	Applicant's Actions or Behavior
US	Directs a plant down power to 95% in accordance with GOP-4C, RAPID POWER REDUCTION.
<u>GOP-4C REFERENCE PAGE</u> <u>GENERAL NOTES</u> 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 Manager or Unit Supervisor. F B. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed. A C. 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. D. Once a Rapid Power Reduction has begun, every effort should be made to prevent the Turbine from reaching "AT SET LOAD" unless it is desired to stabilize the plant. <u>REACTOR CONTROL</u> A. During operation with a positive Moderator Temperature Coefficient, power and temperature changes will require constant operator attention. B. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated. 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): E 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. <u>REACTOR TRIP CRITERIA DURING RAPID LOAD REDUCTION</u> A. If any of the following conditions occur, trip the Reactor and implement EOP-1.0: 1) RCS T_{avg} is less than 551°F for greater than 15 minutes. 2) T_{avg}/T_{ref} mismatch exceeds 10°F. 3) Pressurizer pressure approaches 1870 psig. 4) Power reduction at 5% per minute is not sufficient to mitigate the event.	
	NOTE 3.0 If time allows, load reductions should be discussed with the Load Dispatcher.

GOP-4C

GOP-4C

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 1	Event # 2	Page: 16 of 52	
Event Description: FW Booster pump "B" trips requiring power reduction					
Time/ Position	Applicant's Actions or Behavior				
	<u>CAUTION 3.1 through 3.12</u> a. Thermal Power changes of greater than 15% in any one- our period requires completion of GTP-702 Attachment III.H. b. The following IPCS points, should be monitored periodically to determine if a thermal power change of greater than 15% in any one hour period has been exceeded: U0485-MAX-1HR – Max power in the past hour U0485-MIN-1HR – Min power in the past hour U0485-DIFF-1HR – Difference between Max and Min U1169-1M-MAX-1HR – Max power in the past hour U1169-1M-MIN-1HR – Min power in the past hour U1169-1M-DIFF-1HR – Difference between Max and Min				GOP-4C
BOOTH OPERATOR:	If contacted as Shift Engineer regarding GTP-702 Attachment, report back "I will complete GTP-702 Attachment III.H".				
RO	3.1 Commence rapid Plant Shutdown as follows: a. Energize all Pressurizer Heaters.				GOP-4C
	NOTE 3.1.b Setting FCV-113 A&B, BA FLOW SET PT to 8.3 will yield 33 gpm Boration flow rate.				GOP-4C
CREW	b. Maintain the following with rod motion or boron concentration changes: 1) Tavg within 10°F and trending to Tref. 2) ΔI within limits. 3) Control Rods above the rod insertion limit.				GOP-4C
BOP	c. Using the EHC HMI, Control/Load screen, reduce load per SOP-214, Main Turbine And Controls, Section III.D, Turbine Load Reduction/Shutdown, at a rate of 5% per minute or less.				GOP-4C
EVALUATOR NOTE	The BOP will now obtain the hard card of SOP-214, Section III.D to reduce load. The steps to reduce load are as follows below.				
BOP	2.1. Ensure the Control/Load screen is selected.				SOP-214

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 2 Page: 17 of 52
 Event Description: FW Booster pump "B" trips requiring power reduction

Time/ Position	Applicant's Actions or Behavior	
	<u>NOTE 2.2</u> The turbine will come off the limiter and turbine load will lower once Load Set Reference is less than Load Limit Reference. Acknowledging dialog boxes is "skill of the Craft".	SOP-214
BOP	2.2 To lower Turbine Load using Load Set, perform the following: - To lower Turbine Load using Load Set, perform the following: - Select (or enter) the desired Rate %/min on Load Set. - Select Load on Load Set (a dialog box will open). - Enter the desired load. (PEER✓) - Confirm desired load. (PEER✓) - Verify proper system response. - If during a load reduction, it is desired to stop the load reduction, perform the following: - Select Hold on Load Set. - Select the desired Rate %/min to resume load reduction. - If desired, place LOAD LIMIT in service per Section III.	SOP-214
EVAULATOR NOTE	The RO will setup to borate the RCS using SOP-106, Section III.F. The steps for borating are as follows below.	
	<u>NOTE 2.0</u> - Energizing additional Pressurizer Heaters will enhance mixing. - LCV-115A, LTDN DIVERT TO HU-TK, will begin to modulate to the HU-TK position at 70% level on LI-115, VCT LEVEL %.	SOP-106
RO	2.0 INSTRUCTIONS 2.1 Ensure at least one Reactor Coolant Pump is running.	SOP-106
RO	2.2 Place RX COOL SYS MU switch to STOP.	SOP-106
RO	2.3 Place RX COOL SYS MU MODE SELECT switch to BOR. (Peer ✓)	SOP-106
RO	2.4 Adjust FCV-113 A&B, BA FLOW SET PT, for desired flow rate. (Peer ✓)	SOP-106

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 2 Page: 18 of 52
Event Description: FW Booster pump "B" trips requiring power reduction

Time/ Position	Applicant's Actions or Behavior	
RO	2.5 Set FIS-113, BA TO BLNDR FLOW, batch integrator to the desired volume. (Peer ✓)	SOP-106
RO	2.6 Place RX COOL SYS MU switch to START.	SOP-106
RO	NOTE 2.7 Step 2.7 may be omitted when borating less than 10 gallons. 2.7 Place FCV-113 A&B, BA FLOW, controller in AUTO.	SOP-106
RO	NOTE 2.8 The AUTO setpoint dial for FCV-113A&B, BA FLOW, controller may be adjusted slowly to obtain the desired flow rate. 2.8 Verify the desired Boric Acid flow rate on FR-113, BA TO BLNDR GPM (F-113).	SOP-106
RO	2.9 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.	SOP-106
RO	2.10 Place RX COOL SYS MU switch to STOP.	SOP-106

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 2 Page: 19 of 52
Event Description: FW Booster pump "B" trips requiring power reduction

Time/ Position	Applicant's Actions or Behavior	
RO	NOTE 2.11 a. If plant conditions require repeated borations, Step 2.11 may be omitted. b. The volume in the piping between the blender and the VCT outlet is approximately 3.8 gallons. 2.11 Alternate Dilute 4 to 6 gallons of Reactor Makeup Water to flush the line down stream of the blender by performing the following: 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. (Peer ✓) 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.	SOP-106
RO	2.12 Place RX COOL SYS MU MODE SELECT switch to AUTO. (Peer ✓)	SOP-106
RO	2.13 Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm). (Peer ✓)	SOP-106
RO	2.14 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.	SOP-106
RO	2.15 Adjust FCV-113 A & B, BA FLOW, SET PT per one of the following: a. OAP-100.6, Attachment IA, Reactivity Control Parameters. b. Desired position to ensure proper boric acid addition based on current RCS conditions.	SOP-106
RO	2.16 Place RX COOL SYS MU switch to START. (Peer ✓)	SOP-106

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 2 Page: 20 of 52
Event Description: FW Booster pump "B" trips requiring power reduction

Time/ Position	Applicant's Actions or Behavior

RO	2.17 Perform the following: 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:	The next event will be initiated at the discretion of the Lead Examiner.

SOP-106

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 1	Event # 3	Page: 21 of 52
Event Description: "A" CCW Pump Trip, "C" CCW Pump fails to auto start				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	On cue from the Examiner, the "A" CCW Pump will trip and the "C" CCW Pump will fail to auto start. The crew will refer to XCP-601, 1-3, CCP A/C TRIP FAIL and start the "C" CCW Pump per the Corrective Actions.			
BOOTH OPERATOR:	When directed – initiate Event 3 (TRIGGER 3).			
Symptoms/ Cues:	• XCP-601 1-2, CCP A/C AUTOSTART FAIL • XCP-601 1-3, CCP A/C TRIP FAIL			
RO	Corrective Actions: 1. Ensure the standby pump starts.			XCP-601 1-3
US	Enters T.S. 3.7.3. With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.			T.S. 3.7.3
EVALUATOR NOTE	SOP-118, COMPONENT COOLING WATER, Precaution 5 states, "Any Component Cooling Water Pump which is inoperable must have its breaker racked down to maintain two loop operability."			
BOOTH OPERATOR:	When called to investigate the cause of the "A" CCW Pump Trip, wait 5 minutes and report back that there is nothing obviously wrong with the pump and you will continue to investigate.			
BOOTH OPERATOR	If asked to rack down the "A" CCW PP Breaker, wait 2 minutes and insert TRIGGER 16.			
EVALUATOR NOTE	The crew may respond IAW AOP-118.1, LOSS OF COMPONENT COOLING WATER. The steps for AOP-118.1 are found on Page 46 of 52.			
EVALUATOR NOTE	The crew should refer to XCP-603 1-3/2-2/3-2, RCP A/B/C THERM BAR FLOW HI and realign Component Cooling Booster Pump alignment per SOP-118, Section III.D. The alarms are in because of two CCBPs running.			
RO	<u>INITIAL CONDITIONS</u> 1.1 Component Cooling System is in operation.			SOP-118

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 3 Page: 22 of 52
Event Description: "A" CCW Pump Trip, "C" CCW Pump fails to auto start

Time/ Position	Applicant's Actions or Behavior
RO	2.1 Shift operating Component Cooling Booster Pumps: a. Place the desired Component Cooling Booster Pump, XPP-58A(B)(C), in START. b. Stop one of the running Component Cooling Booster Pumps. 1) Place XPP-58A(B)(C), in OFF. 2) Place XPP-58A(B)(C), in AUTO. c. Ensure MVT-9593A(B)(C), FROM RCP A(B)(C) THERM BARR is not closed due to high flow.
EVALUATOR NOTE:	Step 2.1 is Not Applicable for the given situation.
RO	2.2 Re-alignment of Component Cooling Booster Pumps following automatic start of a Component Cooling Booster Pump. a. Stop one of the running Component Cooling Booster Pumps. 1) Place XPP-58A(B)(C), in OFF. 2) Place XPP-58A(B)(C), in AUTO. b. Ensure MVT-9593A(B)(C), FROM RCP A(B)(C) THERM BARR is not closed due to high flow.
EVALUATOR NOTE:	The next event will be initiated at the discretion of the Lead Examiner.

SOP-118

SOP-118

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 4 Page: 23 of 52
 Event Description: Pressurizer PORV develops seat leakage.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	The Pressurizer Power Operated Relief valve PCV-445A will commence leaking past its seat. Position indication for PCV-445A will show both red and green lights on. Charging flow will begin increasing. PRT Pressure and Level will begin increasing and the Pressurizer relief line temperature will begin increasing.
BOOTH OPERATOR:	When directed – initiate Event 4 (TRIGGER 4)
Symptoms/ Cues:	Indications Available: XCP-616 4-2, PZR RLF LINE TEMP HI. XCP-616 4-4, PRT LVL LO/ TEMP/LVL/ PRESS HI. XCP-616 3-6, PZR PCS LO BU HTRS ON. PCV-445A, PWR RELIEF, Red and Green position indication BOTH lit. Increasing indication on the following instruments: • TI-471, PRT TEMP F. • PI-472, PRT PRESS PSIG. • FI-122C, CHARGING FLOW GPM. • TI-463, PZR RELIEF TEMP F. Decreasing indication on the following instruments: • PI-444, PZR PRESS PSIG. • PI-445, PZR PRESS PSIG. • PI-455, PZR PRESS PSIG. • PI-456, PZR PRESS PSIG. • PI-457, PZR PRESS PSIG.
US/RO	Enters ARP-001- XCP 616, 4-2 PZR RLF LINE TEMP HI.

XCP 616, 4-2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 1	Event # 4	Page: 24 of 52
Event Description: Pressurizer PORV develops seat leakage.				
Time/ Position		Applicant's Actions or Behavior		
RO	CORRECTIVE ACTIONS: 1. Determine if a PORV has lifted or is leaking by monitoring the Pressurizer pressure on PI-444(445), CNTL CHAN PRESS PSIG. 2. Monitor the following computer points for individual PORV tailpipes: a. T10753 (PCV-444B). b. T10754 (PCV-445A). c. T10755 (PCV-445B).			
RO	3. Refer to SOP-101, Section V.A, PRESSURE PORV TAILPIPE HIGH TEMPERATURE.			
EVALUATOR NOTE:	If at any time Pressurizer pressure becomes less than 2206 psig TS 3.2.5 will be entered for DNB.			
US	TS 3.2.5, DNB PARAMETERS Action: With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.			
EVALUATOR NOTE:	The following are correct ways to respond to this event: • The US may direct closure of PCV-445A and MVG-8000A per OP-AA-100 guidance based on panel indications that show the PORV PCV-445A with Red and Green lights lit. If PCV-445A is attempted to be closed, it will not close and continue to provide dual indication. • Perform actions of SOP-101, Reactor Coolant System Section V.A, PRESSURIZER PORV TAILPIPE HIGH TEMPERATURE. This will also result in MVG-8000A being closed.			
RO	2.1 Observe the following computer points for any indication of valve seat leakage: a. Pressurizer PORV Tailpipe Temperature (T1074). b. PZR PORV PCV444B DISCH TEMP (T10753). c. PZR PORV PCV445A DISCH TEMP (T10754). d. PZR PORV PCV445B DISCH TEMP (T10755). e. "C" Pressurizer Safety Tailpipe Temperature (T1075). f. "B" Pressurizer Safety Tailpipe Temperature (T1076). g. "A" Pressurizer Safety Tailpipe Temperature (T1077).			

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 1 Event # 4		Page: 25 of 52
Event Description: Pressurizer PORV develops seat leakage.				
Time/ Position		Applicant's Actions or Behavior		
RO	2.2	If the alarm is due to an increasing Pressurizer Safety Valve Tailpipe Temperature, go to the appropriate Annunciator Response Procedure. (NO)		SOP-101
RO	2.3	If the cause of the high Pressurizer PORV Tailpipe Temperature cannot be determined using IPCS indication, perform the following to determine which PORV is leaking: a. Close MVG-8000A, RELIEF 445A ISOL. b. Close MVG-8000C, RELIEF 445B ISOL. c. Observe Pressurizer PORV Tailpipe Temperatures.		SOP-101
		NOTE 2.3.d If a PORV is leaking, the PORV Tailpipe Temperature should first decrease as the loop seal passes through and then begin to increase to the alarm set point.		SOP-101
RO		d. If Pressurizer PORV Tailpipe Temperatures decrease, then open MVG-8000C, RELIEF 445B ISOL otherwise proceed to Step 2.3.e. 2) If PORV Tailpipe Temperatures do not increase, then MVG-8000A, RELIEF 445A ISOL is the leaking PORV. Perform the following: a) Ensure that MVG-8000A, RELIEF 445A ISOL, remains closed. b) Proceed to step 2.4.		SOP-101
BOOTH OPERATOR:		If called, acknowledge request to evaluate PCV-445A, PZR PORV as Plant Support Engineering.		
US/RO	2.4	After determination and isolation of leaking the Pressurizer PORV, have Plant Support Engineering evaluate the leaking PORV.		SOP-101
BOOTH OPERATOR:		If called to remove power from MVG-8000A, acknowledge request. Wait 2 minutes and then insert TRIGGER 15 to remove power from MVG-8000A. TRIGGER 15 opens breaker 1DB2Y 03IM.		

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 4 Page: 26 of 52
Event Description: Pressurizer PORV develops seat leakage.

Time/ Position	Applicant's Actions or Behavior
US	Enters T.S. 3.4.4, REACTOR COOLANT SYSTEM – RELIEF VALVES. Action b: With one PORV inoperable and not capable of being manually cycled, within 1 hour: 1) restore the PORV(s) to OPERABLE status or to a condition where it may be manually cycled or 2) close its associated block valve and remove power from the block valve; otherwise, be in at least HOT STANDBY within the next 6hours and in HOTSHUTDOWN within the following 6 hours.
EVALUATOR NOTE:	The next event will be initiated at the discretion of the Lead Examiner.

TS 3.4.4

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 5 Page: 27 of 52
Event Description: PT-485, controlling SG pressure transmitter, fails low.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner the controlling Steam Generator Pressure channel on Steam Generator "B" will fail low. Controlling Steam Flow channel will lower and the Steam Generator Water level control system will respond by lowering feed water flow and Steam Generator level. The BOP responds to annunciator XCP- 624, 4-1 SG A STMLN Δ P HI and XCP- 624, 6-1 SG C STMLN Δ P HI and determines the cause of the event is an instrument failure. The BOP takes corrective action by swapping the controlling channels in accordance with immediate actions of AOP-401.3, Steam Flow - Feedwater Flow Protection Channel Failure.
BOOTH OPERATOR:	When directed – initiate Event 5 (TRIGGER 5)
Symptoms/Cues:	• XCP-624 4-1, SG A STMLN ΔP HI • XCP- 624, 6-1 SG C STMLN ΔP HI • XCP-624 6-4, SG B FWF>STF MISMATCH • "B" SG NR Level lowering.
US	Enters AOP-401.3, STEAM FLOW – FEEDWATER FLOW PROTECTION CHANNEL FAILURE.

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 5 Page: 28 of 52
 Event Description: PT-485, controlling SG pressure transmitter, fails low.

Time/ Position	Applicant's Actions or Behavior
	REFERENCE PAGE FOR Rev 5 AOP-401.3 1 <u>LOSS OF MAIN FEEDWATER FLOW</u> <u>IF</u> Feedwater flow is lost while Reactor Power is GREATER THAN 10%, and cannot be quickly restored from the MCB, <u>THEN</u> Trip the reactor and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1. 2 <u>STEAM GENERATOR LEVEL CONTROL</u> a. <u>IF</u> Narrow Range Steam Generator Level decreases to LESS THAN 40% in <u>any</u> SG, <u>THEN</u> Trip the reactor and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1. b. <u>IF</u> Reactor Power is GREATER THAN 15% and Narrow Range Steam Generator Level exceeds 75% in <u>any</u> SG, <u>THEN</u> Trip the reactor and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1.
	<u>NOTE</u> Throughout this procedure, "AFFECTED" refers to any SG experiencing level control problems.
BOP (IOA)	1. Verify the failed channel is the controlling channel.
	<u>NOTE – Step 2</u> FW and STEAM CONTROL CHANNEL SEL Switches for a SG should be selected to the same direction (<u>both</u> to the left or <u>both</u> to the right).

AOP-401.3

AOP-401.3

AOP-401.3

AOP-401.3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 1	Event # 5	Page: 29 of 52
Event Description: PT-485, controlling SG pressure transmitter, fails low.				
Time/ Position	Applicant's Actions or Behavior			
BOP (IOA)	2. Select the operable flow channel: - Place FW CONTROL CHANNEL SEL Switch to the operable channel. - Place STEAM CONTROL CHANNEL SEL Switch to the operable channel.			AOP-401.3
	<u>NOTE – Step 3</u> CTRL+ALT+S on <u>either</u> EHC HMI is equivalent to 50 MWe, and is the preferred method to accomplish a rapid load reduction.			AOP-401.3
BOP (IOA)	3. Verify Turbine Load is LESS THAN 950 MWe.			AOP-401.3
EVALUATOR NOTE:	Turbine Load will be < 950 MWe due to the previous load reduction.			
BOP	4. Verify only <u>one</u> SG is AFFECTED.			AOP-401.3
BOP	5. Adjust the Feedwater Flow Control Valve as necessary to restore feed flow to the AFFECTED SG.			AOP-401.3
BOP	6. Check if Feedwater Pump speed control is controlling properly: - Feedwater Header pressure is GREATER THAN Main Steam Header pressure. - Feed flow is normal for steam flow and power level. <u>All</u> operating Feedwater Pump speeds and flows are balanced.			AOP-401.3
BOP	7. Verify Narrow Range levels in <u>all</u> SGs are between 60% and 65%.			AOP-401.3
BOP	8. Restore the AFFECTED SG control systems to normal: - Place the Feedwater Flow Control Valve in AUTO. - Place the Feedwater Pump Speed Control System in AUTO. REFER TO SOP-210, FEEDWATER SYSTEM.			AOP-401.3
	<u>NOTE – Step 9</u> Steam flow transmitters FT-474, FT-484, FT-494, FT-475, FT-485, and FT-495 are density compensated by steam pressure transmitters PT-475, PT-485, PT-495, PT-476, PT-486, and PT-496.			AOP-401.3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 5 Page: 30 of 52

Event Description: PT-485, controlling SG pressure transmitter, fails low.

Time/ Position	Applicant's Actions or Behavior	
BOP	9. Perform the following: • Determine the failed instrument channel. • Record the time of the channel failure.	AOP-401.3
	<u>NOTE – Step 10</u> Compliance with T.S. requires tripping failed instrument channel bistables within 72 hours of the channel failure. Time should be allowed for troubleshooting of the failed channel prior to tripping the bistables.	AOP-401.3
US	*10. Place the failed channel protection bistables in a tripped condition within 72 hours of the channel failure: a) Write an R&R for the failed channel. b) Select the attachment for the failed channel from the back of the procedure. c) Record the R&R number on the attachment. d) Determine the cause of the channel failure. e) Notify the I&C Department to place the identified bistables in trip using the attachment.	AOP-401.3
Crew	11. Correct the cause of the channel failure	AOP-401.3
US	Enters Tech Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 14; Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level - Action 6. The inoperable channel must be placed in the tripped condition within 72 hours.	T.S. 3.3.1
US	Enters Tech Spec 3.3.2 Engineered Safety Feature Actuation System Instrumentation Table 3.3-3, Function 1.e; Differential Pressure between Steam Lines - High - Action 24. This Tech Spec also requires the inoperable channel must be placed in the tripped condition within 72 hours.	T.S. 3.3.2
EVALUATOR NOTE:	The next event will be initiated at the discretion of the Lead Examiner.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 31 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner, a Large Break LOCA will be initiated. The reactor will trip and operators will take immediate actions of EOP-1.0. Both RHR pumps will fail to auto start. "B" Service Water Booster pump will fail to auto start. The crew will then transition to EOP-2.0. Once RWST level reaches 18%, the automatic swap of RHR pump suction to the Recirc sump will not occur. The crew will transition to EOP-2.2, ES-1.3 Transfer to Cold Leg Recirc. When the operator attempts to manually open the RHR sump suctions, the valves will open.
BOOTH OPERATOR:	When directed – initiate Event 6 (TRIGGER 6)
Symptoms/ Cues:	A reactor trip occurs due to the DBA LOCA.
US	Enters EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION. EOP-1.0
RO (IOA)	1. Verify Reactor Trip: • 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
RO (IOA)	2. Verify Turbine/Generator Trip: a. Verify all Turbine STM STOP VLVs are closed. b. Ensure Generator Trip (after 30 second delay): 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
RO (IOA)	3. Verify both ESF buses are energized. EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 32 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior
RO (IOA)	4. Check if SI is actuated: a. Check if either: - 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 <u>either</u> SI ACTUATION Switch. c. GO TO Step 6.
	REFERENCE PAGE FOR EOP-1.0 1 <u>RCP TRIP CRITERIA</u> a. <u>IF</u> Phase B Containment Isolation has actuated (XCP-612 4-2), <u>THEN</u> trip <u>all</u> RCPs. b. <u>IF both</u> of the following conditions occur, <u>THEN</u> trip <u>all</u> RCPs: - SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. <u>AND</u> - RCS Wide Range pressure is LESS THAN 1418 psig. 2 <u>REDUCING CONTROL ROOM EMERGENCY VENTILATION</u> 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. 3 <u>MONITOR SPENT FUEL COOLING</u> Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery: - Spent Fuel Pool level. - Spent Fuel Pool temperature. 4 <u>RUPTURED STEAM GENERATOR</u> <u>IF</u> a RUPTURED Steam Generator has been positively identified, <u>THEN</u> throttle EFW to the RUPTURED Steam Generator <u>WHEN</u> its Narrow Range Level is GREATER THAN 26%[41%]. 5 <u>FAULTED STEAM GENERATOR</u> <u>IF</u> a FAULTED Steam Generator has been positively identified, <u>THEN</u> isolate EFW to the faulted Steam Generator as soon as possible <u>UNLESS all three</u> Steam Generators are FAULTED. <u>IF all three</u> Steam Generators are FAULTED, <u>THEN</u> throttle EFW flow to <u>all three</u> Steam Generators to 50 gpm.

EOP-1.0

EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 33 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	Attachment 3, SI Equipment Verification, is included for reference on Page 49 of 52.	EOP-1.0
EVALUATOR NOTE:	Per the Reference Page, the crew should call for a local operator to reduce Control Emergency Ventilation to one train running within 30-minutes of the Safety Injection.	EOP-1.0
EVALUATOR NOTE:	On the reactor trip and safety injection, both RHR Pumps will fail to auto start. Both RHR pumps can be started from the MCB. Critical Task is to start at least one RHR pump in injection mode prior to RVLIS Narrow Range Level decreasing to less than 34%.	EOP-1.0
EVALUATOR NOTE:	On the safety injection, the "B" Service Water Booster pump will fail to auto start. When the operator attempts to start the pump, it will not start.	EOP-1.0
BOP	6. Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.	EOP-1.0
CREW	7. Announce plant conditions over the page system.	EOP-1.0
RO	*8. Verify RB pressure has remained LESS THAN 12 psig on PR951, RB PSIG (P-951), red pen.	EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 34 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior

RO

***8. ALTERNATIVE ACTION**

Perform the following:

a) Verify both the following annunciators are lit:

- XCP-612 3-2 (RB SPR ACT).
- XCP-612 4-2 (PHASE B ISOL).

b) Verify RB SPRAY/PHASE B ISOL monitor lights are bright on XCP-6105.

c) Ensure the following are open:

- MVG-3001A(B), RWST TO SPRAY PUMP A(B) SUCT.
- MVG-3002A(B), NAOH TO SPRAY PUMP A(B) SUCT.
- MVG-3003A(B), SPRAY HDR ISOL LOOP A(B).

d) Ensure both RB Spray Pumps are running.e) Verify RB Spray flow is GREATER THAN 2500 gpm for each operating train on:

- FI-7368, SPR PP A DISCH FLOW GPM.
- FI-7378, SPR PP B DISCH FLOW GPM.

f) Stop all RCPs.

EOP-1.0

RO

***9. Check RCS temperature:**

- With any RCP running, RCS Tavg is stable at OR trending to 557°F.

OR

- With no RCP running, RCS Tcold is stable at OR trending to 557°F. **(NO)**

EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 35 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior

RO	*9. ALTERNATIVE ACTION IF RCS temperature is LESS THAN 557°F AND decreasing, THEN stabilize temperature by performing the following as required: a) Close IPV-2231, MS/PEGGING STM TO DEAERATOR. b) Perform one of the following: • IF Narrow Range SG level is LESS THAN 26% [41%] in all SGs, THEN reduce EFW flow as necessary to stop cooldown, while maintaining total EFW flow GREATER THAN 450 gpm. - OR • WHEN Narrow Range SG level is GREATER THAN 26% [41%] in at least one SG, THEN control EFW flow as necessary to stabilize RCS temperature at 557°F. c) Initiate ATTACHMENT 6, STEAM VALVE ISOLATION, while continuing with this procedure. d) IF RCS cooldown continues, THEN close: • MS Isolation Valves, PVM-2801A(B)(C). • MS Isolation Bypass Valves, PVM-2869A(B)(C).	EOP-1.0
RO	10. Check PZR PORVs and Spray Valves: a. PZR PORVs are closed. b. PZR Spray Valves are closed. c. Verify power is available to at least one PZR PORV Block Valve: • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL. • MVG-8000C, RELIEF 445 B ISOL. d. Ensure one of the following Block Valves is open unless it was closed to isolate an open PZR PORV: • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL.	EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 36 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior
RO	<u>NOTE – Step 11</u> Seal Injection flow should be maintained to all RCPs. 11. Check if RCPs should be stopped: a. Check if either of the following criteria is met: - 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
RO/ BOP	12. Verify no SG is FAULTED: - No SG pressure is decreasing in an uncontrolled manner. - No SG is completely depressurized.
CREW	13. Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED: - 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.
RO/ BOP	14. Check if the RCS is INTACT: a. RB radiation levels are normal: - RM-G7, CNTMT HI RNG GAMMA. - RM-G18, CNTMT HI RNG GAMMA. b. RB Sump level are normal c. RB pressure is LESS THAN 1.5 psig. d. XCP-607 2-2 (RBCU DRN FLO HI) is <u>NOT</u> lit.
EVALUATOR NOTE:	The crew should transition to EOP-2.0, E-1, LOSS OF REACTOR OR SECONDARY COOLANT.

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 37 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior
US	Enters EOP-2.0, E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
	REFERENCE PAGE FOR EOP-2.0 1 SI REINITIATION CRITERIA <u>IF either</u> of the following conditions occurs, <u>THEN</u> 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 <u>NOT</u> be maintained GREATER THAN 10% [28%]. 2 RCP TRIP CRITERIA <u>IF either</u> of the following criteria is met, <u>THEN</u> trip <u>all</u> RCPs: - Annunciator XCP-612 4-2 is lit (PHASE B ISOL). - RCS pressure is LESS THAN 1418 psig <u>AND</u> SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. 3 SECONDARY INTEGRITY TRANSITION CRITERIA <u>IF any</u> unisolated SG pressure is decreasing in an uncontrolled manner <u>OR</u> is completely depressurized, <u>THEN</u> GO TO EOP-3.0, E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1. 4 TUBE RUPTURE TRANSITION CRITERIA <u>IF any</u> SG level increases in an uncontrolled manner <u>OR</u> if <u>any</u> SG has abnormal radiation, <u>THEN</u> start Charging Pumps and operate valves as necessary, and GO TO EOP-4.0, E-3, STEAM GENERATOR TUBE RUPTURE, Step 1. 5 COLD LEG RECIRCULATION TRANSITION CRITERION <u>IF</u> RWST level decreases to LESS THAN 18%, <u>THEN</u> GO TO EOP-2.2, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1. 6 LOSS OF EMERGENCY COOLANT RECIRCULATION TRANSITION CRITERION <u>IF</u> Emergency Coolant Recirculation is established and subsequently lost, <u>THEN</u> GO TO EOP-2.4, ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1. 7 REDUCING CONTROL ROOM EMERGENCY VENTILATION 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.
	NOTE Seal Injection flow should be maintained to <u>all</u> RCPs.

EOP-2.0

EOP-2.0

EOP-2.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 38 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
RO	1. Check if RCPs should be stopped: a. Check if <u>either</u> of the following criteria are met: - Annunciator XCP-612 4-2 is lit (PHASE B ISOL). <u>OR</u> - RCS pressure is LESS THAN 1418 psig <u>AND</u> SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. b. Stop <u>all</u> RCPs.	EOP-2.0
BOP	2. Verify <u>no</u> SG is FAULTED: <u>No</u> SG pressure is decreasing in an uncontrolled manner. <u>No</u> SG is completely depressurized.	EOP-2.0
BOP	*3. Check INTACT SG levels: a. Verify Narrow Range level in INTACT SGs is GREATER THAN 26% [41%]. b. Control EFW flow to maintain Narrow Range level in <u>each</u> INTACT SG between 26% [41%] and 60%.	EOP-2.0
RO	4. Reset <u>both</u> SI RESET TRAIN A(B) Switches.	EOP-2.0
RO	5. Reset Containment Isolation: - RESET PHASE A – TRAIN A(B) CNTMT ISOL. - RESET PHASE B – TRAIN A(B) CNTMT ISOL.	EOP-2.0
BOP	6. Check if Secondary radiation levels are normal: a. Check radiation levels normal on: - 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. b. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO. c. Notify Chemistry to sample <u>all</u> SG secondary sides, and screen samples for abnormal activity using a frisker.	EOP-2.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 39 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
RO	*7. Check PZR PORVs and Block Valves: a. Verify power is available to the PZR PORV Block Valves: 1) MVG-8000A, RELIEF 445 A ISOL. 2) MVG-8000B, RELIEF 444 B ISOL. 3) MVG-8000C, RELIEF 445 B ISOL.	EOP-2.0
	<u>CAUTION – Step 7.b</u> If <u>any</u> 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.	EOP-2.0
RO	b. Verify <u>all</u> PZR PORVs are closed. c. Verify at least <u>one</u> PZR PORV Block Valve is open.	EOP-2.0
BOP	8. Place <u>both</u> ESF LOADING SEQ A(B) RESETS to: a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS.	EOP-2.0
RO	9. Establish Instrument Air to the RB: a. Start <u>one</u> Instrument Air Compressor and place the other in Standby. b. Verify PI-8342, INSTR AIR HDR PRESS PSIG, indicates GREATER THAN 60 psig. c. Open PVA-2659, INST AIR TO RB AIR SERV. d. Open PVT-2660. AIR SPLY TO RB.	EOP-2.0
RO	*10. 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].	EOP-2.0
RO	*10. ALTERNATIVE ACTION a. GO TO Step 11.	EOP-2.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 40 of 52
 Event Description: LBLOCA.

Time/ Position Applicant's Actions or Behavior

- RO *11. Check if RB Spray should be stopped:
- Check if any RB Spray Pumps are running.
 - Determine the number of RB Spray Pumps required from the table below:

EOP-2.0

RO

REACTOR BUILDING PRESSURE	RBCUs RUNNING IN EMERGENCY MODE	SPRAY PUMPS REQUIRED
GREATER THAN 55 psig	0, 1 or 2	2
BETWEEN 11 psig and 55 psig AND increasing	0, 1 or 2	2
BETWEEN 11 psig and 55 psig AND decreasing.	0 or 1	2
	2	1
LESS THAN 11 psig	0, 1 or 2	0

EOP-2.0

- RO
- Check if the number of RB Spray Pumps is GREATER THAN the number required.
 - Check if at least two RB Spray Pumps are running.
 - Depress both RESET TRAIN A(B) RB SPRAY.
 - Reduce the number of running RB Spray Pumps:
 - Stop one RB Spray Pump and place in Standby.
 - Close the discharge valve for the RB Spray Pump that was just secured.
 - MVG-3003A, SPRAY HDR ISOL LOOP A.
 - MVG-3003B, SPRAY HDR ISOL LOOP B.
 - Check if the last RB Spray Pump can be secured:
 - Verify that RB pressure is LESS THAN 11 psig.

EOP-2.0

EVALUATOR NOTE: With only one SWBP Running, only the "A" Train RBCU is counted in this table because the "B" Train RBCU has no cooling flow due to "B" SWBP not running.

- RO 11. **ALTERNATIVE ACTION**
- CONTINUE with Step 12. Observe the CAUTION prior to Step 12.
- WHEN RB Spray termination criteria are met, THEN COMPLETE Step 11.h.

EOP-2.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 41 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
	<u>CAUTION – Step 12</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.	EOP-2.0
RO	12. Check if RHR Pumps should be stopped: a. Check RCS pressure: 1) RCS pressure is GREATER THAN 325 psig.	EOP-2.0
RO	12. ALTERNATIVE ACTION 1) GO TO Step 15. Observe the CAUTION prior to Step 15.	EOP-2.0
	<u>CAUTION – Step 15</u> The DGs should NOT be run at a minimum load or unloaded for extended periods of time, to prevent carbon fouling.	EOP-2.0
BOP	15. Check if DGs should be stopped: a. Verify <u>both</u> ESF buses are energized by offsite power. b. Stop <u>any</u> unloaded DG. REFER TO SOP-306, EMERGENCY DIESEL GENERATION.	EOP-2.0
RO	16. Verify equipment is available for Cold Leg Recirculation: a. Verify A Train equipment available: 1) XPP0031A-RH, RESIDUAL HEAT REMOVAL PUMP A. 2) XVG08809A-SI, REFUEL WTR STG TK RH PUMP A SUCT VLV. 3) XVG08811A-SI, CNTMT SUMP RH PUMP A SUCT ISOL VALVE. 4) XVG08812A-SI, RH PUMP A SUCTION HEADER VALVE. 5) <u>One</u> Train A Charging Pump: • XPP0043A CHARGING/SI PUMP A. <u>OR</u> • XPP0043C CHARGING/SI PUMP C (TRAIN A). 6) LCV00115B-CS, CHG PUMP A SUCTION HDR RWST HDR ISOL VALVE. 7) XVG08706A-RH, CHG/SI PUMP SUCT HDR RH HDR A(B) INLET VLV.	EOP-2.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 42 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior

RO	b. Verify B Train equipment available: 1) XPP0031B-RH, RESIDUAL HEAT REMOVAL PUMP B. 2) XVG08809B-SI, REFUEL WTR STG TK RH PUMP B SUCT VLV. 3) XVG08811B-SI, CNTMT SUMP RH PUMP B SUCT ISOL VALVE. 4) XVG08812B-SI, RH PUMP B SUCTION HEADER VALVE. 5) <u>One</u> Train B Charging Pump: • XPP0043B CHARGING/SI PUMP B. <u>OR</u> • XPP0043C CHARGING/SI PUMP C (TRAIN B). 6) LCV00115D-CS, CHG PUMP A SUCTION HDR RWST HDR ISOL VALVE. 7) XVG08706B-RH, CHG/SI PUMP SUCT HDR RH HDR A(B) INLET VLV.	EOP-2.0
RO	c. Open <u>both</u> MVG-9503A(B), CC TO RHR HX A(B).	EOP-2.0
	<u>CAUTION – Step 16.d</u> • 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, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.	EOP-2.0
RO	d. Shift the CCW Train to fast speed in the Active Loop. REFER TO SOP-118, COMPONENT COOLING WATER. e. Consult with the TSC personnel to determine if equipment required for Cold Leg Recirculation is available.	EOP-2.0
BOOTH INSTRUCTOR:	When called as TSC, acknowledge request.	
	<u>NOTE – Step 17</u> 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.	EOP-2.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 43 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
BOP	17. Check the AB for evidence of ECCS leakage: a. Verify AB radiation levels are normal on: • 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 <u>NOT</u> lit (AB SMP LVL HI). c. Verify annunciators XCP-606 3-4 and XCP-607 3-4 are <u>NOT</u> lit (LD TRBL AB SMP/FLDRN LVL HI). d. Verify annunciators XCP-606 3-1 and XCP-607 3-1 are <u>NOT</u> lit (LTDN LD TEMP HI).	EOP-2.0
RO	18. Obtain necessary Chemistry samples: a. Ensure <u>all</u> RCS sample valves are in AUTO: • 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: • RCS. • <u>All</u> SGs for isotopic activity.	EOP-2.0
BOP	19. Shut down and stabilize the Secondary Plant. REFER TO AOP-214.1, TURBINE TRIP.	EOP-2.0
RO	20. Check if RCS cooldown and depressurization is required: a. RCS pressure is GREATER THAN 325 psig.	EOP-2.0
RO	20. ALTERNATIVE ACTION a. <u>IF</u> RHR Pump flow is GREATER THAN 1100 gpm, <u>THEN GO TO</u> Step 21. Observe the CAUTION prior to Step 21.	EOP-2.0
	<u>CAUTION – Step 21</u> Switchover to recirculation may cause high radiation in the AB.	EOP-2.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 44 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior

RO	21. Check if transfer to Cold Leg Recirculation is required: a. RWST level is LESS THAN 18%. b. GO TO EOP-2.2, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.	EOP-2.0
EVALUATOR NOTE:	The crew should transition to EOP-2.2, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION. If RWST level < 18% prior to Step 21, the crew should transition to EOP-2.2 based upon the Reference Page.	
RO	<u>CAUTION</u> If the suction source is lost to <u>any</u> SI <u>OR</u> RB Spray Pump, the AFFECTED pump should be stopped to prevent pump damage.	EOP-2.2
RO	<u>NOTE</u> Procedures referenced from the Critical Safety Function status trees should <u>NOT</u> be implemented prior to completion of Step 14.	EOP-2.2
RO	*1. <u>IF</u> it is known that <u>any</u> pump suction can <u>NOT</u> be transferred from the RWST, <u>THEN</u> place that pump in PULL TO LK NON-A, to delay RWST depletion.	EOP-2.2
RO	*2. Verify that RWST level is GREATER THAN 10%.	EOP-2.2
RO	3. Verify RHR Sump level is GREATER THAN 414 ft. • LI-1969, RHR SUMP A LEVEL FEET. • LI-1970, RHR SUMP B LEVEL FEET.	EOP-2.2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 45 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior

RO Critical Task	4. Align RHR to the Sumps: • For Train A: a. Ensure <u>both</u> MVG-8811A and MVG-8812A, RHR SUMP A TO RHR PP A, are open. b. Ensure MVG-8809A, RWST TO RHR PP A, is closed. • For Train B: a. Ensure <u>both</u> MVG-8811B and MVG-8812B, RHR SUMP B TO RHR PP B, are open. b. Ensure MVG-8809B, RWST TO RHR PP B, is closed.
EVALUATOR NOTE:	When RWST level < 18%, the RHR suction valves from the RHR Sump on Train A and B will fail to open, but can be opened from the MCB. Critical Task is to realign any running ECCS pump to the RHR Sump prior to RWST level lowering below 10%.
EVALUATOR NOTE:	The scenario may be terminated when the crew has aligned RHR Pumps for Cold Leg Recirculation in EOP-2.2 or at the discretion of the Lead Examiner.

EOP-2.2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 46 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior

EVALUTOR NOTE	THESE ARE THE STEPS OF AOP-118.1.
US	Enters AOP-118.1, LOSS OF COMPONENT COOLING WATER.
	REFERENCE PAGE FOR AOP-118.1 1 <u>Reactor Trip:</u> <u>IF</u> a Reactor Trip occurs, this procedure should be continued concurrently with the recovery actions of EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION. 2 <u>Charging Pump Operation:</u> <u>Any</u> Charging Pump can be started or continue to be operated on a loss of Component Cooling Water to its oil coolers within <u>one</u> of the following limitations: • 20 minutes without local Charging Pump temperature monitoring. <u>OR</u> • <u>No</u> time limit as long as <u>any</u> maximum temperature of ATTACHMENT 5, CHARGING PUMP TEMPERATURE MONITORING, is <u>NOT</u> exceeded <u>AND</u> local Charging Pump temperature monitoring remains in place. 3 <u>Reactor Coolant Pump Operation With Degraded Component Cooling Water System Operation:</u> <u>Any</u> running Reactor Coolant Pump should be stopped if <u>any</u> of the following conditions exist: - Component Cooling Water flow to the motor bearing coolers can <u>NOT</u> be restored within <u>ten</u> minutes. - Motor Bearing temperature exceeds 195°F. - Lower Seal Water Bearing Temperature exceeds 225°F. - CBO temperature exceeds 250°F. 4 <u>WHEN a CCW pump is restored to service, THEN GO TO procedure Step 26.</u>

AOP-118.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 47 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
RO	1. Determine the cause for the loss of CCW: a. Check for annunciators on XCP-601, 602, and 603. b. REFER TO the appropriate ARPs. c. Attempt to correct the cause for loss of CCW.	AOP-118.1
EVALUATOR NOTE	Per XCP-601 1-2, CCP A/C AUTOSTART FAIL, the crew starts "C" CCW Pump.	
RO	2. Verify CCW Surge Tank level is stable <u>AND</u> <u>no</u> makeup is in progress.	AOP-118.1
RO	3. Establish <u>either</u> train of CCW as the Active Loop. REFER TO SOP-118, COMPONENT COOLING WATER.	AOP-118.1
RO	4. Check if at last <u>one</u> CCW loop is restored: a. At least <u>one</u> CCW Pump is running. b. CCW Pump discharge pressure is GREATER THAN 60 psig. - PI-7032, LOOP A DISCH PRESS PSIG. - PI-7042, LOOP B DISCH PRESS PSIG. c. CCW loop flow is GREATER THAN 4500 gpm: - FM-7030, A CCW LOOP (IUR14400, M3/SW 2-1). - FM-7040, B CCW LOOP (IUR14401, M4/SW 2-1).	AOP-118.1
RO	5. Check CCW flow to the Reactor Coolant Pumps: a. Verify CCW flow to the RCP Thermal Barriers is GREATER THAN 110 gpm on FI-7273A(B) THERM BARR FLOW GPM. b. Verify CCW flow to the RCP Bearing Coolers is GREATER THAN 400 gpm on FI-7263A(B), BRG FLOW GPM.	AOP-118.1
RO	6. Verify <u>both</u> trains of CCW are operable.	AOP-118.1
RO	7. If necessary, place Charging and Normal Letdown in service. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.	AOP-118.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 48 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
RO	8. Verify letdown is in a normal line up: a. Letdown Isolation Valves are open: 1) LCV-459, LTDN LINE ISOL. 2) LCV-460, LTDN LINE ISOL. b. The desired Orifice Isolation Valve(s) are open to obtain 60 gpm to 120 gpm: • PVT-8149A, LTDN ORIFICE A ISOL (45 gpm). • PVT-8149B, LTDN ORIFICE B ISOL (60 gpm). • PVT-8149C, LTDN ORIFICE C ISOL (60 gpm). c. PCV-145, LO PRESS LTDN, is controlling in AUTO. d. PVT-8152, LTDN LINE ISOL is open. e. TCV-143, LTDN TO VCT OR DEMIN, in is in the DEMIN/AUTO position. f. TCV-144, CC TO LTDN HX, is controlling in AUTO.	AOP-118.1
RO	9. If necessary, restore normal CCW cooling to the AFFECTED Charging Pump(s). a. Start a Charging Pump that is supplied by CCW. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM. b. Stop the AFFECTED Charging Pump. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM. c. Perform the RETURN AS FOUND line up per the appropriate AOP-118.1, LOSS OF COMPONENT COOLING WATER, ATTACHMENT used for alternate cooling. d. Restore the AFFECTED Charging Pump to service. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.	AOP-118.1
EVALUATOR NOTE:	Normal CCW Flow has been restored. The US does not need to perform this step.	
US	10. RETURN TO the Procedure and Step in effect.	AOP-118.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 49 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
EVALUTOR NOTE:	THESE ARE THE STEPS OF EOP-1.0, ATTACHMENT 3	
BOP	1 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.	EOP-1.0 Attachment 3
BOP	2 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.	Attachment 3
BOP	3 Verify total EFW flow is GREATER THAN 450 gpm.	Attachment 3
BOP	4 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.	Attachment 3
BOP Critical Task	5 Ensure SI Pumps are running: • Two Charging Pumps are running. • Both RHR Pumps are running.	Attachment 3
EVALUATOR NOTE:	Both RHR Pumps will fail to auto-start. They can be started on this step or when recognized that they failed to start from an auto-start signal per OP-AP-100. Critical Task is to start at least one RHR pump in injection mode prior to RVLIS Narrow Range Level decreasing to less than 34%.	
BOP	6 Ensure two RBCU Fans are running in slow speed (one per train).	Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 50 of 52
 Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
BOP	7	Verify Service Water flow to RBCUs: a. Ensure Service Water Pump A is running. b. Check if Service Water Booster Pump A is running. c. GO TO Step 7.f. f. Ensure Service Water Pump B is running. g. Check if Service Water Booster Pump B is running. ALTERNATIVE ACTION g. GO TO Step 7.i. i. Verify <u>both</u> of the following: • XVB-3107B, RBCU 64B/65B RTN TO SW PND is closed. <u>AND</u> • Alarm XCP-605 1-5 XVB3107B-SW SLOW CLOSURE is <u>NOT</u> lit. j. Start Service Water Booster Pump B. k. Verify GREATER THAN 2000 gpm flow for each train on: (NO) • FI-4466, SWBP A DISCH FLOW GPM. • FI-4496, SWBP B DISCH FLOW GPM. ALTERNATIVE ACTION k. Consult with TSC personnel for evaluation.
EVALUATOR NOTE:	The "B" SWBP will not start from the MCB.	
BOP	8	Ensure one CCW pump per train is running.
BOP	9	Ensure two Chilled Water Pumps and Chillers are running.
BOP	10	Verify both trains of Control Room Ventilation are running in Emergency Mode.

Attachment 3

Attachment 3

Attachment 3

Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 1 Event # 6 Page: 51 of 52
Event Description: LBLOCA.

Time/ Position	Applicant's Actions or Behavior	
BOP	11 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).	Attachment 3
BOP	12 Ensure Excess Letdown Isolation Valves are closed: • PVT-8153, XS LTDN ISOL. • PVT-8154, XS LTDN ISOL.	Attachment 3
BOP	13 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.	Attachment 3
BOP	14. Verify proper SI alignment: a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104. b. Verify <u>all</u> SAFETY INJECTION monitor lights are dim on XCP-6106. c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. d. Check if RCS pressure is LESS THAN 325 psig. e. Verify RHR flow on: • FI-605A, RHR DISCHARGE PUMP A FLOW GPM. <u>AND</u> • FI-605B, RHR DISCHARGE PUMP B FLOW GPM. f. Notify the CRS that ATTACHMENT 3, SI EQUIPMENT VERIFICATION, is complete.	Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 2021 NRC

Page: 52 of 52

Procedure Revisions used in this Scenario Guide			
Number	Title	Rev	Date
STP-127.001	PRESSURIZER BLOCK VALVE OPERABILITY TEST	8C	6/17/16
GOP-4C	RAPID POWER REDUCTION	1F	12/9/22
SOP-101	REACTOR COOLANT SYSTEM	32I	5/2/23
SOP-106	REACTOR MAKEUP WATER SYSTEM	12B	7/11/19
SOP-214	MAIN TURBINE AND CONTROLS	22	3/8/23
XCP-601	ANNUNCIATOR RESPONSE PROCEDURE	6B	9/15/20
XCP-616	ANNUNCIATOR RESPONSE PROCEDURE	7D	8/16/20
XCP-625	ANNUNCIATOR RESPONSE PROCEDURE	9	11/21/15
AOP-401.3	STEAM FLOW – FEEDWATER FLOW PROTECTION CHANNEL FAILURE	5	1/11/23
EOP-1.0	E-0, REACTOR TRIP OR SAFETY INJECTION	32	7/15/21
EOP-2.0	E-1, LOSS OF REACTOR OR SECONDARY COOLANT	18	2/5/20
EOP-2.2	ES-1.3, TRANSFER TO COLD LEG RECIRCULATION	19	2/5/20
	V.C. SUMMER TECHNICAL SPECIFICATIONS	223	11/10/22

Scenario 1 of VC Summer's 2023 NRC exam had PT-485 failing low for the "B" Steam Generator. This transmitter failure requires SRO's to analyze Technical Specifications. The guide was incomplete with the required Technical Specifications. The following Technical Specifications are required to be entered for PT-485 failure.

- Tech Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 14; Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level - Action 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:

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

The # states that the provisions of Specification 3.0.4 are not applicable.

- Tech Spec 3.3.2 Engineered Safety Feature Actuation System Instrumentation Table 3.3-3, Function 1.e; Differential Pressure between Steam Lines - High - Action 24*.
- Tech Spec 3.3.2 Engineered Safety Feature Actuation System Instrumentation Table 3.3-3, Function 1.f; Steam Line Pressure-Low – Action 24*.
- Tech Spec 3.3.2 Engineered Safety Feature Actuation System Instrumentation Table 3.3-3, Function 4.e; Steam Line Pressure-Low – Action 24*.

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:

- 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 4.3.2.1.

The * states that the provisions of Specification 3.0.4 are not applicable.

Form 3.3-1 Scenario Outline

Facility:	VC SUMMER	Scenario #:	#2
Scenario Source:	New	Op. Test #:	ILO 22-01 NRC-2023
Examiners:	Applicants/ Operators:		
_____	_____		
_____	_____		
_____	_____		
Initial Conditions:	- Reactor power is 90%. "B" train work week. - XFN-0065B RBCU is OOS.		
Turnover:	Reduce power to 85% at 1/2% per minute in accordance with GOP-4B POWER OPERATION (MODE 1 - DESCENDING).		
Critical Tasks:	- Manually trip the reactor when it fails to AUTO trip with three faulted Steam Generators before SG WR < 12%. - Control the EFW flowrate (minimum of 50 gpm to each SG < 26% level) and terminate SI, in order to minimize the RCS cooldown rate before a severe (orange-path) challenge develops to the Integrity Critical Safety Function Status Tree.		

Event No.	Mal. No.	Event Type*	Event Description
1	N/A	R-OATC, N-BOP, US	Decrease reactor power to 85%.
2	MAL-RCS008G MAL-RCS008H	TS-US	RCS Loop C T _{HOT} RTD Fails low.
3#	PMP-SW002B	C-RO, US TS-US	Service Water Pump B Bearing failure (Non-Active Train) (2019 NRC scenario #1)
4	OVR-CW019B	I/MC-BOP, US	ALT CLR TEMP Controller fails low.
5	MAL-CCW004	I/MC-OATC, US	TCV-144 fails closed, Letdown temperature control in manual.

Form 3.3-1 Scenario Outline

6	ANN-EG017	C-BOP, US	XTF-2 trouble alarm, transfer BOP busses to alt power.
7	MAL-AUX009BA MAL-AUX009BB MAL-AUX009BC MAL-MSS004A MAL-MSS006A MAL-MSS006B MAL-MSS006C MAL-PCS009AB MAL-PCS009BB MAL-TUR001	M-All	Earthquake Turbine Trip, "A" SG Faults and the MSIVs fail to close automatically or manually. ATWS, can be tripped from the Control Room.
TERMINATE: The scenario may be terminated once the crew has terminated Safety Injection in accordance with EOP-3.1, ECA-2.1, Uncontrolled Depressurization of all Steam Generators or at the discretion of the Lead Examiner.			
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Used on previous two NRC Exams.

The following notation is used in the Form 3.3-2 "Time" column:

IOA designates Immediate Operator Action steps.

***** designates Continuous Action steps.

TURNOVER:

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

Train "B" RBCU, XFN-0065B is tagged out for breaker maintenance and is to be returned to service next shift.

The Unit is at 90% power MOL.

The Main Turbine is at Set Load.

132 gal of Boric Acid have been added.

The crew will be instructed to reduce power to 85% at 1/2% per minute in accordance with GOP-4B, Power Operation (Mode 1 - Descending), starting at Step 3.2.a, to remove 'A' Circ Water Pump for maintenance per SOP-207, Circulating Water, Section IV.C.

Phoenix display monitor is out of service. The Shift Engineer is tracking all necessary actions in Work Control.

Current RCS Boron concentration by chemistry is 1060 ppm.

GTP-702 Attachment III.H is not required to be performed for the load reduction.

Pre-loaded Items

- OVR-AH023A
CS-AH279 RBCU FAN 65B SLOW SPEED GREEN L
FINAL: OFF
- OVR-AH022A
CS-AH280 RBCU FAN 65B FAST SPEED GREEN L
FINAL: OFF

EVENT 1: Lower reactor power.

The crew will take the shift and immediately commence the down power in accordance with GOP-4B, Power Operation (Mode 1 Descending). The US will direct a power decrease at 1/2% per minute and provide oversight during the load decrease. The RO will adjust RCS boron in accordance with a reactivity plan while the BOP operates Turbine EHC system controls to decrease turbine load. Once power has been reduced sufficiently for the chief examiner, the next event may be inserted.

EVENT 2: RCS Loop C THOT RTD Fails low

- **TRIGGER 2**
 - o MAL-RCS008G
RCS RTD FAILURE (LOOP 3 – HOT LEG) 432B1
FINAL: 530
 - o MAL-RCS008H
RCS RTD FAILURE (LOOP 3 – HOT LEG) 432B2
FINAL: 530

On cue from the Examiner, two (2) Loop C THOT RTDs will fail Low. The crew will respond in accordance with XCP-615, 1-2, RCS TAVG LO, which will have them implement AOP-401.2,

Form 3.3-1 Scenario Outline

Protection Channel RCS Loop RTD Failure. They will identify the failed RTD and ensure an operable loop is selected on ΔT TR-412 Input Switch. Once the Tech Spec has been identified, the next event may be inserted.

EVENT 3: Service Water Pump “B” bearing failure (Non-Active Train)

- **TRIGGER 3**
 - o PMP-SW002B
XPP0039B SW PMP B BRG FAILURE
FINAL: 5
- **TRIGGER 10**
 - o LOA-AUX077
CELL SWITCH OF SERVICE WATER PUMP C TRAIN B
FINAL: RACK IN
DELAY: 15 sec
- LOA-AUX003
SW PMP C ISOL TAIN A – 3118A
FINAL: 0
RAMP: 5 sec
- LOA-AUX004
SW PMP C ISOL TRAIN B – 3118B
FINAL: 1
DELAY: 5 sec
RAMP: 5 sec
- LOA-AUX001
SERVICE WATER PUMP C DISCONNECT SWITCH
FINAL: TRAIN B
DELAY: 10 sec
- **TRIGGER 11**
 - o LOA-AUX075
CELL SWITCH OF SERVICE WATER PUMP B
FINAL: RACK OUT

On cue from the examiner, the “B” Service Water Pump bearing will fail causing an indication of a pump overload that will require the candidates to trip the pump. The crew will enter AOP-117.1, LOSS OF SERVICE WATER and rack up the “C” Service Water Pump to restore cooling.

Tech Spec 3.7.4 Action Statement requires: With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Once the crew has restored Service Water with the “C” Service Water pump and identified the Tech Spec, the next event may be inserted.

EVENT 4: ALT Cooler Temp controller output will fail to 0.

- **TRIGGER 4**
 - o CNH-TA004O
ALT CLR TMP OUTPUT
FINAL: 0
- **TRIGGER 12**
 - o LOA-TUR005
GEN AUX PNL XPN-7201 ALARM RESET
FINAL: RESET
- **AUTO TRIGGER 14 x11o063m (ALT CLR MAN LIGHT)**
 - o CNH-TA004O
ALT CLR TMP OUTPUT
FINAL: 0
DELETE IN: 1 sec

On cue from the Examiner, the ALT COOLER TEMP controller will fail to 0 output. This will cause XCP-632 3-2 and XCP-632 3-3 to alarm. TI-4270 will be reading >120°F. The BOP will take manual control of this controller and return TI-4270 back into its normal control band. This will be performed in accordance with XCP-632 3-2. Once TI-4270 is back into its normal control band, the next event may be inserted.

EVENT 5: Letdown temperature control valve controller fails to 0% (Closed).

- **TRIGGER 5**
 - o MAL-CCW004
CCW TO LETDOWN HEAT EXCHANGER TCV-144 CONTROLLER FAILURE
FINAL: 0

On cue from the Examiner the Controller for TCV-144, CCW to Letdown HX, fails low in AUTO. The controller will close the temperature control valve causing letdown temperature to rise. Annunciators XCP-613 1-2 DEMIN FLO DIVERT TEMP HI and XCP-603 1-5, LTDN/SL WTR HX FLO LO TEMP HI will be referenced. The RO will take manual control to restore CCW flow to the Letdown Heat Exchanger. Once the RO has restored CCW flow to the Letdown Heat Exchanger and temperatures have stabilized, the next event may be inserted.

EVENT 6: Unit Aux Transformer trouble, transfer BOP busses.

- **TRIGGER 6**
 - o ANN-EG017
UNIT AUX XFMR XTF-2 TRBL
FINAL: ON
- **AUTO-TRIGGER 13** x12i080t (BUS 1C NORM FEED TO TRIP)
 - o ANN-EG017 (NEW)
UNIT AUX XFMR XTF-2 TRBL
FINAL: ON
DELETE IN: 300 sec

On cue from the Examiner, XCP-633 6-3, UNIT AUX XFMR XTF-2 TRBL will come into alarm. The crew will send an AO out to inspect the transformer. Winding temperatures will be reported back as 122°C and slowly rising. In accordance with XCP-633 6-3, the BOP will transfer loads to the emergency auxiliary transformer per SOP-304. Once this has occurred, temperatures will lower on XTF-2 and the alarm will be cleared. Once BOP loads have been transferred to the emergency auxiliary transformer, the next event may be inserted.

EVENT 7: Earthquake leading to all three Steam Generators being faulted and an ATWS

- **PRELOAD**
 - o MAL-PCS009AB
REACTOR TRIP BREAKER A FAILURE (FAIL TO OPEN)
FINAL: AUTO
 - o MAL-PCS009BB
REACTOR TRIP BREAKER B FAILURE (FAIL TO OPEN)
FINAL: AUTO
- **AUTO TRIGGER 7** x12i080t (BUS 1C NORM FEED TO TRIP)
 - o MAL-TUR001
INADVERTENT TURBINE TRIP
DELAY: 30 sec
 - o MAL-AUX009BA
SEISMIC EVENT EARTHQUAKE FULL O.B.E.(NORTH/SOUTH HORIZONTAL)
FINAL: 25.4
DELAY: 30 sec
 - o MAL-AUX009BB
SEISMIC EVENT EARTHQUAKE FULL O.B.E.(UP/DOWN VERTICAL)
FINAL: 25.4
DELAY: 30 sec
 - o MAL-AUX009BC
SEISMIC EVENT EARTHQUAKE FULL O.B.E.(EAST/WEST HORIZONTAL)
FINAL: 25.4
DELAY: 30 sec

Form 3.3-1 Scenario Outline

- o MAL-MSS004A
STEAMLINE S/G A BREAK OUTSIDE CONTAINMENT
FINAL = 1.25E6 lbm/hr
DELAY: 30 sec
RAMP: 15 sec
- o MAL-MSS006A
MAIN STEAM ISOLATION VALVE (S/G A) FAILURE
FINAL: FAILURE TO CLOSE
- o MAL-MSS006B
MAIN STEAM ISOLATION VALVE (S/G B) FAILURE
FINAL: FAILURE TO CLOSE
- o MAL-MSS006C
MAIN STEAM ISOLATION VALVE (S/G A) FAILURE
FINAL: FAILURE TO CLOSE

On cue from the Examiner, an earthquake will occur followed by "A" SG becoming faulted and no MSIVs can be closed. The reactor will fail to trip automatically but can be tripped from the control room. The crew should manually trip the reactor and enter EOP-1.0, E-0 Reactor Trip or Safety Injection. The crew will transition out to EOP-3.0, E-2 Faulted Steam Generator Isolation. They will then transition to EOP-3.1, ECA-2.1 Uncontrolled Depressurization of all Steam Generators.

CRITICAL TASKS:

- Manually trip the reactor when it fails to AUTO trip with three faulted Steam Generators before SG WR <12%.
- Control the EFW flowrate (minimum of 50 gpm to each s/g < 26% level) and terminate SI, in order to minimize the RCS cooldown rate before a severe (orange-path) challenge develops to the Integrity Critical Safety Function Status Tree.

TERMINATION:

The scenario may be terminated once the crew has terminated Safety Injection in accordance with EOP-3.1, ECA-2.1 Uncontrolled Depressurization of all Steam Generators. or at the discretion of the Lead Examiner.

Form 3.3-1 Scenario Outline

2023 NRC #2

Scenario Attributes		Events
Events after EOP entry (1-2)	2	- Three MSIV stuck OPEN, MSIVs can't be closed locally. - ATWS, Reactor can be tripped from the control room.
Abnormal Events (2-4)	4	- SW Pump B Bearing failure (Non-Active Train) TS (2019 NRC #1) - ALT CLR TEMP controller failed low. - TCV-144 fails closed. L/D temp control in manual. - XTF-2 trouble alarm, transfer loads to alternate power.
Major Transients (1-2)	1	Three Faulted Steam Generators.
EOPs Entered (1-2)	1	EOP-3.1, ECA-2.1 UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.
EOP Contingencies (0-2)	1	EOP-3.1, ECA-2.1 UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.
Preidentified CTs (≥ 2)	2	- Manually trip the reactor when it fails to AUTO trip with three faulted Steam Generators before SG WR <12%. - Control the EFW flowrate (minimum of 50 gpm to each s/g < 26% level) and terminate SI, in order to minimize the RCS cooldown rate before a severe (orange-path) challenge develops to the Integrity Critical Safety Function Status Tree.

Explanation of Critical Task Basis is below:

Critical Task 1: Manually trip the reactor when it fails to AUTO trip with three faulted Steam Generators before SG WR <12%.

This creates a condition where the core is at power and there is no SG available for heat removal because less than 12% wide range level, the SGs are considered empty. By not tripping the reactor in EOP-1.0 prior to SG wide range levels going below 12%, you have bypassed the EOP-directed actions that are essential to an event's overall mitigative strategy. Being at power with empty Steam Generators is an unanalyzed condition.

① Verify Reactor Trip: • Trip the Reactor using <u>either</u> ☐ • Verify <u>all</u> Reactor Trip and Bypass Breakers are open. ☐ • Verify <u>all</u> Rod Bottom Lights are lit. ☐ • Verify Reactor Power level is decreasing. ☐	1 Trip the Reactor using <u>both</u> ☐ Reactor Trip Switches. If the Reactor will <u>NOT</u> trip <u>OR</u> is ☐ <u>NOT</u> subcritical, <u>THEN</u> GO TO EOP-13.0, FR-S.1, RESPONSE TO ABNORMAL NUCLEAR POWER GENERATION, Step 1.

N.01

SG level just in the wide range, including allowances for normal channel accuracy and reference leg process errors [12%].

BACKGROUND

Steam Generator level just in the wide range allowing for normal channel accuracy, plus reference leg process errors, is verified prior to re-establishing feed flow to an isolated Steam Generator. Use 12% for readability. If the Steam Generator is completely dried out, feed flow is introduced slowly to minimize thermal stress.

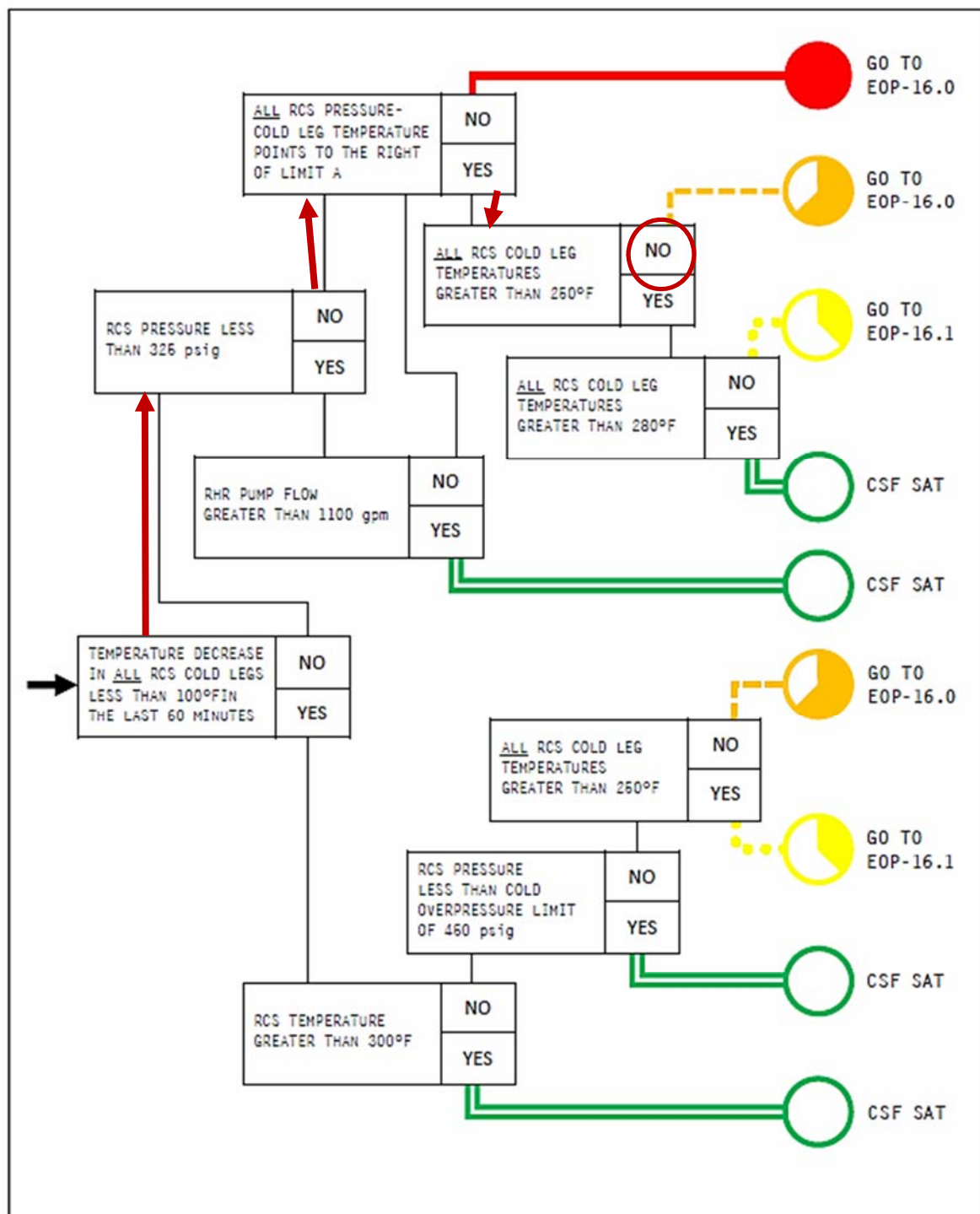
Used in the following procedures:

EOP-15.4, FSP-1.1, FSP-2.0

Critical Task 2: Control the EFW flowrate (minimum of 50 gpm to each s/g < 26% level) and terminate SI, in order to minimize the RCS cooldown rate before a severe (orange-path) challenge develops to the Integrity Critical Safety Function Status Tree.

The concern here is developing an Orange path on the Integrity Critical Safety Function Status tree because all RCS Cold legs went < 250°F. This meets the critical task methodology of NUREG 1021 because this is a task with one or more actions that would prevent a challenge to plant safety such as preventing the following: conditions that result in orange or red path critical safety functions (Westinghouse and AP1000). See CSFST flow path below.

INTEGRITY



Form 3.3-1 Scenario Outline

SIMULATOR SCENARIO SETUP

INITIAL CONDITIONS:

- IC Set 257
- 90% Power, MOL
- Burnup = 10,004 MWD/MTU
- Current Core Cycle = 28
- RCS Boron Concentration = 1060 ppm
- FCV-113 Pot Setting = 4.54
- Rod Position: Group D = 202
- Tavg = 584.1°F

PRE-EXERCISE:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.).
- Complete VCS-TQP-0807 Attachment I-A, Unit 1 Booth Instructor Checklist.
- Verify plant aligned for "B1" work week IAW PTP-101.004, Safety Related Train Swap Checklist.
- Verify red Placard on "A" CCW Pump and "B" Charging Pump.
- Verify the Hard Card for Turbine operation is in its proper storage location and cleaned.
- Verify the Hard Card for borating via MVT-8104 is in its proper storage location and cleaned.
- Ensure no NI's are removed from service, on SIPCS type in "add/omit" to verify.
- Ensure 115kV & 230kV setpoints are set to appropriate values for the shutdown condition IAW SOP-304, Enclosure B.
- Verify Rod Bank Update set correctly: 202 Steps on Bank D, 226 steps on all other Banks.
- Place HOLD Tag on RBCU 65B NORM and SLOW Speed Switches.
- Ensure Phoenix computer screen is turned off.
- Ensure you have a turnover sheet for each position.
- Have a blank copy of SOP-117 Attachment VI available upon request.
- Conduct two-minute drill.

COMMUNICATIONS NOTE:

The following are the Unit Numbers for Building Operators for communication from the Control Room:

- Unit 4 – Control Building Operator
- Unit 5 – Turbine Building Operator
- Unit 6 Upper – Auxiliary Building Upper Operator
- Unit 6 Lower – Auxiliary Building Lower Operator
- Unit 7 – Intermediate Building Operator

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2 Event # 1		Page: 13 of 53	
Event Description: Decrease reactor power to 85%.					
Time/ Position		Applicant's Actions or Behavior			
EVALUATOR NOTE:		Crew will pre-brief and perform a 5% down power IAW GOP-4B.			
BOOTH OPERATOR:		NO TRIGGER			
US		Directs a plant down power to 85% in accordance with GOP-4B, POWER OPERATION (MODE 1 – DESCENDING)			
		<u>GOP- 4B REFERENCE PAGE</u> <u>GENERAL NOTES</u> 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 Manager or Unit Supervisor. B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-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 Load Dispatcher prior to commencing the load change. 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. <u>REACTOR CONTROL</u> A. During operation with a positive Moderator Temperature Coefficient: 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. B. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated. 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): 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. <u>TURBINE CONTROL</u> A. If during power descension plant stabilization is required, HOLD should be selected on the EHC HMI: Control/Load screen. B. To resume power descension 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. 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. 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. <u>MSR CONTROL</u> 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.			

GOP-4B

GOP-4B

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2 Event # 1		Page: 14 of 53	
Event Description: Decrease reactor power to 85%.					
Time/ Position	Applicant's Actions or Behavior				
	<u>NOTE 3.2</u> a. Step 3.2 lowers Reactor Power from 90% to 48%. b. While the plant is being maneuvered, total condensate flow through the Blowdown Heat Exchangers must be maintained greater than 450 gpm, which should maintain condensate outlet temperature at least 30°F below the DA temperature.				GOP-4B
BOP	3.2 Reduce Reactor Power to 48% as follows: a. Using the EHC HMI, Control/Load screen, reduce load per SOP-214, Main Turbine And Controls, Section III.D, Turbine Load Reduction/Shutdown, at a rate of 1% per minute or less.				GOP-4B
EVALUATOR NOTE:	The BOP will now obtain the hard card of SOP-214, Section III.D to reduce load. The steps to reduce load are as follows below.				
BOP	2.1. Ensure the Control/Load screen is selected.				SOP-214
	<u>NOTE 2.2</u> The turbine will come off the limiter and turbine load will lower once Load Set Reference is less than Load Limit Reference. Acknowledging dialog boxes is "skill of the Craft".				SOP-214
BOP	2.2 To lower Turbine Load using Load Set, perform the following: a. To lower Turbine Load using Load Set, perform the following: b. Select (or enter) the desired Rate %/min on Load Set. c. Select Load on Load Set (a dialog box will open). d. Enter the desired load. (PEER✓) e. Confirm desired load. (PEER✓) f. Verify proper system response. g. 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
EVAULATOR NOTE:	The RO will setup to borate the RCS using SOP-106, Section F. The steps for borating are as follows below.				

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event # 1	Page: 15 of 53	
Event Description: Decrease reactor power to 85%.					
Time/ Position		Applicant's Actions or Behavior			
		<u>NOTE 3.2.b</u> 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.			SOP-106
BOP		b. 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).			SOP-106
		<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 %.			SOP-106
RO		2.0 INSTRUCTIONS 2.1 Ensure at least one Reactor Coolant Pump is running.			SOP-106
RO		2.2 Place RX COOL SYS MU switch to STOP.			SOP-106
RO		2.3 Place RX COOL SYS MU MODE SELECT switch to BOR. (Peer ✓)			SOP-106
RO		2.4 Adjust FCV-113 A&B, BA FLOW SET PT, for desired flow rate. (Peer ✓)			SOP-106
RO		2.5 Set FIS-113, BA TO BLNDR FLOW, batch integrator to the desired volume. (Peer ✓)			SOP-106
RO		2.6 Place RX COOL SYS MU switch to START.			SOP-106
RO		NOTE 2.7 Step 2.7 may be omitted when borating less than 10 gallons. 2.7 Place FCV-113 A&B, BA FLOW, controller in AUTO.			SOP-106
RO		NOTE 2.8 The AUTO setpoint dial for FCV-113A&B, BA FLOW, controller may be adjusted slowly to obtain the desired flow rate. 2.8 Verify the desired Boric Acid flow rate on FR-113, BA TO BLNDR GPM (F-113).			SOP-106
RO		2.9 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.			SOP-106
RO		2.10 Place RX COOL SYS MU switch to STOP.			SOP-106

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2 Event # 1	Page: 16 of 53
Event Description: Decrease reactor power to 85%.			
Time/ Position	Applicant's Actions or Behavior		
RO	NOTE 2.11 a. If plant conditions require repeated borations, Step 2.11 may be omitted. b. The volume in the piping between the blender and the VCT outlet is approximately 3.8 gallons. 2.11 Alternate Dilute 4 to 6 gallons of Reactor Makeup Water to flush the line down stream of the blender by performing the following: 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. (Peer ✓) 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.		
RO	2.12 Place RX COOL SYS MU MODE SELECT switch to AUTO. (Peer ✓)		
RO	2.13 Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm). (Peer ✓)		
RO	2.14 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.		
RO	2.15 Adjust FCV-113 A & B, BA FLOW, SET PT per one of the following: a. OAP-100.6, Attachment IA, Reactivity Control Parameters. b. Desired position to ensure proper boric acid addition based on current RCS conditions.		
RO	2.16 Place RX COOL SYS MU switch to START. (Peer ✓)		
RO	2.17 Perform the following: 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.		

SOP-106

SOP-106

SOP-106

SOP-106

SOP-106

SOP-106

SOP-106

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event # 1 Page: 17 of 53
Event Description: Decrease reactor power to 85%.

Time/ Position	Applicant's Actions or Behavior

EVALUATOR NOTE:	The next event will be initiated at the discretion of the Lead Examiner.

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event # 2 Page: 18 of 53
 Event Description: RCS Loop C T_{HOT} RTD Fails low.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	On cue from the Examiner, two (2) Loop C T_{HOT} RTDs will fail Low. The crew will respond in accordance with XCP-615, 1-2, RCS TAVG LO, which will have them implement AOP-401.2, Protection Channel RCS Loop RTD Failure. They will identify the failed RTD and ensure an operable loop is selected on ΔT TR-412 Input Switch.	
BOOTH OPERATOR:	When directed – initiate Event 2 (TRIGGER 2).	
Symptoms/ Cues:	• XCP-615 1-2, RCS TAVG LO • XCP-615 1-5, RCS TAVG DEV HI/LO • XCP-615 3-5, RCS ΔT DEV HI/LO	
RO	Corrective Actions: 1. Monitor TI-412D, TI-422D, and TI-432D to determine if a channel failed. 2. Place Rod Control in MAN and match Tavg to Tref. When plant conditions allow, return Rod Control to AUTO with Shift Manager Concurrence.	XCP-615 1-2
EVALUATOR NOTE:	Crew will not take rods to manual due to the fact that the failure does not impact automatic rod control. No credit is being taken for rods in manual. This event is for a Technical Specifications call for the SRO.	
BOP	Supplemental Actions: 1. If a channel has failed, perform the following: a. Refer to AOP-401.2 to trip all bistable associated with that channel. b. Refer to Technical Specification Table 3.3-3 for minimum channel requirements.	XCP-615 1-2
US	Enters AOP-401.2, PROTECTION CHANNEL RCS LOOP RTD FAILURE.	AOP-401.2
RO	1. Determine which RCS loop has a failed RTD by comparing loop ΔT and Tavg indicators.	AOP-401.2
EVALUATOR NOTE:	The RO should determine that TI-432D has failed.	AOP-401.2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event # 2	Page: 19 of 53
Event Description: RCS Loop C T _{HOT} RTD Fails low.				
Time/ Position	Applicant's Actions or Behavior			
RO	2. Ensure an operable loop is selected on ΔT TR-412 INPUT SEL Switch.			AOP-401.2
RO	3. Within <u>one</u> hour, verify P-12, Tavg LO-LO status light is in the required state for the existing plant conditions. Time of Failure _____ Time Permissives verified _____			AOP-401.2
US	4. Within 72 hours, have I&C place the failed channel in a tripped conditions using the appropriate attachment: • ATTACHMENT 1, PROTECTION CHANNEL RCS LOOP A RTD INSTRUMENTATION. • ATTACHMENT 2, PROTECTION CHANNEL RCS LOOP B RTD INSTRUMENTATION. • ATTACHMENT 3, PROTECTION CHANNEL RCS LOOP C RTD INSTRUMENTATION.			AOP-401.2
CREW	5. Determine and correct the cause of the channel failure.			AOP-401.2
US	Enters Tech Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 7; Overtemperature ΔT Three Loop Operation – Action 6. The inoperable channel must be placed in the tripped condition within 72 hours. Enters Tech Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 8; Overpower ΔT Three Loop Operation – Action 6. The inoperable channel must be placed in the tripped condition within 72 hours.			T.S. 3.3.1
US	Enters Tech Spec 3.3.2 Engineered Safety Feature Actuation System Instrumentation Table 3.3-3, Function 4.d; Steam Flow in Two Steam Lines – High COINCIDENT with Tavg – Low-Low - Action 24. This Tech Spec also requires the inoperable channel must be placed in the tripped condition within 72 hours.			T.S. 3.3.2
BOOTH OPERATOR:	When called to investigate the failure and trip the appropriate bistables as I&C, acknowledge the request.			

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event # 2 Page: 20 of 53
Event Description: RCS Loop C T_{HOT} RTD Fails low.

Time/ Position Applicant's Actions or Behavior

AOP-401.2
REVISION 3
ATTACHMENT 3
PAGE 1 of 1

Attachment 3

PROTECTION CHANNEL RCS LOOP C RTD INSTRUMENTATION

TRIPPED BISTABLE STATUS

INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT
LOOP C	TB-432-B-1	C3-721-BS-1	CHAN III LP C OPΔT
	TB-432-B-2	C3-721-BS-2	CHAN III W/DRWL ROD BLCK
ITE00432-B1	TB-432-C-1	C3-721-BS-3	CHAN III LP C OTΔT
ITE00432-B2	TB-432-C-2	C3-721-BS-4	CHAN III W/DRWL ROD BLCK
ITE00432-B3	TB-432-D-1	C3-722-BS-2	CHAN III RCS LP C TAVG LO
ITE00432-D	TB-432E	C3-722-BS-1	CHAN III LP C P-12

R&R# _____

TRIP

APPLICABLE STPS	STP # USED TO TRIP BISTABLE	TRIP STATUS LIGHT ON	TRIPPED BY	VERIFIED BY
302.003				
345.003				

RESTORATION

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

REVIEWED BY: _____ /
SHIFT MANAGER DATE

TECH SPECS

TABLE 3.3-1 ITEMS 7, 8

TABLE 3.3-3 ITEMS 4.d, 9.b

EVALUATOR NOTE: The next event will be initiated at the discretion of the Lead Examiner.

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2 Event # 3		Page: 21 of 53
Event Description: Service Water Pump "B" bearing failure (Non-Active Train).				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	On cue from the examiner, the "B" Service Water Pump bearing will fail causing an indication of a pump overload that will require the candidates to trip the pump. The crew will enter AOP-117.1, LOSS OF SERVICE WATER and rack up the "C" Service Water Pump to restore cooling.			
BOOTH OPERATOR:	When directed – initiate Event 3 (TRIGGER 3).			
Symptoms/ Cues:	• XCP-605 1-3, SWP B/C MOTOR OVRLD If Pump Trips before securing: • XCP-605 1-2, SWP B/C TRIP • XCP-605 1-4, SWP B/C DISCH PRESS LO			
US	Corrective Actions: 1. If total flow is excessive, reduce flow to all components with excessive flow. 2. If the overload condition cannot be cleared, stop the overloaded pump. 3. Place the spare Service Water Pump in service per SOP-117.			XCP-605 1-3
US	Corrective Actions: 1. Place the spare Service Water Pump in service per SOP-117.			XCP-605 1-2
EVALUATOR NOTE:	The US may choose to take actions per AOP-117.1, LOSS OF SERVICE WATER. Actions of AOP-117.1 are on Page 45 of 52 for reference.			
BOOTH OPERATOR:	When called to investigate the cause of the "B" SW Pump failure, wait 1 minute and report back the motor is hot to the touch. If called to investigate the "B" SW Pump breaker, wait 1 minute and report back nothing wrong with the breaker. If called to silence the HVAC alarm, wait 1 minute and report the "B" Chiller High Temperature alarm came in (XCP-6210-LCB8 8-22, "HIGH TEMP").			
Crew	Enters SOP-117, SECTION III.F, SHIFTING LOOP B SERVICE WATER PUMPS			

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event # 3	Page: 22 of 53
Event Description: Service Water Pump "B" bearing failure (Non-Active Train).				
Time/ Position	Applicant's Actions or Behavior			
RO/BOP	2.1 Shift from Service Water Pump B to Service Water Pump C in service, as follows: a. With the exception of racking down XSW1EB 04, SERVICE WATER PUMP XPP0039B-SW, complete Attachment VI.			
EVALUATOR NOTE:	SOP-117 Att. VI is not in the simulator. When requested, provided a blank copy to the crew.			
BOOTH OPERATOR:	When requested to complete SOP-117 Attachment VI with the exception of racking down the "B" SW PP breaker, wait 2 minutes and insert TRIGGER 10.			
BOOTH OPERATOR:	XVT-3157C/3158C ARE not modeled in the simulator. When requested, wait 1 minute and report actions complete.			
RO/BOP	b. Close XVT03158C-SW, SW PP C MTR LOWER BRG CLG WTR SUP VALVE (SW-436).			
RO/BOP	c. Start XPP-0039C, PUMP C TRAIN B.			
RO/BOP	d. Ensure sufficient Service Water Pump C cooling water flow by throttling XVT03158C-SW, SW PP C MTR LOWER BRG CLG WTR SUP VALVE, to obtain lower bearing flow between 3 gpm and 4 gpm (SW-436).			
RO/BOP	e. Verify MVB-3116C, SWP C DISCH, automatically opens.			
RO/BOP	f. Ensure Service Water Pump C cooling water flow has remained between 3 gpm and 4 gpm. If not throttle XVT03158C-SW, SW PP C MTR LOWER BRG CLG WTR SUP VALVE as necessary (SW-436).			
RO/BOP	g. Ensure sufficient Service Water Pump C cooling water flow by throttling XVT03157C-SW, SW PP C MTR UPPER BRG CLG WTR SUP VALVE, to obtain upper bearing flow between 10 gpm and 12 gpm (SW-436).			
RO/BOP	h. At XPN-13, C SERVICE WATER SCREEN, Control Panel (SW-436), verify proper traveling screen operation as follows: 1) Place the Screen Selector in HAND. 2) Verify proper screen operation and screen wash flow. 3) Place the Screen Selector Switch in AUTO.			

 SOP-117
Section III.F

Section III.F

Section III.F

Section III.F

Section III.F

Section III.F

Section III.F

Section III.F

Section III.F

Section III.F

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event # 3	Page: 23 of 53
Event Description: Service Water Pump “B” bearing failure (Non-Active Train).				
Time/ Position		Applicant’s Actions or Behavior		
BOOTH OPERATOR:		The Service Water Screen is not modeled in the simulator. When requested to complete Step 2.1.h, wait 2 minutes and report back completion and proper operation of the “C” SW PP Screen.		
RO/BOP		i. Stop XPP-0039B, PUMP B, and place the control switch in PULL TO LK NON-A.		
RO/BOP		j. Verify MVB-3116B, SWP B DISCH, automatically closes.		
BOOTH OPERATOR:		The “B” SW PP is already secured and MVB-3116B is already closed.		
RO/BOP		k. Re-verify Service Water Pump C cooling water flow and adjust, as necessary, by throttling the following (SW-436): 1) XVT03157C-SW, SW PP C MTR UPPER BRG CLG WTR SUP VALVE, to obtain upper bearing flow between 10 gpm and 12 gpm. 2) XVT03158C-SW, SW PP C MTR LOWER BRG CLG WTR SUP VALVE, to obtain lower bearing flow between 3 gpm and 4 gpm.		
BOOTH OPERATOR:		When requested, “C” SW PP cooling water flow is sufficient, within the ranges given.		
RO/BOP		l. Rack down XSW1EB 04, SERVICE WATER PUMP XPP0039B-SW (SW-440).		
BOOTH OPERATOR:		When requested to rack down “B” SW Pump breaker, wait 2 minutes and insert TRIGGER 11.		
RO/BOP		m. At XPN-12, B SERVICE WATER SCREEN, Control Panel (SW-436), place the Screen Selector Switch to OFF.		
BOOTH OPERATOR:		“C” SW Screen is not modeled in simulator. When requested, report you have place the Screen Selector Switch to OFF.		
RO/BOP		n. Complete Attachment VI.		
EVALUATOR NOTE:		There are no additional actions to take per Attachment VI.		
RO/BOP		o. Adjust flow through service water loads, as necessary.		

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event # 3 Page: 24 of 53	
Event Description: Service Water Pump "B" bearing failure (Non-Active Train).	
Time/ Position	Applicant's Actions or Behavior
RO/BOP	p. Ensure proper Service Water flow through the operable Train B Chiller per SOP-501.
US	Enters Tech Spec 3.7.4. Action Statement requires: With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
EVALUATOR NOTE:	Once the crew has restored Service Water with the "C" Service Water pump and identified the Tech Spec, or at the Lead Examiner's discretion, the next event may be inserted.

Section III.F

T.S. 3.7.4

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event # 4 Page: 25 of 53
Event Description: Alternator Cooler Temperature Controller Failure.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner, the ALT COOLER TEMP controller will fail to 0 output. This will cause XCP-632 3-2 and XCP-632 3-3 to alarm. TI-4270 will be reading >120°F. The BOP will take manual control of this controller and return TI-4270 back into its normal control band. This will be performed in accordance with XCP-632 3-2. Alarm takes about 3.5 minutes to come in from the time the malfunction is inserted.
BOOTH OPERATOR:	When directed – initiate Event 4 (TRIGGER 4)
Symptoms/ Cues:	• XCP-632 3-2, ALT CLR TEMP HI/LO • XCP-632 3-3, GEN AUX PNL TRBL • TI-4270, ALT CLR TEMP °F
BOP	Corrective Actions: 1. Verify alternator temperature on TI-4270, ALT CLR TEMP °F. 2. Refer to Curve Book Figure VII-12 ALT COOLER TEMP (DEGF) to adjust ALT COOLER TEMP controller, as required. 3. Verify proper operation of ITV04270-TC, ALTERNATOR COOLER TEMP CNTRL VLV (TB-436).
BOP	Supplemental Actions: 1. Verify correct valve alignment per SOP-219. 2. If ITV04270-TC, ALTERNATOR COOLER TEMP CNTRL VLV (TB-436), has failed, throttle XVT03419-TC, ALT CLR TEMP CNTRL VLV BYPASS (TB-436), as necessary to control temperature. 3. Determine and correct the alarm cause.
EVALUATOR NOTE:	The BOP should take manual control of the Alternate Cooler Temperature Controller on the MCB and adjust in Manual to control temperature on TI-4270.

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event # 4 Page: 26 of 53
Event Description: Alternator Cooler Temperature Controller Failure.

Time/ Position	Applicant's Actions or Behavior
BOOTH OPERATOR:	When called as I&C to investigate the failure, acknowledge request. When called as AO to investigate XCP-632 3-3, GEN AUX PNL TRBL, wait 2 minutes and insert TRIGGER 12 and report back "ALTERNATOR AIR TEMP HIGH" alarm is in. TRIGGER 12 clears the MCB alarm.
EVALUATOR NOTE:	Once TI-4270 is back into its normal control band or at the Lead Examiner's discretion, the next event may be inserted.

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event # 5	Page: 27 of 53
Event Description: TCV-144, CCW to Letdown HX Controller Failure.				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	On cue from the Examiner the Controller for TCV-144, CCW to Letdown HX, fails low in AUTO. The controller will close the temperature control valve causing letdown temperature to rise. Annunciators XCP-613 1-2 DEMIN FLO DIVERT TEMP HI and XCP-603 1-5, LTDN/SL WTR HX FLO LO TEMP HI will be referenced. The RO will take manual control to restore CCW flow to the Letdown Heat Exchanger.			
BOOTH OPERATOR:	When directed – initiate Event 5 (TRIGGER 5)			
Symptoms/ Cues:	• XCP-613 1-2 DEMIN FLO DIVERT TEMP HI • XCP-603 1-5, LTDN/SL WTR HX FLO LO TEMP HI • TI-144, HX (CC CNTRL) TEMP °F • TI-143, HX (DIVERT CNTRL) °F			
RO	Corrective Actions: 1. If necessary, reduce Letdown flow to minimum by ensuring the 45 gpm orifice is in service and both 60 gpm orifices are isolated. 2. Verify proper operation of TCV-144, CC TO LTDN HX. 3. If necessary, place TCV-144, CC TO LTDN HX, in MAN and increase flow.			
BOOTH OPERATOR:	When called as I&C to investigate the failure, acknowledge request.			
EVALUATOR NOTE:	Once the RO has restored CCW flow to the Letdown Heat Exchanger and temperatures have stabilized or at the Lead Examiner's discretion, the next event may be inserted.			

XCP-613 1-2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event #6 Page: 28 of 53
 Event Description: Rising Temperatures on XTF-2, UNIT AUX TRANSFORMER.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner, XCP-633 6-3, UNIT AUX XFMR XTF-2 TRBL will come into alarm. The crew will send an AO out to inspect the transformer. Winding temperatures will be reported back as 122°C and slowly rising. In accordance with XCP-633 6-3, the BOP will transfer loads to the emergency auxiliary transformer per SOP-304. Once this has occurred, temperatures will lower on XTF-2 and the alarm will be cleared.
BOOTH OPERATOR:	When directed – initiate Event 6 (TRIGGER 6)
Symptoms/ Cues:	XCP-633 6-3, UNIT AUX XFMR XTF-2 TRBL
US	Corrective Actions: 1. If a trip occurs, refer to UNIT AUX DIFF LCKOUT 86T2-1 (XCP-639 3-2). 2. Dispatch an Operator to XTF0002, UNIT AUXILIARY TRANSFORMER, to determine the cause of the alarm. If necessary, contact PSE/Substation Maintenance for assistance. 3. Notify the System Controller.
BOOTH OPERATOR:	When sent as AO to investigate XTF-2 Trouble Alarm, wait 1 minute and report back that Winding Temperature is 122°C and slowly rising. Oil Temperature is 101°C and slowly rising. No pumps or fans are running. If the crew asks for updated temperature BEFORE BOP Buses have been transferred to alternate power, increase Winding and Oil Temperature by 1°C every 5 minutes NOT TO EXCEED 105°C for Oil Temperature or 135°C for Winding Temperature (these are Reactor Trip Setpoints). If called as System Control about the grid, report that the grid is stable.

XCP-633 6-3

XCP-633 6-3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event #6	Page: 29 of 53
Event Description: Rising Temperatures on XTF-2, UNIT AUX TRANSFORMER.				
Time/ Position	Applicant's Actions or Behavior			
US	Supplemental Actions: 1. If oil temperatures exceed 100° C or winding temperatures exceed 120° C, transfer loads to the Emergency Auxiliary Transformers per SOP-304, 115KV/7.2KV Operations. 2. If oil temperatures exceed 105° C or winding temperatures exceed 135° C, trip the plant per EOP-1.0, E-0, Reactor Trip Or Safety Injection, or AOP-214.1, Turbine Trip, and de-energize XTF0002, UNIT AUXILIARY TRANSFORMER, per SOP-302, 230 KV Substation. 3. Perform ISP-032, Large Power Transformer Hazardous Zone Traffic Exclusion, to keep people clear. 4. When the cause has been corrected, verify XTF0002, UNIT AUXILIARY TRANSFORMER, auxiliaries are returned to normal operation per SOP-302, 230 KV Substation.			XCP-633 6-3
EVALUATOR NOTE:	The crew should transfer BOP Buses to alternate power per SOP-304, 115KV/7.2KV OPERATIONS.			
BOP	Enters SOP-304, 115KV/7.2KV OPERATIONS, Section IV.A, TRANSFERRING BOP BUSES FROM NORMAL TO ALTERNATE FEED.			SOP-304
BOP	<u>INITIAL CONDITIONS</u> 1.1 XTF0031 and XTF0032, EMERGENCY AUXILIARY TRANSFORMER #1 and #2, are in service per SOP-302. 1.2 Conditions exist which require removal of normal feed for the buses. 1.3 XTF0001, MAIN TRANSFORMER, and XTF0002, UNIT AUXILIARY TRANSFORMER, are in service per SOP-302.			SOP-304
	<u>CAUTION 2.0</u> For the protection of equipment, parallel operations should be kept to a minimum with both normal and alternate feeder breakers closed. Due to the fact that with both breakers closed, currents may exceed long term overcurrent trip setpoints. Trips may occur in 40 to 100 seconds. The bus ammeters will peg high due to the CTs seeing the sum of both the applicable BOP bus and XTF0002 being in parallel.			SOP-304
BOP	2.1 Verify the applicable bus voltage from Enclosure B is within the limits for the oncoming configuration.			SOP-304

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event #6 Page: 30 of 53
Event Description: Rising Temperatures on XTF-2, UNIT AUX TRANSFORMER.

Time/ Position	Applicant's Actions or Behavior

BOP	2.2 If required, have the System Controller adjust the 115KV and/or 230KV voltages for the oncoming configuration prior to transferring BOP buses.	SOP-304
	<u>NOTE 2.3 through 2.5</u> a. When BUS 1A, 1B, or 1C is aligned to its alternate feed, automatic transfer to its normal feed is not available. b. When transferring the bus, there is a delay while the bus synchronizes. Hold the switch in the closed position until the breaker closes.	SOP-304
BOP	2.3 Manually transfer Bus 1A to alternate feed as follows: a. Place BUS 1A AUTO-MAN XFER Switch in MAN. b. Close BUS 1A ALT FEED breaker. (PEER ✓) c. Open BUS 1A NORM FEED breaker. (PEER ✓) d. Verify BUS 1A potential lights remain lit. e. Place BUS 1A AUTO-MAN XFER Switch in AUTO. (PEER ✓)	SOP-304
BOP	2.3 Manually transfer Bus 1B to alternate feed as follows: a. Place BUS 1B AUTO-MAN XFER Switch in MAN. b. Close BUS 1B ALT FEED breaker. (PEER ✓) c. Open BUS 1B NORM FEED breaker. (PEER ✓) d. Verify BUS 1B potential lights remain lit. e. Place BUS 1B AUTO-MAN XFER Switch in AUTO. (PEER ✓)	SOP-304
BOP	2.5 Manually transfer BUS 1C to alternate feed as follows: a. Ensure the following annunciators on Panel XCP-638 are clear: 1) 3-5, XTF31 OPC. 2) 3-6, XTF31 OPIS TRBL. b. Place BUS 1C AUTO-MAN XFER Switch in MAN. c. Close BUS 1C ALT FEED breaker. (PEER ✓) d. Open BUS 1C NORM FEED breaker. (PEER ✓) e. Verify BUS 1C potential lights remain lit. f. Place BUS 1C AUTO-MAN XFER Switch in AUTO. (PEER ✓)	SOP-304

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event #6 Page: 31 of 53
Event Description: Rising Temperatures on XTF-2, UNIT AUX TRANSFORMER.

Time/ Position	Applicant's Actions or Behavior

BOP	2.6 If required, adjust the 115KV and/or 230KV alarm setpoints per Attachment VA and/or Attachment VB for the current lineup.	SOP-304
BOP	2.7 Notify the System Controller of the applicable bus voltage limits from Enclosure B.	SOP-304
BOOTH OPERATOR:	If contacted after BOP Buses have been transferred for an update in XTF-2 Winding and Oil Temperature, report 1°C lower temperature than most recent report and slowly lowering.	
EVALUATOR NOTE:	Once BOP loads have been transferred to the emergency auxiliary transformer, the next event will automatically insert after 30 seconds.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event #7	Page: 32 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	An Earthquake will occur, this will cause the faulted Steam Generators and an ATWS.			
BOOTH OPERATOR:	Auto initiate Event 7 (TRIGGER 7)			
Symptoms/ Cues	- Both Reactor Trip breakers – RED light lit and GREEN light dim. - XCP-626 4-4, TURB TRIP - XCP-638 4-5, RB FOUND SEIS SWITCH OBE EXCEED - XCP-638 4-6, SEIS RCDR SYS START/PWR LOSS - XCP-638 5-6, SEIS RESPNS SPECTRUM ANNUN TRBL			
EVALUATOR NOTE:	Due to the seismic event, the crew may take actions from AOP-610.1, SEISMIC EVENT RESPONSE. Steps from AOP-610.1 are included on Page 47 of 52 for reference. These actions are not required to be performed.			
US	Directs RO and BOP to perform immediate actions of EOP-1.0, REACTOR TRIP OR SAFETY INJECTION.			
US	Enters EOP-1.0, E-0 Reactor Trip or Safety Injection.			
EVALUATOR NOTE:	Critical Task is to manually trip the reactor when it fails to AUTO trip with three faulted Steam Generators before SG WR < 12%.			
RO (IOA) Critical Task	1. Verify Reactor Trip: - Trip the Reactor using both Reactor Trip Switches. - 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
RO (IOA)	2. Verify Turbine/Generator Trip: a. Verify all Turbine STM STOP VLVs are closed. b. Ensure Generator Trip (after 30 second delay): 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
RO (IOA)	3. Verify both ESF buses are energized.			EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event #7 Page: 33 of 53
 Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.

Time/ Position	Applicant's Actions or Behavior
RO (IOA)	4. Check if SI is actuated: a. Check if either: • 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.
	REFERENCE PAGE FOR EOP-1.0 1 <u>RCP TRIP CRITERIA</u> a. <u>IF</u> Phase B Containment Isolation has actuated (XCP-612 4-2), <u>THEN</u> trip <u>all</u> RCPs. b. <u>IF both</u> of the following conditions occur, <u>THEN</u> trip <u>all</u> RCPs: • SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. <u>AND</u> • RCS Wide Range pressure is LESS THAN 1418 psig. 2 <u>REDUCING CONTROL ROOM EMERGENCY VENTILATION</u> 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. 3 <u>MONITOR SPENT FUEL COOLING</u> Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery: • Spent Fuel Pool level. • Spent Fuel Pool temperature. 4 <u>RUPTURED STEAM GENERATOR</u> <u>IF</u> a RUPTURED Steam Generator has been positively identified, <u>THEN</u> throttle EFW to the RUPTURED Steam Generator <u>WHEN</u> its Narrow Range Level is GREATER THAN 26%[41%]. 5 <u>FAULTED STEAM GENERATOR</u> • <u>IF</u> a FAULTED Steam Generator has been positively identified, <u>THEN</u> isolate EFW to the faulted Steam Generator as soon as possible <u>UNLESS all three</u> Steam Generators are FAULTED. • <u>IF all three</u> Steam Generators are FAULTED, <u>THEN</u> throttle EFW flow to <u>all three</u> Steam Generators to 50 gpm.

EOP-1.0

EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event #7	Page: 34 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.				
Time/ Position	Applicant's Actions or Behavior			
BOP	6. Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.			
EVALUATOR NOTE:	Attachment 3 can be found on Page 42 of 52 for reference.			
EVALUATOR NOTE:	Per the Reference Page, the crew should call for a local operator to reduce Control Emergency Ventilation to one train running within 30-minutes of the Safety Injection.			
US	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.			
RO	9. Check RCS temperature: - With any RCP running, RCS Tavg is stable at OR trending to 557°F. (NO) - OR - With no RCP running, RCS Tcold is stable at OR trending to 557°F.			
RO	Alternative Action Step: 9. IF RCS temperature is LESS THAN 557°F AND decreasing, THEN stabilize temperature by performing the following as required: - Close IPV-2231, MS/PEGGING STM TO DEAERATOR. - Perform one of the following: - IF Narrow Range SG level is LESS THAN 26% [41%] in all SGs, THEN reduce EFW flow as necessary to stop cooldown, while maintaining total EFW flow GREATER THAN 450 gpm. - OR - WHEN Narrow Range SG level is GREATER THAN 26% [41%] in at least one SG, THEN control EFW flow as necessary to stabilize RCS temperature at 557°F. - Initiate ATTACHMENT 6, STEAM VALVE ISOLATION, while continuing with this procedure. - IF RCS cooldown continues, THEN close: - MS Isolation Valves, PVM-2801A(B)(C). - MS Isolation Bypass Valves, PVM-2869A(B)(C).			

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event #7	Page: 35 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.				
Time/ Position		Applicant's Actions or Behavior		
RO	10. Check PZR PORVs and Spray Valves: a. PZR PORVs are closed. b. PZR Spray Valves are closed. c. Verify power is available to at least one PZR PORV Block Valve: - MVG-8000A, RELIEF 445 A ISOL. - MVG-8000B, RELIEF 444 B ISOL. - MVG-8000C, RELIEF 445 B ISOL. d. Ensure one of the following Block Valves is open unless it was closed to isolate an open PZR PORV: - MVG-8000A, RELIEF 445 A ISOL. - MVG-8000B, RELIEF 444 B ISOL.			
NOTE - Step 11 Seal Injection flow should be maintained to all RCPs.				
RO	11. Check if RCPs should be stopped: a. Check if either of the following criteria is met: - 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.			
RO	12. Verify no SG is FAULTED: - No SG pressure is decreasing in an uncontrolled manner. (NO) - No SG is completely depressurized.			
RO	Alternative Action Step: 12. GO TO EOP-3.0, E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.			
EVALUATOR NOTE:	The crew may have a red path on Heat Sink because IF they throttled EFW flow to <450 gpm. If so, they will transition to EOP-15.0, Response to Loss of Secondary Heat Sink. They will read a Caution at the beginning of the procedure and immediately transition out of EOP-15.0 because they throttled EFW on purpose.			
US/CREW	Notifies a Red Path on Heat Sink and transitions to EOP-15.0, Response to Loss of Secondary Heat Sink.			

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2 Event #7		Page: 36 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.				
Time/ Position		Applicant's Actions or Behavior		
CAUTION				
- If total EFW flow is LESS THAN 450 gpm due to operator action, this procedure should NOT be performed, since these actions are NOT appropriate if 450 gpm EFW flow is available. - If a NON-FAULTED SG is available, feed flow should NOT be reestablished to any FAULTED SG, to prevent thermal shock to SG tubes.				
US	Transitions out of EOP-15.0 into EOP-3.0, E-2 Faulted Steam Generator Isolation.			
BOP	1. Ensure all the following are closed: - MS Isolation Valves, PVM-2801A(B)(C). - MS Isolation Bypass Valves, PVM-2869A(B)(C).			
BOOTH OPERATOR:	When contacted to shut MSIVs, Wait 2 minutes and report back that you were unable to close the MSIVs.			
BOP	2. Check if any SG is NON-FAULTED: - Pressure in any SG is stable OR increasing. (NO) - Any SG is NOT completely depressurized.			
BOP	Alternative Action Step: 2. IF all SG pressures are decreasing in an uncontrolled manner OR completely depressurized, THEN GO TO EOP-3.1, ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, Step 1.			
US	Enters EOP-3.1, ECA-2.1 Uncontrolled Depressurization of all Steam Generators.			

EOP-15.0

EOP-3.0

EOP-3.0

EOP-3.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 37 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

REFERENCE PAGE FOR EOP-3.1

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].

OR

- PZR level can NOT be maintained GREATER THAN 10% [28%].

2 SECONDARY INTEGRITY TRANSITION CRITERION

IF any SG pressure increases at any time, except while performing SI Termination in Steps 13 through 18, THEN GO TO EOP-3.0, E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

3 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, E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

4 COLD LEG RECIRCULATION TRANSITION CRITERION

IF RWST level decreases to LESS THAN 18%, THEN GO TO EOP-2.2, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, 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.

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event #7 Page: 38 of 53	
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.	
Time/ Position	Applicant's Actions or Behavior
BOP	1. Isolate secondary pressure boundaries for all SGs: a. Close all of the following valves: • MS Isolation, PVM-2801A(B)(C). • MS Isolation Bypass, PVM-2869A(B)(C). • FW Flow Control, FCV-478(488)(498). • FW Isolation, PVG-1611A(B)(C). • SG Blowdown, PVG-503A(B)(C). • FW Flow Control Bypass, FCV-3321(3331)(3341). CAUTION - Step 1.b 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. b. Complete isolation of all SGs: 1. Close all the following valves: • SG Chemical Feed Isolation, MVK-1633A(B)(C). • MS Drain Isolation, PVT-2843A(B)(C) PVT-2877A(B). 2. Locally open the following breakers: • XMC1DA2X 05EH, EF PUMP MAIN STEAM BLOCK VLV XVG2802A-MS (IB-463). • XMC1DB2Y 05EH, EMERG FEEDWATER PUMP MAIN STEAM BLOCK XVG2802B-MS (AB-463). 3. Locally close the following valves (IB-436 East Pen): • XVG02802A-MS, MS HEADER B EF PUMP TURBINE SUPPLY VLV. • XVG02802B-MS, MS HEADER C EF PUMP TURBINE SUPPLY VLV. 4. Place all Steamline PWR RELIEF A(B)(C) SETPT Controllers in MAN and closed. 5. Place all Steamline Power Relief A(B)(C) Mode Switches in PWR RLF.
BOOTH OPERATOR:	When contacted to locally open breakers and close 2802A/B, wait 3 minutes, use the LOAs on the LOA RESET PANEL to open the breakers and close the valves, Then report back "I've opened the breakers for 2802A/B and have closed both valves".

EOP-3.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2 Event #7		Page: 39 of 53	
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.					
Time/ Position		Applicant's Actions or Behavior			
CAUTION - Step 2 A minimum EFW flow of 50 gpm must be maintained to each SG that has a Narrow Range level LESS THAN 26% [41%], to minimize thermal shock to SG components.					EOP-3.1
NOTE – Step 2 Shutdown margin should be monitored during RCS cooldown.					EOP-3.1
BOP	2. Ensure the RCS cooldown is minimized: a. Place MD EFP RESET to RESET. b. Place TD EFP RESET to RESET. c. Verify the cooldown rate in the RCS Cold Legs is LESS THAN 100°F/hr. d. Verify Narrow Range level in all SGs is LESS THAN 60%. e. Verify RCS Thot is stable OR decreasing.				EOP-3.1
NOTE - Step 3 Seal Injection flow should be maintained to all RCPs.					EOP-3.1
RO	3. Check if RCPs should be stopped: a. Verify annunciator XCP-612 4-2 is NOT lit (PHASE B ISOL). b. Check if RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. NOTE - Step 3.c RCPs should NOT be stopped if the RCS pressure decrease is due solely to the cooldown. c. Stop all RCPs.				EOP-3.1
RO	4. Check PZR PORVs and Block Valves: a. Verify power is available to the PZR PORV Block Valves: 1. MVG-8000A, RELIEF 445 A ISOL. 2. MVG-8000B, RELIEF 444 B ISOL. 3. MVG-8000C, RELIEF 445 B ISOL. CAUTION - Step 4.b If any PZR PORV opens because of high PZR pressure, Step 4.b should be repeated after pressure decreases to LESS THAN 2330 psig, to ensure the PORV recloses. b. Verify all PZR PORVs are closed. c. Verify at least one PZR PORV Block Valve is open.				EOP-3.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 40 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

RO	5. Reset both SI RESET TRAIN A(B) Switches.	EOP-3.1
RO	6. Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.	EOP-3.1
NOTE - Step 7 Any high radiation level received on a radiation monitor that was unisolated at event initiation, may be considered a valid alarm.		EOP-3.1
BOP	7. Check if Secondary radiation levels are normal: a. Check radiation levels normal on all unisolated radiation monitors: • RM-G19A(B)(C), STMLN HI RNG GAMMA. • RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR. • RM-L10, SG BLOWDOWN CW DISCHARGE LIQUID MONITOR. • RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR. b. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO. c. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.	EOP-3.1
CAUTION - Step 8 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.		EOP-3.1
RO	8. Check if RHR Pumps should be stopped: a. Check if any RHR Pump is running with suction aligned to the RWST. b. Check RCS pressure: 1. RCS pressure is GREATER THAN 325 psig. 2. RCS pressure is stable OR increasing. c. Stop any RHR Pump which is running with suction aligned to the RWST and place in Standby.	EOP-3.1
BOP	9. Verify RWST level is GREATER THAN 18%.	EOP-3.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event #7 Page: 41 of 53
 Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.

Time/ Position	Applicant's Actions or Behavior	
RO	10. Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Verify PI-8342, INSTR AIR HDR PRESS PSIG, indicates GREATER THAN 60 psig. c. Open PVA-2659, INST AIR TO RB AIR SERV. d. Open PVT-2660, AIR SPLY TO RB.	EOP-3.1
RO	11. Check if SI Accumulators should be isolated: a. Verify RCS pressure is LESS THAN 315 psig. (NO)	EOP-3.1
RO	Alternative Action Step: 11. Check if SI Accumulators should be isolated: a. WHEN RCS pressure is LESS THAN 315 psig, THEN COMPLETE Step 11. CONTINUE WITH Step 12.	EOP-3.1
RO	12. Check if SI flow should be reduced: a. Verify RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 52.5°F [67.5°F]. b. Verify RCS pressure is stable OR increasing. NOTE - Step 12.c If PZR level is LESS THAN 10% [28%], the PZR should refill from SI flow after pressure is stabilized. c. Verify PZR level is GREATER THAN 10% [28%].	EOP-3.1
RO	13. Stop all but one Charging Pump and place in Standby.	EOP-3.1
RO	14. Verify RCS pressure is stable OR increasing.	EOP-3.1
RO Critical Task	15. Establish Normal Charging: a. Close FCV-122, CHG FLOW. b. Open both MVG-8107 and MVG-8108, CHG LINE ISOL. c. Adjust FCV-122, CHG FLOW, to obtain 70 gpm Charging flow. d. Close both MVG-8801A(B), HI HEAD TO COLD LEG INJ.	EOP-3.1
RO	16. Control FCV-122, CHG FLOW, to maintain PZR level between 22% [39%] and 76% [69%].	EOP-3.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 2	Event #7	Page: 42 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	Critical Task is to control the EFW flowrate (minimum of 50 gpm to each SG < 26% level) and terminate SI, in order to minimize the RCS cooldown rate before a severe (orange-path) challenge develops to the Integrity Critical Safety Function Status Tree.			
EVALUATOR NOTE:	The scenario may be terminated once the crew has terminated Safety Injection in accordance with EOP-3.1 or at the discretion of the Lead Examiner			

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 43 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

EVALUTOR NOTE:	THESE ARE THE STEPS OF EOP-1.0, ATTACHMENT 3	
BOP	1. 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.	EOP-1.0 Attachment 3
BOP	2. 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.	Attachment 3
BOP	3. Verify total EFW flow is GREATER THAN 450 gpm.	Attachment 3
BOP	4. 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.	Attachment 3
BOP	5. Ensure SI Pumps are running: • Two Charging Pumps are running. • Both RHR Pumps are running.	Attachment 3
BOP	6. Ensure two RBCU Fans are running in slow speed (one per train).	Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 44 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

BOP	7. Verify Service Water flow to RBCUs: a. Ensure Service Water Pump A is running. b. Check if Service Water Booster Pump A is running. c. GO TO Step 7.f. f. Ensure Service Water Pump B is running. g. Check if Service Water Booster Pump B is running. h. GO TO Step 7.k. k. Verify GREATER THAN 2000 gpm flow for each train on: (NO) • FI-4466, SWBP A DISCH FLOW GPM. • FI-4496, SWBP B DISCH FLOW GPM.	Attachment 3
BOP	8. Ensure one CCW pump per train is running.	Attachment 3
BOP	9. Ensure two Chilled Water Pumps and Chillers are running.	Attachment 3
BOP	10. Verify both trains of Control Room Ventilation are running in Emergency Mode.	Attachment 3
BOP	11. 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).	Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 45 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

BOP	12. Ensure Excess Letdown Isolation Valves are closed: • PVT-8153, XS LTDN ISOL. • PVT-8154, XS LTDN ISOL.	Attachment 3
BOP	13. 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.	Attachment 3
BOP	14. Verify proper SI alignment: a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104. b. Verify <u>all</u> SAFETY INJECTION monitor lights are dim on XCP-6106. c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. d. Check if RCS pressure is LESS THAN 325 psig.	Attachment 3
BOP	14.d. ALTERNATIVE ACTION Notify the CRS that ATTACHMENT 3, SI EQUIPMENT VERIFICATION, is complete.	Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 46 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

EVALUTOR NOTE	These are steps for AOP-118.1, LOSS OF COMPONENT COOLING WATER.	
	<u>NOTE</u> <u>IF</u> a reactor trip occurs, <u>THEN</u> this procedure should be continued concurrently with the recovery actions of EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION.	AOP-117.1
RO	1. Check if <u>any</u> Service Water Loop is operating: • Stable PUMP AMPS. • Pump Discharge Pressure indicated.	AOP-117.1
RO	2. Check if Service Water loop A is in service: • <u>One</u> Service Water Loop A pump is running. • Service Water loop A discharge pressure is GREATER THAN Service Water loop B discharge pressure.	AOP-117.1
RO	3. Check if A Train is the Active Train.	AOP-117.1
EVALUATOR NOTE:	The RO determines that the Service Water Loop A is in service as the Active Train.	
RO	4. Perform the following: a. Place XPP0045B, SW BOOSTER PUMP B in Pull to Lock. b. Open PVG-3105B-SW, FS TO DG B. c. Verify GREATER THAN 370 gpm Fire Service flow through the B Diesel Generator coolers on FM-4492, B CLG (IUR14401, M4/SW 6-2).	AOP-117.1
RO	5. Shift Loop B Service Water Pumps to the standby pump running. REFER TO SOP-117, SERVICE WATER SYSTEM. 6. GO TO Step 10.	AOP-117.1
	<u>NOTE – Step 10</u> SI or Blackout signal disables the SW screen wash system. Local action to wash the Service Water traveling screens will be ineffective until the associated ESF LOADING SEQ A(B) RESETS is taken to NON-ESF LCKOUTS.	AOP-117.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 47 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

RO	10. Verify the Active Train Service Water Pump discharge pressure is GREATER THAN 50 psig.	AOP-117.1
RO	11. Check if Component Cooling Water temperatures are stable <u>OR</u> decreasing.	AOP-117.1
RO	12. Verify A Service Water Loop is operating.	AOP-117.1
RO	13. Place PVG-3105A-SW, FS TO DG A in AUTO.	AOP-117.1
RO	14. Restore A Service Water Booster Pump as follows: a. Verify <u>both</u> of the following: - XVB-3107A, RBCU 64A/65A RTN TO SW PND is closed. <u>AND</u> - Alarm XCP-604 1-5 XVB3107A-SW SLOW CLOSURE is <u>NOT</u> lit. b. Place XPP0045A, SW BOOSTER PUMP A in standby.	AOP-117.1
RO	15. Verify B Service Water Loop is operating.	AOP-117.1
US	15. ALTERNATIVE ACTION GO TO Step 18.	AOP-117.1
RO	18. Check if Service Water loop A is in service.	AOP-117.1
RO	19. Check if Service Water loop B is in service.	AOP-117.1
US	19. ALTERNATIVE ACTION RETURN to Step 3.	AOP-117.1
US	Enters Tech Spec 3.7.4. Action Statement requires: With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.	T.S. 3.7.4
BOOTH OPERATOR:	When requested to complete SOP-117 Attachment VI with the exception of racking down the "B" SW PP breaker, wait 2 minutes and insert TRIGGER 10.	
BOOTH OPERATOR:	When requested to rack down "B" SW Pump breaker, wait 2 minutes and insert TRIGGER 11.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 48 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

EVALUTOR NOTE	These are steps for AOP-610.1, SEISMIC EVENT RESPONSE.
	<u>NOTE</u> • <u>IF</u> a reactor trip occurs or is required during the performance of this procedure, <u>THEN</u> EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION should be performed while continuing with this procedure. • A "Felt" earthquake is defined as a vibratory ground motion that is of sufficient intensity that it is felt at the station and recognized as an earthquake based on the consensus of the Control Room staff.
RO/BOP	1. Verify a Seismic Event has occurred by report of Earthquake felt in the plant and confirmed by <u>one</u> of the following: • Control room indication of degraded performance of <u>any</u> safety related structure, system, or component. <u>OR</u> • National Earthquake Information Center. <u>NOTE – Step 1.a</u> The USGS Earthquake website can also be found using Google search. a. Via Website: 1) Enter earthquake.usgs.gov/earthquakes in the browser address window. 2) Select the Latest Earthquakes or appropriate link. b. Via Telephone: 1) Call (303) 273-8500. 2) Select Option #3. 3) Provide analyst with the following VCSNS coordinates: • 34° 17' 54.1" North latitude. • 81° 18' 54.6" West longitude. <u>OR</u> • Main Control Board Alarms: a. XCP-638 4-5, RB FOUND SEIS SWITCH OBE EXCEED. b. XCP-638 4-6, SEIS RCDR SYS START/PWR LOSS. c. XCP-638 5-6, SEIS RESPNS SPECTRUM ANNUN TRBL. <u>OR</u> • The University of South Carolina Geosciences Department at (803) 777-6449.

AOP-610.1

AOP-610.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 49 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

RO/BOP	2. Verify stable plant conditions: a. Reactor Power is stable. b. ΔT Power is stable. c. <u>No</u> Steam Flow Feed Flow mismatch exists. d. Main Turbine Load is stable.	AOP-610.1
RO/BOP	3. Initiate walkdown of MCB, REFER TO ATTACHMENT 1, MAIN CONTROL BOARD WALKDOWN.	AOP-610.1
RO/BOP	4. <u>IF</u> necessary, <u>THEN</u> suspend ALL Core Alterations and direct the RB Coordinator to establish Containment Integrity.	AOP-610.1
RO/BOP	5. Evaluate conditions for implementing the Emergency Plan. REFER TO VCS-EPP-001, CLASSIFICATION OF EMERGENCIES: - EAL – HU2.1. - EAL – SA9.1. - EAL – CA6.1.	AOP-610.1
RO/BOP	6. Direct the Shift Engineer to perform the following: a. Complete ATTACHMENT 2, SEISMIC EVENT CONTROL ROOM OBSERVATIONS. b. Have the alarms on the Seismic Monitor Panel reset. c. Direct I&C personnel to obtain the printout at XPN-6041-EI, EARTHQUAKE MONITORING PANEL (CB-436) and promptly deliver it to the Control Room. d. Direct I&C personnel to retrieve seismic data and calibrate instrumentation as outlined in ICP-391.010, SEISMIC MONITORING SYSTEM DATA RETRIEVAL.	AOP-610.1
BOOTH OPERATOR:	If called as I&C, acknowledge request.	AOP-610.1
RO/BOP	7. Verify the Operating Basis Earthquake has been exceeded based on <u>one</u> of the following: <u>One</u> or more of the red OBE indicating lights are illuminated on IYA 1780, RX BLDG FOUNDATION MATT DETECTOR in <u>any</u> direction at a frequency between 2 Hz and 10 Hz. <u>OR</u> - XCP-638 4-5, RB FOUND SEIS SWITCH OBE EXCEED is in alarm. <u>OR</u> - Evaluation of the earthquake printout.	AOP-610.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 50 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

RO/BOP	8. Perform Safe Shutdown Equipment Walkdowns outside the control Room: • ATTACHMENT 4, CONTROL BUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN. • ATTACHMENT 5, TURBINE BUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN. • ATTACHMENT 7, INTERMEDIATE BUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN. • ATTACHMENT 6, AUXILIARY BUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN.	AOP-610.1
BOOTH OPERATOR:	When called as local operators to complete plant walkdowns, wait 5-minutes and report separately from each building completion with no equipment damage noted.	AOP-610.1
US	9. Perform an assessment of <u>any</u> damage incurred based on MCB and Plant walk downs performed in Step 8. <u>WHEN</u> the damage assessment is complete, <u>THEN</u> complete Step 10. CONTINUE WITH Step 11.	AOP-610.1
	<u>NOTE – Step 10</u> If the seismic instrumentation indicates OBE exceedance, yet the plant suffers only minor damage based on plant walkdowns, a decision to shutdown should be further discussed with plant management staff. In any case it is expected that this decision will be made within eight hours of the earthquake occurrence.	AOP-610.1
US	10. With plant management concurrence, determine if a shut down to at least Mode 3 is required. REFER TO GOP-4B, POWER OPERATION (MODE 1 - DESCENDING).	AOP-610.1
RO/BOP	11. Check the Spent Fuel Pool Cooling Pump(s): a. Check if at least <u>one</u> Spent Fuel Cooling Pump is running. b. Verify annunciator XCP-608(609) 1-4 is <u>NOT</u> lit (SF HX A(B) FLO LO). c. Verify annunciator XCP-608(609) 1-3 is <u>NOT</u> lit (SFP TEMP HI).	AOP-610.1
RO/BOP	12. Perform ATTACHMENT 3, DRY CASK STORAGE AREA ASSESSMENT.	AOP-610.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 51 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

RO/BOP	13. Increase Plant Systems leakage monitoring: a. Perform a system leakrate calculation every 6 hours for the first 24 hours following the event or after the plant is shutdown. Perform STP-114.002, OPERATIONAL LEAKAGE CALCULATION. b. RB Sump inleakge: • LI-1964. • LIT-1963. • IPCS SUMSUM. c. Monitor the following: • Refueling Water Storage Tank (IPCS L0990A). • Service Water Pond Level (IPCS L4418A). • Spent Fuel Pool Level (IPCS L7433A). • CCW Surge Tank (IPCS L7092A). • Chill Water Expansion Tank A(B) (IPCS L9004A L9006A). • Condensate Storage Tank (IPCS L3621A). • Lake Monticello Level (IPCS L4003A). • Liquid Waste System (IPCS 4RW1). • Main Control Board leak Detection alarms.	AOP-610.1
RO/BOP	14. Verify Fire Service System is intact as based on plant system walkdown reports.	AOP-610.1
RO/BOP	15. <u>WHEN ALL</u> plant walkdowns are complete, <u>THEN</u> Deliver Seismic Event report to Design Engineering personnel. • XPN-6041-EI, EARTHQUAKE MONITORING PANEL printout. • ATTACHMENT 2, SEISMIC EVENT CONTROL ROOM OBSERVATIONS. • ATTACHMENT 4, CONTROL BUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN. • ATTACHMENT 5, TURBINE GUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN. • ATTACHMENT 7, INTERMEDIATE BUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN. • ATTACHMENT 6, AUXILIARY BUILDING SAFE SHUTDOWN EQUIPMENT WALKDOWN. • AOP-610.1, SEISMIC EVENT RESPONSE, ATTACHMENT 3, DRY CASK STORAGE AREA ASSESSMENT.	AOP-610.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 2 Event #7 Page: 52 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.

Time/ Position	Applicant's Actions or Behavior

US	16. Direct Design Engineering personnel to implement ES-426, Earthquake Response Procedure.	AOP-610.1
US	17. Update Risk Monitor with <u>any</u> equipment that is deemed non-functional.	AOP-610.1
US	18. <u>WHEN</u> Design Engineering has completed their evaluation, <u>THEN</u> perform their recommended actions.	AOP-610.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 2	Event #7	Page: 53 of 53
Event Description: Earthquake, followed by three faulted Steam Generators and an ATWS.			
Time/ Position	Applicant's Actions or Behavior		

Procedure Revisions used in this Scenario Guide			
Number	Title	Rev	Date
GOP-4B	POWER OPERATION (MODE 1 – DESCENDING)	1J	3/21/23
SOP-106	REACTOR MAKEUP WATER SYSTEM	12B	7/11/19
SOP-117	SERVICE WATER SYSTEM	26A	12/2/22
SOP-214	MAIN TURBINE AND CONTROLS	22	3/8/23
SOP-304	115KV/7.2KV/ OPERATIONS	15	7/28/22
XCP-605	ANNUNCIATOR RESPONSE PROCEDURE	7B	7/6/21
XCP-613	ANNUNCIATOR RESPONSE PROCEDURE	9H	1/24/22
XCP-615	ANNUNCIATOR RESPONSE PROCEDURE	8	3/2/22
XCP-632	ANNUNCIATOR RESPONSE PROCEDURE	8B	5/26/23
XCP-633	ANNUNCIATOR RESPONSE PROCEDURE	10	11/19/21
AOP-117.1	LOSS OF SERVICE WATER	6	5/12/22
AOP-401.2	PROTECTION CHANNEL RCS LOOP RTD FAILURE	3	11/28/15
EOP-1.0	E-0, REACTOR TRIP OR SAFETY INJECTION	32	7/15/21
EOP-3.0	E-2, FAULTED STEAM GENERATOR ISOLATION	14	2/5/20
EOP-3.1	ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS	19	2/5/20
	V.C. SUMMER TECHNICAL SPECIFICIATIONS	223	11/10/22

Form 3.3-1 Scenario Outline

Facility:	VC SUMMER	Scenario #:	#3
Scenario Source:	New	Op. Test #:	ILO 22-01 NRC-2023
Examiners:	Applicants/ Operators:		
Initial Conditions:	- Reactor power is 75%. "B" train work week. - XFN-0065B RBCU is OOS.		
Turnover:	Continue power ascension to 100%.		
Critical Tasks:	- Control initial RCS cooldown in EOP-4.0 such that no RCS Cold Leg Temperature goes $\leq 250^{\circ}\text{F}$. - Isolate Steam flow from Ruptured SG before S/G pressure lowers to 460 psig.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP, US R-RO	Increase power to 100% in accordance with GOP-4A.
2	MAL-FWM002A	C-BOP, US	"A" Condensate Pump Trip.
3#	PMP-CS004S	C-RO, US TS-US	The running Charging Pump shaft shears. (2019 NRC Scenario #2)
4	MAL-NIS003D	I/MC-RO, US TS-US	Power Range Channel N-44 fails low, causing automatic control rods to withdraw.
5	XMT-FW017O	I/MC-BOP, US	PT-508 (FW PP DISCH HDR PRESS) fails low causing Main Feed Pumps to speed up.

Form 3.3-1 Scenario Outline

6	MAL-RCS002B	M-All	“B” SGTR
	VLV-MS003P		“B” SG PORV opens after reactor trip. Creates a faulted ruptured SG that can be isolated.
	PMP-AH022F PMP-AH023F PMP-AH025F		Control Room Emergency Ventilation fails to actuate when the Safety Injection actuates.
TERMINATE: The scenario may be terminated when the crew has stopped the first charging pump after the depressurization in EOP-4.0 or at the discretion of the Lead Examiner.			
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Used on previous two NRC Exams.

The following notation is used in the Form 3.3-2 "Time" column:

IOA designates Immediate Operator Action steps.

***** designates Continuous Action steps.

Form 3.3-1 Scenario Outline

TURNOVER:

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

Train "B" RBCU, XFN-0065B is tagged out for breaker maintenance and is to be returned to service next shift.

The Unit is at 75% power MOL, plant stable.

Management directs that the Unit power be increased to 100% at ½% per minute in accordance with GOP-4A POWER OPERATION (MODE 1 - ASCENDING) continuing with step 3.16.e in accordance with the reactivity plan provided.

Phoenix display monitor is out of service. The Shift Engineer is tracking all necessary actions in Work Control.

Current RCS Boron concentration by chemistry is 1103 ppm.

Pre-loaded Items

- OVR-AH022A
CS-AH280 RBCU FAN 65B FAST SPEED GREEN L
FINAL: OFF
- OVR-AH023A
CS-AH279 RBCU FAN 65B SLOW SPEED GREEN L
FINAL: OFF

EVENT 1: Raise Reactor Power.

GOP-4A, Power Operation (Mode 1 - ASCENDING) will be used to guide the actions of the crew. The US will direct a power increase at 1/2% per minute or less and provide oversight during the load increase. The RO will adjust RCS boron in accordance with a reactivity plan while the BOP operates Turbine EHC system controls to increase turbine load. Once power has been raised sufficiently for the chief examiner, the next event may be inserted.

EVENT 2: "A" Condensate Pump trip.

- **TRIGGER 2**
 - o MAL-FWM002A
CONDENSATE PUMP A TRIP

On cue from the Examiner, the "A" Condensate Pump will trip. The crew will enter AOP-208.1, Condensate Pump Trip/Loss of Condensate Flow. The BOP will start the "C" Condensate pump and open XVB-614C, C DISCH ISOL to restore normal condensate flow for the current conditions. Once "C" Condensate pump has been started and DA level has stabilized, the next event may be inserted.

EVENT 3: The running Charging Pump shaft shears

- **TRIGGER 3**
 - o PMP-CS004S
XPP0043A CHRG/SI PMP A SHEARED SHAFT
- **TRIGGER 12**
 - o LOA-CVC043
CHARGING PUMP C SUPPLY BRKR TRAIN A
FINAL: RACKED IN
- **TRIGGER 13**
 - o LOA-CVC041
CHARGING PUMP A SUPPLY BRKR
FINAL: RACKED OUT
- **TRIGGER 16**
 - LOA-CVC070
XPN5585 – ALT SEAL INJ SYSTEM CONTROL SWITCH
FINAL: OFF
- **TRIGGER 22**
 - LOA-CVC070
XPN5585 – ALT SEAL INJ SYSTEM CONTROL SWITCH
FINAL: AUTO

On cue from the Examiner the running Charging Pump “A” shaft will shear. This will cause a loss of charging flow and a lowering Pressurizer level. The crew will respond using AOP-102.2, LOSS OF CHARGING. Letdown will be isolated and either the “B” or “C” Charging pump will be started in accordance with SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM. The RO will maintain RCS inventory using the charging system.

The US will refer to TS 3.5.2, Emergency Core Cooling Systems, ECCS Subsystems - $T_{avg} > 350^{\circ}\text{F}$. Action a: With one ECCS subsystem inoperable, restore the inoperable subsystem 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.

Once the crew has re-established charging and Tech Specs have been addressed, the next event may be inserted.

EVENT 4: Power Range NI Channel N-44 fails LOW.

- **TRIGGER 4**
 - o MAL-NIS003D
POWER RANGE CHANNEL 44 FAILURE
FINAL: 0%

On cue from the Examiner Power Range NI Channel N-44 will fail low. This will cause rods to withdraw automatically. The crew will implement AOP-401.10, Power Range Channel Failure and place the Rod Control Bank Select switch in MAN. The channel will be removed from service.

The US applies Tech Spec 3.3.1, Reactor Trip System Instrumentation Table 3.3-1 function 2, Power Range Neutron Flux high trip and function 3, Power Range Neutron Flux – high positive rate, both of which specify action 2. Action 2 requires that the inoperable channel be placed in the tripped condition within 72 hours.

In addition the US must apply Tech Spec 3.3.1, Table 3.3-1 function 19, Reactor Trip System Interlocks; B. Low Power Reactor Trips Block, P-7, C. Power Range Neutron Flux, P-8, D. Power Range Neutron Flux, P-10 and F. Power Range Neutron Flux, P-9 all of which specify action 7. Action 7 requires that within one hour determine by observation of the associated permissive annunciators window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3

Once the crew has stabilized Tav_g with rods in manual and addressed the Tech Specs, the next event may be inserted.

EVENT 5: PT-508 fails low, causing Main Feedwater Pumps to speed up.

- **TRIGGER 5**
 - o XMT-FW017O
IPT00508 FW PP DSCHG HDR PRESS PI-508 FAIL TO POSN
FINAL: 200 psig
RAMP: 15 sec

On cue from the Examiner, PT-508 will fail low, causing main feedwater pumps to speed up. The BOP will take manual control of the Main Feedwater Pump Master Controller and raise main feedwater pump speed. The crew will enter AOP-210.3, Feedwater Pump Malfunction. They will restore main feedwater pump D/P to the proper program band in manual. Once main feedwater pump D/P has been restored to the proper program band, the next event may be inserted.

EVENT 6: SGTR, Ruptured SG becomes faulted

- **PRELOAD**
 - o PMP-AH022F
XFN0030A CNTRL ROOM EMERG FAN A FAIL TO START
 - o PMP-AH023F
XFN0030B CNTRL ROOM EMERG FAN B FAIL TO START
 - o PMP-AH025F
XFN0032B CNTRL ROOM VENT FAN B FAIL TO START
- **TRIGGER 6**
 - o MAL-RCS002B
STEAM GENERATOR B TUBE LEAK
FINAL: 300
- **AUTO-TRIGGER 14** x06o013a (B SG PORV OPENS)
 - o VLV-MS003P
IPV02010-MS STM DMP PWR REL VLV FAIL POSITION
FINAL: 65%
- **AUTO-TRIGGER 15** x10o021m (ALLOWS B SG PORV TO BE CLOSED)
 - o VLV-MS003P (NEW)
IPV02010-MS STM DMP PWR REL VLV FAIL POSITION
FINAL: 65%
DELETE IN: 1 sec
- **AUTO-TRIGGER 17** x16i036t (ALLOWS XFN-30A TO BE STARTED)
 - o PMP-AH022F
XFN0030A CNTRL ROOM EMERG FAN A FAIL TO START
DELETE IN: 1 sec
- **AUTO-TRIGGER 18** x16i037t (ALLOWS XFN-32B TO BE STARTED)
 - o PMP-AH025F
XFN0032B CNTRL ROOM VENT FAN B FAIL TO START
DELETE IN: 1 sec
- **AUTO-TRIGGER 19** x16i038t (ALLOWS XFN-30B TO BE STARTED)
 - o PMP-AH023F
XFN0030B CNTRL ROOM EMERG FAN B FAIL TO START
DELETE IN: 1 sec
- **TRIGGER 20**
 - o LOA-AUX130
DIESEL AIR COMPRESSOR LOCAL CONTROL
FINAL: START

Form 3.3-1 Scenario Outline

- **TRIGGER 21**
 - LOA-FWM163
SG B MTR DR EF PUMP SUPPLY HEADER VALVE – 1017B
FINAL: 0
- **TRIGGER 21**
 - LOA-FWM166
SG B TURB DR EF PUMP SUPPLY HDR VALVE – 1018B
FINAL: 0

On cue from the Examiner, the “B” SG will become ruptured. This will lead to a reactor trip and entry into EOP-1.0. When the reactor trips, the “B” SG PORV will open. Control Room Emergency Ventilation will fail to start automatically but can be started manually using Attachment 3 of EOP-1.0. The crew can isolate the SG PORV using Attachment 6 of EOP-1.0 or they may transition to EOP-3.0 and isolate it in this procedure. The crew will transition to EOP-4.0 where they will isolate the “B” SG, cooldown, depressurize and get off Safety Injection.

CRITICAL TASKS:

- Control initial RCS cooldown in EOP-4.0 such that no RCS Cold Leg Temperature goes $\leq 250^{\circ}\text{F}$.
- Isolate Steam flow from Ruptured SG before S/G pressure lowers to 460 psig.

TERMINATION:

The scenario may be terminated when the crew has stopped the first charging pump after the depressurization in EOP-4.0 or at the discretion of the Lead Examiner.

Form 3.3-1 Scenario Outline

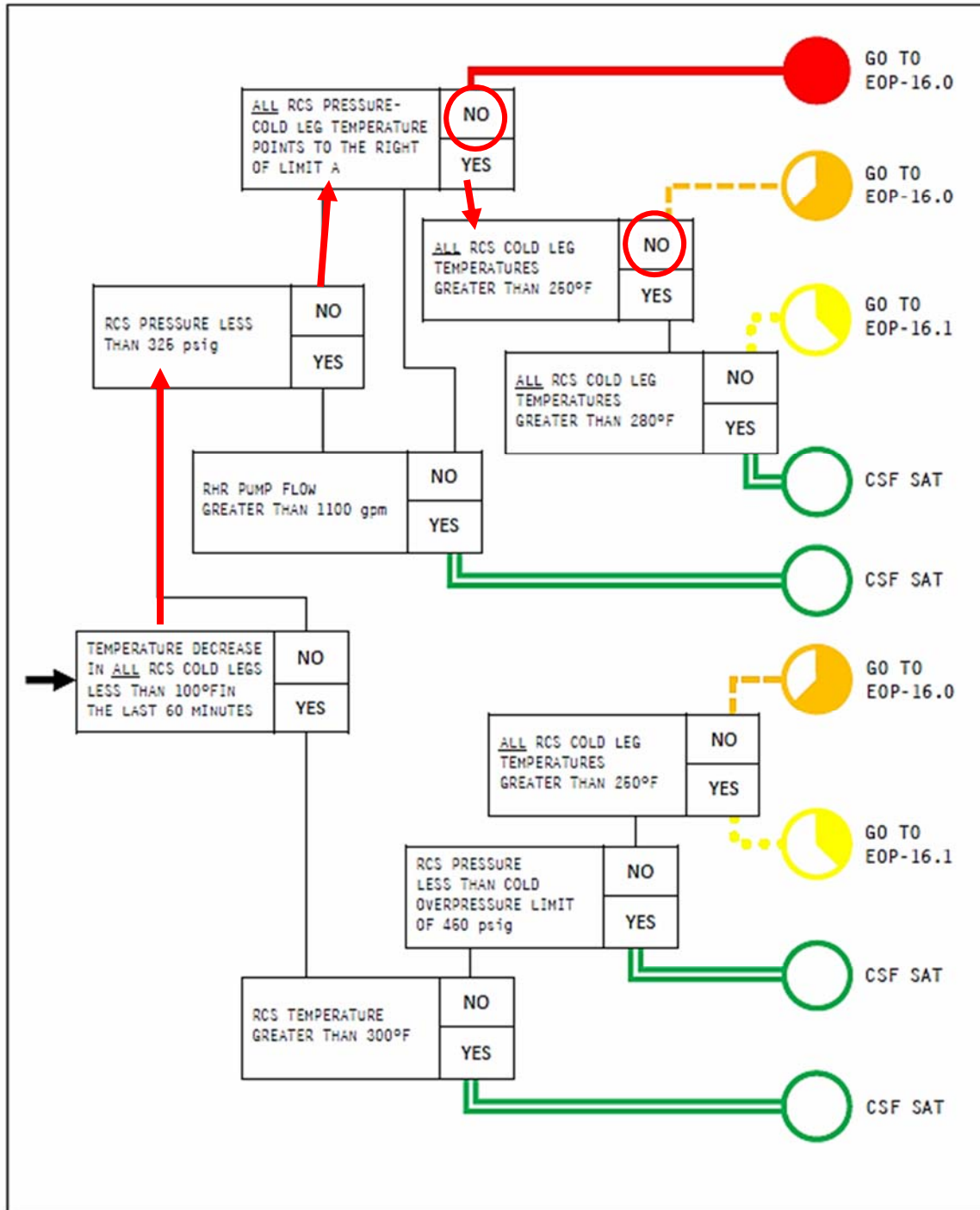
2023 NRC #3

Scenario Attributes		Events
Events after EOP entry (1-2)	1	• Ruptured SG PORV Opens on TRIP, can be manually closed.
Abnormal Events (2-4)	4	• NI-44 fails low, rods withdraw. • "A" Condensate Pump trip start standby Pump. • PT-508, FW PP DISCH HDR PRESS PSIG, fails low. • "A" Charging pump sheared shaft. (2019 NRC #2).
Major Transients (1-2)	1	• Steam Generator Tube Rupture.
EOPs Entered (1-2)	2	• EOP-3.0, E-2 FAULTED STEAM GENERATOR ISOLATION. • EOP-4.0, E-3 STEAM GENERATOR TUBE RUPTURE.
EOP Contingencies (0-2)	0	• N/A
Preidentified CTs (≥ 2)	2	• Control the initial RCS cooldown in EOP-4.0 such that a transition to EOP-16.0 is not required. • Isolate Steam flow from Ruptured SG before transition to EOP-4.2 is required.

Explanation of Critical Task Basis is below:

The first critical task is to control initial RCS cooldown in EOP-4.0, E-3 STEAM GENERATOR TUBE RUPTURE such that a transition to EOP-16.0 is not required. EOP-16.0 is entered from a Red or Orange path on the Integrity Critical Safety Function Status Tree. Controlling this cooldown meets the critical task methodology of NUREG 1021 because this is a task with one or more actions that would prevent a challenge to plant safety such as preventing the following: conditions that result in orange or red path critical safety functions (Westinghouse and AP1000). See CSFST flow path below.

INTEGRITY



Form 3.3-1 Scenario Outline

The second critical task is to isolate steam flow from the ruptured SG before transition to EOP-4.2, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED is required. A Steam Generator Tube Rupture will be inserted into the "B" SG. When the reactor is tripped, the PORV on the "B" SG will open and can only be manually closed. This creates a ruptured/faulted SG. The "B" SG PORV will be required to be closed prior to meeting transition criteria to EOP-4.2. Closing the "B" SG PORV meets the critical task methodology of NUREG 1021 because this action is an EOP-directed action that is *essential* to an event's overall mitigative strategy. By not closing the "B" SG PORV, the mitigation strategy has changed. Below is a picture from EOP-4.0 that shows if the "B" SG PORV isn't closed and the ruptured SG pressure goes below 460 psig, a transition to EOP-4.2 is required.

8 Verify each RUPTURED SG pressure
is GREATER THAN 460 psig. ☐

8 GO TO EOP-4.2, ECA-3.1, SGTR WITH
LOSS OF REACTOR COOLANT:
SUBCOOLED RECOVERY DESIRED,
Step 1. ☐

Form 3.3-1 Scenario Outline

SIMULATOR SCENARIO SETUP

INITIAL CONDITIONS:

- IC Set 258
- 75% Power, MOL
- Burnup = 10,000 MWD/MTU
- Current Core Cycle = 28
- RCS Boron Concentration = 1103 ppm
- FCV-113 Pot Setting = 4.73
- Rod Position: Group D = 191
- Tavg = 579.8°F

PRE-EXERCISE:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.).
- Complete VCS-TQP-0807 Attachment I-A, Unit 1 Booth Instructor Checklist.
- Verify plant aligned for "B1" work week IAW PTP-101.004, Safety Related Train Swap Checklist.
- Verify red Placard on "A" CCW Pump and "B" Charging Pump.
- Verify the Hard Card for Turbine operation is in its proper storage location and cleaned.
- Verify the Hard Card for borating via MVT-8104 is in its proper storage location and cleaned.
- Ensure no NI's are removed from service, on SIPCS type in "add/omit" to verify.
- Ensure 115kV & 230kV setpoints are set to appropriate values for the shutdown condition IAW SOP-304, Enclosure B.
- Place HOLD Tag on RBCU 65B NORM and SLOW Speed Switches.
- Ensure Phoenix computer screen is turned off.
- Ensure you have a turnover sheet for each position.
- Conduct two-minute drill.

COMMUNICATIONS NOTE:

The following are the Unit Numbers for Building Operators for communication from the Control Room:

- Unit 4 – Control Building Operator
- Unit 5 – Turbine Building Operator
- Unit 6 Upper – Auxiliary Building Upper Operator
- Unit 6 Lower – Auxiliary Building Lower Operator
- Unit 7 – Intermediate Building Operator

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 1 Page: 12 of 65
Event Description: Raise power IAW GOP-4A.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	Crew will increase power in accordance with GOP-4A POWER OPERATION (MODE 1 - ASCENDING) continuing with step 3.16.e.
BOOTH OPERATOR:	NO TRIGGER
Symptoms/ Cues:	None
US	Directs a power increase in accordance with GOP-4A, POWER OPERATION (MODE 1 ASCENDING).

GOP-4A

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC

Scenario # 3 Event # 1

Page: 13 of 65

Event Description: Raise power IAW GOP-4A.

Time/ Position	Applicant's Actions or Behavior
	<u>GOP- 4A REFERENCE PAGE</u> <u>GENERAL NOTES</u> 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 Manager or Unit Supervisor. B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-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. <u>REACTOR CONTROL</u> 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. <u>TURBINE CONTROL</u> 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. <u>MSR CONTROL</u> 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.
	<u>NOTE 3.14 through 3.16</u> Steps 3.14 through 3.16 raise Reactor Power from 48% to 90%.

GOP-4A

GOP-4A

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3	Event # 1	Page: 14 of 65
Event Description: Raise power IAW GOP-4A.				
Time/ Position		Applicant's Actions or Behavior		
BOP	3.16.e At 80% Reactor Power, align Control Valve drain valves as follows: 1) Ensure PVG-2898B, DV-4, is open as follows: a) Verify Control Valve #4 is closed. b) Verify PVG-2898B, DV-4, is open. c) If both PVG-2898B, DV-4, and Control Valve #4 are closed, open PVG-2898B, DV-4, by opening PVG-2898D, STM LEAD DRN FOR CV-1. 2) Open MVG-2897, COMB CNTRL VLV BSD. f. When Control Valve #4 indicates greater than 5% open, perform the following: 1) Ensure PVG-2898B, DV-4, is CLOSED. 2) Close MVG-2897, COMB CNTRL VLV BSD.			GOP-4A
EVAULATOR NOTE	The RO will setup to alternate dilute the RCS using SOP-106, Section III.E. The steps for alternate diluting are as follows below.			
	NOTE 2.0 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 %.			SOP-106
RO	2.0 INSTRUCTIONS 2.1 Ensure at least one Reactor Coolant Pump is running.			SOP-106
RO	2.2 Place RX COOL SYS MU switch to STOP.			SOP-106
RO	2.3 Place RX COOL SYS MU MODE SELECT switch to ALT DIL. (Peer ✓)			SOP-106
RO	2.4 Adjust FCV-168, TOTAL MU FLOW, for desired flow rate. (Peer ✓)			SOP-106
RO	2.5 Set FIS-168, TOTAL MU FLOW, batch integrator to desired volume. (Peer ✓)			SOP-106
RO	2.6 Place RX COOL SYS MU switch to START.			SOP-106
RO	2.7 Verify desired flow rate on FR-113, TOTAL MU GPM (F-168).			SOP-106

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3	Event # 1	Page: 15 of 65
Event Description: Raise power IAW GOP-4A.				
Time/ Position		Applicant's Actions or Behavior		
RO	2.8	Verify alternate dilution stops when preset volume is reached on FIS-168, TOTAL MU FLOW, batch integrator.		SOP-106
RO	2.9	Place RX COOL SYS MU switch to STOP.		SOP-106
RO	2.10	Place RX COOL SYS MU MODE SELECT switch to AUTO. (Peer ✓)		SOP-106
RO	2.11	Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm). (Peer ✓)		SOP-106
RO	2.12	Place RX COOL SYS MU switch to START. (Peer ✓)		SOP-106
EVALUATOR NOTE	The BOP will now obtain the hard card of SOP-214, Section III.E to raise load. The steps to raise load are as follows below.			
	CAUTION 2.0 The load set should not be raised drastically and kept close to the actual load. Large load increases could occur if a runback occurs.			SOP-214
BOP	2.1	Select Ramp Rate and enter desired rate of 1% or less.		SOP-214
BOP	2.2	Raise Turbine Load by one of the following methods: a. Slowly Raise Turbine load automatically as follows (preferred method): 1) Select the Load pushbutton (a dialog box opens). 2) Enter the desired load setpoint. (Peer ✓) 3) Confirm setpoint. (Peer ✓) 4) Verify proper plant response.		SOP-214
EVALUATOR NOTE:	The next event will be initiated at the discretion of the Lead Examiner.			

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3	Event # 2	Page: 16 of 65
Event Description: "A" Condensate Pump trip.				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	On cue from the Examiner, the "A" Condensate Pump will trip. The crew will enter AOP-208.1, Condensate Pump Trip/Loss of Condensate Flow. The BOP will start the "C" Condensate pump and open XVB-614C, C DISCH ISOL to restore normal condensate flow for the current conditions.			
BOOTH OPERATOR:	When directed – initiate Event 2 (TRIGGER 2).			
Symptoms/ Cues:	• XCP-627 3-1, CO PP A/B/C/ TRIP • LI-3135, DEAER STOR TK WR LVL FEET • LI-3136, DEAER STOR TK NR LVL FEET			
US	Enters AOP-208.1, CONDENSATE PUMP TRIP/LOSS OF CONDENSATE FLOW			AOP-208.1
BOP (IOA)	1. Check if a Condensate Pump trip has occurred.			AOP-208.1
BOP	*2. Check if at least <u>one</u> Condensate Pump running.			AOP-208.1
BOP	3. Verify window XCP-627 (4-1), DEAER STOR TK LVL HI/HI-HI, is <u>NOT</u> lit.			AOP-208.1
BOP	4. Start an idle Condensate Pump.			AOP-208.1
	<u>NOTE – Step 5</u> Nominal stroke time for XVB00614A(B)(C), A(B)(C) DISCH ISOL, is 30 seconds.			AOP-208.1
BOP	5. Open XVB00614A(B)(C), A(B)(C) DISCH ISOL for the Condensate Pump started in Step 3 or Step 4.			AOP-208.1
US	GO TO Step 8.			AOP-208.1
BOP	*8. Verify Deaerator Storage Tank level is stable or increasing.			AOP-208.1
BOP	*9. Verify XCP-627 4-2, DEAER STOR TK VLV LO, is <u>NOT</u> lit.			AOP-208.1
BOP	10. Adjust IFK-3136, FLOW TO DEAERTOR, to maintain Deaerator Storage Tank level between 2.5 ft and 5 ft Narrow Range.			AOP-208.1
BOP	11. Verify Condensate flow is indicated on FI-3120, CO FLOW TO DEAER GPM X 10 ³ .			AOP-208.1
BOP	12. When plant conditions allow, place IFK-3136, FLOW TO DEAERATOR, in AUTO.			AOP-208.1
BOP	13. Ensure that <u>both</u> Exhaust Hood Spray Pumps are secured. • XPP-0075A, EXH HOOD SPRAY PUMP A. • XPP-0075B, EXH HOOD SPRAY PUMP B.			AOP-208.1
BOP	14. <u>WHEN</u> hotwell level has returned to normal, <u>THEN</u> locally ensure that XVB-00632-CO, COND REJECT TO COND STG TK VONT VLV OUT is open (TB-412).			AOP-208.1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC	Scenario # 3	Event # 2	Page: 17 of 65
Event Description: "A" Condensate Pump trip.			

Time/ Position	Applicant's Actions or Behavior	
US	15. RETURN TO the Procedure and Step in effect.	AOP-208.1
BOOTH OPERATOR:	When asked to investigate the "A" Condensate Pump and breaker, wait 2 minutes and report there is nothing obviously wrong with the pump or breaker.	AOP-208.1
EVALUATOR NOTE:	Once "C" Condensate pump has been started and DA level has stabilized, the next event may be inserted or at the discretion of the Lead Examiner.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 3 Page: 18 of 65
 Event Description: "A" Charging Pump Sheared Shaft.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner the running Charging Pump "A" shaft will shear. This will cause a loss of charging flow and a lowering Pressurizer level. The crew will respond using AOP-102.2, LOSS OF CHARGING. Letdown will be isolated and either the "B" or "C" Charging pump will be started in accordance with SOP 102, Chemical and Volume Control System. The RO will maintain RCS inventory using the charging system.
BOOTH OPERATOR:	When directed – initiate Event 3 (TRIGGER 3).
Symptoms/ Cues:	• XCP-617(618)(619) 2-2, RCP A(B)(C) #1 SL INJ FLO LO. • XCP-614 2-1, ALT SL INJ PUMP RUN. • XCP-614 2-2, ALT SL INJ DSL GEN RUN. • XCP-614 5-1, CHG LINE FLO HI/LO. • XCP-613 1-4, REGEN HX LTDN OUT TEMP HI Abnormal indication on the following: • FI-122A, CHG FLOW GPM. • FI-122C, CHARGING FLOW GPM. • PI-121, CHG PRESS PSIG. • LT-112A (115), % LEVEL. • LR-459, PZR % LEVEL & LEVEL SP.
EVALUATOR NOTE:	XCP-616 4-1, PZR SAFETY VLV LINE TEMP HI and XCP-616 4-2, PZR RLF LINE TEMP HI may come into alarm during this event due to the lifting of the Letdown Relief Valve that relieves to the PRT.
RO	Enters XCP-614 5-1, CHG LINE FLO HI/LO.
RO	CORRECTIVE ACTIONS: 1. If the running Charging Pump suction flowpath has become isolated, secure the Charging Pump and go to AOP-102.2, LOSS OF CHARGING. (NO) 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.

XCP 614, 5-1

XCP 614, 5-1

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3	Event # 3	Page: 19 of 65
Event Description: "A" Charging Pump Sheared Shaft.				
Time/ Position		Applicant's Actions or Behavior		
BOOTH OPERATOR:		If contacted to investigate the Charging pumps report: • If crew hasn't opened breaker, wait 1 minute and report "The "A" Pump motor is running with no pump discharge pressure." • If crew has opened breaker, wait 1 minute and report "The "A" pump shaft appears to be sheared." • If contacted to check breaker for "A" Charging pump, wait 1 minute and report "No evidence of breaker failure." • If the crew chooses to start "C" Charging pump to restore charging, when contacted to rack "C" Charging Pump breaker to "A" bus, wait 2-minutes and report "Ready to Rack "C" pump to "A" bus." Use TRIGGER 12 to rack the "C" breaker to "A" bus and report "The "C" Charging pump breaker is racked up". This is being performed IAW SOP-102, Attachment VA. • If the crew chooses to start "B" Charging pump to restore charging, wait until charging and Letdown are re-established before racking up the "C" Charging pump on the "A" Train. • If contacted to rack "A" Charging Pump breaker down, wait 2 minutes and report "Ready to Rack down "A" pump breaker." Use TRIGGER 13 to rack the "A" breaker down and report "The "A" Charging pump breaker is racked down".		
US		Enters AOP-102.2, LOSS OF CHARGING		
		CAUTION Seal water injection should be maintained any time the RCS is pressurized.		
		NOTE The Alternate Seal Injection System should deliver 20 gpm of borated water from the RWST to the RCS.		
RO		1. Check if Charging Pump flow is normal: (NO) • 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.		

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 3 Page: 20 of 65
Event Description: "A" Charging Pump Sheared Shaft.

Time/ Position	Applicant's Actions or Behavior

RO

1. ALTERNATIVE ACTION

AOP-102.2

Perform the following:

- a) Ensure the Charging Pump is secured.
- b) Close all Letdown Isolation Valves:
 - 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 110 gpm on FI-7273A(B), THERM BARR FLOW GPM.
- e) Display Dedicated Display ZZRCPBRG on the IPCS to monitor RCP temperatures.
- f) Verify the Alternate Seal Injection System is in service as indicated by either of the following:
 - BOTH the following annunciators are lit:
 - 1) XCP-614 2-1 (ALT SL INJ PUMP RUN).
 - 2) XCP-614 2-2 (ALT SL INJ DSL GEN RUN).
 - OR
 - Seal Injection flow indicated on the following:
 - FT-130, SL INJ FLO on IUR01156.
 - FT-127, SL INJ FLO on IUR01155.
 - FT-124, SL INJ FLO on IUR01154.
- g) Contact Electrical and Mechanical Maintenance to investigate.
- h) GO TO Step 3.

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 3 Page: 21 of 65
 Event Description: "A" Charging Pump Sheared Shaft.

Time/ Position	Applicant's Actions or Behavior						
RO	3. Verify Charging System valve lineup: - IF Charging Pump suction is aligned to the VCT, THEN ensure both LCV-115C(E), VCT OUTLET ISOL are open. - Ensure the following valves are open: - MVG-8106, CHG PP. - MVT-8109A(B)(C), CHG PP A(B)(C). - MVG-8130A(B), LP A SUCT TO CHG PP C. - MVG-8131A(B), LP B SUCT TO CHG PP C. - MVG-8132A(B), CHG PP C TO LP A DISCH. - MVG-8133A(B), CHG PP C TO LP B DISCH						
RO	c. Check the Charging Header valve lineup as follows: - Ensure MVG-8107, CHG LINE ISOL, is open. - Ensure MVG-8108, CHG LINE ISOL, is open. - Ensure FCV-122, CHG FLOW, is in MAN and CLOSE. - Ensure one of the following valves is open: - PVT-8146, NORM CHG TO RCS LP B. OR - PVT-8147, ALT CHG TO RCS LP A. - Verify VCT level is GREATER THAN 20%. - Locally verify Charging Pump suction pressure meets the requirements in the table below as indicated on the following (AB-388): <table border="1"> <thead> <tr> <th>SUCTION SOURCE</th><th>PRESSURE</th></tr> </thead> <tbody> <tr> <td>RWST</td><td>Between 15 and 100 PSIG</td></tr> <tr> <td>VCT</td><td>Between 30 and 100 PSIG</td></tr> </tbody> </table>	SUCTION SOURCE	PRESSURE	RWST	Between 15 and 100 PSIG	VCT	Between 30 and 100 PSIG
SUCTION SOURCE	PRESSURE						
RWST	Between 15 and 100 PSIG						
VCT	Between 30 and 100 PSIG						

AOP-102.2

AOP-102.2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 3 Page: 22 of 65
Event Description: "A" Charging Pump Sheared Shaft.

Time/ Position	Applicant's Actions or Behavior	
BOOTH OPERATOR:	If directed to locally verify Charging suction pressure, and "C" OR "B" pump ready for start, wait 1 minute and report "Suction pressure on all gauges is approximately 57 psig and "C" OR "B" Charging pump is ready for start."	AOP-102.2
BOOTH OPERATOR:	The US may assume authority for making the decision to start a Charging Pump. If the US calls the Shift Manager for permission to start the pump as stated in the procedure, grant permission.	AOP-102.2
US/ RO	4. With Shift Manager's permission, start a Charging Pump, while monitoring RCP temperatures. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.	AOP-102.2
EVALUATOR NOTE:	The steps for starting an idle charging pump IAW SOP-102 Section III.B are on page 62 of 65.	AOP-102.2
RO	5. WHEN a Charging Pump is operating, THEN perform the following. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM. a. Place Charging and Normal Letdown in service. b. Secure Alternate Seal Injection.	AOP-102.2
BOOTH OPERATOR:	When called to secure ASI System, wait 2 minutes and insert TRIGGER 16. If asked to place AI System back in AUTO, wait 2 minutes and insert TRIGGER 22.	AOP-102.2
BOOTH OPERATOR:	If crew calls local operator to verify Seal Water Injection Filter A DP due to XCP-614 3-4 in alarm, wait 2-min and report that: • If ASI is running and alarm is lit, DP is 19 psid. • If ASI is not running and alarm is clear, DP is 8 psid.	
EVALUATOR NOTE:	The following steps for reestablishing Letdown are from SOP-102 Section IV.M.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 3 Page: 23 of 65
 Event Description: "A" Charging Pump Sheared Shaft.

Time/ Position	Applicant's Actions or Behavior	
RO	2.1 Place FCV-122, CHG FLOW, in MAN and close. 2.2 Place PCV-145, LO PRESS LTDN, in MAN and open to 70%. (PEER ✓) 2.3 Place TCV-144, CC TO LTDN HX, in MAN and open to 100%. 2.4 Place TCV-143, LTDN TO VCT OR DEMIN, in VCT. 2.5 Open PVT-8152, LTDN LINE ISOL. 2.6 Open the following: a. LCV-459, LTDN LINE ISOL. b. LCV-460, LTDN LINE ISOL. 2.7 Ensure the following Charging Line Isolation Valves are open: a. MVG-8107, CHG LINE ISOL. b. MVG-8108, CHG LINE ISOL.	SOP-102
RO	2.8 Slowly open FCV-122, CHG FLOW, to establish 60 gpm flow as indicated on FI-122A, CHG FLOW GPM.	SOP-102
RO	2.9 Open Orifice Isolation Valves to obtain the desired Letdown flow rate (60 gpm to 120 gpm): a. PVT-8149A, LTDN ORIFICE A ISOL (45 gpm). b. PVT-8149B, LTDN ORIFICE B ISOL (60 gpm). c. PVT-8149C, LTDN ORIFICE C ISOL (60 gpm).	SOP-102
RO	2.10 Adjust FCV-122, CHG FLOW, as required to maintain TI-140, REGEN HXOUT TEMP °F, between 250°F and 350°F while maintaining Pressurizer level. 2.11 Adjust PCV-145, LO PRESS LTDN, to maintain PI-145, LO PRESS LTDN PRESS PSIG, between 300 psig and 400 psig. 2.12 Place PCV-145, LO PRESS LTDN, in AUTO.	SOP-102
RO	2.13 Adjust TCV-144, CC TO LTDN HX, potentiometer as necessary to maintain the desired VCT temperature. Refer to VCS Curve Book, Figure VII.15 2.14 Place TCV-144, CC TO LTDN HX, in AUTO.	SOP-102

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 3 Page: 24 of 65
 Event Description: "A" Charging Pump Sheared Shaft.

Time/ Position	Applicant's Actions or Behavior
RO	2.15 When Pressurizer level is within 1% of and trending to programmed level, place the PZR LEVEL MASTER CONTROL in MAN. 2.16 Establish automatic FCV-122, CHG FLOW, control as follows: a. Determine the correct PZR LEVEL MASTER CONTROL setpoint by dividing the current Charging flow by 1.5. b. Manually adjust the PZR LEVEL MASTER CONTROL to this setpoint. c. Place FCV-122, CHG FLOW, in AUTO. (PEER ✓) 2.17 Adjust PZR LEVEL MASTER CONTROL in MAN, as necessary, to maintain Pressurizer level at or near programmed level. 2.18 When Pressurizer level is within 1% of and trending to programmed level, place PZR LEVEL MASTER CONTROL in AUTO. (PEER ✓) 2.19 Monitor LR-459, PZR % LEVEL & LEVEL SP, recorder to verify that Charging flow is maintaining actual Pressurizer level at or near the programmed setpoint. 2.20 After the Letdown temperatures have stabilized, place TCV-143, LTDN TO VCT OR DEMIN, in DEMIN/AUTO.
US	Enters T.S. 3.5.2, EMERGENCY CORE COOLING SYSTEMS, ECCS SUBSYSTEMS – TAVG => 350°F. T.S. 3.5.2 action a. applied during the time NO charging pump was operable on Train A. The action will be exited once the "C" Charging Pump aligned to the "A" header and "A" Pump Breaker is racked down. ACTION: a. With one ECCS subsystem inoperable, restore the inoperable subsystem 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:	If at any point PZR Pressure < 2206 psig, the crew will meet conditions for T.S. 3.2.5, DNB PARAMETERS, with an action to "restore parameters within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours."
EVALUATOR NOTE:	The next event may be inserted after normal charging and letdown is restored and Technical Specifications have been addressed, or at the discretion of the Lead Examiner. PZR level control does not have to be restored to Automatic per the discretion of the Lead Examiner.

SOP-102

T.S. 3.5.2

T.S. 3.2.5

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 4 Page: 25 of 65
 Event Description: N-44 fails low.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	On cue from the Examiner, Power Range Channel N-44 fails low, causing automatic control rods to withdraw. The crew will enter AOP-401.10, POWER RANGE CHANNEL FAILURE, in response.	
BOOTH OPERATOR:	When directed – initiate Event 4 (TRIGGER 4).	
Symptoms/ Cues:	• XCP-620 1-4, PR CHAN DEV. • RODS OUT white light lit. • NIS-44B, NIS POWER % FULL POWER, indicates zero. • Step Counters for Control Bank “D” indicating rods withdrawing.	
US	Enters AOP-401.10, POWER RANGE CHANNEL FAILURE.	AOP-401.10
RO (IOA)	1. Verify normal indication on Power Range Channel N-44.	AOP-401.10
RO (IOA)	1. ALTERNATIVE ACTION IF Power Range Channel N-44 has failed, <u>THEN</u> place the ROD CNTRL BANK SEL Switch in MAN.	AOP-401.10
RO (IOA)	2. Stabilize <u>any</u> plant transients in progress.	AOP-401.10
BOP	*3. Maintain stable plant conditions.	AOP-401.10
US	4. Verify <u>no</u> testing is in progress on the operable Power Range channels.	AOP-401.10
BOOTH OPERATOR:	If called as I&C to verify no testing is in progress, respond that no testing is in progress.	
BOP	5. Place ROD STOP BYPASS Switch (on the MISCELLANEOUS CONTROL AND INDICATION PANEL) for the failed Power Range channel in BYPASS.	AOP-401.10

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 4 Page: 26 of 65

Event Description: N-44 fails low.

Time/ Position	Applicant's Actions or Behavior	
RO	6. Verify the appropriate Rod Stop Bypass status light is bright: • For N-41, A1 OP ROD STOP BYP (XCP-6111 4-1). • For N-42, B1 OP ROD STOP BYP (XCP-6111 4-2). • For N-43, A2 OP ROD STOP BYP (XCP-6111 4-3). • For N-44, B2 OP ROD STOP BYP (XCP-6111 4-4).	AOP-401.10
RO	7. Adjust Control Rods to maintain Tavg within 1.0°F of Tref .	AOP-401.10
RO	8. Align the Power Range channel comparator circuits: a. Place the following switches to the failed Power Range channel position: 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).	AOP-401.10
EVALUATOR NOTE:	The candidate should select any position other than the “P4” or the “ΔFIV” positions.	AOP-401.10
RO	9. Ensure NR-45 is selected to appropriate operable channels.	AOP-401.10
RO	10. Within one hour, verify that the following permissive status lights are in the required state for the existing plant condition. • P-7. • P-8. • P-9. • P-10.	AOP-401.10

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 4 Page: 27 of 65
 Event Description: N-44 fails low.

Time/ Position	Applicant's Actions or Behavior										
US	11. Remove the following IPCS points for the AFFECTED Instrument from processing. REFER TO OAP-107.1, CONTROL OF IPCS FUNCTIONS. <table><tr><th>INSTRUMENT</th><th>IPCS POINT</th></tr><tr><td>N-41</td><td>N0041A N0042A N0049A</td></tr><tr><td>N-42</td><td>N0043A N0044A N0050A</td></tr><tr><td>N-43</td><td>N0045A N0046A N0051A</td></tr><tr><td>N-44</td><td>N0047A N0048A N0052A</td></tr></table>	INSTRUMENT	IPCS POINT	N-41	N0041A N0042A N0049A	N-42	N0043A N0044A N0050A	N-43	N0045A N0046A N0051A	N-44	N0047A N0048A N0052A
INSTRUMENT	IPCS POINT										
N-41	N0041A N0042A N0049A										
N-42	N0043A N0044A N0050A										
N-43	N0045A N0046A N0051A										
N-44	N0047A N0048A N0052A										
BOOTH OPERATOR:	If IPCS Points are removed from service, ensure they are put back in service after the conclusion of the scenario.										
RO	12. Check if Reactor Power is LESS THAN 75%.										
RO	12. ALTERNATIVE ACTION Initiate GTP-702, Attachment IV.F.										
RO	13. Check if Reactor Power is LESS THAN 50%.										
RO	13. ALTERNATIVE ACTION Initiate GTP-702, Attachment IV.D.										
	NOTE – Step 14 Compliance with T.S. requires tripping failed instrument channel bistables within 72 hours of the channel failure. Time should be allowed for troubleshooting of the failed channel prior to tripping the bistables.										
US	14. Place the failed channel protection bistables in a tripped condition within 72 hours of the channel failure: a. Write an R&R for the failed channel. b. Select the attachment for the failed channel from the back of this procedure. c. Record the R&R number on the attachment. d. Determine the cause of the channel failure.										

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC

Scenario # 3 Event # 4

Page: 28 of 65

Event Description: N-44 fails low.

Time/ Position

Applicant's Actions or Behavior

AOP-401.10
ATTACHMENT 4
PAGE 1 of 1
REVISION 4

AOP-401.10

POWER RANGE NUCLEAR INSTRUMENTATION N-44

TRIPPED BISTABLE STATUS

INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT
N-44	NC-44P	NIS RACK	CHAN IV PR FLUX LO SET PT
	NC-44R	NIS RACK	CHAN IV PR FLUX HI SET PT
	NC-44U(+)	NIS RACK	CHAN IV PR FLUX RATE HI

R&R# _____

TRIP

APPLICABLE STPS	STP # USED TO TRIP BISTABLE	TRIP STATUS LIGHT ON	TRIPPED BY	VERIFIED BY
302.041				
310.008				

RESTORATION

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

REVIEWED BY: _____ / _____
SHIFT MANAGER DATE

TECH SPECS

TABLE 3.3-1 ITEMS 2, 3, 19

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 4 Page: 29 of 65
 Event Description: N-44 fails low.

Time/ Position	Applicant's Actions or Behavior	
US	Enters Tech Spec Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 2, Power Range, Neutron Flux High and Low Setpoint – Action 2. POWER OPERATION may proceed provided the following conditions are satisfied: a. The inoperable channel is placed in the tripped condition within 72 hours. b. The Minimum Channel 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.	AOP-401.10
US	Enters Tech Spec Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 3, Power Range, Neutron Flux High and Low Setpoint – Action 2. SAME ACTION AS ABOVE.	AOP-401.10
US	Enters Tech Spec Spec 3.3.1 Reactor Trip System Instrumentation Table 3.3-1, Function 19, Reactor Trip System Interlocks – 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. This T.S. is only applicable if the crew does not perform AOP-401.10 Step 10 and it has been greater than 1-hour.	AOP-401.10
EVALUATOR NOTE:	The next event will be initiated at the discretion of the Lead Examiner.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 5 Page: 30 of 65
Event Description: PT-508, FW PP DISCH HDR PRESS PSIG, fails low

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner, PT-508 will fail low, causing main feedwater pumps to speed up. The BOP will take manual control of the Main Feedwater Pump Master Controller and raise main feedwater pump speed. The crew will enter AOP-210.3, Feedwater Pump Malfunction. They will restore main feedwater pump D/P to the proper program band in manual.
BOOTH OPERATOR:	When directed – initiate Event 5 (TRIGGER 5).
Symptoms/ Cues:	• All MFW Pump Speeds increasing. • All SG Levels rising. Potential Annunciators: • XCP-624 1-5/2-5/3-5, SG A/B/C LVL DEV • XCP-624 6-4, SG C FWF>STF MISMATCH
US	ENTERS AOP-210.3, FEEDWATER PUMP MALFUNCTION.

AOP-210.3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3 Event # 5	Page: 31 of 65
Event Description: PT-508, FW PP DISCH HDR PRESS PSIG, fails low			
Time/ Position	Applicant's Actions or Behavior		
	REFERENCE PAGE FOR AOP-210.3 1 <u>MAIN FEEDWATER REGULATING VALVE MANUAL CONTROL</u> Manual Control of Main Feedwater Regulating Valves is permissible at <u>any</u> time as deemed necessary during the performance of this procedure. If a Main Feedwater Regulating Valve has been placed in Manual it should be returned to Automatic as soon as possible. 2 <u>LOSS OF MAIN FEEDWATER FLOW</u> <u>IF</u> Feedwater flow is lost while Reactor Power is GREATER THAN 10%, and cannot be quickly restored from the MCB, <u>THEN</u> Trip the reactor and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1. 3 <u>STEAM GENERATOR LEVEL CONTROL</u> a. <u>IF</u> Narrow Range Steam Generator Level decreases to LESS THAN 40% in <u>any</u> SG, <u>THEN</u> Trip the reactor and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1. b. <u>IF</u> Reactor Power is GREATER THAN 15% and Narrow Range Steam Generator Level exceeds 75% in <u>any</u> SG, <u>THEN</u> Trip the reactor and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1. 4 <u>MAIN FEED PUMP SPEED CONTROL</u> <u>IF</u> IPT00464 has failed high with the Steam Dumps in Steam Pressure Mode, <u>THEN</u> Trip the reactor and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1.		
BOP (IOA)	1. Verify at least <u>one</u> Feedwater Pump is running.		
BOP (IOA)	2. Check if a Feedwater Pump trip has occurred.		

AOP-210.3

AOP-210.3

AOP-210.3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3	Event # 5	Page: 32 of 65
Event Description: PT-508, FW PP DISCH HDR PRESS PSIG, fails low				
Time/ Position		Applicant's Actions or Behavior		
BOP (IOA)	2. ALTERNATIVE ACTION Place the MCB MASTER SPEED CNTRL in MAN and adjust to 50%, <u>THEN</u> adjust as needed to control Feedwater Flow. GO TO Step 4.			
	<u>NOTE – Step 4</u> DCS Graphic 310, FWP OVERVIEW displays the Main Feedwater Pump Recirculation Valve position and can be used to determine if adjustment is needed.			
BOP	4. Adjust Main Feedwater Pump speeds to maintain the following for <u>each</u> Steam Generator: • Main Feedwater flow within ±0.5 MPPH of Steam Flow. • Narrow Range SG level at or trending to 60%.			
BOP	5. Verify the following: • <u>All</u> Main Feedwater Pump Speeds are within 120 RPM of <u>each</u> other. • On DCS Graphic 310, FWP OVERVIEW, <u>all</u> Main Feedwater Pump speeds are stable.			
	<u>NOTE – Step 6</u> The term stable is intended to mean operating slowly enough that the Main Feedwater Regulating Valves can accommodate flow changes caused by Main Feedwater Pump Recirculation Valve operation. Until this occurs, adjustment of Main Feedwater Pump speed is the preferred means of feed flow control.			
BOP	6. On DCS Graphic 310, FWP OVERVIEW, verify that Main Feedwater Pump Recirculation Valve positions are stable.			
BOP	7. Verify Main Feedwater pressure is AT LEAST 85 psig GREATER THAN Main Steam Pressure.			
BOP	*8. Maintain Narrow Range Steam Generator Level between 60% and 65%.			
BOP	9. If necessary, place Main Feed Regulating valves in AUTO.			

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 5 Page: 33 of 65
 Event Description: PT-508, FW PP DISCH HDR PRESS PSIG, fails low

Time/ Position	Applicant's Actions or Behavior	
	<u>NOTE – Step 10</u> Main Feedwater Program ΔP should be established using the following as available: - PI-508, FW PP DISCH HDR PRESS PSIG. <u>Any</u> operating Main Feedwater Pump Discharge Pressure - PI-464C, MS HDR PRESS PSIG. <u>Any</u> available MCB Main Steam Header Pressure. - IPCS (ZZMENU S/G SU Trend or FW Start)	AOP-210.3
BOP	10. Restore Feedwater Pump D/P to program as follows: a. Slowly adjust Main Feedwater Pump speeds to maintain Feedwater Pump discharge header pressure to within the limits of ATTACHMENT 1, FEEDWATER PUMP D/P LIMITS. b. Adjust the AFFECTED PUMP A(B)(C) SPEED CNTRL (MCB M/A Stations) as necessary to balance <u>all</u> operating Feedwater Pumps speed to within 120 rpm of each other.	AOP-210.3
BOP	11. <u>IF</u> plant conditions allow, <u>THEN</u> place the MCB MASTER SPEED CONTROL in AUTO.	AOP-210.3
CREW	12. Determine and correct the cause of the Feedwater Pump speed control malfunction.	AOP-210.3
BOOTH OPERATOR:	If called as I&C to investigate the failure, acknowledge the request.	
EVALUATOR NOTE:	Once main feedwater pump D/P has been restored to the proper program band or at the Lead Examiners discretion, the next event may be inserted.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 34 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior
EVALUATOR NOTE:	On cue from the Examiner, the "B" SG will become ruptured. This will lead to a reactor trip and entry into EOP-1.0. When the reactor trips, the "B" SG PORV will open. Control Room Emergency Ventilation will fail to start automatically but can be started manually using Attachment 3 of EOP-1.0. The crew will transition to EOP-4.0 where they will isolate the "B" SG, cooldown, depressurize and get off Safety Injection.
BOOTH OPERATOR:	When directed – initiate Event 6 (TRIGGER 6).
Symptoms/ Cues:	• Lowering PZR Level. • Lowering RCS Pressure. • XCP-646 2-1, MN STM LINE RM-G19 HI RAD. • XCP-646 2-2, MN STM LINE RM-G19B TRBL.
BOOTH OPERATOR:	If called as local operator for Corrective Actions of XCP-646 2-1, MN STM LINE RM-G19 HI RAD, respond in the following way: • Acknowledge requests for Health Physics and Chemistry. • When asked to align condenser exhaust to the Auxiliary Building Charcoal Exhaust as follows: a. Open XVB-110, MN&AUX COND VAC PP CHAR EXH DISCH VALVE, and b. Close XVB-109, MN&AUX COND VAC PUMP ATMOS DISCH VALVE, Wait 2-minutes and report that XVB-110 is Open and XVB-109 is Closed.
US	Enters AOP-112.2, ARG-3, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI.
	<u>CAUTION</u> IF the associated running vacuum pump flow meters are not working, THEN RMA-9 alarm and/or indication is not a reliable entry condition into this procedure. Entry should be based on grab sample analysis in this case.

AOP-112.2

AOP-112.2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 35 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
	<u>NOTE</u> - Conditions for implementing Emergency Plan Procedures should be evaluated using VCS-EPP-001, CLASSIFICATION OF EMERGENCIES. - Due to N-16 gamma radiation effects, RM-G19A(B)(C), STMLN HIRNG GAMMA, will display elevated readings and should not be used for classification of EAL while the Reactor is critical.	AOP-112.2
RO	*1. Check if PZR level can be maintained: - Fully open FCV-122, CHG FLOW. - Verify PZR level is STABLE <u>OR</u> INCREASING.	AOP-112.2
RO	*1. ALTERNATIVE ACTION - Perform the following: - Isolate Letdown as follows: - Close PVT-8149A(B)(C), LTDN ORIFICE A(B)(C) ISOL. <u>IF</u> PZR level continues to decrease, <u>THEN</u> perform the following: - Start a second CCW pump. - Start a second Charging Pump.	AOP-112.2
RO	*1. c. Control FCV-122, CHG FLOW, as necessary to maintain PZR level.	AOP-112.2
RO	*2. Check if SI is required: - Check if <u>any</u> of the following criteria are met: - PZR level is decreasing with Charging maximized and Letdown isolated. <u>OR</u> - PZR level is approaching 8%. <u>OR</u> - PZR pressure is approaching 1870 psig. - Perform the following: - Trip the Reactor. - GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION. <u>WHEN</u> EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION Immediate Actions are complete, <u>THEN</u> actuate SI.	AOP-112.2

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 36 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	The crew will meet Reactor Trip and SI criteria.	
US	Enters EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION.	EOP-1.0
RO (IOA)	1. Verify Reactor Trip: • 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
RO (IOA)	2. Verify Turbine/Generator Trip: a. Verify all Turbine STM STOP VLVs are closed. b. Ensure Generator Trip (after 30 second delay): 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
RO (IOA)	3. Verify both ESF buses are energized.	EOP-1.0
RO (IOA)	4. Check if SI is actuated: a. Check if either: • 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 <u>either</u> SI ACTUATION Switch. c. GO TO Step 6.	EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC

Scenario # 3 Event # 6

Page: 37 of 65

Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

REFERENCE PAGE FOR 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.

4 RUPTURED STEAM GENERATOR

IF a RUPTURED Steam Generator has been positively identified, THEN throttle EFW to the RUPTURED Steam Generator WHEN its Narrow Range Level is GREATER THAN 26%(41%).

5 FAULTED STEAM GENERATOR

- IF a FAULTED Steam Generator has been positively identified, THEN isolate EFW to the faulted Steam Generator as soon as possible UNLESS all three Steam Generators are FAULTED.
- IF all three Steam Generators are FAULTED, THEN throttle EFW flow to all three Steam Generators to 50 gpm.

EOP-1.0

**EVALUATOR
NOTE:**

Attachment 3, SI Equipment Verification, is included for reference on Page 52 of 65.

EOP-1.0

**EVALUATOR
NOTE:**

Per the Reference Page, the crew should call for a local operator to reduce Control Emergency Ventilation to one train running within 30-minutes of the Safety Injection.

EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 38 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	On the reactor trip and safety injection, "B" SG PORV will fail partially open. The crew can isolate the SG PORV using any of the following methods: • EOP-1.0, Attachment 6. (Page 55 of 65) • OP-AA-100 Guidance for a failed controller. • SOP-202 Section IV.A, STEAMLINE POWER RELIEF VALVE OPERATION. (Page 61 of 65) • EOP-4.0 Attachment 1B. (Page 57 of 65) • EOP-3.0. (Page 58 of 65) If the crew transitions to EOP-3.0 to isolate "B" SG PORV, they will transition to EOP-4.0 from EOP-3.0. Critical Task is to isolate Steam flow from Ruptured SG before S/G pressure lowers to 460 psig.	EOP-1.0
EVALUATOR NOTE:	On the safety injection, the Control Room Emergency Ventilation will fail to start automatically but can be started manually using Attachment 3 of EOP-1.0.	EOP-1.0
BOP	6. Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.	EOP-1.0
CREW	7. Announce plant conditions over the page system.	EOP-1.0
RO	*8. Verify RB pressure has remained LESS THAN 12 psig on PR951, RB PSIG (P-951), red pen.	EOP-1.0
RO	*9. Check RCS temperature: • With any RCP running, RCS Tavg is stable at OR trending to 557°F. (NO) - OR • With no RCP running, RCS Tcold is stable at OR trending to 557°F.	EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 39 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior
RO	*9. ALTERNATIVE ACTION IF RCS temperature is LESS THAN 557°F AND decreasing, THEN stabilize temperature by performing the following as required: a) Close IPV-2231, MS/PEGGING STM TO DEAERATOR. b) Perform one of the following: • IF Narrow Range SG level is LESS THAN 26% [41%] in all SGs, THEN reduce EFW flow as necessary to stop cooldown, while maintaining total EFW flow GREATER THAN 450 gpm. OR • WHEN Narrow Range SG level is GREATER THAN 26% [41%] in at least one SG, THEN control EFW flow as necessary to stabilize RCS temperature at 557°F. c) Initiate ATTACHMENT 6, STEAM VALVE ISOLATION, while continuing with this procedure. d) IF RCS cooldown continues, THEN close: • MS Isolation Valves, PVM-2801A(B)(C). - MS Isolation Bypass Valves, PVM-2869A(B)(C).
RO	10. Check PZR PORVs and Spray Valves: a. PZR PORVs are closed. b. PZR Spray Valves are closed. c. Verify power is available to at least one PZR PORV Block Valve: • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL. • MVG-8000C, RELIEF 445 B ISOL. d. Ensure one of the following Block Valves is open unless it was closed to isolate an open PZR PORV: • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL.

EOP-1.0

EOP-1.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 40 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
RO	<u>NOTE – Step 11</u> Seal Injection flow should be maintained to all RCPs. 11. Check if RCPs should be stopped: a. Check if either of the following criteria is met: - 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	EOP-1.0
RO/ BOP	12. Verify no SG is FAULTED: - 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: - 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
US	13. ALTERNATIVE ACTION GO TO EOP-4.0, E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.	EOP-1.0
EVALUATOR NOTE:	The crew will transition to EOP-4.0, E-3, STEAM GENERATOR TUBE RUPTURE.	
US	Enters EOP-4.0, E-3, STEAM GENERATOR TUBE RUPTURE.	EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 41 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior
	REFERENCE PAGE FOR EOP-4.0 1 SI REINITIATION CRITERIA <u>IF</u> <u>either</u> of the following conditions occurs, <u>THEN</u> start Charging Pumps and operate valves as necessary: - RCS subcooling on TI-499A(B), A(B) TEMP °F, can <u>NOT</u> be maintained GREATER THAN 52.5°F [67.5°F]. <u>OR</u> - PZR level can <u>NOT</u> be maintained GREATER THAN 10% [28%]. <u>IF</u> SI Reinitiation occurs after procedure Step 28, <u>THEN</u> GO TO EOP-4.2, ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED, Step 1. 2 SECONDARY INTEGRITY TRANSITION CRITERIA <u>IF</u> <u>any</u> unisolated SG pressure is decreasing in an uncontrolled manner <u>OR</u> is completely depressurized, <u>THEN</u> GO TO EOP-3.0, E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, unless it is needed for RCS cooldown. 3 COLD LEG RECIRCULATION TRANSITION CRITERION <u>IF</u> RWST level decreases to LESS THAN 18%, <u>THEN</u> GO TO EOP-2.2, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1. 4 MULTIPLE TUBE RUPTURE CRITERIA <u>IF</u> <u>any</u> INTACT SG level increases in an uncontrolled manner <u>OR</u> <u>any</u> INTACT SG has abnormal radiation, <u>THEN</u> stop <u>any</u> cooldown or depressurization in progress and RETURN TO EOP-4.0, E-3, STEAM GENERATOR TUBE RUPTURE, Step 1. 5 REDUCING CONTROL ROOM EMERGENCY VENTILATION 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.
	<u>NOTE</u> Seal Injection flow should be maintained to <u>all</u> RCPs.
RO	*1. Check if RCPs should be stopped: a. Check if either of the following criteria is met: - Annunciator XCP-612 4-2 is lit (PHASE B ISOL). <u>OR</u> - RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. (NO)
US	*1. ALTERNATIVE ACTION a. GO TO Step 2. Observe the NOTE prior to Step 2.

EOP-4.0

EOP-4.0

EOP-4.0

EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 42 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
	<u>NOTE – Step 2</u> Cycling of multiple PZR PORVs should be minimized to conserve operating air.	EOP-4.0
RO	2. Perform the following: a. Check if both of the following are available: • PCV-445A, PWR RELIEF. • PCV-444B, PWR RELIEF. b. Close one of the following: • PCV-445A, PWR RELIEF. • PCV-444B, PWR RELIEF.	EOP-4.0
RO	<u>CAUTION - Step 3</u> Radiation levels may have increased in steamlines. Proper radiological precautions must be taken when obtaining samples to minimize personnel exposure.	EOP-4.0
BOP	3. Identify the RUPTURED SG(s): • Narrow Range level in any SG increasing in an uncontrolled manner. OR • High Radiation on any of the following: 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: • 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.	EOP-4.0
BOP	4. For each RUPTURED SG, initiate the appropriate isolation attachment: • ATTACHMENT 1B, ISOLATION OF B STEAM GENERATOR	EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 43 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	EOP-4.0, ATTACHMENT 1B is included for reference on Page 57 of 65. Critical Task is to isolate steam flow from Ruptured SG before S/G pressure lowers to 460 psig.	EOP-4.0
US	5. Locally, start XAC0014, Diesel Driven Air Compressor. REFER TO SOP-220, STATION AND BACKUP INSTRUMENT AIR SYSTEMS (YD-436).	EOP-4.0
BOOTH OPERATOR:	When requested to locally start the Diesel Driven Air Compressor, Wait 2 minutes, insert TRIGGER 20 and report back that the Diesel Driven Air Compressor is running.	EOP-4.0
	<u>CAUTION – Step 6</u> 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.	EOP-4.0
	<u>NOTE – Step 6</u> If the TD EFW Pump is tripped, it should be reset as time permits.	EOP-4.0
US	6. IF SG B OR SG C is RUPTURED, THEN perform the following: a. IF at least one MD EFW Pump is running, THEN isolate the TD EFW Pump by placing PVG-2030, STM SPLY TO TD EFP TRN A(B), to CLOSE. b. Notify local Operators to perform Alternative Action Step 6, while continuing with this procedure.	EOP-4.0
BOOTH OPERATOR:	If called as AO to reset the TDEFW PP, when the RPMs indicate 0, reset the pump using the LOA RESETS page.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3	Event # 6	Page: 44 of 65
Event Description: "B" SGTR.				
Time/ Position		Applicant's Actions or Behavior		
US		6. ALTERNATIVE ACTION <u>IF</u> SG B <u>OR</u> SG C is RUPTURED, <u>THEN</u> locally deenergize and close the appropriate valve: - For SG B: 1) Open XMC1DA2X 05EH, EF PUMP MAIN STEAM BLOCK VLV XVG2802A-MS (IB-463). 2) Close XVG2802A-MS, MS HEADER B EF PUMP TURBINE SUPPLY VLV (IB-436 East Pen). - For SG C: 1) Open XMC1DB2Y 05EH, EMERG FEEDWATER PUMP MAIN STEAM BLOCK XVG2802B-MS (AB-436). 2) Close XVG2802B-MS, MS HEADER C EF PUMP TURBINE SUPPLY VLV (IB-436 East Pen).		
BOOTH OPERATOR:		When called to perform Step 6.AA, wait 2 minutes and use the LOA RESETS Page to perform actions.		
		<u>CAUTION – Step 7</u> If any RUPTURED SG is FAULTED, feed flow to that SG should remain isolated during subsequent recovery actions unless needed for RCS cooldown, to prevent excessive cooldown due to the FAULT.		
BOP		*7. Check level in each RUPTURED SG: a. Verify Narrow Range level in each RUPTURED SG is GREATER THAN 26%[41%]. b. Stop EFW flow to each RUPTURED SG: 1. Close FCV-3531(3541)(3551), MD EFP TO SG A(B)(C). 2. Close FCV-3536(3546)(3556), TD EFP TO SG A(B)(C). 3. Maintain Narrow Range level in each RUPTURED SG GREATER THAN 26%[41%].		
		<u>CAUTION – Step 8</u> The major flowpaths from each RUPTURED SG (MSIV, TD EFW Pump, and PORV) must be isolated before performing Step 8, to minimize radiological releases and ensure RCS subcooling is maintained.		
BOP		8. Verify each RUPTURED SG pressure is GREATER THAN 460 psig.		

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC

Scenario # 3 Event # 6

Page: 45 of 65

Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

US

9. Determine the required core exit TC temperature for RCS cooldown from the table below:

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

RO

10. Check if any RCP is running.

EOP-4.0

NOTE – Step 11

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

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 46 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior
BOP	11. Dump steam from each INTACT SG: a. WHEN RCS Tavg is LESS THAN P-12 (552°F), THEN: - Place both STM DUMP INTERLOCK Switches to BYP INTLK. - Place both STMLN SI TRAIN A(B) Switches to BLOCK. b. Dump steam from each INTACT SG to the Condenser: - Verify PERMISV C-9 status light is bright on XCP-6114 1-3. - Perform the following: - Verify the MS Isolation Valves, PVM-2801A(B)(C), are open for the INTACT SGs. OR - IF the RUPTURED SG(s) MSIV is closed, THEN open MS Isolation Bypass Valves : - Depress both MAIN STEAM ISOL VALVES RESET TRAIN A(B). - Open MS Isolation Bypass Valves, PVM-2869A(B)(C), for only the INTACT SGs. - Place the STM DUMP CNTRL Controller in MAN and closed. - Place the STM DUMP MODESELECT Switch in STM PRESS. - Adjust the STM DUMP CNTRL Controller to fully open the Bank 1 Steam Dump Valves, (Approximately 14% Demand).
	<u>NOTE – Step 12</u> Steps 14 through 20 should be performed as time permits, while the cooldown is in progress.
BOP	12. Verify core exit TC temperature is LESS THAN the value determined in Step 9.
BOP	12. ALTERNATIVE ACTION WHEN core exit TC temperature is LESS THAN the value determined in Step 9, THEN COMPLETE Step 13. Observe the NOTE prior to Step 13. CONTINUE WITH Step 14.

EOP-4.0

EOP-4.0

EOP-4.0

EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 47 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	Step 13 is a Continuous Action step to stop the RCS cooldown when the required CETC Temperature is reached. If that temperature is reached prior to getting to Step 20, then Step 13 will be performed. It is included below for Reference.	EOP-4.0
	<u>NOTE – Step 13</u> With <u>no</u> RCPs running, it may be necessary to manually open steam dumps or Steamline PORVs to maintain desired TC temperature.	EOP-4.0
BOP	13. Stop the RCS cooldown to the Condenser: a. Adjust the STM DUMP CNTRL Controller to closed. b. Adjust the setpoint to maintain core exit TC temperature LESS THAN the required temperature per Step 9. c. Place the STM DUMP CNTRL Controller in AUTO.	EOP-4.0
BOP	14. Check INTACT SG levels: 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	15. Check PZR PORVs and Block Valves: a. Verify power is available to the PZR PORV Block Valves: 1. MVG-8000A, RELIEF 445 A ISOL. 2. MVG-8000B, RELIEF 444 B ISOL. 3. MVG-8000C, RELIEF 445 B ISOL.	EOP-4.0
	<u>CAUTION – Step 15.b</u> If any PZR PORV opens because of high PZR pressure, Step 15.b should be repeated after pressure decreases to LESS THAN 2330 psig, to ensure the PORV recloses.	EOP-4.0
EVALUATOR NOTE:	The crew may have closed PCV-445A or PCV-444B at Step 2. Either is appropriate. The entirety of Step 15 is included for whichever valve they closed.	

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 48 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
RO	15. b. Verify all PZR PORVs are closed. c. Check if PCV-445A, PWR RELIEF switch is in close. d. Ensure MVG-8000A, RELIEF 445 A ISOL, is Open e. GO TO Step 16. f. Check if PCV-444B, PWR RELIEF, switch is in close. g. Ensure MVG-8000B, RELIEF 444 B ISOL, is open. h. GO TO Step 16.	EOP-4.0
RO	16. Reset both SI RESET TRAIN A(B) Switches.	EOP-4.0
RO	17. Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.	EOP-4.0
RO	18. Establish Instrument Air to the RB: a. Open PVA-2659, INST AIR TO RB AIR SERV. b. Open PVT-2660, AIR SPLY TO RB.	EOP-4.0
	<u>CAUTION – Step 19</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.	EOP-4.0
RO	19. 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.	EOP-4.0
BOP	20. Verify core exit TC temperature is LESS THAN the value determined in Step 9.	EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 49 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
BOP	21. Stop the RCS cooldown: a. Stop the RCS cooldown to the Condenser: 1) Adjust the STM DUMP CNTRL Controller to closed. 2) Adjust the setpoint to maintain core exit TC temperature LESS THAN the required temperature per Step 9. 3) Place the STM DUMP CNTRL Controller in AUTO.	EOP-4.0
	<u>NOTE – Step 21.b</u> With no RCPs running, it may be necessary to manually open steam dumps or Steamline PORVs to maintain desired TC temperature.	EOP-4.0
BOP Critical Task	21.b. Adjust controller setpoints as necessary to maintain core exit TC temperatures LESS THAN the required temperature per Step 9.	EOP-4.0
EVALUATOR NOTE:	Critical Task is to control initial RCS cooldown in EOP-4.0 such that no RCS Cold Leg Temperature goes $\leq 250^{\circ}\text{F}$.	
BOP	22. Verify each RUPTURED SG pressure is stable OR increasing.	EOP-4.0
	<u>NOTE – Step 23</u> 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, ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED, is NOT required.	EOP-4.0
RO	23. Verify RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 72.5°F [87.5°F].	EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 50 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior
RO	24. Depressurize the RCS using Normal PZR Spray at the maximum rate: a. Establish Normal PZR Spray: - Using RCP A: - Open PCV-444D, PZR SPRAY. - Close PCV-444C, PZR SPRAY, if RCP C is <u>NOT</u> running. - Using RCPs B and C: - Open PCV-444C, PZR SPRAY. - Close PCV-444D, PZR SPRAY, if RCP A is <u>NOT</u> running. b. Use maximum available spray until <u>any one</u> of the following criteria met: - RCS pressure is LESS THAN RUPTURED SG(s) pressure <u>AND</u> PZR levels is GREATER THAN 10% [28%]. <u>OR</u> - RCS pressure is WITHIN 300 psig of RUPTURED SG(s) pressure <u>AND</u> PZR level is GREATER THAN 40% [50%]. <u>OR</u> - PZR level is GREATER THAN 76% [69%]. <u>OR</u> - RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 52.5°F [67.5°F]. c. Stop RCS depressurization: - Close <u>both</u> PCV-444C(D), PZR SPRAY. - Close PVT-8145, PZR SPRAY FR CVCS. d. GO TO Step 27. Observe the CAUTION prior to Step 27.
	<u>CAUTION – Step 27</u> When SI termination criteria are met, SI must be terminated to prevent overfilling the RUPTURED SG(s).

EOP-4.0

EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 51 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior
RO/BOP	27. Check if SI flow should be terminated: 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: • Total EFW flow available to INTACT SGs is GREATER THAN 450 gpm. <u>OR</u> • Narrow Range SG level is GREATER THAN 26% [41%] in at least <u>one</u> INTACT SG. c. RCS pressure is stable <u>OR</u> increasing. d. PZR level is GREATER THAN 10% [28%].
RO	28. Stop all but <u>one</u> Charging Pump and place in Standby.
EVALUATOR NOTE:	The scenario may be terminated when the crew has stopped the first charging pump after the depressurization in EOP-4.0 or at the discretion of the Lead Examiner.

EOP-4.0

EOP-4.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 52 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

EVALUTOR NOTE:	THESE ARE THE STEPS OF EOP-1.0, ATTACHMENT 3	
BOP	1. 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.	EOP-1.0 Attachment 3
BOP	2. 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.	Attachment 3
BOP	3. Verify total EFW flow is GREATER THAN 450 gpm.	Attachment 3
BOP	4. 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.	Attachment 3
BOP	5. Ensure SI Pumps are running: • Two Charging Pumps are running. • Both RHR Pumps are running.	Attachment 3
BOP	6. Ensure two RBCU Fans are running in slow speed (one per train).	Attachment 3
BOP	7. Verify Service Water flow to RBCUs: a. Ensure Service Water Pump A is running. b. Check if Service Water Booster Pump A is running. c. GO TO Step 7.f.	Attachment 3
BOP	7.f. Ensure Service Water Pump B is running. g. Check if Service Water Booster Pump B is running. h. GO TO Step 7.k.	Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 53 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
BOP	7.k. Verify GREATER THAN 2000 gpm flow for <u>each</u> train on: • FI-4466, SWBP A DISCH FLOW GPM. • FI-4496, SWBP B DISCH FLOW GPM.	Attachment 3
BOP	8. Ensure one CCW pump per train is running.	Attachment 3
BOP	9. Ensure two Chilled Water Pumps and Chillers are running.	Attachment 3
BOP	10. Verify both trains of Control Room Ventilation are running in Emergency Mode.	Attachment 3
BOP	10. ALTERNATIVE ACTION Start <u>both</u> trains of Control Room Emergency Ventilation as follows: a) For Train A: 1) Place XFN-32A, SPLY FAN A in STOP. 2) Start XFN-32A, SPLY FAN A. 3) Start XFN-30A, EMERG FLTR FAN A. b) For Train B: 1) Place XFN-32B, SPLY FAN B in STOP. 2) Start XFN-32B, SPLY FAN B. 3) Start XFN-30B, EMERG FLTR FAN B.	
BOP	11. 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).	Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 54 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

BOP

12. Ensure Excess Letdown Isolation Valves are closed:

- PVT-8153, XS LTDN ISOL.
- PVT-8154, XS LTDN ISOL.

Attachment 3

BOP

13. 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.

Attachment 3

BOP

14. Verify proper SI alignment:

- Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104.
- Verify all SAFETY INJECTION monitor lights are dim on XCP-6106.
- Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.
- Check if RCS pressure is LESS THAN 325 psig.

Attachment 3

BOP

14.d. **ALTERNATIVE ACTION**

Notify the US that ATTACHMENT 3, SI EQUIPMENT VERIFICATION, is complete.

Attachment 3

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 55 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

EVALUTOR NOTE:	THESE ARE THE STEPS OF EOP-1.0, ATTACHMENT 6
BOP	1. Close Feedwater Pump TURB DRN VLVs: • MOV-1-5A. • MOV-1-5B. • MOV-1-5C.
BOP	2. Close the following turbine drain valves: • MVG-2896A, SV-1 BSD. • MVG-2896B, SV-2 BSD. • MVG-2896C, SV-3 BSD. • MVG-2896C, SV-4 BSD.
BOP	3. Ensure the following drain valves are in AUTO: • PVT-2851A,B,C,D, MS LINES TO TURB DRN. • PVT-2713A,B,C,D, STM DUMP DRN BYP. • PVT-2870, TO MSR A & B DRN. • PVT-2875, TO MSR A & B DRN. • PVT-2845A,B,C • PVT-2824, • PVT-2879A,B, LINE DRN. • PVT-2838A,B, HDR DRNS.
BOP	4. Place the STM DUMP CNTRL Controller in MAN and CLOSED.
BOP	5. Place the STM DUMP MODE SELECT Switch in STM PRESS.
BOP	6. Place the STM DUMP CNTRL Controller in AUTO.
BOP	*7. <u>WHEN</u> the Condenser is <u>NOT</u> available, <u>THEN</u> perform the following: a. Place the Steamline Power Relief A(B)(C) Mode Switches in PWR RLF. b. Adjust the PWR RELIEF A(B)(C) SETPT Controllers as necessary to control RCS temperature.
BOP	8. Verify proper response of <u>all</u> Steamline PORVs and Condenser Steam Dumps for existing plant conditions.

 EOP-1.0
Attachment 6

Attachment 6

Attachment 6

Attachment 6

Attachment 6

Attachment 6

Attachment 6

Attachment 6

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 56 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

BOP	9. Ensure SG Blowdown Valves, PVG-503A(B)(C), are closed.

Attachment 6

BOP	10. If desired, drain valves may be aligned per Shift Manager discretion based on current and expected plant status.

Attachment 6

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC		Scenario # 3	Event # 6	Page: 57 of 65
Event Description: "B" SGTR.				
Time/ Position	Applicant's Actions or Behavior			
EVALUTOR NOTE:	THESE ARE THE STEPS OF EOP-4.0, ATTACHMENT 1B			
	<u>CAUTION – Step 1</u> At least <u>one</u> SG must be maintained available for RCS cooldown.			
BOP Critical Task	1. Isolate flow from <u>each</u> RUPTURED SG: a. Place the PWR RELIEF B SETPT Controller in MAN and closed. b. Adjust the PWR RELIEF B SETPT Controller to 8.85 (1150 psig). c. Place the B Steamline Power Relief Mode Switch in PWR RLF. d. Place the PWR B RELIEF B SETPT Controller in AUTO. e. <u>WHEN</u> RCS Tavg is LESS THAN P-12 (552°F), <u>THEN</u> place <u>both</u> STM DUMP INTERLOCK Switches in BYP INTLK. f. Verify the B Steamline PORV closed. g. Close the following for <u>each</u> RUPTURED SG: • SG Blowdown, PVG-503B, B ISOL. • MS Drain Isolation, PVT-2843B, B DRN ISOL. h. Close the following for <u>each</u> RUPTURED SG: • MS Isolation Valve, PVM-2801B, B ISOL VLV. • MS Isolation Bypass Valve, PVM-2869B, B BYP VLV.			

EOP-4.0
Attachment 1B

Attachment 1B

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 58 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

EVALUTOR NOTE: THESE ARE THE STEPS OF EOP-3.0, E-2, FAULTED STEAM GENERATOR ISOLATION.	
	<u>CAUTION</u> - At least <u>one</u> SG must be maintained available for RCS cooldown. <u>Any</u> FAULTED SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown, to prevent reinitiating the break.
BOP	1. Ensure <u>all</u> the following are closed: - MS Isolation Valves, PVM-2801A(B)(C). - MS Isolation Bypass Valves, PVM-2869A(B)(C).
BOP	2. Check if <u>any</u> SG is NON-FAULTED: - Pressure in <u>any</u> SG is stable <u>OR</u> increasing. <u>Any</u> SG is <u>NOT</u> completely depressurized.
BOP	3. Identify <u>any</u> FAULTED SG(s): <u>Any</u> SG pressure decreasing in an uncontrolled manner. <u>OR</u> <u>Any</u> SG completely depressurized.
BOP	4. Close the following for <u>each</u> FAULTED SG: - FW Flow Control, FCV-478(488)(498). - FW Isolation, PVG-1611A(B)(C). - SG Blowdown, PVG-503A(B)(C). - FW Flow Control Bypass, FCV-3321(3331)(3341).

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 59 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
BOP	5. Complete the isolation of <u>each</u> FAULTED SG: - Close SG Chemical Feed Isolation, MVK-1633A(B)(C). - Close MS Drain Isolation, PVT-2843A(B)(C). - Close MS Drain Isolation, PVT-2877A for SG A. PVT-2877B for SG C. - Place the Steamline PWR RELIEF A(B)(C) SETPT Controller(s) in MAN and closed. - Place the Steamline Power Relief A(B)(C) Mode Switch(s) in PWR RLF. - Close FCV-3531(3541)(3551), MD EFP TO SG A(B)(C). - Close FCV-3536(3546)(3556), TD EFP TO SG A(B)(C). - Locally unlock and close XVG01017A(B)(C) – EF, SG A(B)(C) MTR DR EF PUMP SUPPLY HEADER VALVE (IB-423). - Locally unlock and close XVG01018A(B)(C) – EF, SG A(B)(C) TURB DR EF PUMP SUPPLY HDR VALVE (IB-423).	EOP-3.0
BOOTH OPERATOR:	When called to locally close XVG-1017B and XVG-1018B, insert TRIGGER 21.	EOP-3.0
	<u>CAUTION – Step 5.i</u> 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.	EOP-3.0
BOP	5. j. Close and locally deenergize the appropriate valve if SG B or SG C is FAULTED: • For SG B: - Close MVG-2802A, MS LOOP B TO TD EFP. - Open XMC1DA2X 05EH, EF PUMP MAIN STEAM BLOCK VLV XVG2802A-MS (IB-463).	EOP-3.0
BOOTH OPERATOR:	When called, use LOA Resets to take the appropriate local action(s).	EOP-3.0
BOP	6. Check if the FAULTED SG MS Isolation and MS Isolation Bypass Valves are closed.	EOP-3.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 60 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

	<u>NOTE – Step 7</u> Any high radiation level received on a radiation monitor that was unisolated at event initiation, may be considered a valid alarm.	EOP-3.0
BOP	7. Check if Secondary radiation levels are normal: a. Check radiation levels normal on <u>all</u> unisolated radiation monitors: • RM-G19A(B)(C), STMLN HI RNG GAMMA. • RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR. • RM-L10, SG BLOWDOWN CW DISCHARGE LIQUID MONITOR. • RM-A9, CNDSR EXHAUSE GAS ATMOS MONITOR.	EOP-3.0
BOP	7. ALTERNATIVE ACTION GO TO EOP-4.0, E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.	EOP-3.0

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 61 of 65
Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

EVALUTOR NOTE:	THESE ARE THE STEPS OF SOP-202 SECTION IV.A, STEAMLINE POWER RELIEF VALVE OPERATION
	<u>CAUTION 2.1</u> If a primary to secondary leak exists in any Steam Generator, Health Physics should be notified of Steamline Power Relief Valve operation.
	<u>NOTE 2.1</u> If a Steamline Power Relief Valve cannot be closed from the MCB, Section V.B, ISOLATION OF STEAMLINE POWER RELIEF VALVES IPV02000, 2010, OR 2020, may be used.
BOP	2.1 Take manual control of valve(s) to be operated as followed: a. Transfer the applicable controller(s) to MAN and close: (PEER ✓) 1) PWR RELIEF A SETPT. 2) PWR RELIEF B SETPT. 3) PWR RELIEF C SETPT. b. Place the corresponding mode selector switch(es) to PWR RLF: (PEER ✓) 1) A SD/PWR RELIEF. 2) B SD/PWR RELIEF. 3) C SD/PWR RELIEF.

SOP-202
Section IV.A

Section IV.A

Section IV.A

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 62 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	THE FOLLOWING STEPS ARE FOR STARTING AN IDLE CHARGING PUMP IAW SOP-102, SECTION III.B. SPECIFICALLY "B" CHARGING PUMP. STEP 2.1 IS NOT APPLICABLE.	
US	2.3 To start XPP-0043B, PUMP B, on miniflow, proceed as follows:	SOP-102 Section III.B
RO	a. If XSW1DB 15, CHARGING INJ PUMP XPP0043B-CS, is racked down, then initiate Attachment VD.	Section III.B
RO	b. Ensure XPP-43B-PP1, CHG PP B AUX OIL PP, is running.	Section III.B
RO	c. Ensure Train B Component Cooling is operating per SOP-118.	Section III.B
EVALUATOR NOTE:	If the crew decides to start "B" Charging Pump, they will have to perform SOP-118, COMPONENT COOLING WATER, Section III.A to start the "B" Component Cooling Water Pump before starting the "B" Charging Pump. SOP-118 Section III.A, Step 2.3 for starting the "B" Component Cooling Water Pump are below.	
RO	2.3 If Train B Component Cooling is to be utilized and is the inactive loop, perform the following: a. If in Modes 4-6 with RHR in service, ensure XMC1DB2Y 12AD, CC INLET TO RHR HT EXCH B, XVB9503B-CC (AB-463) is closed. b. Verify MVB-9503B, CC TO RHR HX B, is open. c. Start one of the following in slow speed: (PEER √) 1) XPP-0001B, PUMP B. 2) XPP-0001C, PUMP C TRAIN B. d. Locally verify greater than 1 gpm sample flow on RML0002B, LIQUID RAD MON COMPONENT COOLING (IB-412).	SOP-118 Section III.A
BOOTH OPERATOR:	If called for a pre-start check of "B" CCW Pump, wait 1-minute and report that the "B" CCW Pump is ready for a start. If called for a post-start check of "B" CCW Pump, wait 1-minute and report that it was a good start for "B" CCW Pump and RM-L2B is > 1 gpm.	

Section III.A

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 63 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior

EVALUATOR NOTE:	The following steps continue with SOP-102, Section III.B for starting the "B" Charging Pump.	
RO	d. Ensure Train B Chill Water is operating per SOP-501.	SOP-102 Section III.B
RO	e. Verify IPI00152A, CHARGING PUMP B SUCTION PRESS IND (AB-388), indicates pump suction pressure is greater than one of the following: 1. 15 psig if the Charging Pump suction is aligned to the RWST. 2. 30 psig if the Charging Pump suction is aligned to the VCT with VCT level 20% or greater.	Section III.B
RO	f. Ensure MINIFLOW ISOL, MVT-8109B, CHG PP B, is open.	Section III.B
RO	g. Start XPP-0043B, PUMP B. (PEER ✓)	Section III.B
US	<u>CAUTION Step 2.3.h</u> If the Auxiliary Oil Pump does not stop automatically, do not manually stop the Auxiliary Oil Pump. This is to prevent bearing damage due to the potential that the attached oil pump has failed.	Section III.B
RO	h. Verify XPP-43B-PP1, CHG PP B AUX OIL PP, stops automatically when the Charging Pump comes up to full speed.	Section III.B
RO	i. Monitor the following to verify proper pump operation: 1. Charging Pump B running current is between 30 amps and 50 amps. 2. PI-121, CHG PRESS PSIG, is between 2650 psig and 2850 psig. 3. XVG-9684B-CC, CCW TO CHG PP B, is open.	Section III.B
EVALUATOR NOTE:	THE FOLLOWING STEPS ARE FOR STARTING AN IDLE CHARGING PUMP IAW SOP-102, SECTION III.B. SPECIFICALLY "C" CHARGING PUMP. STEP 2.1 IS NOT APPLICABLE.	
US	2.4 To start XPP-0043C, PUMP C, on miniflow, proceed as follows:	SOP-102 Section III.B
RO	a. If required, initiate one of the following as appropriate: 1. If XSW1DA 06, CHARGING INJ PUMP C XPP0043C-CS, is racked down and Charging Pump C is to be aligned to Train A, initiate Attachment VA.	Section III.B

Form 3.3-2 Required Operator Actions

Op Test No: 22-01 NRC Scenario # 3 Event # 6 Page: 64 of 65
 Event Description: "B" SGTR.

Time/ Position	Applicant's Actions or Behavior	
RO	b. Following the completion of Attachment VA(B), Chilled Water Expansion Tank levels should be monitored for indications of equalization: 1. L9004A, CHILLED WATER EXPANSION TNK A LV, or ILI09004-VU, CHILL WATER EXP TK A LEVEL IND (IB-412). 2. L9006A, CHILLED WATER EXPANSION TNK B LV, or ILI09006-VU, CHILL WATER TK B LEVEL IND (IB-412).	Section III.B
RO	c. Ensure XPP-43C-PP1, CHG PP C AUX OIL PP, is running.	Section III.B
RO	d. Ensure the appropriate train of Component Cooling is operating per SOP-118.	Section III.B
RO	e. Ensure the appropriate train of Chill Water is operating per SOP-501.	Section III.B
RO	f. Verify IPI00152A, CHARGING PUMP B SUCTION PRESS IND (AB-388), indicates pump suction pressure is greater than one of the following: 1. 15 psig if the Charging Pump suction is aligned to the RWST. 2. 30 psig if the Charging Pump suction is aligned to the VCT with VCT level 20% or greater.	Section III.B
RO	g. Ensure MINIFLOW ISOL, MVT-8109C, CHG PP C, is open.	Section III.B
RO	h. Start XPP-0043C, PUMP C. (PEER✓)	Section III.B
US	<u>CAUTION Step 2.4.i</u> If the Auxiliary Oil Pump does not stop automatically, do not manually stop the Auxiliary Oil Pump. This is to prevent bearing damage due to the potential that the attached oil pump has failed.	Section III.B
RO	i. Verify XPP-43B-PP1, CHG PP B AUX OIL PP, stops automatically when the Charging Pump comes up to full speed.	Section III.B
RO	j. Monitor the following to verify proper pump operation: 4. Charging Pump B running current is between 30 amps and 50 amps. 5. PI-121, CHG PRESS PSIG, is between 2650 psig and 2850 psig. 6. XVG-9684B-CC, CCW TO CHG PP B, is open.	Section III.B

Form 3.3-2 Required Operator Actions

Op Test No: 2021 NRC

Page: 65 of 65

Procedure Revisions used in this Scenario Guide			
Number	Title	Rev	Date
GOP-4A	POWER OPERATION (MODE 1 – ASCENDING)	3I	1/6/23
SOP-102	CHEMICAL AND VOLUME CONTROL SYSTEM	25E	4/24/23
SOP-106	REACTOR MAKEUP WATER SYSTEM	12B	7/11/19
SOP-214	MAIN TURBINE AND CONTROLS	22	3/8/23
XCP-614	ANNUNCIATOR RESPONSE PROCEDURE	6E	6/7/17
AOP-102.2	LOSS OF CHARGING	1	11/3/15
AOP-112.2	ARG-3, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI	8	5/12/22
AOP-208.1	CONDENSATE PUMP TRIP/LOSS OF CONDENSATE FLOW	3	6/26/18
AOP-210.3	FEEDWATER PUMP MALFUNCTION	4	4/6/20
AOP-401.10	POWER RANGE CHANNEL FAILURE	4	4/26/17
EOP-1.0	E-0, REACTOR TRIP OR SAFETY INJECTION	30	11/16/18
EOP-4.0	E-3, STEAM GENERATOR TUBE RUPTURE	27	2/5/20
	V.C. SUMMER TECHNICAL SPECIFICATIONS	223	11/10/22

Form 3.3-1 Scenario Outline

Facility:	VC SUMMER	Scenario #:	#4
Scenario Source:	Bank	Op. Test #:	ILO 22-01 NRC-2023
Examiners:	_____	Operators:	US: _____
	_____		RO: _____
	_____		BOP: _____
Initial Conditions:	- Reactor power is 10⁻³%. "B" train work week. - XFN-0065B RBCU is OOS.		
Turnover	Increase reactor power to between 1% and 3% in accordance with GOP-3, Reactor Startup From Hot Standby to Startup (MODE 3 to MODE 2).		
Critical Tasks:	- Start the Turbine Driven EFW pump prior to requiring a transition to EOP-15.0, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEATSINK. - Establish containment isolation no later than 15-minutes from: - The time they actuate Phase A/Containment Ventilation Isolation by placing <u>either</u> CS-SG02A(B), TRAIN A & B, Switch to ACTUATE (if operator notices failure), <u>OR</u> - From the time the operator informs the US that EOP-1.0 Attachment 3 is complete (if operator does not notice failure).		

Event No.	Malf No.	Event Type*	Event Description
1	N/A	R-RO N-BOP, US	Raise Reactor Power to 1-3%.
2	MAL-RCS014A	C-RO, US TS-US	Thermal Barrier Leak on the "A" Reactor Coolant Pump.
3	PMP-AR001T	C-BOP, US	Loss of running Condenser Vacuum Pump.
4	MAL-CVC016A	I/MC-RO, US	FCV-122 fails open in AUTO.

Form 3.3-1 Scenario Outline

5#	PMP-EF002B PMP-EF002T	TS-US	“B” MDEFW pump bearing failure followed by a trip. (2019 NRC Scenario #3)
6#	PMP-EF001T MAL-MSS017A	C/MC-BOP, US	Failure of “A” MDEFW pump. Turbine Driven EFW pump fails to autostart. (2019 NRC Scenario #3)
7	MAL-RCS020C	M-ALL	Small Break LOCA on Loop “C” hot leg.
8	PMP-SW005T VLV-SW012P		SW Booster Pump “A” trips 1 min after SI and XVB-3107A fails to close.
9	VLV-HR015P VLV-HR006P		Phase A Valves SVX-6054 and SVX-6050A fail to automatically close on Phase A. SVX-6050A can be closed from MCB.
TERMINATE: The scenario may be terminated once the crew has transitioned to EOP-2.1, ES-1.2 Post LOCA Cooldown and Depressurization or at the Lead Examiners discretion.			
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Used on previous two NRC Exams.

The following notation is used in the Form 3.3-2 "Time" column:

IOA designates Immediate Operator Action steps.

***** designates Continuous Action steps.

Form 3.3-1 Scenario Outline

TURNOVER:

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

Train "B" RBCU, XFN-0065B is tagged out for breaker maintenance and is to be returned to service next shift.

The Unit is at 10⁻³% power MOL. A reactor and plant startup are in progress using GOP-3, Reactor Startup from Hot Standby to Startup (Mode 3 to Mode 2). The recording of Critical Data, step 3.13, has been completed and the reactor is critical in Mode 2 at 10⁻³% power. The secondary plant has been warmed with the turbine on turning gear. Sections of GOP-4A, Power Operation (Mode 1 - Ascending) have been completed to perform initial lineups and to warm the secondary plant. General Test Procedure, GTP-702 Surveillance Activity Tracking and Triggering, Attachment II G, Operational Mode Change Plant Startup - Entering Mode 1, has been completed.

Management directs that the Unit power be increased to 1% - 3% in accordance with GOP-3 step 3.14.

MTC is negative.

Current RCS Boron concentration by chemistry is 1539 ppm.

Phoenix display monitor is out of service. The Shift Engineer is tracking all necessary actions in Work Control.

An off-going operator will control temperature and EFW flow until the on-coming shift assumes the watch.

Pre-loaded Items

- OVR-AH022A
CS-AH280 RBCU FAN 65B FAST SPEED GREEN L
FINAL: OFF
- OVR-AH023A
CS-AH279 RBCU FAN 65B SLOW SPEED GREEN L
FINAL: OFF

EVENT 1: Raise power to 1-3%

The RO will increase Reactor Power by withdrawing control rods. The RO will recognize the negative reactivity feedback as the Point of Adding Heat is achieved and stabilize power between 1-3%. The BOP will adjust Emergency Feedwater flow to the Steam Generators as steam flow increases. The crew will transition to GOP-4A, Power Operation (Mode 1 - Ascending). Once power has been raised sufficiently for the chief examiner, the next event may be inserted.

EVENT 2: Thermal Barrier Leak on the “A” Reactor Coolant Pump

- **TRIGGER 2**
 - o MAL-RCS014A
RCP 1 THERMAL BARRIER LEAK
FINAL: 20 gpm
RAMP: 120 sec

On cue from the Examiner, a thermal barrier leak will begin on the “A” Reactor Coolant Pump. The crew may enter XCP-603, 1-2 or go to AOP-101.1, Loss of Reactor Coolant Not Requiring SI. MVT-9593A will need to be closed to isolate the leak.

The US will refer to Tech Spec 3.4.6.2, Reactor Coolant System Operational Leakage for Identified Leakage greater than 10 gpm, action b. They must reduce the leakage rate within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours

Once the crew has isolated the thermal barrier, the next event may be inserted.

EVENT 3: Loss of running Cond Vacuum Pump

- **TRIGGER 3**
 - o PMP-AR001T
XAC0001A MAIN CONDENSER VACUUM PMP A TRIP ON COMMAND

On cue from the Evaluator, the running Condenser Vacuum Pump will trip. The BOP will respond in accordance with an XCP-628 1-1, CVP A/B/C TRIP and align valves and start the “C” Condenser Vacuum Pump. Once the “C” Condenser Vacuum pump has been started, the next event may be inserted.

EVENT 4: FCV-122 fails OPEN in AUTO

- **TRIGGER 4**
 - o MAL-CVC016A
CHARGING FLOW CONTROL VALVE FAILURE (AUTO ONLY)
FINAL: 100

On cue from the Examiner, FCV-122 will fail open. XCP-614, 5-1, CHG LINE FLO HI/LO will alarm. The RO will take manual control of FCV-122 and maintain Regenerative Heat Exchanger temperature and Pressurizer level. Once Regenerative Heat Exchanger temperature and Pressurizer level have stabilized, the next event may be inserted.

EVENT 5 and 6: “A” and “B” MDEFW Pumps trip.

- **PRELOAD**
 - MAL-MSS017A
PVG-2030-MS TDEFP AUTO START FAILURE
- **TRIGGER 5**
 - PMP-EF002T
XPP0021B MOTOR DRIVEN EFW PMP B TRIP ON COMMAND
DELAY: 35 sec
 - PMP-EF002B
XPP0021B MOTOR DRIVEN EFW PMP B BRG FAILURE
RAMP: 5 sec
FINAL: 7
- **TRIGGER 6 – Auto Trigger if necessary - x06o013a (RTB OPEN)**
 - PMP-EF001T
XPP0021A MOTOR DRIVEN EFW PMP A TRIP ON COMMAND

At approximately 1-3% power, on cue from the Examiner, the "B" MDEFW pump bearing will fail. The "B" EFW Pump will trip after a short delay if not stopped by the BOP. The BOP may adjust EFW flow to maintain Steam Generator Water level.

The US will apply TS 3.7.1.2, EMERGENCY FEEDWATER SYSTEM Action “a”: 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.

If the crew trips the reactor after “B” MDEFW pump trips, the “A” MDEFW pump will automatically trip requiring the crew to start the Turbine Driven EFW pump.

If the crew does not trip the reactor when “B” MDEFW pump trips, Trigger 6, “A” MDEFW pump trip, will be manually inserted after Technical Specifications are addressed for the “B” MDEFW pump trip.

The BOP will be required to start the Turbine-driven EFW Pump and adjust EFW flow to maintain Steam Generator levels. Once the BOP starts the Turbine Driven EFW pump, the Small Break LOCA will automatically be inserted.

EVENT 7-9: Small Break LOCA on LOOP C Hot Leg 500 gpm.

- **PRELOAD**
 - o VLV-HR015P
XVX06054-HR CNMT ISO VLV FOR PT8254 FAIL POSITION
FINAL: 100
 - o VLV-HR006P
XVX06050A-HR POST ACC H2&LP A IN RB FAIL POSITION
FINAL: 100
- **TRIGGER 7 – Auto Trigger – x07o351r (XVG-2030 VALVE OPEN)**
 - o MAL-RCS020C
REACTOR COOLANT SYSTEM LEAK HOT LEG (LOOP 3)
DELAY: 15 sec
FINAL: 500
- **TRIGGER 11**
 - o LOA-CCW052
CCW PUMP C MANUAL SPEED SELECTOR SWITCH
FINAL: FAST SPEED
- **TRIGGER 12**
 - o LOA-CCW050
CW PUMP A MANUAL SPEED SELECTOR SWITCH
FINAL: FAST SPEED
- **AUTO-TRIGGER 21 Ipplsi (SI ACTUATED)**
 - o PMP-SW005T
XPP0045A SW BOOSTER PMP A TRIP ON COMMAND
DELAY: 60 sec
 - o VLV-SW012P
XVB03107A-SW SW R BLDG OTLT A FAIL POSITION
DELAY: 60 sec
FINAL: 100
- **AUTO-TRIGGER 22, x02i410d (SVX-6050A SWITCH TO CLOSE)**
 - o VLV-HR006P
XVX06050A-HR POST ACC H2&LP A IN RB FAIL POSITION
FINAL: 0
DELETE IN: 1 sec

Form 3.3-1 Scenario Outline

Once the crew starts the Turbine Driven EFW pump, a Small Break LOCA will automatically be inserted. They will enter EOP-1.0, E-0 Reactor Trip or Safety Injection. SI SVX-6054 and SVX-6050A Containment isolation valves will fail to close. SVX-6050A can be closed from the MCB. SW Booster pump A will trip and XVB-3107A will fail to close requiring operators to isolate RBCU 64A/65A. The crew will transition from EOP-1.0 to EOP-2.0, E-1 Loss of Reactor or Secondary Coolant to EOP-2.1, ES-1.2 Post LOCA Cooldown, and initiate a cooldown.

CRITICAL TASKS:

- Start the Turbine Driven EFW pump prior to requiring a transition to EOP-15.0, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEATSINK.
- Establish containment isolation prior to transitioning out of EOP-2.0.

TERMINATION:

The scenario may be terminated once the crew has transitioned to EOP-2.1, ES-1.2 Post LOCA Cooldown and Depressurization or at the Lead Examiners discretion.

Form 3.3-1 Scenario Outline

2023 NRC #4

Scenario Attributes		Events
Events after EOP entry (1-2)	2	- SW Booster Pump "A" trips 1 min after SI and XVB-3107A fails to close. - Phase A Valves SVX-6054 and SVX-6050A fail to automatically close on Phase A. SVX-6050A can be closed from MCB.
Abnormal Events (2-4)	4	- Thermal Barrier Leak on the "A" Reactor Coolant Pump. - Loss of running Condenser Vacuum Pump. - FCV-122 fails open in AUTO. "B" MDEFW Pump bearing failure leading to a trip. "A" MDEFW pump trips and TDEFW pump fails to auto start.
Major Transients (1-2)	1	SBLOCA on Loop "C" Hot leg.
EOPs Entered (1-2)	1	EOP-2.0, E-1 LOSS OF REACTOR OR SECONDARY COOLANT.
EOP Contingencies (0-2)	0	N/A
Preidentified CTs (≥ 2)	2	- Start the Turbine Driven EFW pump prior to requiring a transition to EOP-15.0, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEATSINK. - Establish containment isolation no later than 15-minutes from: - The time they actuate Phase A/Containment Ventilation Isolation by placing <u>either</u> CS-SG02A(B), TRAIN A & B, Switch to ACTUATE (if operator notices failure), <u>OR</u> - From the time the operator informs the US that EOP-1.0 Attachment 3 is complete (if operator does not notice failure).

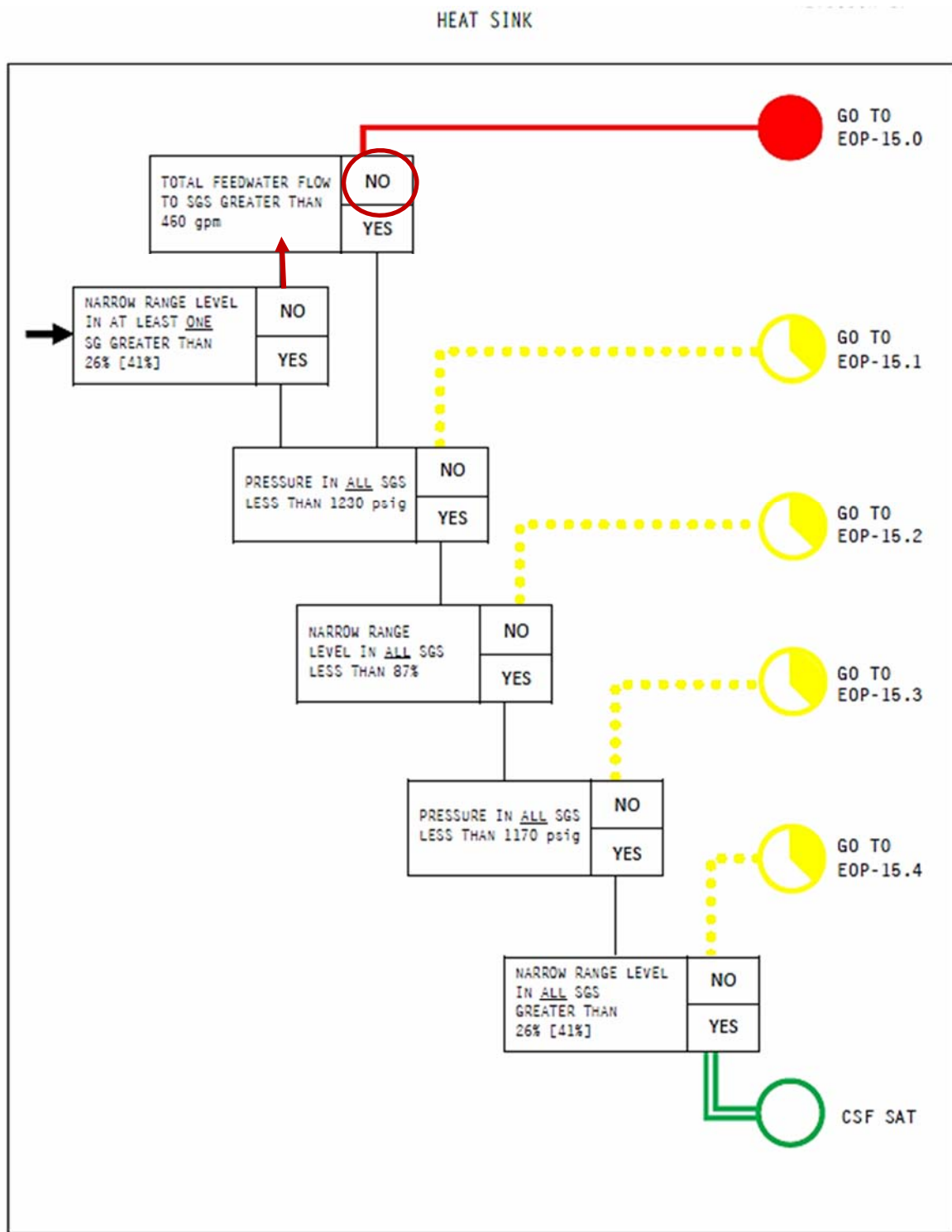
Explanation of Critical Task Basis is below:

Critical Task 1: Start the Turbine Driven EFW pump prior to requiring a transition to EOP-15.0, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEATSINK.

During the last event leading into the major, both Motor Driven EFW pumps will end up being tripped or fail to start. When this occurs, the reactor will be tripped and an operator will be required to start the only available EFW pump, the Turbine Driven. If the Turbine Driven EFW pump is not started, there will be no EFW flow and SG level <26% and therefore conditions will be met for a Red path for EOP-15.0. Starting the Turbine Driven EFW pump meets the critical task methodology of NUREG 1021 because this task has one or more actions that would prevent a challenge to plant safety such as preventing the

Form 3.3-1 Scenario Outline

following (examples are not all-inclusive): conditions that result in orange or red path critical safety functions (Westinghouse and AP1000). See CSFST flow path below.



Form 3.3-1 Scenario Outline

Critical Task 2:

Establish containment isolation no later than 15-minutes from:

- The time they actuate Phase A/Containment Ventilation Isolation by placing either CS-SG02A(B), TRAIN A & B, Switch to ACTUATE (if operator notices failure), OR
- From the time the operator informs the US that EOP-1.0 Attachment 3 is complete (if operator does not notice failure).

The major event is a Small Break LOCA with two Phase “A” valves failing to close and isolate containment. This creates a release path to the environment. Closing at least one of these valves, isolating the release path meets the critical task methodology of NUREG 1021 because it directly leads to the restoration of one or more safety functions. Specifically Safety Function 5, system 103 Containment System. Below is the procedure step for isolating Phase “A” valves and on the following page is a list on Containment Isolation and Backup Valve locations.

13 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.

13 Perform the following:

- a) Actuate Phase A/Containment Ventilation Isolation by placing either CS-SG02A(B), TRAIN A & B, Switch to ACTUATE. ☐
- b) Close each required Containment Isolation Valve OR its Backup Valve from the MCB. REFER TO ATTACHMENT 5, CONTAINMENT ISOLATION AND BACKUP VALVE LOCATIONS. ☐

Form 3.3-1 Scenario Outline

CONTAINMENT ISOLATION AND BACKUP VALVE LOCATIONS

REVISION 02

VALVE ID	VALVE DESCRIPTION	TYPE	LOCATION	PENETRATION NUMBER	BACKUP ISOLATION
XVB00001A-AH	REACTOR BLDG PURGE SUPPLY HEADER VALVE	A	FB-479	402	PVB-1B
XVB00001B-AH	RB PURGE SUPPLY ISOL VLV (IRC)	A	RB	402	PVB-1A
XVB00002A-AH	REACTOR BLDG PURGE EXHAUST HEADER VALVE	A	FB-479	101	PVB-2B
XVB00002B-AH	RB PURGE EXHAUST ISOL VLV (IRC)	A	RB	101	PVB-2A
XVG00503A-BD	STEAM GEN A BLOWDOWN HEADER ISOL VALVE	A	AB-412	326	IFV-4701A
XVG00503B-BD	STEAM GEN B BLOWDOWN HEADER ISOL VALVE	A	IB-412	224	IFV-4701B
XVG00503C-BD	STEAM GEN C BLOWDOWN HEADER ISOL VALVE	A	IB-412	219	IFV-4701C
XVT02660-IA Note 1	RB INSTRUMENT AIR SUPPLY ISOL VLV (ORC)	A	AB-436	311	PVT-2660 (Manual) Note 1
XVT02662A-IA	RB IA SUCTION ISOLATION VALVE (ORC)	A	AB-412	319	PVT-2662B
XVT02662B-IA	RB IA SUCTION HDR ISOLATION VALVE (IRC)	A	RB	319	PVT-2662A
SVX-6050A	POST ACCID H2 LOOP A VLV (IRB)	S	MCB	301B	SVX-6052A
SVX-6054	RB NR PRESS CNTMT ISOL	S	MCB	301B	SVX-6050A

Form 3.3-1 Scenario Outline

SIMULATOR SCENARIO SETUP

INITIAL CONDITIONS:

- IC Set 259
- $10^{-3}\%$ Power, MOL
- Burnup = 10,000 MWD/MTU
- Current Core Cycle = 28
- RCS Boron Concentration = 1539 ppm
- FCV-113 Pot Setting = 6.60
- Rod Position: Group D = 100 steps
- Tavg = 558.3°F

PRE-EXERCISE:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.).
- Complete VCS-TQP-0807 Attachment I-A, Unit 1 Booth Instructor Checklist.
- Verify plant aligned for "B1" work week IAW PTP-101.004, Safety Related Train Swap Checklist.
- Verify red Placard on "A" CCW Pump and "B" Charging Pump.
- Verify the Hard Card for Turbine operation is in its proper storage location and cleaned.
- Verify the Hard Card for borating via MVT-8104 is in its proper storage location and cleaned.
- Set RO SIPCS station to ZZREAC.
- Verify Rod Bank Update set correctly: 100 steps on Control Bank D and 226 steps on all other Banks.
- Verify NR-45 is set to One Intermediate Range and One Power Range channel and is set to fast speed.
- Reset Digital Reactivity on SIPCS (disable calc, select N35 and N36, re-enable and calculate)
- Ensure no NI's are removed from service, on SIPCS type in "add/omit" to verify.
- Place HOLD Tag on RBCU 65B NORM and SLOW Speed Switches.
- Ensure 115kV & 230kV setpoints are set to appropriate values for the shutdown condition IAW SOP-304, Enclosure B.
- Ensure you have the following pre-marked up procedures:
 - o GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2)
 - o GOP-4A, Power Operation (Mode 1 - Ascending)
- Ensure Phoenix computer screen is turned off.

Form 3.3-1 Scenario Outline

- Have two copies of SOP-118 Attachment VIIA available upon request.
- Have two copies of SOP-118 Attachment VIIIA available upon request.
- Ensure XCP-620 2-5, CMPTR ROD DEV, is **not** lit. If it is lit:
 - Enter RBU into IPCS and verify the information matches current rod height.
 - If rod height in RBU doesn't match current rod height, update the information and save it. This should clear XCP-620 2-5.
- Ensure you have a turnover sheet for each position.
- Conduct two-minute drill.

COMMUNICATIONS NOTE:

The following are the Unit Numbers for Building Operators for communication from the Control Room:

- Unit 4 – Control Building Operator
- Unit 5 – Turbine Building Operator
- Unit 6 Upper – Auxiliary Building Upper Operator
- Unit 6 Lower – Auxiliary Building Lower Operator
- Unit 7 – Intermediate Building Operator

Op Test No: 2023 NRC		Scenario # 4	Event # 1	Page: 14 of 51
Event Description: Raise Reactor Power to 1-3%				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	The crew will increase reactor power to between 1% and 3% in accordance with GOP-3 REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2).			
BOOTH OPERATOR:	No TRIGGER.			
	<u>CAUTION 3.14</u> While operating with a positive Moderator Temperature Coefficient: - All reactivity additions should be slow and controlled. - A stable Startup Rate of 0.3 decade per minute should not be exceeded. - Rods should be moved in 1/2 step increments until the effect of rod motion has been evaluated.			GOP-3
	<u>NOTE 3.14</u> Ensure sufficient Emergency Feedwater Flow exists prior to raising power.			GOP-3
RO	3.14. Increase Reactor Power to between 1% and 3%.			GOP-3
RO	3.15. 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> - Adjustment of Tavg with the Rod Control System must not be attempted with the ROD CNTRL BANK SEL Switch in any position other than MAN. - Manual rod control is required to establish equilibrium conditions, since C-5 blocks automatic rod withdrawal.			GOP-3
RO	3.16. Maintain Tavg between 555°F and 559°F.			GOP-3
	<u>NOTE 3.17</u> Emergency Feedwater Flow and Steam Generator Blowdown Flows should be adjusted simultaneously to ensure sufficient Emergency Feedwater Flow exist.			GOP-3

Op Test No: 2023 NRC Scenario # 4 Event # 1 Page: 15 of 51

Event Description: Raise Reactor Power to 1-3%

Time/ Position	Applicant's Actions or Behavior	
BOP	3.17. Adjust Steam Generator Blowdown flow between 45 GPM and 50 GPM on each Steam Generator while maintaining Narrow Range Steam Generator levels between 60% and 65% with chemistry within specification using the following: a. Blowdown per SOP-212, Steam Generator Blowdown. b. Emergency Feedwater per SOP-211, Emergency Feedwater System.	GOP-3
US	3.18. Complete Attachment II.G, Operational Mode Change Plant Startup - Entering Mode 1, of GTP-702.	GOP-3
US	3.19. Proceed to GOP-4A, Power Operation (Mode 1 - Ascending).	GOP-3
BOOTH OPERATOR:	If called at any time to look at feedwater heaters because of the feedwater heater dump valve not being closed, wait 2 minutes and report back "no issues, everything is operating correctly".	
EVALUATOR NOTE:	The next event may be inserted following completion of the power ascension and prior to beginning Step 3.17, or at the discretion of the Lead Examiner.	

Appendix D		Required Operator Actions	Form ES-D-2
Op Test No: 2023 NRC		Scenario # 4 Event # 2	Page: 16 of 51
Event Description: Thermal Barrier Leak on the “A” Reactor Coolant Pump			
Time/ Position		Applicant’s Actions or Behavior	
EVALUATOR NOTE:		Thermal Barrier Leak on the “A” Reactor Coolant Pump	
BOOTH OPERATOR:		When directed – initiate Event 2 (TRIGGER 2).	
Symptoms/ Cues		• XCP-603, 1-2 RCP A THERM BAR FLO HI. • XCP-643, 3-6 CC SRG TK VENT 7096 CLSD HI RAD. • XCP-644, 1-3 CC LOOP A RM-L2A HI RAD. • XCP-644, 1-4 CC LOOP A RM-L2A TRBL. • CCW Surge Tank Level.	
EVALUATOR NOTE:		May enter XCP-603, 1-2, XCP-644, 1-3 OR AOP-101.1, LOSS OF REACTOR COOLANT NOT REQUIRING SI.	
CREW		1. Monitor RML-2A and RML-2B for radiation level increase.	
RO		2. If due to thermal barrier leakage, close MVT-9593A, FROM RCP A THERM BARR.	
RO		3. Verify seal injection flow available to Reactor Coolant Pump A.	
US		US Enters XCP-644, 1-3, CC LOOP A RM-L2A HI RAD	
CREW		Corrective Actions: 1. Verify the Automatic Action has occurred. 2. Verify the alarm is valid by observing RM-L2A and R/R-5 for increasing radiation. 3. Notify Health Physics and request a radiological survey. 4. Notify Chemistry and request a sample of the Component Cooling System. 5. Monitor Component Cooling System flows, temperatures and annunciators for any indications of equipment failure.	
BOOTH OPERATOR:		When called to sample the CCW system, wait 5 minutes and report back that the CCW system has elevated activity levels.	

Op Test No: 2023 NRC Scenario # 4 Event # 2 Page: 17 of 51
 Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump

Time/ Position	Applicant's Actions or Behavior
RO	Supplemental Actions: 1. Isolate the source of inleakage when confirmed by sample analysis or a radiological survey. 2. If leakage is from a Reactor Coolant Pump Thermal Barrier, verify adequate seal injection flow and close the associated following valve for the affected pump: a. MVG-9593A, FROM RCP A THERM BARR. b. MVG-9593B, FROM RCP B THERM BARR. c. MVG-9593C, FROM RCP C THERM BARR. d. Refer to SOP-101 for Reactor Coolant Pump operating parameters.
EVALUATOR NOTE:	Until the leak is identified, the leakage is considered unidentified and is subject to the T.S. 3.4.6.2 - 1 GPM limit. Quantification of the leak can be made by the increase in charging or by the rise seen on the CCW Surge Tank, which would require reference to the Curve Book and a calculation based on time.
US	Enters T.S. 3.4.6.2, Reactor Coolant System Operational Leakage and applies Action b: 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System With any operational Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE, primary-to-secondary leakage, and leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
EVALUATOR NOTE:	If the crew doesn't use the Alarm Response Procedures above to mitigate the RCP Thermal Barrier leak, the steps for AOP-101.1 are below. If the crew does use the Alarm Response Procedures above to mitigate the RCP Thermal Barrier leak, the next event may be inserted following the US assessment of Tech Specs, after they have closed 9593A, or at any time per the discretion of the Lead Examiner.

XCP-644, 1-3

TS 3.4.6.2

Op Test No: 2023 NRC Scenario # 4 Event # 2 Page: 18 of 51
 Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump

Time/ Position	Applicant's Actions or Behavior	
	<u>NOTE</u> - If a Reactor Trip occurs AND SI is NOT required, this procedure should be continued after the actions of EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE, are completed. - As valves are isolated, it may be necessary to monitor RCS pressure for a period of time to determine if the leak is isolated.	AOP-101.1
RO	*1. Verify PZR level is at or trending to program level. (NO)	AOP-101.1
RO	ALTERNATIVE ACTION 1. IF PZR level is decreasing, THEN perform the following: - Open FCV-122, CHG FLOW, as necessary to maintain PZR level. - IF PZR level continues to decrease, THEN reduce Letdown to one 45 gpm orifice: - Set PCV-145, LO PRESS LTDN, to 70%. - Ensure PVT-8149A, LTDN ORIFICE A ISOL, is open. - Close both PVT-8149B(C), LTDN ORIFICE B(C) ISOL. - Adjust PCV-145, LO PRESS LTDN, to maintain PI-145, LO PRESS LTDN PRESS PSIG, between 300 psig and 400 psig. - Place PCV-145, LO PRESS LTDN, in AUTO.	AOP-101.1
RO	*2. Check if SI is required: (NO) a. Check if any of the following criteria are met: - PZR level is decreasing with Charging maximized and Letdown minimized. - OR - PZR level is approaching 8%. - OR - PZR pressure is approaching 1870 psig. - OR - VCT level is approaching 5%.	AOP-101.1
US	ALTERNATIVE ACTION a. GO TO Step 3	AOP-101.1

Op Test No: 2023 NRC Scenario # 4 Event # 2 Page: 19 of 51
 Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump

Time/ Position	Applicant's Actions or Behavior	
	<u>NOTE – Step 3</u> Conditions for implementing Emergency Plan Procedures should be evaluated using EPP.001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.	AOP-101.1
CREW	3. Determine RCS leak rate: a. Estimate the RCS leak rate: • REFER TO IPCS CHGNET. • REFER TO IPCS 4RW1. b. Estimate the RCS leak rate using IPCS VCT level. (14 gal/percent) c. If necessary, calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAKAGE CALCULATION.	AOP-101.1
US	4. Check if the RCS leak rate is GREATER THAN Tech Spec 3.4.6.2 limits.	AOP-101.1
US	5. Comply with the applicable Tech Spec 3.4.6.2 action statement.	AOP-101.1
RO	6. Verify RCS pressure is GREATER THAN 2210 psig.	AOP-101.1
RO	7. Close all Letdown Isolation Valves: a. PVT-8149A, LTDN ORIFICE A ISOL. b. PVT-8149B, LTDN ORIFICE B ISOL. c. PVT-8149C, LTDN ORIFICE C ISOL. d. LCV-459, LTDN LINE ISOL. e. LCV-460, LTDN LINE ISOL.	AOP-101.1

Op Test No: 2023 NRC Scenario # 4 Event # 2 Page: 20 of 51

Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump

Time/ Position	Applicant's Actions or Behavior	
RO	8. Check if the leak has been isolated: (NO) a. Evaluate the following: • IPCS CHGNET • IPCS 4RW1 • Pressurizer level • VCT Level • Reactor Building Conditions b. If necessary, calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAKAGE CALCULATION.	AOP-101.1
RO	ALTERNATIVE ACTION 8. Perform the following: 1. Isolate Charging by closing either of the following: • MVG-8107, CHG LINE ISOL. • MVG-8108, CHG LINE ISOL. 2. GO TO Step 11.	AOP-101.1
RO	11. Check if the leak has been isolated: (NO) a. Evaluate the following: • IPCS CHGNET • IPCS 4RW1 • Pressurizer level • VCT Level • Reactor Building Conditions b. If necessary, calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAKAGE CALCULATION.	AOP-101.1

Op Test No: 2023 NRC Scenario # 4 Event # 2 Page: 21 of 51
 Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump

Time/ Position	Applicant's Actions or Behavior	
RO	ALTERNATIVE ACTION 11. Perform the following: 1. Close FCV-122, CHG FLOW 2. Ensure both of the following are open: - MVG-8107, CHG LINE ISOL. - MVG-8108, CHG LINE ISOL. 3. Restore Normal Letdown using ATTACHMENT 2, ESTABLISHING NORMAL LETDOWN. 4. If desired, restore Automatic Charging flow control using ATTACHMENT 3, RESTORING AUTOMATIC CHARGING FLOW CONTROL. 5. GO TO Step 14.	AOP-101.1
EVALUATOR NOTE:	The following is directions contained in Attachment 2 to restore letdown.	
RO	1. Establish Normal Letdown: a. Adjust FCV-122, CHG FLOW, to obtain 70 gpm Charging flow.	AOP-101.1 ATT 2
RO	b. Set PCV-145, LO PRESS LTDN, to 70%.	AOP-101.1 ATT 2
RO	c. Open TCV-144, CC TO LTDN HX.	AOP-101.1 ATT 2
RO	d. Open PVT-8152, LTDN LINE ISOL.	AOP-101.1 ATT 2
RO	e. Place TCV-143, LTDN TO VCT OR DEMIN, in VCT position.	AOP-101.1 ATT 2
RO	f. Open both LCV-459 and LCV-460, LTDN LINE ISOL.	AOP-101.1 ATT 2
RO	g. Open desired Orifice Isolation Valve(s) to obtain 60 gpm to 120 gpm: - PVT-8149A, LTDN ORIFICE A ISOL (45 gpm). - PVT-8149B, LTDN ORIFICE B ISOL (60 gpm). - PVT-8149C, LTDN ORIFICE C ISOL (60 gpm).	AOP-101.1 ATT 2
RO	h. Adjust FCV-122, CHG FLOW, to maintain TI-140, REGEN HX OUT TEMP °F, between 250°F and 350°F while maintaining PZR level.	AOP-101.1 ATT 2

Op Test No: 2023 NRC		Scenario # 4	Event # 2	Page: 22 of 51
Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump				
Time/ Position	Applicant's Actions or Behavior			
RO	i. Adjust PCV-145, LO PRESS LTDN, to maintain PI-145, LO PRESS LTDN PRESS PSIG, between 300 psig and 400 psig.			AOP-101.1 ATT 2
RO	j. Place PCV-145, LO PRESS LTDN, in AUTO.			AOP-101.1 ATT 2
RO	k. Place TCV-144, CC TO LTDN HX, in AUTO.			AOP-101.1 ATT 2
RO	l. WHEN Letdown temperatures are stable, place TCV-143, LTDN TO VCT OR DEMIN, in DEMIN/AUTO.			AOP-101.1 ATT 2
EVALUATOR NOTE:	The following is directions contained in Attachment 3 for restoring Normal Charging.			
RO	1. Place FCV-122, CHG FLOW in AUTO as follows: a. Place the following in MAN: 1) PZR LEVEL MASTER CONTROL 2) FCV-122, CHG FLOW			AOP-101.1 ATT 3
RO	b. Adjust FCV, CHG FLOW, in MAN to establish Pressurizer level at or near programmed level.			AOP-101.1 ATT 3
RO	c. Establish automatic FCV-122, CHG FLOW, control as follows: 1) Adjust FCV-122, CHG FLOW, to establish 75 gpm flow as indicated on FI-122A, CHG FLOW GPM. 2) Manually adjust the PZR LEVEL MASTER CONTROL to 50% demand. 3) Place FCV-122, CHG FLOW, in AUTO.			AOP-101.1 ATT 3
RO	d. Adjust PZR LEVEL MASTER CONTROL in MAN, as necessary, to maintain Pressurizer level at or near programmed level.			AOP-101.1 ATT 3
RO	e. When Pressurizer level is within 1% and trending toward programmed level, place PZR LEVEL MASTER CONTROL in AUTO.			AOP-101.1 ATT 3
EVALUATOR NOTE:	The following is a return to the guidance in the body of AOP-101.1.			

Op Test No: 2023 NRC Scenario # 4 Event # 2 Page: 23 of 51
 Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump

Time/ Position	Applicant's Actions or Behavior	
	<u>CAUTION – Step 14</u> Proper radiological precautions must be taken when obtaining steamline samples to minimize personnel exposure.	AOP-101.1
CREW	14. Verify no SG tubes are leaking: - Narrow Range level in no SG is increasing with feed flow LESS THAN steam flow. - Radiation levels on all of the following are normal: - 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. - No steam flow/feed flow mismatch (feed flow low). - As determined by Chemistry sample analysis of all SG secondary sides for activity.	AOP-101.1
RO	15. Check the PZR PORVs: Check if RCS pressure is LESS THAN 2330 psig.	AOP-101.1
	<u>CAUTION – Step 15.b</u> If any PZR PORV opens because of high PZR pressure, Step 15.b should be repeated after pressure decreases to LESS THAN 2300 psig to ensure the PORV recloses.	AOP-101.1
RO	- Verify all PZR PORVs are closed. - Check if PRT conditions are normal by verifying PRT LVL LO/TEMP/LVL/PRESS HI (XCP-616 4-4), is NOT lit. - Verify at least one PZR PORV Block Valve is open.	AOP-101.1

Op Test No: 2023 NRC Scenario # 4 Event # 2 Page: 24 of 51
 Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump

Time/ Position	Applicant's Actions or Behavior	
CREW	16. Check if Reactor Building conditions are normal: a. RB radiation levels are normal on the following: • RM-G5, RB PERSONNEL ACCESS AREA GAMMA. • RM-G6, RB REFUEL BRIDGE AREA GAMMA. • RM-A2, RB SAMPLE LINE PARTICULATE (IODINE) (GAS) ATMOS MONITOR. b. RB Sump levels are normal. c. RB pressure is LESS THAN 1.5 psig. d. The following annunciators are NOT lit: • RBCU 1A/2A DRN FLO HI (XCP-606 2-2). • RBCU 1B/2B DRN FLO HI (XCP-607 2-2). • RCS LEAK DET >1 GPM (XCP-6153-6).	AOP-101.1
	<u>NOTE – Step 17</u> Conditions for implementing Emergency Plan Procedures should be evaluated using EPP.001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.	AOP-101.1
CREW	17. Check if Aux Building conditions are normal: a. Radiation levels are normal on the following: • RM-A13, PLANT VENT HI RANGE. • RM-A3, MAIN PLANT VENT EXH ATMOS MONITOR: PARTICULATE (IODINE) (GAS). • RM-A11, AB VENT GAS ATMOS MONITOR. • Aux Building local area radiation monitors. b. AB SMP LVL HI (XCP-631 6-1), is NOT lit. c. LD TRBL AB SMP/FLDRN LVL HI (XCP-606(607) 3-4), is NOT lit.	AOP-101.1
RO	18. Check if the Component Cooling Water System is intact: • Radiation Level is normal on RM-L2A(B), COMPONENT COOLING LIQUID MONITOR. (NO) OR • CCW Surge Tank is normal and stable.	AOP-101.1

Op Test No:	2023 NRC	Scenario # 4	Event # 2	Page: 25 of 51
Event Description: Thermal Barrier Leak on the "A" Reactor Coolant Pump				
Time/ Position	Applicant's Actions or Behavior			
US	ALTERNATIVE ACTION 18. GO TO Step 20.			AOP-101.1
RO	20. Check if flow on FT-130, SL INJ FLO on IUR01156, is GREATER THAN 6 GPM.			AOP-101.1
RO	21. Close MVT-9593A, FROM RCP A THERM BARR.			AOP-101.1
RO	22. Check if the leak has been isolated: • CCW Surge Tank level is stable. • If necessary, calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAKAGE CALCULATION.			AOP-101.1
US	23. GO TO Step 42.			AOP-101.1
CREW	42. Evaluate Plant status: a. Maintain stable plant conditions. b. Consult with the Shift Manager to determine further actions.			AOP-101.1
US	43. RETURN TO Procedure and Step in effect.			AOP-101.1
US	Enters T.S. 3.4.6.2, Reactor Coolant System Operational Leakage and applies Action b: 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System With any operational Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE, primary-to-secondary leakage, and leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Tech Specs			AOP-101.1
EVALUATOR NOTE:	The next event may be inserted following the US assessment of Tech Specs, after they have closed 9593A or at any time per the discretion of the Lead Examiner.			

Appendix D		Required Operator Actions	Form ES-D-2
Op Test No: 2023 NRC		Scenario # 4 Event # 3	Page: 26 of 51
Event Description: Loss of running Condenser Vacuum Pump.			
Time/ Position	Applicant's Actions or Behavior		
EVALUATOR NOTE:	On cue from the Examiner, "A" CVP will trip.		
BOOTH OPERATOR:	When directed – initiate Event 3 (TRIGGER 3).		
Symptoms/ Cues	- XCP-628 1-1, CVP A/B/C TRIP. - Increasing pressure indication on PI-3006, MAIN CNDSR MAIN A PRESS INCHES HG		
US	Enters ARP-001- XCP-628 1-1.		
BOOTH OPERATOR:	If contacted as field operator regarding Condenser Vacuum pump status, wait 1 minute then report as follows in accordance with the information requested: "The "A" condenser vacuum pump is stopped and the motor bearings are extremely hot." "The "C" Condenser Vacuum pump is ready for start" "Good start on the "C" Condenser Vacuum pump" If contacted about the status of XVB00118C, wait 1 minute and report that the valve is open after "C" Condenser Vacuum pump is started. If contacted about the status of XVB00118A, wait 1 minute and report that the valve is closed.		
BOP	CORRECTIVE ACTIONS: - Determine which vacuum pump tripped. - If Main Vacuum Pump A tripped, perform the following: - Open MVB-102A, VAC PP C TO CNDSR A. - Start XAC-0001C, MAIN CVP C. - Place XAC-0001A, MAIN CVP A, to STOP.		
BOP	5. Verify vacuum is stable on PI-3006(3016), MAIN A(B) PRESS INCHES HG.		
EVALUATOR NOTE:	The next event may be initiated after the "C" Condenser Vacuum Pump has been started or at any time per the discretion of the Lead Evaluator.		

XCP-628 1-1

XCP-628 1-1

XCP-628 1-1

XCP-628 1-1

Appendix D		Required Operator Actions	Form ES-D-2
Op Test No: 2023 NRC		Scenario # 4 Event # 4	Page: 27 of 51
Event Description: FCV-122 fails OPEN in AUTO			
Time/ Position	Applicant's Actions or Behavior		
EVALUATOR NOTE:	FCV-122 fails OPEN in AUTO.		
BOOTH OPERATOR:	When directed – initiate Event 4 (TRIGGER 4).		
RO	The RO may take action in accordance with OP-AA-100 for equipment not responding properly in Automatic control. RO may establish manual control and restore charging flow.		
US/ RO	Enters XCP-614, 5-1, CHG LINE FLO HI/LO.		
	CORRECTIVE ACTIONS: 1. If the running Charging Pump suction flowpath has become isolated, secure the Charging Pump and go to AOP-102.2, Loss of Charging. (NO)		
	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. (NO)		
RO	3. Monitor LT-112A and LT-115, % LEVEL, to verify proper VCT level.		
RO	4. Monitor FI-122A, CHG FLOW GPM.		
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. (NO)		

Op Test No: 2023 NRC Scenario # 4 Event # 4 Page: 28 of 51
 Event Description: FCV-122 fails OPEN in AUTO

Time/ Position	Applicant's Actions or Behavior
RO	6. If Charging flow has NOT been lost but a loss of automatic control of FCV-122, CHG FLOW, is suspected perform the following: - 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, CHARGING HEADER FLOW CONTROL VALVE (AB-412 West Pen).
EVALUATOR NOTE:	The next event may be initiated while the RO is re-establishing manual Pressurizer Level and Regenerative Heat Exchanger Outlet temperature, or at the discretion of the Lead Examiner.

XCP-614, 5-1

Op Test No: 2023 NRC		Scenario # 4	Event # 5 and 6	Page: 29 of 51
Event Description: "B" Motor Driven EFW pump BRG failure followed by trip requiring EFW flow adjustments. After plant is stable and Technical specification have been addressed the "A" Motor Driven EFW pump will trip and start of Turbine Driven EFW pump will be required.				
Time/ Position	Applicant's Actions or Behavior			
EVALUATOR NOTE:	At approximately 1-3% power, on cue from the Examiner the "B" MDEFW pump bearing will fail and the "B" EFW Pump will trip after a short delay. The BOP may adjust EFW flow to maintain Steam Generator levels.			
BOOTH OPERATOR:	When directed – initiate Event 5 (TRIGGER 5).			
Symptoms/ Cues	• XCP-623 1-5, MD EFP B MOTOR OVRLD • XCP-623 1-3, MD EFP B TRIP			
US	Enters ARP-001- XCP-623, 1-5, MD EFP B MOTOR OVRLD.			XCP-623 1-5
EVALUATOR NOTE:	The 400 gpm demand referred to in the Overload Annunciator is a reduced flow intended to clear the condition.			
BOP	AUTOMATIC ACTIONS: 1. If overload condition continues, pump may trip on overcurrent. CORRECTIVE ACTIONS: 1. If possible, reduce demand to less than 400 gpm by throttling the flow control valves to the Steam Generators. 2. Start Motor Driven Emergency Feedwater Pump A if necessary to maintain Steam Generator levels.			XCP-623 1-5
US	3. Refer to SOP-211, EMERGENCY FEEDWATER SYSTEM.			XCP-623 1-5
BOOTH OPERATOR:	If contacted as field operator to investigate the condition of the "B" MD EFW pump and or breaker, wait 3 minutes and report, "The pump bearings are hot to the touch." If dispatched as an operator to check breaker status, wait 3 minutes then report, "The breaker is open with no flags."			
EVALUATOR NOTE:	The US may direct the BOP to Stop the "B" MD EFW Pump.			
US	Enters ARP-001- XCP-623, 1-3, MD EFP B TRIP.			XCP-623 1-3

Op Test No: 2023 NRC		Scenario # 4		Event # 5 and 6		Page: 30 of 51		
Event Description: "B" Motor Driven EFW pump BRG failure followed by trip requiring EFW flow adjustments. After plant is stable and Technical specification have been addressed the "A" Motor Driven EFW pump will trip and start of Turbine Driven EFW pump will be required.								
Time/ Position		Applicant's Actions or Behavior						
BOP		CORRECTIVE ACTIONS: 1. Start Motor Driven Emergency Feedwater Pump A if necessary to maintain Steam Generator levels. 2. Reduce feedwater demand to less than 400 gpm. SUPPLEMENTAL ACTIONS: 1. If Steam Generator levels cannot be maintained with one motor driven pump start the Turbine Driven Emergency Feedwater Pump. 2. Place PUMP B control switch in NORMAL-AFTER-STOP to clear the alarm. 3. Determine the cause of the trip and correct as soon as possible. 4. If the pump is inoperable, refer to Tech Spec 3.7.1.2.						XCP-623 1-3
US		Refer to Technical Specification 3.7.1.2 EMERGENCY FEEDWATER SYSTEM: ACTION a: 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.						T.S. 3.7.1.2
EVALUATOR NOTE:		After Technical specification have been addressed, a trip of the "A" MDEFW pump will occur requiring starting of the TDEFW pump. If the candidates trip the reactor when "B" MDEFW pump trips, the "A" MDEFW pump will automatically trip when the reactor trips.						
BOOTH OPERATOR:		When directed – initiate Event 6 (TRIGGER 6).						
US		Enters ARP-001- XCP-622, 1-3, MD EFP A TRIP.						XCP-622 1-3

Op Test No: 2023 NRC		Scenario # 4	Event # 5 and 6	Page: 31 of 51
Event Description: "B" Motor Driven EFW pump BRG failure followed by trip requiring EFW flow adjustments. After plant is stable and Technical specification have been addressed the "A" Motor Driven EFW pump will trip and start of Turbine Driven EFW pump will be required.				
Time/ Position	Applicant's Actions or Behavior			
BOP Critical Task	CORRECTIVE ACTIONS: 1. Start Motor Driven Emergency Feedwater Pump B if necessary to maintain Steam Generator levels. 2. Reduce feedwater demand to less than 400 gpm. SUPPLEMENTAL ACTIONS: 1. If Steam Generator levels cannot be maintained with one motor driven pump start the Turbine Driven Emergency Feedwater Pump. 2. Place PUMP A control switch in NORMAL-AFTER-STOP to clear the alarm.			
EVALUATOR NOTE:	Critical Task is to start the Turbine Driven EFW pump prior to requiring a transition to EOP-15.0, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEATSINK.			
BOOTH OPERATOR:	If the crew calls for a pre-start check of the TDEFW Pump, wait 1-minute and report the TDEFW Pump is ready for a start.			
EVALUATOR NOTE:	The crew may immediately start the TDEFW pump by placing either PVG-2030 control switch to open.			
EVALUATOR NOTE:	The next event automatically initiates on starting of the TDEFW pump, or at any time per the discretion of the Lead Evaluator.			

XCP-622 1-3

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 32 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	On start of the TDEFW pump, a SBLOCA will occur on the "C" Hot Leg.	
BOOTH OPERATOR:	Automatically initiated –Event 7 (TRIGGER 7).	
US	Enters EOP-1.0, E-0 LOSS OF REACTOR COOLANT NOT REQUIRING SI.	
RO (IOA)	1. Verify Reactor Trip: • 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
BOP (IOA)	2. Verify Turbine/Generator Trip: - Verify all Turbine STM STOP VLVs are closed. - Ensure Generator Trip (after 30 second delay): - Ensure the GEN BKR is open. - Ensure the GEN FIELD BKR is open. - Ensure the EXC FIELD CNTRL is tripped.	EOP-1.0
BOP (IOA)	3. Verify both ESF buses are energized.	EOP-1.0
RO/BOP (IOA)	4. Check if SI is actuated: - Check if either: • 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.	EOP-1.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 33 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior
Crew	5. Check if SI is required: a. Check if any of the following conditions exist: - 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:	Depending on plant conditions, the crew may enter EOP-1.1, ES-0.1, REACTOR TRIP RESPONSE, and insert a Manual SI based upon the following Reference Page Condition: <u>IF either</u> of the following conditions occurs, <u>THEN</u> actuate SI and GO TO EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1: PZR level can <u>NOT</u> be maintained GREATER THAN 8%. If the crew inserts a Manual SI per EOP-1.1, they will re-perform Immediate Operator Actions.

EOP-1.0

EOP-1.0

Op Test No: 2023 NRC

Scenario # 4 Events #7-9

Page: 34 of 51

Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior

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.

4 RUPTURED STEAM GENERATOR

IF a RUPTURED Steam Generator has been positively identified, THEN throttle EFW to the RUPTURED Steam Generator WHEN its Narrow Range Level is GREATER THAN 26%[41%].

5 FAULTED STEAM GENERATOR

- IF a FAULTED Steam Generator has been positively identified, THEN isolate EFW to the faulted Steam Generator as soon as possible UNLESS all three Steam Generators are FAULTED.

- IF all three Steam Generators are FAULTED, THEN throttle EFW flow to all three Steam Generators to 50 gpm.

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 35 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
EVALUATOR NOTE:	Attachment 3, SI Equipment Verification, is included for reference on page 47 of 51 of this scenario guide. • Critical Task is to establish containment isolation no later than 15-minutes from: • The time they actuate Phase A/Containment Ventilation Isolation by placing <u>either</u> CS-SG02A(B), TRAIN A & B, Switch to ACTUATE (if operator notices failure), <u>OR</u> • From the time the operator informs the US that EOP-1.0 Attachment 3 is complete (if operator does not notice failure).	EOP-1.0
EVALUATOR NOTE:	Per the Reference Page, the crew should call for a local operator to reduce Control Emergency Ventilation to one train running within 30-minutes of the Safety Injection.	EOP-1.0
BOP	6. Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.	EOP-1.0
CREW	7. Announce plant conditions over the page system.	EOP-1.0
RO	*8. Verify RB pressure has remained LESS THAN 12 psig on PR951, RB PSIG (P-951), red pen.	EOP-1.0
RO	*9. Check RCS temperature: • With any RCP running, RCS Tavg is stable at OR trending to 557°F. - OR • With no RCP running, RCS Tcold is stable at OR trending to 557°F. (NO)	EOP-1.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 36 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior
RO	9. ALTERNATIVE ACTION IF RCS temperature is LESS THAN 557°F AND decreasing, THEN stabilize temperature by performing the following as required: - Close IPV-2231, MS/PEGGING STM TO DEAERATOR. - Perform one of the following: - IF Narrow Range SG level is LESS THAN 26% [41%] in all SGs, THEN reduce EFW flow as necessary to stop cooldown, while maintaining total EFW flow GREATER THAN 450 gpm. - OR - WHEN Narrow Range SG level is GREATER THAN 26% [41%] in at least one SG, THEN control EFW flow as necessary to stabilize RCS temperature at 557°F. - Initiate ATTACHMENT 6, STEAM VALVE ISOLATION, while continuing with this procedure. - IF RCS cooldown continues, THEN close: - MS Isolation Valves, PVM-2801A(B)(C). - MS Isolation Bypass Valves, PVM-2869A(B)(C).
RO	10. Check PZR PORVs and Spray Valves: - PZR PORVs are closed. - PZR Spray Valves are closed. - Verify power is available to at least one PZR PORV Block Valve: - MVG-8000A, RELIEF 445 A ISOL. - MVG-8000B, RELIEF 444 B ISOL. - MVG-8000C, RELIEF 445 B ISOL. - Ensure one of the following Block Valves is open unless it was closed to isolate an open PZR PORV: - MVG-8000A, RELIEF 445 A ISOL. - MVG-8000B, RELIEF 444 B ISOL.

EOP-1.0

EOP-1.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 37 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
RO	11. Check if RCPs should be stopped: a. Check if either of the following criteria is met: - 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.	EOP-1.0
EVALUATOR NOTE:	RCPs are not required to be stopped because the event occurred from MODE 2 in accordance with OAP-103.4, EOP/FSP/AOP/ARP USER'S GUIDE, 6.11.b.	EOP-1.0
	12. Verify no SG is FAULTED: - No SG pressure is decreasing in an uncontrolled manner. - No SG is completely depressurized.	EOP-1.0
	13. Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED: - 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
	14. Check if the RCS is INTACT: a. RB radiation levels are normal on: - RM-G7, CNTMT HI RNG GAMMA. - RM-G18, CNTMT HI RNG GAMMA. b. RB Sump levels are normal. (NO) c. RB pressure is LESS THAN 1.5 psig. d. The following annunciators are NOT lit: - XCP-606 2-2 (RBCU 1A/2A DRN FLO HI). - XCP-607 2-2 (RBCU 1B/2B DRN FLO HI).	EOP-1.0

Op Test No: 2023 NRC	Scenario # 4 Events #7-9	Page: 38 of 51
Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.		

Time/ Position	Applicant's Actions or Behavior
	ALTERNATIVE ACTION 14. GO TO EOP-2.0, E-1 LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
US	Transition to EOP-2.0, E-1 LOSS OF REACTOR OR SECONDARY COOLANT

EOP-1.0

EOP-1.0

Op Test No: 2023 NRC

Scenario # 4 Events #7-9

Page: 39 of 51

Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior

EOP-2.0

REFERENCE PAGE FOR 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, E-2, 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, E-3, 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, ES-1.3, 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, ECA-1.1, 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: 2023 NRC Scenario # 4 Events #7-9 Page: 40 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
RO	<u>NOTE</u> Seal Injection flow should be maintained to all RCPs. 1. Check if RCPs should be stopped: a. Check if either of the following criteria is met: 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	EOP-2.0
BOP	2. Verify no SG is faulted: • No SG pressure is decreasing in an uncontrolled manner. • No SG is completely depressurized.	EOP-2.0
BOP	*3. Check INTACT SG levels: 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 26% [41%] and 60%.	EOP-2.0
RO	4. Reset both SI RESET TRAIN A(B) Switches.	EOP-2.0
RO	5. Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.	EOP-2.0
BOOTH OPERATOR:	When contacted as Chemistry to sample for abnormal activity acknowledge request, wait 5 minutes and report: "The steam generator activities are normal."	

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 41 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
CREW	6. Check if Secondary radiation levels are normal: a. Check radiation levels normal on: • 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. b. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO. c. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.	EOP-2.0
RO	*7. Check PZR PORVs and Block Valves: a. Verify power is available to the PZR PORV Block Valves: 1) MVG-8000A, RELIEF 445 A ISOL. 2) MVG-8000B, RELIEF 444 B ISOL. 3) MVG-8000C, RELIEF 445 B ISOL.	EOP-2.0
RO	<u>CAUTION - Step 7.b</u> 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. b. Verify all PZR PORVs are closed. c. Verify at least one PZR PORV Block Valve is open.	EOP-2.0
BOP	8. Place both ESF LOADING SEQ A(B) RESETS to: a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS.	EOP-2.0
RO	9. Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Verify PI-8342, INSTR AIR HDR PRESS PSIG, indicates GREATER THAN 60 psig. c. Open PVA-2659, INST AIR TO RB AIR SERV. d. Open PVT-2660, AIR SPLY TO RB.	EOP-2.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 42 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
RO	*10. 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: • 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. <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. d. PZR level is GREATER THAN 10% [28%]. (NO) ALTERNATIVE ACTION d. Try to stabilize RCS pressure with Normal PZR Spray. GO TO Step 11.	EOP-2.0
RO	*11. Check if RB Spray should be stopped: a. Check if any RB Spray Pumps are running: (NO)	EOP-2.0
US	*11. ALTERNATIVE ACTION a. IF no RB Spray Pump was previously running, THEN GO TO Step 12. Observe the CAUTION prior to Step 12.	EOP-2.0
	<u>CAUTION - Step 12</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.	EOP-2.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 43 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
RO	*12. 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. (NO) ALTERNATIVE ACTION 2) GO TO Step 13.	EOP-2.0
EVALUATOR NOTE:	RHR pumps may be tripped here even though RCS pressure is slowly decreasing. This step is to check if you will need low head injection and at this point, we do not, so the crew is trained to secure the RHR pumps in this step for these conditions and restart them if necessary.	
RO	13. Check if RCS pressure is stable OR decreasing.	EOP-2.0
BOP	14. Check if pressure in all SGs is stable OR increasing.	EOP-2.0
	<u>CAUTION - Step 15</u> The DGs should NOT be run at a minimum load or unloaded for extended periods of time, to prevent carbon fouling.	EOP-2.0
BOP	15. 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.	EOP-2.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 44 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior
RO	16. Verify equipment is available for Cold Leg Recirculation: a. Verify A Train equipment available: 1. XPP0031A-RH, RESIDUAL HEAT REMOVAL PUMP A. 2. XVG08809A-SI, REFUEL WTR STG TK RH PUMP A SUCT VLV. 3. XVG08811A-SI, CNTMT SUMP RH PUMP A SUCT ISOL VALVE. 4. XVG08812A-SI, RH PUMP A SUCTION HEADER VALVE. 5. One Train A Charging Pump: • XPP0043A CHARGING/SI PUMP A. OR • XPP0043C CHARGING/SI PUMP C (Train A). 6. LCV00115B-CS, CHG PUMP A SUCTION HDR RWST HDR ISOL VALVE. 7. XVG08706A-RH, CHG/SI PUMP SUCT HDR RH HDR A(B) INLET VLV. b. Verify B Train equipment available: 1. XPP0031B-RH, RESIDUAL HEAT REMOVAL PUMP B. 2. XVG08809B-SI, REFUEL WTR STG TK RH PUMP B SUCT VLV. 3. XVG08811B-SI, CNTMT SUMP RH PUMP B SUCT ISOL VALVE. 4. XVG08812B-SI, RH PUMP B SUCTION HEADER VALVE. 5. One Train B Charging Pump: • XPP0043B CHARGING/SI PUMP B. OR • XPP0043C CHARGING/SI PUMP C (Train B). 6. LCV00115D-CS, CHG PUMP B SUCTION HDR RWST HDR ISOL VALVE. 7. XVG08706B-RH, CHG/SI PUMP SUCT HDR RH HDR B INLET VLV. c. Open both MVB-9503A(B), CC TO RHR HX A(B).

EOP-2.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 45 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
	<u>CAUTION - Step 16.d</u> • 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, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.	EOP-2.0
RO	d. Shift the CCW Train to fast speed in the Active Loop. REFER TO SOP-118, COMPONENT COOLING WATER. e. Consult with TSC personnel to determine if equipment required for Cold Leg Recirculation is available.	EOP-2.0
EVALUATOR NOTE:	SOP-118 Att. VIIA and VIIIA are not in the simulator. Provide a blank copy of each attachment upon request.	
BOOTH OPERATOR:	When called as the TSC for Step 16.e, acknowledge request. When directed to perform SOP-118 Attachment VIIIA, wait 2 minutes and insert Trigger 11 to shift "C" CCW pump to fast speed. When directed to perform SOP-118 Attachment VIIA, wait 2 minutes and insert Trigger 12 to shift "A" CCW pump to fast speed. If requested to check "C" CCW pump out for a start, wait 1 minute and report back that it is ready for a start.	
	<u>NOTE - Step 17</u> 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.	EOP-2.0

Op Test No: 2023 NRC Scenario # 4 Events #7-9 Page: 46 of 51
 Event Description: SBLOCA on "C" loop Hot Leg of 500 gpm.

Time/ Position	Applicant's Actions or Behavior	
CREW	17. Check the AB for evidence of ECCS leakage: - Verify AB radiation levels are normal on: - 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. - Verify annunciator XCP-631 6-1 is NOT lit (AB SMP LVL HI). - Verify annunciators XCP-606 3-4 and XCP-607 3-4 are NOT lit (LD TRBL AB SMP/FLDRN LVL HI). - Verify annunciators XCP-606 3-1 and XCP-607 3-1 are NOT lit (LTDN LD TEMP HI).	EOP-2.0
CREW	18. Obtain necessary Chemistry samples: - Ensure all RCS sample valves are in AUTO: - SVX-9364B and SVX-9365B, RCS LP B SMPL ISOL. - SVX-9364C and SVX-9365C, RCS LP C SMPL ISOL. - Notify Chemistry to sample the following: - RCS. - All SGs for isotopic activity.	EOP-2.0
CREW	19. Shut down and stabilize the Secondary Plant. REFER TO AOP-214.1, TURBINE TRIP.	EOP-2.0
RO	20. Check if RCS cooldown and depressurization is required: - RCS pressure is GREATER THAN 325 psig. - GO TO EOP-2.1, ES-1.2, POST-LOCA COOLDOWN AND DEPRESSURIZATION, Step 1.	EOP-2.0
EVALUATOR NOTE:	The scenario may be terminated once the crew has transitioned to EOP-2.1, ES-1.2 Post LOCA Cooldown and Depressurization or at the Lead Examiners discretion.	

Op Test No: 2023 NRC Scenario # 4 Event # N/A Page: 47 of 51
 Event Description: EOP-1.0, Attachment 3.

Time/ Position	Applicant's Actions or Behavior

EVALUTOR NOTE:		THESE ARE THE STEPS OF EOP-1.0, ATTACHMENT 3
BOP	1. 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.	EOP-1.0 Attachment 3
BOP	2. 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.	Attachment 3
BOP	3. Verify total EFW flow is GREATER THAN 450 gpm.	Attachment 3
BOP	4. 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.	Attachment 3
BOP	5. Ensure SI Pumps are running: - Two Charging Pumps are running. - Both RHR Pumps are running.	Attachment 3
BOP	6. Ensure two RBCU Fans are running in slow speed (one per train).	Attachment 3

Op Test No: 2023 NRC Scenario # 4 Event # N/A Page: 48 of 51
 Event Description: EOP-1.0, Attachment 3.

Time/ Position	Applicant's Actions or Behavior
BOP	7. Verify Service Water to the RBCUs: a. Ensure two Service Water Pumps are running. b. Check if Service Water Booster Pump A is running. (NO) ALTERNATIVE ACTION b. GO TO Step 7.d. d. Verify both of the following: (NO) • XVB-3107A, RBCU 64A/65A RTN TO SW PND is closed. AND • Alarm XCP-604 1-5 XVB3107A-SW SLOW CLOSURE is NOT lit. ALTERNATIVE ACTION d. Perform the following: 1) Place Service Water Booster Pump A in PULL TO LK NON-A. 2) Close MVG-3103A, RBCU 64A/65A OUT HDR ISOL. 3) Contact the TSC to coordinate efforts to close XVB-3107A, RBCU 64A/65A RTN TO SW PND. 4) WHEN XVB-3107A, RBCU 64A/65A RTN TO SW PND, is closed, THEN refill Train A RBCUs with the Service Water Booster Pump A tripped per SOP-117, SERVICE WATER SYSTEM. 5) GO TO Step 7.f. f. Check if Service Water Booster Pump B is running. g. GO TO Step 7.j j. Verify GREATER THAN 2000 gpm flow for each train on: (NO) • FI-4466, SWBP A DISCH FLOW GPM. • FI-4496, SWBP B DISCH FLOW GPM. ALTERNATIVE ACTION j. Consult with TSC personnel for evaluation.
BOP	8. Ensure one CCW pump per train is running.
BOP	9. Ensure two Chilled Water Pumps and Chillers are running.

Attachment 3

Attachment 3

Attachment 3

Op Test No: 2023 NRC Scenario # 4 Event # N/A Page: 49 of 51
 Event Description: EOP-1.0, Attachment 3.

Time/ Position	Applicant's Actions or Behavior	
BOP	10. Verify both trains of Control Room Ventilation are running in Emergency Mode.	Attachment 3
BOP	11. 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 Tav_g 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).	Attachment 3
BOP	12. Ensure Excess Letdown Isolation Valves are closed: • PVT-8153, XS LTDN ISOL. • PVT-8154, XS LTDN ISOL.	Attachment 3
BOP	13. 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. (NO)	Attachment 3
EVALUATOR NOTE:	Critical Task is to establish containment isolation no later than 15-minutes from: • The time they actuate Phase A/Containment Ventilation Isolation by placing <u>either</u> CS-SG02A(B), TRAIN A & B, Switch to ACTUATE (if operator notices failure), <u>OR</u> • From the time the operator informs the US that EOP-1.0 Attachment 3 is complete (if operator does not notice failure).	

Op Test No: 2023 NRC Scenario # 4 Event # N/A Page: 50 of 51
 Event Description: EOP-1.0, Attachment 3.

Time/ Position	Applicant's Actions or Behavior

BOP Critical Task	ALTERNATIVE ACTION 13. Perform the following: a) Actuate Phase A/Containment Ventilation Isolation by placing either CS-SG02A(B), TRAIN A & B, Switch to ACTUATE b) Close each required Containment Isolation Valve OR its Backup Valve from the MCB. REFER TO ATTACHMENT 5, CONTAINMENT ISOLATION AND BACKUP VALVE LOCATIONS. c) IF at least one valve for each RB penetration is NOT closed, THEN isolate each AFFECTED penetration locally. REFER TO ATTACHMENT 5, CONTAINMENT ISOLATION AND BACKUP VALVE LOCATIONS.
BOP	14. Verify proper SI alignment: a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104. b. Verify all SAFETY INJECTION monitor lights are dim on XCP-6106. c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. d. Check if RCS pressure is LESS THAN 325 psig. (NO)
BOP	14. ALTERNATIVE ACTION d. Notify the US that ATTACHMENT 3, SI EQUIPMENT VERIFICATION, is complete.

Attachment 3

Attachment 3

Op Test No: 2023 NRC	Scenario # 4	Event # N/A	Page: 51 of 51
Event Description: N/A			
Time/ Position	Applicant's Actions or Behavior		

Procedure Revisions used in this Scenario Guide			
Number	Title	Rev	Date
GOP-3	REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2)	14C	1/18/23
GOP-4A	POWER OPERATION (MODE 1 – ASCENDING)	3I	1/6/23
XCP-603	ANNUNCIATOR RESPONSE PROCEDURE	5F	11/13/15
XCP-614	ANNUNCIATOR RESPONSE PROCEDURE	6E	6/7/17
XCP-623	ANNUNCIATOR RESPONSE PROCEDURE	5B	7/29/19
XCP-628	ANNUNCIATOR RESPONSE PROCEDURE	7E	2/6/23
XCP-644	ANNUNCIATOR RESPONSE PROCEDURE	1D	12/4/12
AOP-101.1	LOSS OF REACTOR COOLANT NOT REQUIRING SI	4	5/5/21
EOP-1.0	E-0, REACTOR TRIP OR SAFETY INJECTION	32	7/15/21
EOP-2.0	E-1, LOSS OF REACTOR OR SECONDARY COOLANT	18	2/5/20
EOP-2.1	ES-1.2, POST-LOCA COOLDOWN AND DEPRESSURIZATION	20	2/5/20
	V.C. SUMMER TECHNICAL SPECIFICATIONS	223	11/10/22

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-a-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-a-N23

DESCRIPTION: Emergency boration using gravity feed.

TASK: 000-024-05-01 PERFORM EMERGENCY BORATION

TASK Candidate performs the following:

- STANDARD:**
- Dispatches operator to locally open XVD08329-CS, CHARGING/SI PUMPS SUCTION HEADER VALVE and XVD08331-CS, CHARGING/SI PUMPS SUCT HDR ISOL VALVE.
 - Closes either LCV-115C or LCV-115E VCT OUTLET ISOL.

TERMINATING CUE: Operator verifies flow on FI-122A CHG FLOW GPM indicates >30 GPM.

LOCATION:
SIMULATOR

METHOD:
PERFORM

REFERENCES: AOP-106.1, EMERGENCY BORATION
XCP-621 1-1, CRB INSERT LMT LO-LO

K/A: 004 A4.18 Ability to manually operate and/or monitor in the control room:
Emergency Borate valve (4.2)

TOOLS: AOP-106.1, EMERGENCY BORATION
XCP-621 1-1, CRB INSERT LMT LO-LO

VALIDATED TIME: 10 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** YES

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- PT-446 has failed low causing control rods to step in to below the rod insertion limits.
- The crew has placed control rods in manual and has selected PT-447.
- When attempting restore Tavg, control rods failed to move.

INITIATING CUES:

US directs you as the RO to respond to XCP-621 1-1, CRB INSERT LMT LO-LO.

A more rapid emergency boration is required.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: JPS-a-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 1	1						
ARP-621, 1-1 CRB INSERT LMT LO-LO							
CORRECTIVE ACTIONS:							
Step 1: Observe TI-412A (422A) (432A), LOOP A(B)(C) ΔT , and Digital Rod Position indications.							
Step 2: If the alarm is valid, immediately Emergency Borate per AOP-106.1, EMERGENCY BORATION until Shutdown Margin is restored							
STEP STANDARD:							
Candidate will go to AOP-106.1, EMERGENCY BORATION based on TI-412A (422A) (432A), LOOP A(B)(C) ΔT , and Digital Rod Position indications as well as SPCS screen for Rod Insertion Limits.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
BOOTH OPERATOR: Place the Simulator in RUN when the Evaluator indicates the JPM may begin.							
EVALUATOR NOTES:							
• The candidate may also look at the Yokogawa Recorder readings for Rod Insertion Limits. • The candidate may go directly to AOP-106.1 without referring to XCP-621, 1-1 in advance based on rods below rod insertion limits.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 2	2						
AOP-106.1, EMERGENCY BORATION							
NOTE: If ESFLS has actuated, XPP-13A(B), BA XFER PP A(B), will NOT operate until the NON-ESF LCKOUTS are reset.							
NOTE: If more rapid Emergency Boration is desired, Step 1 is NOT required.							
STEP STANDARD:							
Reads the Notes, acknowledges input from US and goes to Step 2.							
CUES:							
EVALUATOR CUE: If the candidate asks US if desired, inform them to refer to the cue sheet. Candidate may address step 1 of AOP-106.1. It will be ineffective if performed.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 3	3						
Step 1, Emergency Borate through the Boric Acid Blender: a. Check if the plant is in Mode 1 OR Mode 2. b. Place RX COOL SYS MU switch to STOP. c. Place RX COOL SYS MU MODE SELECT switch to BOR. d. Set FIS-113, BA TO BLNDR FLOW, batch integrator to GREATER THAN OR EQUAL TO 1000. e. Adjust FCV-113 A&B, BA FLOW, controller to 8.0. NOTE - Step 1.f If boration stops, this step may be repeated as desired. f. Place RX COOL SYS MU switch to START. g. Place FCV-113 A&B BA FLOW controller in AUTO. NOTE - Step 1.h The Auto setpoint dial for FCV-113A&B, BA FLOW, controller may be slowly adjusted as necessary to obtain desired flow rate. h. Verify GREATER THAN 30 gpm flow on FR-113, BA TO BLNDR GPM (F-113). (NO) Step 1, ALTERNATIVE ACTION, GO TO Step 2.							
STEP STANDARD:							
EVALUATOR NOTE: Step 1 of AOP-106.1 will be ineffective if performed. The Step is provided here to allow evaluator to follow candidate actions if performed.							
CUES:							
COMMENTS:							

JPM: JPS-a-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 4	4						
Step 2, Emergency Borate via the Emergency Borate Valve: a. Ensure at least one Charging Pump is running.							
STEP STANDARD:							
Verifies that the "A" Charging pump is running, the pump shows amps and red light ON, green light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 5	5						
Step 2 b. Verify PZR pressure is LESS THAN 2330 psig.							
STEP STANDARD:							
Verifies PZR pressure instrumentation reads less than 2330 psig.							
CUES:							
COMMENTS:							

JPM: JPS-a-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT	☐	UNSAT	☐
JPM STEP 6	6						
Step 2							
c. Open MVT-8104, EMERG BORATE.							
STEP STANDARD:							
Opens MVT-8104, EMER BORATE valve, valve indicates -red light ON, green light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT	☐	UNSAT	☐
JPM STEP 7	7						
Step 2							
d. Ensure XPP-13A(B), BA XFER PP A(B), is running.							
STEP STANDARD:							
Verifies either "A" or "B" Boric Acid Transfer Pump indication is red light ON, green light OFF.							
CUES:							
COMMENTS:							

JPM: JPS-a-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 8	8						
Step 2							
e. Verify GREATER THAN 30 gpm flow on FI-110, EMERG BORATE FLOW GPM.							
STEP STANDARD:							
Determines boric acid flow near zero by FI-110 indication. Transitions to the Alternative Action of Step 2 which reads "GO TO Step 3".							
CUES:							
EVALUATOR NOTE: The JPM is alternate path beginning with this step.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 9	9						
Step 3, Emergency Borate through the Boric Acid Blender:							
a. Close MVT-8104, EMERG BORATE.							
STEP STANDARD:							
Closes MVT-8104, EMERG BORATE valve and verifies the following indications, -red light OFF, green light ON							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 10	10						
Step 3 b. Align the Chemical And Volume Control System for boration: 1) Ensure both LCV-115C(E), VCT OUTLET ISOL are open 2) Open FCV-113B, MU TO CHG PP.							
STEP STANDARD:							
Ensures LCV-115C (E) are open by verifying red light ON, green light OFF for each valve. Opens FCV-113B, MU TO CHG PP valve, verifies red light ON, green light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 11	11						
Step 3 c. Close FCV-168B, MU WTR TO BLENDER.							
STEP STANDARD:							
Closes FCV-168B, MU WTR TO BLENDER and verifies red light OFF, green light ON.							
CUES:							
COMMENTS:							

JPM: JPS-a-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 12	12						
Step 3							
d. Ensure XPP-13A(B), BA XFER PP A(B), is running.							
STEP STANDARD:							
Verifies either "A" or "B" Boric Acid Transfer Pump indicates red light ON, green light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 13	13						
Step 3							
e. Open FCV-113A, BA TO BLENDER.							
f. Ensure at least one Charging Pump is operating.							
STEP STANDARD:							
Opens FVC-113A, BA TO BLENDER, valve, indicates open -red light ON, green light OFF.							
CUES:							
EVALUATOR NOTE: Charging Pump was verified running in a previous step.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP 14

14

Step 3

g. Verify GREATER THAN 30 gpm flow on FR-113, BA TO BLNDR AND TOTAL MU.

STEP STANDARD:

Reads FR-113 and sees 0 gpm, transitions to the Alternative Action step 3 g, which reads IF Emergency Boration flow is NOT established, THEN GO TO Step 4. Observe the CAUTION prior to Step 4.

CUES:

COMMENTS:

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP 15

15

CAUTION: Charging Pump amps and flow should be closely monitored to ensure suction supply is maintained to prevent pump damage.

Step 4: Emergency Borate by gravity drain of the Boric Acid Tank:

- a. Locally open both Charging Pump Suction Header Isolation Valves (AB-456):
 - XVD08329-CS, CHARGING/SI PUMPS SUCTION HEADER VALVE.
 - XVD08331-CS, CHARGING/SI PUMPS SUCT HDR ISOL VALVE.

STEP STANDARD:

Directs local operator to open XVD08329 and 8331.

CUES:

BOOTH OPERATOR: When called as the local operator to open XVD-8329 and 8331 initiate **TRIGGER 1** and report back valves have been opened.

EVALUATOR NOTE: It is critical that the local operator be directed to open both of these valves since they are in series and must be open to provide a flowpath to the Charging Pump suction.

COMMENTS:

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 16	16						
Step 4 b. Adjust FCV-122, CHG FLOW, to obtain GREATER THAN 30 gpm Charging flow.							
STEP STANDARD:							
Adjusts FCV-122 for > 30 gpm.							
CUES:							
EVALUATOR NOTE: This is the minimum required boration flow in accordance with Technical Specification 3.1.3.5 for Shutdown Margin.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 17	17						
Step 4 c. Close LCV-115C(E), VCT OUTLET ISOL							
STEP STANDARD:							
Closes LCV-115C and LCV-115E, VCT OUTLET ISOL, valves and verifies -red light OFF, green light ON.							
CUES:							
EVALUATOR NOTE: Candidate only needs to close one of these valves to isolate the VCT.							
COMMENTS:							

JPM: JPS-a-N23

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 18	18						
Step 4							
d. Verify GREATER THAN 30 gpm flow on FI-122A CHG FLOW GPM. IF flow is NOT indicated, THEN immediately open LCV-115 C(E), VCT OUTLET ISOL.							
STEP STANDARD:							
Verifies greater than 30 gpm on FI-122A.							
CUES:							
EVALUATOR NOTE: The JPM can be ended once the candidate verifies flow >30 gpm on FI-122A.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: JPM: JPS-a-N23

IC SET: 268

INSTRUCTIONS:

RUN IC- 268

NOTE: IC-268 is setup to begin this JPM when the simulator is taken to run. If IC-268 is not available or if conditions must be reestablished, then the following instructions will create the proper setup using IC-10:

1. RUN
2. Activate MAL-TUR012A FINAL VALUE=0 (PT-446 Failure)
3. When CRB INSERT LMT LO-LO annunciator is in alarm:
FREEZE
4. Place rod control in MAN and select PT-447.
5. Run 60 seconds and acknowledge annunciators.
6. Load LOA-CVC058 FINAL VALUE =1 (Open 8329 & 8331) Trigger #1
7. Activate MAL-CVC009 FINAL VALUE =100% (Plugged boric acid filter)
8. When student is ready: RUN
9. When requested, insert Trigger #1

PRE-LOAD

LOA-CVC058 SEVERITY=1 (Open 8329 & 8331) Trigger #1

COMMENTS:

Provide spare operator to silence alarms.

REVISION HISTORY:

This is a reformatted version of 2017 NRC JPM a. Added rods failed to move information in turnover and MAL-CRF001 ROD FAIL TO MOVE code to setup.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- PT-446 has failed low causing control rods to step in to below the rod insertion limits.
- The crew has placed control rods in manual and has selected PT-447.
- When attempting restore Tavg, control rods failed to move.

INITIATING CUES:

US directs you as the RO to respond to XCP-621 1-1, CRB INSERT LMT LO-LO.

A more rapid emergency boration is required.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-b-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-b-N23

DESCRIPTION: Transfer In-Service Charging Pump (Alternate Path)

TASK: 004-001-01-01 PERFORM LINEUPS OF THE CHEMICAL AND VOLUME CONTROL SYSTEM PER GOP-1/SOP-102

TASK STANDARD: While aligning "B" Charging pump for train swap, the following items are performed:

- The "B" Charging Pump is started.
- The "A" Charging pump is running before securing the "B" Charging pump.
- The "B" Charging pump is secured after receiving XCP-614 3-6, CCW TO CHG PP B VLV NOT FULL OPEN alarm.

TERMINATING CUE: The "B" Charging pump is stopped after starting.

PREFERRED LOCATION:

SIMULATOR

PREFERRED METHOD:

PERFORM

REFERENCES:

ARP-001-XCP-614, ANNUNCIATOR RESPONSE PROCEDURE (PANEL XCP-614)

SOP-118, COMPONENT COOLING SYSTEM

SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM

K/A 004 A4.08 Ability to manually operate and/or monitor in the control room:
Charging (RO 3.8 SRO 3.4)

10CFR55: 45 (a) 3

TOOLS: Copy of SOP-118 Section III B, ACTIVE LOOP SWITCHOVER, marked with IC, step 2.1 and 2.2 complete, step 2.3 and 2.4 N/A and step 2.5 complete up to 2.5.h.

Copy of SOP-102 Section III F marked with initial conditions complete and Section 2.1 and 2.2 N/A.

VALIDATION TIME: 5 Mins.

TIME CRITICAL: NO

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

When I tell you to begin, you are to perform the actions as directed in the initiating cues.

I will describe the general conditions under which this task is to be performed and provide the necessary tools with which to perform this task.

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, this Job Performance Measure will be satisfied.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is operating at 100% power.
- Train "B" is being established as the active loop.
- "C" Charging pump is Out of Service.
- Both the "A" and "B" CCW pumps are running in accordance with SOP- 118, Component Cooling Water Section III B, Active Loop Switchover.
- SOP-118 Section III B step 2.5.h directs "Transfer the in service Charging Pump to Train "B" per SOP-102."
- SOP-102 initial conditions have been met and it has been determined that there is no need to perform the 175 gallon flush of "B" Charging pump.

INITIATING CUES:

The US has directed you to place "B" Charging pump in service on "B" train and stop the "A" Charging pump, per SOP-102, Section III F, Step 2.3.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: JPS-b-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Section III.F. Step 2.3. To start XPP-0043B, PUMP B, on mini flow, proceed as follows: a. If XSW1DB 15, CHARGING INJ PUMP B XPP0043B-CS, is racked down, then initiate Attachment VD.							
STEP STANDARD:							
No action required.							
CUES:							
EVALUATOR NOTE: "B" Charging Pump is already racked up. EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
Step 2.3 continued: b. Ensure XPP-43B-PP1, CHG PP B AUX OIL PP, is running.							
STEP STANDARD:							
Candidate locates CHG PP B AUX OIL PP control switch, verifies switch positioned to AUTO, red light ON, green light OFF.							
CUES:							
COMMENTS:							

JPM: JPS-b-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
Step 2.3 continued:							
c. Ensure Train B Component Cooling is operating per SOP-118.							
STEP STANDARD:							
Candidate locates COMPONENT COOLING PUMPS, PUMP B XPP-0001B, observes red light ON, green light OFF and pump amps indicated.							
CUES:							
EVALUATOR NOTE: The candidate may alternately refer to the turnover information which states that "B" CCW train is running IAW SOP-118.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	4						
Step 2.3 continued:							
d. Ensure Train B Chill Water is operating per SOP-501.							
STEP STANDARD:							
Candidate walks to the HVAC Panel and locates "B" Train Chill Water controls and verifies red light ON and green light OFF for "B" Train Chiller and Chill Water PP.							
CUES:							
EVALUATOR NOTE: Candidate may also look on Main Control Board at XCP 6104 and see "WTR CHLR 1B/1C RUN" light BRIGHT.							
BOOTH OPERATOR: If Unit 4 (CB Operator) is called, report that the "B" Chiller and Chill Water PP are running.							
COMMENTS:							

JPM: JPS-b-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
Step 2.3 continued: e. Verify IPI00152A, CHARGING PUMP B SUCTION PRESS IND (AB-388), indicates pump suction pressure is greater than one of the following: 1) 15 psig if the Charging Pump suction is aligned to the RWST. 2) 30 psig if the Charging Pump suction is aligned to the VCT with VCT level 20% or greater.							
STEP STANDARD:							
Candidate contacts building operator for pump suction pressure.							
CUES:							
BOOTH OPERATOR: When contacted to check out the "B" Charging pump acknowledge request, wait 30 secs and report "The "B" Charging pump is ready for start, suction pressure is 52 psig.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	6						
Step 2.3 continued: f. Ensure MINIFLOW ISOL, MVT-8109B, CHG PP B, is open.							
STEP STANDARD:							
Candidate locates control switch CHG PP B, MVT-8109B, verifies red light ON, green light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	7						
Step 2.3 continued: g. Start XPP-0043B, PUMP B. (PEER ✓)							
STEP STANDARD:							
Candidate locates CHARGING PUMP B XPP-0043B switch and places it in START, observes red light ON, green light OFF and pump amps indicated.							
CUES:							
EVALUATOR NOTE: Candidate should make a plant announcement. BOOTH OPERATOR: Candidate may call as soon as they start the charging pump and realize 9684 didn't open. If the Candidate requests local temperature monitoring, acknowledge request and report "Local temperature monitoring is NOT available."							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	8						
CAUTION Step 2.3.h If the Auxiliary Oil Pump does not stop automatically, do not manually stop the Auxiliary Oil Pump. This is to prevent bearing damage due to the potential that the attached oil pump has failed.							
Step 2.3 continued: h. Verify XPP-43B-PP1, CHG PP B AUX OIL PP, stops automatically when the Charging Pump comes up to full speed.							
STEP STANDARD:							
Candidate locates CHG PP B AUX OIL PP control switch and observes red light OFF and green light ON.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP	9

Step 2.3 continued:

i. Monitor the following to verify proper pump operation:

1) Charging Pump B running current is between 30 amps and 50 amps.

2) PI-121, CHG PRESS PSIG, is between 2650 psig and 2850 psig.

STEP STANDARD:

Candidate locates:

- Pump ammeter and observes between 30 and 50 amps.
- CVCS CHG PRESS PSIG PI-121 and observes between 2650 and 2850 psig.

CUES:

COMMENTS:

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP	10

Step 2.3 continued:

i. Monitor the following to verify proper pump operation:

3) XVG-9684B-CC, CCW TO CHG PP B, is open.

STEP STANDARD:

Candidate locates XVG9684B-CC, CCW TO CHG PP B and observes red light OFF, green light ON.

Responds to annunciator XCP-614 3-6, CCW TO CHG PP B VLV NOT FULL OPEN.

CUES:

EVALUATOR NOTE: Alternate Path begins here

EVALUATOR NOTE: The candidate may take an early action once they have noticed that this valve did not open and secure the "B" Charging Pump since it is not currently needed.

COMMENTS:

JPM: JPS-b-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	11						
Annunciator XCP-614 3-6, CCW TO CHG PP B VLV NOT FULL OPEN:							
CORRECTIVE ACTIONS:							
Step 1 Check XVG-9684B-CC, CC WTR TO CHG PP B position indication.							
STEP STANDARD:							
Candidate locates XVG9684B-CC, CCW TO CHG PP B and observes red light OFF, green light ON.							
CUES:							
BOOTH OPERATOR: If the Candidate requests local temperature monitoring, acknowledge request and report "Local temperature monitoring is NOT available."							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	12						
CAUTION 2 Any Charging Pump can continue to be operated on a loss of Component Cooling Water to its oil coolers within one of the following: 1) 20 minutes without local temperature monitoring. OR 2) No time limit as long as any maximum temperature of Attachment 5, Charging Pump Temperature Monitoring, of AOP-118.1, Loss of Component Cooling, is NOT exceeded AND local Charging Pump temperature monitoring remains in place.							
Step 2. If the pump is running without Component Cooling Water, perform the following: a. Check electrical alignment of C Charging Pump. If aligned to B Train, start C Charging Pump per SOP-102.							
STEP STANDARD:							
No action required.							
CUES:							
EVALUATOR NOTE: The "C" Charging Pump is unavailable as stated in the Initial Conditions.							
COMMENTS:							

JPM: JPS-b-N23

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	13						
Step 2.a. continued							
IF NOT:							
1) Ensure a Train A Component Cooling Pump is running.							
2) Start a Train A Charging Pump per SOP-102.							
b. Stop Charging Pump B.							
STEP STANDARD:							
Candidate locates:							
• COMPONENT COOLING PUMPS, PUMP A XPP-0001A, observes red light ON, green light OFF and pump amps indicated. • CHARGING PUMP A XPP-0043A switch, observes red light ON, green light OFF and pump amps indicated. • CHARGING PUMP B XPP-0043B switch and places it in STOP, observes red light OFF, green light ON and no pump amps indicated.							
CUES:							
EVALUATOR NOTE: The "A" Charging pump should still be running. If it was stopped it must be restarted IAW SOP-102.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: NRC JPS-b-N21

IC SET: 269

INSTRUCTIONS:

RUN IC-269

1. Place Simulator in RUN.
2. Put Hold Tag on the "C" Charging pump.
3. Ensure the CCW placard is on the "A" CCW Pump.
4. Ensure the Charging Pump placard is on the "B" Charging Pump.
5. Mark rack copy of SOP-118 with Section III B Initial conditions complete, Step 2.1 and 2.2 complete, step 2.4 as N/A and step 2.5 complete up to step 2.5.h.
6. Mark rack copy of SOP-102 Section III F initial conditions complete and Section 2.1 and 2.2 N/A.
7. Reset SIPCS screens to normal at power arrangement and clear all SIPCS and Bailey alarms.

IF IC-269 is unavailable, perform the following:

1. Reset to IC-10 and FREEZE.

PRE-LOAD

OVR-CC048A

XVG-9684B-VU CCW TO CHG PP B (XVG-9684B-VU)

Override To: ON

OVR-CC048B

XVG-9684B-VU CCW TO CHG PP B (XVG-9684B-VU)

Override To: OFF

AUTO TRIGGER 1 (x04i058s) "B" Charging pump placed in start, 614 3-6 turns on.

ANN-CC046

CCW TO CHG PP B VLV NOT FULL OPEN

Delay: 5 sec

Fail To: ON

AUTO TRIGGER 2 (x04i058t) "B" Charging pump placed in stop, 614 3-6 turns off.

ANN-CC046 (NEW)

CCW TO CHG PP B VLV NOT FULL OPEN

Fail To: OFF

Delete in: 1 sec

2. Place the simulator in RUN.

Continued on next page.

JPM: JPS-b-N23

3. Swap "C" CCW pump to Train "B" using the following:

LOA-CCW001
CCW PUMP C DISCONNECT SWITCH
Position to: TRAIN B

LOA-CCW009
CC PP C SUCT LP B ISO VLV - 9519
Final Value: 1 (OPEN)

LOA-CCW010
CC PP C SUCT LP A ISO VLV – 9521
Final Value: 0 (CLOSED)

LOA-CCW011
CC PP C DISCH LP B ISO VLV - 9523C
Final Value: 1 (OPEN)

LOA-CCW012
CC PP C DISCH LP A ISO VLV - 9523D
Final Value: 0 (CLOSED)

LOA-CCW044
CELL SWITCH OF CCW PUMP C TRAIN A
Position To: RACK OUT

4. Establish Train "B" as the active loop of CCW by performing SOP-118 Section III B step 2.5 a-g. Use the below to Rack in "C" CCW pump on Train "B";

LOA-CCW045
CELL SWITCH OF CCW PUMP C TRAIN B
Position To: RACK IN

5. Place the simulator in FREEZE and save to desired IC.
6. Place the simulator in RUN.
7. Put Hold Tag on the "C" Charging pump.
8. Ensure the CCW placard is on the "A" CCW Pump.
9. Ensure the Charging Pump placard is on the "B" Charging Pump.
10. Mark rack copy of SOP-118 with Section III B Initial conditions complete, Step 2.1 and 2.2 complete, step 2.4 as N/A and step 2.5 complete up to step 2.5.h.
11. Mark rack copy of SOP-102 Section III F initial conditions complete and Section 2.1 and 2.2 N/A.
12. Reset SIPCS screens to normal at power arrangement and clear all SIPCS and Bailey alarms.

COMMENTS:

Provide spare operator to silence alarms.

REVISION HISTORY:

This JPM is a reformat of 2018 JPM JPSF-011-A17 used for ILO-16-01.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is operating at 100% power.
- Train "B" is being established as the active loop.
- "C" Charging pump is Out of Service.
- Both the "A" and "B" CCW pumps are running in accordance with SOP- 118, Component Cooling Water Section III B, Active Loop Switchover.
- SOP-118 Section III B step 2.5.h directs "Transfer the in service Charging Pump to Train "B" per SOP-102."
- SOP-102 initial conditions have been met and it has been determined that there is no need to perform the 175 gallon flush of "B" Charging pump.

INITIATING CUES:

The US has directed you to place "B" Charging pump in service on "B" train and stop the "A" Charging pump, per SOP-102, Section III F, Step 2.3.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-c-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-c-N23

DESCRIPTION: Pressurizer Pressure Control Malfunction

TASK: 000-509-05-02 Recover From Reactor Trip per EOP-1.1.

TASK STANDARD: RCS depressurization is stopped by securing the RCPs in any of the following combinations before Pressurizer Pressure reaches the Auto SI Setpoint of 1850 psig:

- "A" and "C" RCPs
- "A" and "B" RCPs
- "A", "B", and "C" RCPs

TERMINATING CUE: RCS depressurization is halted.

LOCATION:

SIMULATOR

METHOD:

PERFORM

REFERENCES: EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE

K/A: 027 AA1.01 Ability to operate and/or monitor the following as they apply to a Pressurizer Pressure Control System Malfunction: PZR heaters, sprays, and PORVs (3.8)

TOOLS: EOP-1.1, ES-0.1 REACTOR TRIP RECOVERY with steps 1-7 marked as complete.

VALIDATED TIME: 7 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** YES

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The reactor was tripped from 100% power.
- The crew have transitioned to EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE and have completed steps 1 through 7.

INITIATING CUES:

The US directs you to perform EOP-1.1 beginning with step 8.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: JPS-c-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 1	1						
Step 8: Verify all Control Rods are fully inserted.							
STEP STANDARD:							
Candidate locates Control Rod Position Indication and verifies all rod bottom red lights ON and all rods indicate fully inserted, green column LIT for each rod.							
CUES:							
EVALUATOR CUE: Provide the marked up rack copy of EOP-1.1, ES-0.1, REACTOR TRIP RESPONSE once the candidate has been briefed on the initiating cue.							
BOOTH OPERATOR: Place the Simulator in RUN when the Evaluator indicates the JPM may begin.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 2	2						
Step 9: Check DA level control: Step 9 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. Step 9 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).							
STEP STANDARD:							
Candidate locates DA Level Indication LI-3135 and verifies level is less than 10.5 ft. Candidate contacts AO and directs adjustment of Condensate flow from the Blowdown heat exchangers.							
CUES:							
BOOTH OPERATOR: When contacted as AO to adjust Blowdown Hx condensate flow acknowledge request. BOOTH OPERATOR: The "Set TCV-3062A, B, C to 10% Open" button on the COMMON LOA/RESET PANEL will set the ITV to the requested value. BOOTH OPERATOR: Once candidate completes EOP-1.1 Step 9 insert TRIGGER 1 – PZR spray valves 444C and 444D fail partially open. EVALUATOR NOTE: The low Pressurizer Pressure SI setpoint will be reached in approximately 2 minutes after inserting TRIGGER 1 if no operator action is taken.							
COMMENTS:							

CRITICAL:	No	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 3	3						
Step 10: Check PZR level control:							
Step 10a: Verify PZR level is GREATER THAN 17%.							
STEP STANDARD:							
Candidate locates PZR LEVEL % LI-459A, 460 and 461 and verifies level is greater than 17%.							
CUES:							
COMMENTS:							

CRITICAL:	No	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 4	4						
Step 10b: Verify Charging and Letdown are in service.							
STEP STANDARD:							
Candidate locates Charging controls and notes Charging and Letdown are in service.							
CUES:							
EVALUATOR NOTE: Charging and letdown indications may be found on panel XCP-6107. Indications include: "A" Charging pump breaker red light ON, green light OFF and normal running amps on the ammeter. - CHG FLOW GPM, FI-122A. - LO PRESS LTDN FLOW GPM, FI-150. - PVT-459 and 460, LTDN LINE ISOL indicate red lights ON, green lights OFF. - PVT-8149A and 8149B, LTDN ORIFCE A (B) ISOL indicate red lights ON, green lights OFF.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 5	5						
Step 10c: Verify PZR level is trending to program level. Step 10c: Alternative action: Control Charging and Letdown to maintain PZR level at program level.							
STEP STANDARD:							
Candidate locates indications and verifies level is trending to program level. (Program level is 25% for this condition) Candidate locates controls and adjusts as necessary to maintain PZR level.							
CUES:							
EVALUATOR NOTE: Control of PZR level may be accomplished by placing FCV-122 in manual. Candidate may choose to allow auto control to restore level to 25%. Pressurizer level indication may be found on panel XCP-6109L on meters LEVEL % LI-459A, 460 and 461.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 6	6						
Step 11: Check PZR pressure control: Step 11a: Verify PZR pressure is GREATER THAN 1850 psig.							
STEP STANDARD:							
Candidate locates indications and verifies pressure is greater than 1850 psig.							
CUES:							
EVALUATOR NOTE: Pressurizer pressure may be found on panel XCP-6109L on meters PRESS PSIG PI-455, 456, 457 and 444.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP 7

7

Step 11b: Verify PZR pressure is stable at OR trending to 2230 psig (2220 psig to 2250 psig).
(NO)

STEP STANDARD:

Candidate locates indications and verifies pressure is less than 2230 psig and trending downward.

CUES:

EVALUATOR NOTE: Candidate may refer to IPSC trend and or the WR pressure recorder (PR-402) in order to validate trend.

COMMENTS:

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP 8

8

Step 11b **ALTERNATIVE ACTION:**

IF PZR pressure is LESS THAN 2230 psig AND decreasing, THEN:

1) Ensure the PZR PORVs are closed. IF any PORV fails to close, THEN close its Block Valve.

STEP STANDARD:

Candidate locates PZR controls and notes; PCV-445A, 445B and 444B, PWR RELIEF indicate Red lights OFF, Green lights ON.

CUES:

COMMENTS:

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 5	9						
Step 11b ALTERNATIVE ACTION: IF PZR pressure is LESS THAN 2230 psig AND decreasing, THEN: 2) Ensure PZR Spray Valves are closed. IF any valve fails to close, THEN perform the following: a) Stop RCP A.							
STEP STANDARD:							
Candidate locates PZR controls and notes: • PCV-444C, PZR SPR CNTRL FR LOOP C indicates Red light ON, Green light ON and attempts to close PCV-444C are unsuccessful. • PCV-444D, PZR SPR CNTRL FR LOOP A indicates Red light ON, Green light ON and attempts to close PCV-444D are unsuccessful. • Candidate locates RCP controls and places switch for RCP "A" in STOP, observes Red light off, Green light on and zero amps on ammeter prior to PZR pressure lowering to less than 1850 psig.							
CUES:							
EVALUATOR NOTE: The critical step is to stop the "A" RCP to assure spray flow is eliminated and RCS pressure is stabilized. EVALUATOR NOTE: This is the point where the JPM becomes alternate path.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 10	10						
Step 11b ALTERNATIVE ACTION: IF PZR pressure is LESS THAN 2230 psig AND decreasing, THEN: b) IF PZR pressure continues to decrease, THEN perform the following: • IF PCV-444C, PZR SPR CNTRL FR LOOP C, will NOT close, THEN stop RCP C. • IF PCV-444D, PZR SPR CNTRL FR LOOP A, will NOT close, THEN stop either RCP B or RCP C.							
STEP STANDARD:							
Candidate locates indications and verifies pressure is trending downward. Candidate locates RCP controls and places switch for RCP "B" or "C" in STOP, observes red light off, green light on and zero amps on ammeter prior to PZR pressure lowering to less than 1850 psig.							
CUES:							
EVALUATOR NOTE: The critical step is to stop the "B" or "C" RCP to assure spray flow is eliminated and RCS pressure is stabilized. EVALUATOR NOTE: • If "A" and "B" RCPs are secured, RCS pressure will stabilize. • If "A" and "C" RCPs are secured, RCS pressure will rise. • It is acceptable if the candidate secures both "B" and "C" RCPs.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP 11	11						
Step 11b ALTERNATIVE ACTION: IF PZR pressure is LESS THAN 2230 psig AND decreasing, THEN: 3) Ensure PZR Heaters are on.							
STEP STANDARD:							
Candidate locates PZR controls and notes: • BU GRP 1 breaker control indicates Red light ON, Green light OFF and BU GRP1 AMPS ammeter indicate amperage. • CNTRL GRP breaker comntrol indicates Red light ON, Green light OFF and CNTRL GRP AMPS ammeter indicates amperage. • BU GRP 2 breaker control indicates Red light ON, Green light OFF and BU GRP 2 AMPS ammeter indicates amperage.							
CUES:							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM:

JPM: JPS-c-N23

IC SET: 270

INSTRUCTIONS:

If IC-270 is designated for this JPM then reset to IC-270 leaving the simulator in FREEZE.

1. Mark up copy of EOP-1.0 steps 1-5 and EOP-1.1 steps 1-7.
2. Ensure any false red path on sub criticality is cleared.
3. When Candidate is ready (on Evaluator cue) go to RUN.

If IC-270 is **not** designated for this JPM then initial conditions may be established by resetting to IC-10 and following the below directions:

1. With the simulator reset to IC-10 and in FREEZE, insert the following:

- **TRIGGER 1**

- o MAL-PRS003A
PRESSURIZER SPRAY VALVE 444C FAILURE
Ramp: 60 sec
Final Value: 75%
- o MAL-PRS003B
PRESSURIZER SPRAY VALVE 444D FAILURE
Ramp: 60 sec
Final Value: 55%

2. Place the Simulator in RUN.
3. Insert a manual Reactor Trip.
4. Perform Actions from EOP-1.0 and EOP-1.1 through step 7.
5. FREEZE and SAVE IC.
6. Mark up copy of EOP-1.0 steps 1-5 and EOP-1.1 steps 1-7.
7. Ensure any false red path on sub criticality is cleared.
8. When Candidate is ready (on Evaluator cue) go to RUN.

COMMENTS:

Provide spare operator to silence alarms.

REVISION HISTORY:

This is a bank JPM from 2018 NRC Exam, JPS-002F-N18.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The reactor was tripped from 100% power.
- The crew have transitioned to EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE and have completed steps 1 through 7.

INITIATING CUES:

The US directs you to perform EOP-1.1 beginning with step 8.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-d-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-d-N23

DESCRIPTION: Perform EOP-1.1, ATTACHMENT 1, STEAM VALVE ISOLATION

TASK: 000-509-05-02 Recover from Reactor Trip per EOP-1.1.

TASK Completion of EOP-1.1, Attachment 1, with the following:

STANDARD:

- MOV-1-5A, Closed.
- MOV-1-5B, Closed.
- MOV-1-5C, Closed.
- MVG-2896A, SV-1 BSD, Closed.
- MVG-2896B, SV-2 BSD, Closed.
- MVG-2896C, SV-3 BSD, Closed.
- MVG-2896D, SV-4 BSD, Closed.
- STM DUMP CNTRL Controller in STM PRESS Mode and in AUTO.

TERMINATING CUE: EOP-1.1, ATTACHMENT 1, STEAM VALVE ISOLATION is complete.

LOCATION:

SIMULATOR

METHOD:

PERFORM

REFERENCES: EOP-1.1 ES-0.1 REACTOR TRIP RESPONSE

K/A: 007 EA1.10 Ability to operate and monitor the following as they apply to a Reactor Trip: SGS (3.5)

TOOLS: EOP-1.1, ATTACHMENT 1, STEAM VALVE ISOLATION

VALIDATED TIME: 5 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- A Reactor Trip has occurred.
- EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE is in progress.
- RCS temperature less than 557°F.
- Shift Manager does not require any additional drain valves to be aligned.

INITIATING CUES:

The US directs you to perform EOP-1.1, ATTACHMENT 1, STEAM VALVE ISOLATION.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: JPS-d-N23

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
NOTE Drain valves may be aligned per Shift Manager discretion based on current and expected plant status. 1. Close Feedwater Pump TURB DRN VLVs: • MOV-1-5A. • MOV-1-5B. • MOV-1-5C.							
STEP STANDARD:							
Candidate locates closes MOV-1-5A, MOV-1-5B, and MOV-1-5C. Observes red light OFF, green light ON.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM. EVALUATOR CUE: If the candidate asks Shift Manager directs no additional drain valves need to be aligned per EOP-1.1, ATTACHMENT 1. BOOTH OPERATOR: Place the Simulator in RUN when the Evaluator indicates the JPM may begin.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
2. Close the following turbine drain valves: • MVG-2896A, SV-1 BSD. • MVG-2896B, SV-2 BSD. • MVG-2896C, SV-3 BSD. • MVG-2896D, SV-4 BSD.							
STEP STANDARD:							
Candidate locates closes MVG-2896A, MVG-2896B, MVG-2896C, and MVG-2896D. Observes red light OFF, green light ON.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
3. Ensure the following drain valves are in AUTO: • PVT-2851A,B,C,D, MS LINES TO TURB DRN. • PVT-2713A,B,C,D, STM DUMP DRN BYP. • PVT-2870, TO MSR A & B DRN. • PVT-2875, TO MSR A & B DRN. • PVT-2845A,B,C, PVT-2824, PVT-2879A,B, LINE DRN. • PVT-2838A,B, HDR DRNS.							
STEP STANDARD:							
Candidate ensures switches are in AUTO for the following valves: • PVT-2851A,B,C,D, MS LINES TO TURB DRN. • PVT-2713A,B,C,D, STM DUMP DRN BYP. • PVT-2870, TO MSR A & B DRN. • PVT-2875, TO MSR A & B DRN. • PVT-2845A,B,C, PVT-2824, PVT-2879A,B, LINE DRN. • PVT-2838A,B, HDR DRNS.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	4						
4. Place the STM DUMP CNTRL Controller in MAN and CLOSED.							
STEP STANDARD:							
Candidate places STM DUM CNTRL Controller in MAN and CLOSED. MAN indicating light is LIT, controller output reads 0.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
5. Place the STM DUMP MODE SELECT Switch in STM PRESS.							
STEP STANDARD:							
Candidate places the STM DUMP MODE SELECT SWITCH to the STM PRESS position.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	6						
6. Place the STM DUMP CNTRL Controller in AUTO.							
STEP STANDARD:							
Candidate places the STM DUMP CNTRL Controller in AUTO, AUTO light is lit.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	7						
7. WHEN the Condenser is NOT available, THEN perform the following							
a. Place the Steamline Power Relief A(B)(C) Mode Switches in PWR RLF.							
b. Adjust the PWR RELIEF A(B)(C) SETPT Controllers as necessary to control RCS temperature.							
STEP STANDARD:							
Candidate determines the Condenser is still available, C-9 light is LIT and this step is not required to be performed at this time.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	8						
8. Verify proper response of all Steamline PORVs and Condenser Steam Dumps for existing plant conditions.							
STEP STANDARD:							
Candidate verifies Condenser Steam Dumps are attempting to maintain RCS Temperature.							
CUES:							
EVALUATOR NOTE: Condenser Steam Dumps should be closed for RCS Temperature less than 557°F.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	9						
9. Ensure SG Blowdown Valves, PVG-503A(B)(C), are closed.							
STEP STANDARD:							
Candidate ensures SG Blowdown Valves, PVG-503A(B)(C), are closed observes red light OFF, green light ON.							
CUES:							
COMMENTS:							

JPM: JPS-d-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	10						
10. If desired, drain valves may be aligned per Shift Manager discretion based on current and expected plant status.							
STEP STANDARD:							
Candidate determines no drain valves need to be aligned per turnover information.							
CUES:							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: JPM: JPS-d-N23

IC SET: 271

INSTRUCTIONS:

If IC-271 is designated for this JPM then reset to IC-271, leaving simulator in FREEZE.

1. When Candidate is ready, (on evaluator cue) go to RUN.

If IC-271 is not designated for this JPM then initial conditions may be established by resetting to IC-10 and following the below directions:

1. With the simulator reset to IC-10 and in FREEZE, insert the following:
2. Place the simulator in RUN and insert a manual reactor trip.
3. Perform actions of EOP-1.0 and 1.1 up to step 6.
4. Ensure RCS Tavg is less than 557°F and decreasing.
5. Place simulator in FREEZE and save to the desired IC.
6. When Candidate is ready, (on evaluator cue) go to RUN.

COMMENTS:

Provide spare operator to silence alarms.

REVISION HISTORY:

This is a new JPM

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- A Reactor Trip has occurred.
- EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE is in progress.
- RCS temperature less than 557°F.
- Shift Manager does not require any additional drain valves to be aligned.

INITIATING CUES:

The US directs you to perform EOP-1.1, ATTACHMENT 1, STEAM VALVE ISOLATION.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-e-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-e-N23

DESCRIPTION: Perform AOP-304.1B, ATTACHMENT 6B, BUS 1DB RE-ENERGIZATION ALIGNMENT.

TASK: 000-143-05-01 Respond to Loss of One Engineered Safety Features (ESF) Bus With D/G Not Available per AOP-304.1

TASK STANDARD: Completion of AOP-304.1B, Attachment 6B with the following:

- XFMR 1EB1 FEED breaker closed.
- BUS 1EB FEED Breaker closed.
- BUS 1EB1 FEED Breaker closed.
- XFMR 1DB1&1DB2 FEED Breaker closed.
- BUS 1DB1 FEED Breaker closed.
- BUS 1DB2 FEED Breaker closed.

TERMINATING CUE: BUS 1DB stub buses energized in accordance with AOP-304.1B, ATTACHMENT 6B.

LOCATION:

SIMULATOR

METHOD:

PERFORM

REFERENCES: AOP-304.1B, LOSS OF BUS 1DB WITH THE DIESEL NOT AVAILABLE

K/A: 062 A4.01 Ability to operate and monitor in the control room: All breakers (including available switchyard) (3.5)

TOOLS: AOP-304.1B, ATTACHMENT 6B, BUS 1DB RE-ENERGIZATION ALIGNMENT

VALIDATED TIME: 5 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- A 51BX Lockout on 1DB occurred.
- AOP-304.1B, LOSS OF BUS 1DB WITH THE DIESEL NOT AVAILABLE is in progress.
- All faults have been corrected cleared.
- Power has been restored to bus 1DB.
- All evaluations and walk downs of the busses have been completed and all busses are ready to be re-energized.
- All stub bus breakers have been racked in.

INITIATING CUES:

The US directs you to perform AOP-304.1B, ATTACHMENT 6B, BUS 1DB RE-ENERGIZATION ALIGNMENT to energize BUS 1DB stub buses.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
CAUTION							
ANY bus with questionable electrical integrity shall be considered unsafe to energize until an evaluation and walk down of the bus in question can be performed.							
1. Check if BUS 1EB1 is safe to energize.							
STEP STANDARD:							
Candidate verifies that all evaluation and walk down have been completed per turnover information.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
EVALUATOR CUE: If the candidate asks Shift Manager directs no additional drain valves need to be aligned per AOP-304.1B, ATTACHMENT 6B.							
BOOTH OPERATOR: Place the Simulator in RUN when the Evaluator indicates the JPM may begin.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
2. Check if BUS 1EB is safe to energize.							
STEP STANDARD:							
Candidate verifies that all evaluation and walk down have been completed per turnover information.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
3. Perform the following: a. Close BUS 1EB FEED breaker. b. Verify BUS 1EB breaker closed light is lit.							
STEP STANDARD:							
Candidate closes BUS 1EB FEED breaker by rotating the switch to close and verifying close light is lit.							
CUES:							
EVALUATOR NOTE: Only closure of the breaker is critical.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	4						
4. Check if BUS 1EB1 FEED breaker is racked in.							
STEP STANDARD:							
Candidate determines that BUS 1EB1 FEED breaker is racked per turnover information.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
5. Perform the following: a. Ensure XFMR 1EB1 FEED breaker is closed. b. Close BUS 1EB1 FEED c. Verify BUS 1EB1 FEED Breaker closed light is lit.							
STEP STANDARD:							
• Candidate closes XFMR 1EB1 FEED breaker by rotating control switch to close and verifying red light is lit and green light is off. • Candidate closes BUS 1EB1 FEED by rotating control switch to close and verifying red light lit and green light is off.							
CUES:							
EVALUATOR NOTE: Only closure of the breakers is critical.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	6						
6. Check if BUS 1DB1 is safe to energize.							
STEP STANDARD:							
Candidate verifies that all evaluation and walk down have been completed per turnover information.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	7						
7. Check if BUS 1DB2 is safe to energize.							
STEP STANDARD:							
Candidate verifies that all evaluation and walk down have been completed per turnover information.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	8						
8. Check if either of the following are safe to energize:							
BUS 1DB1 FEED.							
OR							
BUS 1DB2 FEED.							
STEP STANDARD:							
Candidate verifies that all evaluation and walk down have been completed per turnover information.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	9						
9. Perform the following: a. Close XFMR 1DB1&1DB2 FEED. b. Verify XFMR 1DB1&1DB2 FEED Breaker closed light is lit.							
STEP STANDARD:							
Candidate closes XFMR 1DB1&1DB2 FEED by rotating switch to close and verifying red light is lit and green light is off.							
CUES:							
EVALUATOR NOTE: Only closure of the breaker is critical.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	10						
10. Check if BUS 1DB1 FEED is racked in.							
STEP STANDARD:							
Candidate determines that BUS 1EB1 FEED breaker is racked in per turnover information.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	11						
11. Perform the following: a. Close BUS 1DB1 FEED breaker. b. Verify BUS 1DB1 FEED Breaker closed light is lit.							
STEP STANDARD:							
Candidate closes BUS 1DB1 FEED breaker by rotating switch to close and verifying red light lit and green light off.							
CUES:							
EVALUATOR NOTE: Only closure of the breaker is critical.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	12						
12. Check if BUS 1DB2 FEED is racked in.							
STEP STANDARD:							
Candidate determines that BUS 1DB2 FEED breaker is racked in per turnover information.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	13						
13. Perform the following: a. Close BUS 1DB2 FEED breaker. b. Verify BUS 1DB2 FEED Breaker closed light is lit.							
STEP STANDARD:							
Candidate closes BUS 1DB2 FEED breaker by rotating switch to close and verifying red light lit and green light off.							
CUES:							
EVALUATOR NOTE: Only closure of the breaker is critical.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	14						
14. Notify the CRS of any ESF Bus that cannot be energized.							
STEP STANDARD:							
Candidate notifies US that all busses have been energized.							
CUES:							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: JPM: JPS-e-N23

IC SET: 272

INSTRUCTIONS:

If IC-272 is designated for this JPM then reset to IC-272, leaving simulator in FREEZE.

1. When Candidate is ready, (on evaluator cue) go to RUN.

If IC-272 is not designated for this JPM then initial conditions may be established by resetting to IC-10 and following the below directions:

1. With the simulator reset to IC-10 and in FREEZE, insert the following:
2. Place the simulator in RUN and insert a 51BX lockout on 1DB.

LOA-EPS167

RELAY 51BX-1DB - 7.2 KV SWGR BUS 1DB OVERCURRENT USE LOA EPS-1 TO
RESET

Position To: TRIP

3. Perform actions of AOP-304.1B up to step 30.
4. Reset 51BX lockout on 1DB.

LOA-EPS001

EPS BREAKER O/C TRIP RESET

Position To: RESET

5. Perform actions of AOP-304.1B up to step 35.
5. Place simulator in FREEZE and save to the desired IC.
6. When Candidate is ready, (on evaluator cue) go to RUN.

COMMENTS:

Provide spare operator to silence alarms.

REVISION HISTORY:

This is a new JPM

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- A 51BX Lockout on 1DB occurred.
- AOP-304.1B, LOSS OF BUS 1DB WITH THE DIESEL NOT AVAILABLE is in progress.
- All faults have been corrected cleared.
- Power has been restored to bus 1DB.
- All evaluations and walk downs of the busses have been completed and all busses are ready to be re-energized.
- All stub bus breakers have been racked in.

INITIATING CUES:

The US directs you to perform AOP-304.1B, ATTACHMENT 6B, BUS 1DB RE-ENERGIZATION ALIGNMENT to energize BUS 1DB stub buses.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-f-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-f-N23

DESCRIPTION: Return Power Range N-41 to service after operability is restored.

TASK: 000-034-05-01 RESPOND TO POWER RANGE INSTRUMENTATION
CHANNEL FAILURE PER AOP-401.10

TASK STANDARD: Power Range N-41 is restored to service in accordance with
AOP-401.10:

- Rate Mode switch is in reset.
- Comparator Channel Defeat switch is in normal.
- Upper Section switch in normal.
- Lower section switch in normal.
- Rod Stop Bypass switch for N-41 in operate.

TERMINATING CUE: PR N-41 restored to service in accordance with AOP-401.10 with
rods in automatic.

LOCATION:
SIMULATOR

METHOD:
PERFORM

REFERENCES: AOP-401.10 POWER RANGE CHANNEL FAILURE

K/A: 015 A4.02 Ability to manually operate and/or monitor in the control
room: NIS indicators (3.6)

TOOLS: Rack copy of AOP-401.10 marked complete through step 16.a.

VALIDATED TIME: 9 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is at 51% power.
- Power Range Channel N-41 failed and was removed from service in accordance with AOP-401.10, POWER RANGE CHANNEL FAILURE.
- I&C has repaired the channel and it is ready to be returned to service.

INITIATING CUES:

The US directs the NROATC to place PR Channel N-41 in service in accordance with AOP-401.10, beginning at Step 16.b.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Step 16 continued:							
b. Place RATE MODE Switch to RESET.							
STEP STANDARD:							
Operator locates and places RATE MODE Switch in RESET position.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM. BOOTH OPERATOR: Place the Simulator in RUN when the Evaluator indicates the JPM may begin.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
Step 16 continued:							
c. Place COMPARATOR CHANNEL DEFEAT Switch (on the COMPARATOR AND RATE drawer) in NORMAL.							
STEP STANDARD:							
Operator locates and places COMPARATOR CHANNEL DEFEAT Switch in Normal position; verifies COMPARATOR DEFEAT Light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
Step 16 continued:							
d. Place UPPER SECTION Switch (on the DETECTOR CURRENT COMPARATOR drawer) in NORMAL.							
STEP STANDARD:							
Operator locates and places UPPER SECTION Switch in NORMAL position; verifies Upper Section CHANNEL DEFEAT light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	4						
Step 16 continued:							
e. Place LOWER SECTION Switch (on the DETECTOR CURRENT COMPARATOR drawer) in NORMAL.							
STEP STANDARD:							
Operator locates and places LOWER SECTION Switch in NORMAL position; verifies Lower Section CHANNEL DEFEAT light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
Step 16 continued: f. Place ROD STOP BYPASS Switch for the failed Power Range channel (on the MISCELLANEOUS CONTROL AND INDICATION PANEL drawer) in OPERATE.							
STEP STANDARD:							
Operator locates and places ROD STOP BYPASS Switch for Power Range Channel N-41 in OPERATE.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	6						
Step 17. Ensure all the tripped bistables are reset.							
STEP STANDARD:							
Operator determines, at a minimum, that the following bistables are reset:							
• CHAN I PR FLUX HI SET PT • CHAN I PR FLUX RATE HI							
CUES:							
EVALUATOR NOTE: This can be performed by noting any of the following three methods: • Bistable lights are DIM/BRIGHT on the front of the N-41 drawer. • Verifies the following status lights: - XCP6111-3-11 (CHAN I PR FLUX RATE HI) – DIM - XCP6111-3-13 (CHAN I PR FLUX LO SET PT) – BRIGHT - XCP6111-3-15 (CHAN I PR FLUX HI SET PT) – DIM • Verifies the following alarms are clear: - XCP-620-1-1 (PR HI SETPT FLUX HI) - XCP-620-1-2 (PR LO SETPT FLUX HI) - XCP-620-2-2 (PR FLUX HI RATE SINGLE CHAN ALERT)							
EVALUATOR CUE: If the candidate expresses that STPs must be performed as part of the reset verification of bistables, cue the candidate that the Shift Engineer will verify completion of STPs.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM: JPS-f-N23

JPM SETUP SHEET

JPM: JPM: JPS-f-N23

IC SET: 273

INSTRUCTIONS:

RUN IC-273

IF IC-273 is unavailable, perform the following:

1. Load an IC-26.
2. Fail PR-N41 high.
3. Remove PR-N41 from service per AOP-401.10 through Step 11. It is not necessary to trip channel bistables.
4. Remove failure of PR-N41.
5. Save IC for multiple uses.

COMMENTS:

Provide a marked up copy of AOP-410.10 completed through step 16.a.

Ensure N-41 is removed from IPCS per OAP-107.1, does not save in IC snap.

Ensure N-41 restored after JPM is completed.

REVISION HISTORY:

This is a bank JPM was developed from JPSF-152.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is at 51% power.
- Power Range Channel N-41 failed and was removed from service in accordance with AOP-401.10, POWER RANGE CHANNEL FAILURE.
- I&C has repaired the channel and it is ready to be returned to service.

INITIATING CUES:

The US directs the NROATC to place PR Channel N-41 in service in accordance with AOP-401.10, beginning at Step 16.b.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-g-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-g-N23

DESCRIPTION: Respond to a leak in the Component Cooling Water system while swapping CCW booster pumps.

TASK: 008-021-01-01 Switch Component Cooling Water Trains per SOP-117/SOP-118/SOP-501.

TASK Candidate performs the following actions:

- STANDARD:**
- Starts "B" CCW Booster pump.
 - Secures "A" CCW Booster pump.
 - Opens LCV-7090 and LCV-7088, MU TO SRG TK (A/B SIDE).

TERMINATING CUE: CCW surge tank level is increasing.

LOCATION: SIMULATOR
METHOD: PERFORM

REFERENCES: SOP-118, COMPONENT COOLING WATER
ARP-001-XCP-603, 1-4 CCW SRG TK AUTO MU LVL LO

K/A: 008 A4.07 Ability to manually operate and/or monitor in the control room: Control of minimum level in the CCWS surge tank (2.8)

TOOLS: Rack copy of SOP-118.
Rack copy of ARP-001-XCP-603, 1-4 CCW SRG TK AUTO MU LVL LO

VALIDATED TIME: 5 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** YES

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is at 100% power.
- “A” CCW loop is the active loop.

INITIATING CUES:

The US directs you to shift Component Cooling Booster Pumps to “B” running and “A” in Standby in accordance with SOP-118, COMPONENT COOLING WATER, section III.D, COMPONENT COOLING BOOSTER PUMP OPERATIONS.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
2.1. Shift operating Component Cooling Booster Pumps:							
a. Place the desired Component Cooling Booster Pump, XPP-58A(B)(C), in START.							
STEP STANDARD:							
Candidate starts the "B" CCW Booster pump, verifies red light on green light off.							
CUES:							
EVALUATOR CUE: Provide the candidate with the briefing, briefing sheet prior to beginning the JPM.							
BOOTH OPERATOR: Verify trigger 1 inserts when "B" CCW Booster pump is started.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
2.1. Shift operating Component Cooling Booster Pumps:							
b. Stop one of the running Component Cooling Booster Pumps.							
1) Place XPP-58A(B)(C), in OFF .							
2) Place XPP-58A(B)(C), in AUTO.							
STEP STANDARD:							
Candidate places "A" CCW Booster pump in OFF and then back to AUTO, red light off, green light on.							
CUES:							
COMMENTS:							

JPM: JPS-g-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
2.1. Shift operating Component Cooling Booster Pumps: b. Ensure MVT-9593A(B)(C), FROM RCP A(B)(C) THERM BARR is not closed due to high flow.							
STEP STANDARD:							
Candidate verifies MVT-9593A(B)(C) are open, red light on, green light off.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	4						
Respond to annunciator XCP-603, 1-4 CCW SRG TK AUTO MU LVL LO							
STEP STANDARD:							
Candidate informs US of alarm and implements XCP-603, 1-4.							
CUES:							
EVALUATOR NOTE: This is where the JPM becomes alternate path.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
SETPOINT: ORIGIN: 470' - 0" (61%) ILS07088 469' - 8.25" (58%) ILS07090 XCP-603, 1-4, AUTOMATIC ACTIONS: 1. ILS07088 opens ILV-7088, MU TO SRG TK (B SIDE). 2. ILS07090 opens ILV-7090, MU TO SRG TK (A SIDE). CORRECTIVE ACTIONS: 1. Verify the appropriate makeup valve opens and tank level increases. 2. If tank level does not increase, ensure manual isolation valves are open and a Demineralized Water Pump is running. STEP STANDARD: Candidate determines level in the CCW surge tank is lowering, monitors levels, opens LCV-7088, MU TO SRG TK (B SIDE) and LCV-7090, MU TO SRG TK (A SIDE) and determines CCW surge tank level is increasing. CUES: EVALUATOR NOTE: • Both valves will be required to be open to increase level in the CCW surge tank. • PVG-9627A, SW TO CC LOOP A will not open to provide emergency makeup to the CCW surge tank. • Failure criteria will be if flow is lost to "A" CCW loop based on loss of level in the CCW Surge tank. • JPM may be terminated any time after an increase in CCW surge tank level is achieved. COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: JPM: JPS-g-N23

IC SET: 274

INSTRUCTIONS:

RUN IC-274

IF IC-274 is unavailable, perform the following:

1. Load an IC-10.

2. Insert the following codes:

Trigger 1 (x01o145r) "B" CCW Booster Pump is started

FLX-CCW004

FLEX LEAK CCW PMP A DISCH

Final Value: 100 GPM

Preload

VLV-CC018F

XVG09627A-CC SW SUP TO CCW FAIL AS IS

VLV-CC019F

XVG09627B-CC SW SUP TO CCW FAIL AS IS

VLV-CC002F

ILV07090-CC SRG TNK DEMIN WTR FAIL AS IS

VLV-CC001F

ILV07088-CC SRG TNK DEMIN WTR FAIL AS IS

Trigger 2 (x01i125o) LCV-7090 Switch taken to OPEN

VLV-CC002F

ILV07090-CC SRG TNK DEMIN WTR FAIL AS IS

Delete in: 1 sec

Trigger 3 (x01i124o) LCV-7088 Switch taken to OPEN

VLV-CC001F

ILV07088-CC SRG TNK DEMIN WTR FAIL AS IS

Delete in: 1 sec

3. Go to run

4. Lower CCW Surge tank to 62.5% by opening 9555A, CC SRG TK A SIDE DRN then close 9555A.

LOA-CCW002

CC SRG TK A SIDE DRN - 9555A

5. Freeze the simulator

6. Save IC for multiple uses.

COMMENTS:

None.

REVISION HISTORY:

New JPM

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is at 100% power.
- “A” CCW loop is the active loop.

INITIATING CUES:

The US directs you to shift Component Cooling Booster Pumps to “B” running and “A” in Standby in accordance with SOP-118, COMPONENT COOLING WATER, section III.D, D. COMPONENT COOLING BOOSTER PUMP OPERATIONS.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-h-N23**

CANDIDATE: _____

EVALUATOR: _____

JPM: JPS-h-N23

DESCRIPTION: Aligning RBCU filters for high radiation in containment.

TASK: 000-101-05-01 RESPONSE TO HIGH RB RADIATION LEVEL PER EOP-12.0 /EOP-17.2

TASK STANDARD: Two RBCU Filter Trains are placed in service by:

- Placing RBCU damper controls for XDP-111A and XDP-110B in the FILTER position.
- The RBCU Train "A" Emergency switch has been placed to the XFN-65A position.
- RBCU XFN-65A and XFN-64B have been started.

TERMINATING CUE: Both RBCU Filter Trains are operating.

LOCATION:
SIMULATOR

METHOD:
PERFORM

REFERENCES: EOP-17.2, RESPONSE TO HIGH REACTOR BUILDING RADIATION LEVEL

K/A: 027 A4.01 Ability to manually operate and/or monitor in the control room: CIRS controls. 2.8

TOOLS: Rack copy of EOP-17.2, RESPONSE TO HIGH REACTOR BUILDING RADIATION LEVEL

VALIDATED TIME: 6 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** YES

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- A LOCA is in progress.
- A Yellow Path on Containment exists due to Containment Radiation > 2 R/hr.

INITIATING CUES:

The US has directed you to implement EOP-17.2, RESPONSE TO HIGH REACTOR BUILDING RADIATION LEVEL.

A surrogate operator will acknowledge non-related alarms per your direction.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: JPS-h-N23

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Step 1. Verify Containment Ventilation Isolation Valves closed by verifying the following SAFETY INJECTION monitor lights are dim: a. XCP-6103 2-1 (POST ACCID HR EXH 6056/6066). b. XCP-6103 3-4 (POST ACCID HR EXH 6057 & 6067).							
STEP STANDARD:							
Candidate locates XCP 6103 and verifies light 2-1 POST ACCID HR EXH 6056/6066 and 3-4 POST ACCID HR EXH 6057 & 6067 are dim.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM. BOOTH OPERATOR: Place the Simulator in RUN when the Evaluator indicates the JPM may begin. EVALUATOR CUE: Provide the rack copy of EOP-17.2 once the candidate has been briefed on the initiating cue.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
Step 2. Start both RBCU HEPA Filter Trains: a. Stop RBCU Normal Speed Fans: • XFN 0064A-AH, 1A NORM. • XFN 0065A-AH, 2A NORM. • XFN 0064B-AH, 1B NORM. • XFN 0065B-AH, 2B NORM.							
STEP STANDARD:							
Candidate locates RBCU controls and verifies RBCU Normal Speed Fans are stopped: • 1A NORM, XFN-0064A-AH, observes red light OFF, green light ON with 0 amps indicated. • 2A NORM, XFN-0065A-AH, observes red light OFF, green light ON with 0 amps indicated. • 1B NORM, XFN-0064B-AH, observes red light OFF, green light ON with 0 amps indicated. • 2B NORM, XFN-0065B-AH, observes red light OFF, green light ON with 0 amps indicated.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
2 b. Place RBCU HEPA Filters in service by placing the switches in FILTER: • XDP-110A, RBCU 64A HEPA FLTR BYP DMPR. • XDP-111A, RBCU 65A HEPA FLTR BYP DMPR. • XDP-110B, RBCU 64B HEPA FLTR BYP DMPR. • XDP-111B, RBCU 65B HEPA FLTR BYP DMPR.							
STEP STANDARD:							
Candidate locates RBCU damper controls and places: • XDP-110A switch in FILTER, observes red BYP light ON and green FILTER light OFF. • XDP-111A switch in FILTER, observes red BYP light OFF and green FILTER light ON. • XDP-110B switch in FILTER, observes red BYP light OFF and green FILTER light ON. • XDP-111B switch in FILTER, observes red BYP light ON and green FILTER light OFF.							
CUES:							
EVALUATOR NOTE: RBCU 64A HEPA and RBCU 65B HEPA Filter Bypass dampers failed to reposition to filter as shown by XDP-110A; RBCU 64A HEPA FLTR BYP DMPR, red light ON, green light OFF and XDP-111B; RBCU 65BA HEPA FLTR BYP DMPR, red light ON, green light OFF. EVALUATOR NOTE: Alternate path begins at this step. EVALUATOR NOTE: Placing XDP-111A and XDP-110B in FILTER is critical because the damper will remain bypassed otherwise and there would be no HEPA filter in service on Train "A" or Train "B".							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	4						
Step 2 b: ALTERNATIVE ACTION b. IF any HEPA Filter fails to position to FILTER, THEN ensure the RBCU TRAIN A(B) EMERG Switch is selected to the fan with its respective filter aligned.							
STEP STANDARD:							
Candidate locates RBCU TRAIN A EMERG switch and places it to the XFN65A position, observes XFN 64A white light OFF, XFN 65A white light ON and RBCU-65A does not start. Candidate locates RBCU TRAIN B EMERG switch and verifies it is in the XFN64B position, observes XFN 64B white light ON, XFN 65B white light OFF.							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
2 c. Start the RBCU Slow Speed Fans selected on RBCU TRAIN A EMERG and RBCU TRAIN B EMERG.							
STEP STANDARD:							
Candidate places XFN 0065A-AH slow speed fan switch to START, observes; red light ON, green light OFF, and normal amps. Candidate places XFN 0064B-AH slow speed fan switch to START, observes; red light ON, green light OFF, and normal amps.							
CUES:							
EVALUATOR NOTE: The Candidate may place XFN 0064A-AH to stop. EVALUATOR NOTE: Placing the XFN-65A switch in START is critical because the fan must be started in order to align a Train "A" HEPA filter. Placing the XFN-64B switch in START is critical because the fan must be started in order to align a Train "B" HEPA filter.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: JPM: JPS-h-N23

IC SET: 275

INSTRUCTIONS:

RUN IC- 275

If IC-275 is designated for this JPM then reset to IC-275 leaving the simulator in FREEZE.

1. When Candidate is ready (on Evaluator cue) go to RUN.

If IC-275 is not designated for this JPM then initial conditions may be established by following the below directions:

1. With the simulator reset to IC-10 and in FREEZE, insert the following:

PRE-LOAD

MAL-RCS010
GROSS ISOTOPIC CONCENTRATION IN THE RCS
Final Value: 1.42e+008 uC/gm

PLP-RMS027
AREA RAD MON RM-G7 BACKGROUND
Final Value: 2.1R/hr

PLP-RMS038
AREA RAD MON RM-G18 BACKGROUND
Final Value: 2.1R/hr

OVR-AH025E
SS-AH281 RBCU HEPA FILTER BYPASS DAMPER
Override To: False

OVR-AH025A
SS-AH281 RBCU HEPA FILTER BYPASS DAMPER
Override To: Off

OVR-AH025B
SS-AH281 RBCU HEPA FILTER BYPASS DAMPER
Override To: On

OVR-AH018E
SS-AH283 RBCU HEPA FILTER BYPASS DAMPER
Override To: False

OVR-AH018A
SS-AH283 RBCU HEPA FILTER BYPASS DAMPER
Override To: Off

OVR-AH018B
SS-AH283 RBCU HEPA FILTER BYPASS DAMPER
Override To: On

JPM: JPS-h-N23

OVR-AH026E
SS-AH282 RBCU HEPA FILTER BYPASS DAMPER
Override To: False

OVR-AH026A
SS-AH282 RBCU HEPA FILTER BYPASS DAMPER
Override To: Off

OVR-AH026B
SS-AH282 RBCU HEPA FILTER BYPASS DAMPER
Override To: On

OVR-AH024E
SS-AH284 RBCU HEPA FILTER BYPASS DAMPER
Override To: False

OVR-AH024A
SS-AH284 RBCU HEPA FILTER BYPASS DAMPER
Override To: Off

OVR-AH024B
SS-AH284 RBCU HEPA FILTER BYPASS DAMPER
Override To: On

PMP-AH046F
XFN0064BL RB CLG FAN LOW FAIL TO START

ANN-AH005
RBCU 2A DISCH EMP HI/SMOKE
Fail To: ON

TRIGGER 1

MAL-RCS019C
DBA LOCA (HOT LEG) LOOP 3

AUTO TRIGGER 2 (x02i082f) HEPA Filter Bypass damper XDP-111A placed in filter

OVR-AH018E (NEW)
SS-AH283 RBCU HEPA FILTER BYPASS DAMPER
Override To: False
Delete in: 1 sec

OVR-AH018A (NEW)
SS-AH283 RBCU HEPA FILTER BYPASS DAMPER
Override To: Off
Delete in: 1 sec

OVR-AH018B (NEW)
SS-AH283 RBCU HEPA FILTER BYPASS DAMPER
Override To: On
Delete in: 1 sec

AUTO TRIGGER 3 (x02i394f) HEPA Filter Bypass damper XDP-110B placed in filter

JPM: JPS-h-N23

OVR-AH026E (NEW)
SS-AH282 RBCU HEPA FILTER BYPASS DAMPER
Override To: False
Delete in: 1 sec

OVR-AH026A (NEW)
SS-AH282 RBCU HEPA FILTER BYPASS DAMPER
Override To: Off
Delete in: 1 sec

OVR-AH026B (NEW)
SS-AH282 RBCU HEPA FILTER BYPASS DAMPER
Override To: On
Delete in: 1 sec

AUTO TRIGGER 4 (x02i093s) RB Cooling Fan 64B slow speed switch to start.

PMP-AH046F (NEW)
XFN0064BL RB CLG FAN LOW FAIL TO START
Delete in: 1 sec

2. Place simulator in RUN and activate TRIGGER 1.
3. Perform EOP-1.0.
4. Perform steps of EOP-2.0 as necessary.
5. Run until RB Press < 11 psig and Containment CSFST is YELLOW due to high RB Rad Levels.
6. Place simulator in FREEZE and SAVE IC.
7. When Candidate is ready (on Evaluator cue) go to RUN

COMMENTS:

Provide spare operator to silence alarms.

BOOTH OPERATOR: Use LOA resets page to silence HVAC alarms when they come in.

REVISION HISTORY:

This is a reformatted version of 2018 NRC JPM h.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- A LOCA is in progress.
- A Yellow Path on Containment exists due to Containment Radiation > 2 R/hr.

INITIATING CUES:

The US has directed you to implement EOP-17.2, RESPONSE TO HIGH REACTOR BUILDING RADIATION LEVEL.

A surrogate operator will acknowledge non-related alarms per your direction.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC In-Plant i**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC In-Plant i

DESCRIPTION: Energizing the ESF Loading Sequencer in accordance with STP-125.017.

TASK: 062-008-02-04: Station Blackout Test per STP-125.010 or STP-125.017.

TASK STANDARD: Candidate re-energizes the ESF Loading Sequencer by performing the following in accordance with STP-125.017:

- Close breaker APN5901 16, ESF LOADING SEQ CONT PNL TRN A XPN6020.
- At XPN6020, ESF LOADING SEQUENCE CONTROL PANEL - UNIT 1 (CB-436) reset the ESFLS as follows:
 - Ensures the panel CIRCUIT BREAKER is closed.
 - Places the ON/RESET Toggle Switch in the RESET position.
 - Returns the ON/RESET Toggle Switch to the ON position.

TERMINATING CUE: Once the candidate states they have completed step 6.6.b.3.

LOCATION: **METHOD:**
PLANT **SIMULATE**

REFERENCES:

STP-115.017, DIESEL GENERATOR A LOSS OF OFFSITE POWER TEST

K/A: 013 A4.016: Ability to manually operate and or monitor in the control room: ESF testing.

TOOLS: 23 NRC In-plant JPM i Handout 1 and 2.

VALIDATED TIME: 5 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS:

Personal Protection Equipment (PPE).

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

INITIAL CONDITIONS:

- Plant is shutdown for a refueling outage.
- STP-125.017, DIESEL GENERATOR A LOSS OF OFFSITE POWER TEST is in progress.

INITIATING CUES:

The US has directed you to perform Step 6.6.a and Step 6.6.b of STP-125.017 for re-energizing the ESF Loading Sequencer.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC In-Plant i

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
6.6. Energize and reset XPN6020, ESF LOADING SEQUENCE CONTROL PANEL - UNIT 1, by performing the following: a. Close breaker APN5901 16, ESF LOADING SEQ CONT PNL TRN A XPN6020 (CB-436).							
STEP STANDARD:							
At APN5901, Candidate closes breaker APN5901 16.							
CUES:							
EVALUATOR NOTE: DO NOT OPEN PANEL APN5901!!!							
EVALUATOR CUE: When candidate has closed the breaker, notify the candidate that the breaker is closed.							
EVALUATOR CUE: Show picture of APN5901 after candidate locates the panel.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
6.6. Energize and reset XPN6020, ESF LOADING SEQUENCE CONTROL PANEL - UNIT 1, by performing the following: b. At XPN6020, ESF LOADING SEQUENCE CONTROL PANEL - UNIT 1 (CB-436) reset the ESFLS as follows: 1) Ensure the panel CIRCUIT BREAKER is closed. 2) Place the ON/RESET Toggle Switch in the RESET position (Bottom, left side of the AUTOMATIC TEST Section of the panel). 3) Return the ON/RESET Toggle Switch to the ON position.							
STEP STANDARD:							
Candidate should close the CIRCUIT BREAKER on the panel. (On bottom of panel) Candidate places the toggle switch to the RESET position and then returns the Toggle switch to the ON position.(On Middle left of panel)							
CUES:							
EVALUATOR NOTE: DO NOT OPEN THE PANEL ON XPN6020!!! This will violate exam security because there is an alarm in the Control Room when this panel is opened. EVALUATOR CUE: When the candidates mentions the CIRCUIT BREAKER position, Inform them that the CIRCUIT BREAKER on the panel is open. EVALUATOR CUE: Show picture of XPN6020 after candidate locates the panel. Show close-up pictures of circuit breaker and reset switch when candidate locates them on full cabinet picture.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM: 23 NRC In-Plant i

JPM SETUP SHEET

JPM: 2023 NRC JPM i

IC SET: N/A

INSTRUCTIONS:

None

COMMENTS:

None

REVISION HISTORY:

New JPM for 2023 NRC Exam JPM.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS:

Personal Protection Equipment (PPE).

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

INITIAL CONDITIONS:

- Plant is shutdown for a refueling outage.
- STP-125.017, DIESEL GENERATOR A LOSS OF OFFSITE POWER TEST is in progress.

INITIATING CUES:

The US has directed you to perform Step 6.6.a and Step 6.6.b of STP-125.017 for re-energizing the ESF Loading Sequencer.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC In-Plant j**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC In-Plant j

DESCRIPTION: Local isolation of RCP seals during a loss of all ESF AC power.

TASK: 000-055-05-01 RESPOND TO LOSS OF OFF SITE AND ON SITE
ESF POWER PER EOP-6.0/EOP-1.0.

TASK STANDARD: The following valves have been closed to isolate the RCP Seals in
accordance with EOP-6.0:

- XVT-8100, RC PUMP SEAL RETURN HDR ISOL VLV.
- XVG-9606, RB CC RETURN HEADER VALVE.
- XVT-8105, SEAL INJECTION HEADER ISOLATION VALVE.

TERMINATING CUE: RCP seals isolated per Attachment 9 of EOP-6.0.

LOCATION: **METHOD:**
PLANT SIMULATE

REFERENCES: EOP-6.0 ECA-0.0 LOSS OF ALL ESF AC POWER

K/A: 055 EA1.10 Ability to operate and/or monitor the following as they
apply to a Station Blackout: CVCS (3.6)

TOOLS: 23 NRC In-Plant JPM j HO, copy of EOP-6.0, Attachment 9
23 NRC In-Plant JPM j HO2, picture of valve operator.

VALIDATED TIME: 10 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS:

Personal Protection Equipment (PPE).

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

INITIAL CONDITIONS:

- A total loss of offsite power has occurred and both D/G's have failed to start.
- The US has implemented EOP-6.0, ECA-0.0 LOSS OF ALL ESF AC POWER and is directing actions for locally isolating RCP seals.

INITIATING CUES:

NROATC calls and directs you, the AB Operator to isolate RCP seals IAW Step 1 of Attachment 9 of EOP-6.0.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC In-Plant j

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Step 1: Locally isolate the RCP Seals by closing the following and record on the table below: a) XVT08100-CS, RC PUMP SEAL RETURN HDR ISOL VLV (ORC) (AB-412 West Pen).							
STEP STANDARD:							
Engages manual handwheel by pressing down on the declutch lever on XVT08100-CS and turns handwheel fully clockwise until resistance is felt.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
EVALUATOR CUE: Provide the candidate with 2023 NRC JPM j HO, EOP-6.0 Attachment 9							
EVALUATOR NOTE: MVT-8100 is in the north end of the 412' West Penetration area, which has elevated radiation levels. Accessing the North door to the West Pen will provide the least amount of radiation exposure. Have the examinee point to the correct valve in order to reduce radiation exposure and then leave the room.							
EVALUATOR NOTE: 23 NRC In-Plant JPM j HO2 can be used for demonstrating valve operations in the low does waiting area.							
EVALUATOR CUE: Handwheel rotates clockwise until resistance is felt and threaded shaft is seen.							
COMMENTS:							

JPM: 23 NRC In-Plant j

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
Step 1 continued: b) XVG09606-CC, RB CC RETURN HEADER VALVE (AB-436 West Pen).							
STEP STANDARD:							
Engages manual handwheel by pressing down on the declutch lever on XVG09606-CC and turns handwheel fully clockwise until resistance is felt.							
CUES:							
EVALUATOR CUE: Handwheel rotates clockwise until resistance is felt and threaded shaft is seen.							
EVALUATOR NOTE: 23 NRC In-Plant JPM j HO2 can be used for demonstrating valve operations.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
Step 1 continued: c) XVT08105-CS, SEAL INJECTION HEADER ISOLATION VALVE (AB-436).							
STEP STANDARD:							
Engages manual handwheel by pressing down on the declutch lever on XVT08105-CS and turns handwheel fully clockwise until resistance is felt.							
CUES:							
EVALUATOR NOTE: The lighting in this room may be dim. The use of a flash light may be necessary.							
EVALUATOR NOTE: 23 NRC In-Plant JPM j HO2 can be used for demonstrating valve operations.							
EVALUATOR CUE: Handwheel rotates clockwise until resistance is felt and threaded shaft is seen.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM: 23 NRC In-Plant j

JPM SETUP SHEET

JPM: 2023 NRC JPM j

IC SET: N/A

INSTRUCTIONS:

Provide examinee with 2023 NRC JPM j HO, EOP-6.0, Attachment 9.

COMMENTS:

None

REVISION HISTORY:

Bank JPM

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS:

Personal Protection Equipment (PPE).

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

INITIAL CONDITIONS:

- A total loss of offsite power has occurred and both D/G's have failed to start.
- The US has implemented EOP-6.0, ECA-0.0 LOSS OF ALL ESF AC POWER and is directing actions for locally isolating RCP seals.

INITIATING CUES:

NROATC calls and directs you, the AB Operator to isolate RCP seals IAW Step 1 of Attachment 9 of EOP-6.0.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC In-Plant JPM k**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC In-Plant JPM k

DESCRIPTION: PLACING INVERTER XIT-5901 IN AN ALTERNATE AC LINEUP

TASK: 062-010-01-04 REMOVE ENGINEERING SAFETY FEATURES VITAL
INVERTER FROM SERVICE PER SOP-310

TASK STANDARD: APN-5901 has been shifted to its alternate power source in accordance with SOP-310 by:

- Rotating the BYPASS MANUAL SWITCH - Q050 to the BYPASS position.
- Positioning the BATTERY BREAKER - Q004 to the OFF position.
- Positioning the INPUT BREAKER - Q001 to the OFF position.
- Placing the selector Switch S001 in position 1 till the RECTIFIER OUTPUT VOLTAGE reads 0.

TERMINATING CUE: XIT-5901 is placed in an alternate AC lineup

LOCATION: **METHOD:**
PLANT SIMULATE

REFERENCES:

SOP-310, ENGINEERED SAFETY FEATURES 120 VAC INSTRUMENTATION AND CONTROL POWER SYSTEM

K/A: 062 A4.07 Ability to manually operate and/or monitor in the control room: Synchronizing and paralleling of different AC supplies (3.7)

TOOLS: 23 NRC In-Plant k Handout 1, SOP-310, SECTION IV.E, SHIFTING APN5901 POWER SOURCE TO 1FA AT INVERTER 5901
23 NRC In-Plant k HO2, HO3, HO4, Pictures of control screen.

VALIDATED TIME: 14 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS:

Personal Protection Equipment (PPE).

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

INITIAL CONDITIONS:

- Plant is at 100% power.
- 'A1' Train maintenance work week.
- XIT-5901 is scheduled for preventive maintenance.

INITIATING CUES:

The Shift Manager directs the shifting of APN5901 power source to 1FA at inverter 5901 in accordance with SOP-310, Section IV.E for inverter PMs. All initial conditions are completed.

STP-506.005, DEENERGIZATION OF THE ESF LOAD SEQUENCER LOSS OF VOLTAGE AND DEGRADED VOLTAGE RELAYS has been completed.

The PM's require the Static Switch be manually bypassed.

The breakers will **NOT** be red tagged.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC In-Plant JPM k

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP

1

CAUTION 2.0

a. STP-506.005, De-Energization Of The ESF Load Sequencer Loss Of Voltage And Degraded Voltage Relays A Train, XEG0001A, should be completed on Train A prior to removing Inverter XIT5901 from service. This should be tracked on the Diesel Generator A R&R.

b. Do not actuate the BYPASS MANUAL SWITCH - Q050 when the system is running in NORMAL.

NOTE 2.0

a. All steps are performed in the Relay Room (CB-436) unless otherwise stated.

b. XCP-636 1-5 (INVERTER 5901 TROUBLE) will be locked in alarm at the completion of this procedure.

CAUTION 2.1

If during BYPASS OPERATION a fault occurs the inverter will automatically switch to NORMAL operation if the rectifier is available OR to BATTERY operation if the Battery is available and within tolerance.

2.1 Select .

STEP STANDARD:

Selects .

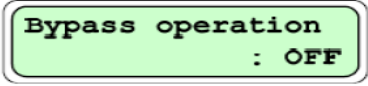
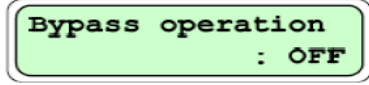
CUES:

EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet and 23 NRC In-Plant JPM k Handout 1 before starting the JPM.

EVALUATOR CUE: Cue operator that  is selected.

COMMENTS:

JPM: 23 NRC In-Plant JPM k

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
2.2 Cursor up  as necessary until  is displayed.							
STEP STANDARD:							
Depresses cursor up  until  is displayed.							
CUES:							
EVALUATOR CUE: Cue operator that  is displayed by displaying 23 NRC HO2.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
2.3 Select  (Activation).							
STEP STANDARD:							
Depresses the  button.							
CUES:							
EVALUATOR CUE: Cue operator that the  button has been pressed.							
COMMENTS:							

JPM: 23 NRC In-Plant JPM k

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	4						
2.4 Verify the following: a. LED 9, BYPASS MAINS O.K. is lit. b. LED 6, SYNCHRONOUS is lit. c. Display indicates Bypass operation :.							
STEP STANDARD:							
Verifies that LED 9 and LED 6 are lit and the display indicates Bypass operation : .							
CUES:							
EVALUATOR CUE: Cue operator that LED 9 and LED 6 lights are lit and display indicates Bypass operation : by displaying 23 NRC HO3.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
If MANUAL BYPASS operation is desired perform the following additional steps: CAUTION In this mode a Bypass Fault will trip the inverter with no alternate supply available for auto transfer. 2.5 Verify static switch LED 10, LOAD VIA EN is lit.							
STEP STANDARD:							
Verifies LED 10, LOAD VIA EN light is lit.							
CUES:							
EVALUATOR CUE: Cue operator that LED 10, LOAD VIA EN light is lit.							
COMMENTS:							

JPM: 23 NRC In-Plant JPM k

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP	6

NOTE 2.6

Placing the Bypass Manual Switch in TEST isolates the Static Switch and the Inverter output from the Alternate Source and will cause the following:

- 1) XCP-636 1-5 (INVERTER 5901 TROUBLE) annunciates (MCB).
- 2) AC OUTPUT Voltage and Frequency indication is lost.

2.6 Turn the BYPASS MANUAL SWITCH - Q050 to TEST.

STEP STANDARD:

The BYPASS MANUAL SWITCH - Q050 is rotated to the TEST position.

CUES:

EVALUATOR NOTE: The turnover sheet says that the PM's require the Static Switch be manually bypassed.

EVALUATOR CUE: Cue operator that BYPASS MANUAL SWITCH - Q050 is in the TEST position.

EVALUATOR CUE: Acknowledge report of XCP-636 1-5 (INVERTER 5901 TROUBLE) alarm on the MCB if candidate reports it the control room.

COMMENTS:

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	

JPM STEP	7

2.7 Verify the following:

- Static switch LED 11, MANUAL BYPASS is lit.
- MANUAL BYPASS alarm is lit.

STEP STANDARD:

Verifies LED 11 light is lit and Manual Bypass light are lit.

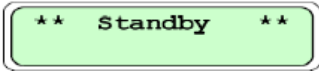
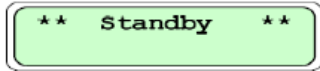
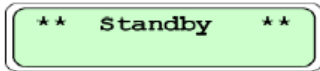
CUES:

EVALUATOR CUE: Cue operator that Static switch LED 11, MANUAL BYPASS is lit and MANUAL BYPASS alarm light is lit.

COMMENTS:

JPM: 23 NRC In-Plant JPM k

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	8						
2.8 Turn off XIT5901 by pressing  and  simultaneously.							
STEP STANDARD:							
Simultaneously presses both  and  to turn off XIT5901.							
CUES:							
EVALUATOR CUE: Cue operator that both  and  have been pressed.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	9						
2.9 Verify the display indicates  .							
STEP STANDARD:							
Verifies that display indicates  .							
CUES:							
EVALUATOR CUE: Cue operator that display indicates  by displaying 23 NRC HO4.							
COMMENTS:							

JPM: 23 NRC In-Plant JPM k

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	10						
2.10 Turn the BYPASS MANUAL SWITCH - Q050 to BYPASS.							
STEP STANDARD:							
BYPASS MANUAL SWITCH - Q050 is rotated to the BYPASS position.							
CUES:							
EVALUATOR CUE: Cue operator that BYPASS MANUAL SWITCH - Q050 is in the BYPASS position.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	11						
2.11 Verify the following:							
• Static switch LED 11, MANUAL BYPASS is lit. • MANUAL BYPASS alarm is lit.							
STEP STANDARD:							
Verifies that LED 11, MANUAL BYPASS Light and MANUAL BYPASS alarm are lit.							
CUES:							
EVALUATOR CUE: Cue operator that LED 11, MANUAL BYPASS Light and MANUAL BYPASS alarm are lit.							
COMMENTS:							

JPM: 23 NRC In-Plant JPM k

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	12						
2.12 Turn BATTERY BREAKER - Q004 to OFF.							
STEP STANDARD:							
Positions the BATTERY BREAKER - Q004 to the OFF position.							
CUES:							
EVALUATOR CUE: Cue operator that the BATTERY BREAKER - Q004 is in the OFF position.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	13						
2.13 Turn INPUT BREAKER - Q001 to OFF.							
STEP STANDARD:							
Positions the INPUT BREAKER - Q001 to the OFF position.							
CUES:							
EVALUATOR CUE: Cue operator that the INPUT BREAKER - Q001 is in the OFF position.							
COMMENTS:							

JPM: 23 NRC In-Plant JPM k

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	14						
2.14 Discharge the capacitors by placing selector Switch S001 in Position 1 and hold until RECTIFIER OUTPUT VOLTAGE reads 0.							
STEP STANDARD:							
Places the selector Switch S001 in position 1 till the RECTIFIER OUTPUT VOLTAGE reads 0.							
CUES:							
EVALUATOR CUE: Cue operator that the selector Switch S001 is in Position 1 and RECTIFIER OUTPUT VOLTAGE reads 0.							
EVALUATOR NOTE: Switch is on the left panel, voltage indicator is on the right panel							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	15						
2.15 Verify XCP-636 1-5 (INVERTER 5901 TROUBLE) is in alarm (MCB).							
STEP STANDARD:							
Call Control Room and verifies XCP-636 1-5 (INVERTER 5901 TROUBLE) is in alarm.							
CUES:							
EVALUATOR CUE: Cue operator that XCP-636 1-5 (INVERTER 5901 TROUBLE) is in alarm on the MCB.							
COMMENTS:							

JPM: 23 NRC In-Plant JPM k

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	16						
NOTE 2.16 If the electricians are to perform inverter PMs and breakers are NOT red tagged, Step 2.16 may be omitted. 2.16 Open the following feeder breakers: a. XMC1DA2Y 06ABL, INVERTER 1 NSSS FEED XIT5901-EV (AB-412). b. DPN1HA 22, INVERTER XIT5901 (IB-412).							
STEP STANDARD:							
Determines that step 2.16 is not required to be performed based on turnover information.							
CUES:							
EVALUATOR NOTE: Operator does not perform Step 2.16, turnover sheet says that the breakers will NOT be red tagged.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM: 23 NRC In-Plant JPM k

JPM SETUP SHEET

JPM: 23 NRC In-Plant k

IC SET: N/A

INSTRUCTIONS:

None

COMMENTS:

None

REVISION HISTORY:

Bank JPM, 2021 AUDIT.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS:

Personal Protection Equipment (PPE).

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

INITIAL CONDITIONS:

- Plant is at 100% power.
- 'A1' Train maintenance work week.
- XIT-5901 is scheduled for preventive maintenance.

INITIATING CUES:

The Shift Manager directs the shifting of APN5901 power source to 1FA at inverter 5901 in accordance with SOP-310, Section IV.E for inverter PMs. All initial conditions are completed.

STP-506.005, DEENERGIZATION OF THE ESF LOAD SEQUENCER LOSS OF VOLTAGE AND DEGRADED VOLTAGE RELAYS has been completed.

The PM's require the Static Switch be manually bypassed.

The breakers will **NOT** be red tagged.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A1-a (R)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A1-a (R)

DESCRIPTION: Verification of Operator Watchstanding Certification

TASK: 119-003-03-01 Conduct Shift and Relief Turnover

TASK STANDARD: Candidate determines that one 12 hour shift must be stood by the end of December 31st to maintain an active license.

TERMINATING CUE: The candidate determines one 12 hour shift is required, enters answers on the handout provided and returns it to the evaluator.

LOCATION:
CLASSROOM

METHOD:
PERFORM

REFERENCES:

OAP-110.2, OPERATOR WATCHSTANDING CERTIFICATION AND TRACKING
OP-AA-103, OPERATOR QUALIFICATIONS

K/A: 2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, and maintenance of active license status, 10 CFR Part 55 (RO 3.3)

TOOLS: Calculator
23 NRC A1-a (R) – Handout 1
Access to paper or electronic copies of V.C. Summer procedures

VALIDATED TIME: 10 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE)

SAT

UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- Today is **December 21.**
- You have been working a special assignment and it is anticipated that you will be permanently assigned to a shift on January 2.
- Your REACTOR OPERATOR license was issued on **September 26** of this year.
- **After** September 26, while on special assignment, you also stood watches on the dates indicated on the handout that has been provided to you.
- All watches include shift turnover as applicable.

INITIATING CUES:

You are directed to evaluate the work history provided and determine whether you can stand an RO shift on January 2, in accordance with VCS administrative requirements.

- If so, **justify your answer.**
- If not, **then identify the remaining requirements,** if any.

Enter your answers on Handout 1.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A1-a (R)

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Candidate reviews information provided to determine whether the operator can stand an RO shift in accordance with VCS administrative requirements given watchstanding history.							
STEP STANDARD:							
Determines the following:							
• 12 hours are left to be stood to maintain an active license. • The watch must be stood in 12 hour shift in a licensed position. • The watch must be stood by end of the quarter (December 31).							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
EVALUATOR CUE: Provide the candidate with 23 NRC A1-a (R) Handout 1 before starting the JPM.							
EVALUATOR NOTE: It is not critical for the candidate to refer to the procedure if the candidate can make the correct determination in step 4 from memory.							
EVALUATOR NOTE: 60 hours - 48 hours (four 12-hour shifts) = 12 hours in one 12 hour shift left to be stood to maintain the license.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A1-a (R)

IC SET: N/A

INSTRUCTIONS:

Ensure that current procedures and curve book are available in hard copy or electronically.

Provide Handout containing the following:

Your Watchstanding History

NROATC	0730 - 1930	October 8
NROATC	0730 - 1230	October 15
BOP	0730 - 1930	October 19
BOP	0730 - 1430	November 11
BOP	0730 - 1330	November 20
CONTROL BUILDING	1930 - 0730	November 22
BOP	0730 - 1930	December 9
NROATC	1930 - 0730	December 13

Record your answer below:

COMMENTS:

REVISION HISTORY:

Bank JPM

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- Today is **December 21.**
- You have been working a special assignment and it is anticipated that you will be permanently assigned to a shift on January 2.
- Your REACTOR OPERATOR license was issued on **September 26** of this year.
- **After** September 26, while on special assignment, you also stood watches on the dates indicated on the handout that has been provided to you.
- All watches include shift turnover as applicable.

INITIATING CUES:

You are directed to evaluate the work history provided and determine whether you can stand an RO shift on January 2, in accordance with VCS administrative requirements.

- If so, **justify your answer.**
- If not, **then identify the remaining requirements,** if any.

Enter your answers on the Handout 1.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A1-b (R)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A1-b (R)

DESCRIPTION: Perform boron change calculations

TASK: 004-006-01-01 PERFORM BORON CONCENTRATION CHANGE CALCULATIONS

TASK STANDARD: Candidate completes OAP-100.6 Attachment IA within the tolerance bands of the answer key.

TERMINATING CUE: The candidate completes OAP-100.6, Attachment IA, enters answers on the handout and returns it to the evaluator.

LOCATION:
CLASSROOM

METHOD:
PERFORM

REFERENCES:

OAP-100.6, CONTROL ROOM CONDUCT AND CONTROL OF SHIFT ACTIVITIES

K/A: 2.1.25 Ability to interpret reference materials, such as graphs, curves, and tables (reference potential) (RO 3.9)

TOOLS: Calculator
23 NRC A1-b (R) Handout 1 – Reactivity Parameters
23 NRC A1-b (R) Handout 2 – OAP-100.6, CONTROL ROOM CONDUCT AND CONTROL OF SHIFT ACTIVITIES ATTACHMENT IA
23 NRC A1-b (R) Handout 3 – Required Figures from Curve Book
Access to paper or electronic copies of V.C. Summer procedures

VALIDATED TIME: 29 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE)

SAT

UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is in MODE 1.
- It is Sunday day shift.

INITIATING CUES:

The US directs you to complete Attachment IA, Reactivity Control Parameters, of OAP-100.6, CONTROL ROOM CONDUCT AND CONTROL OF SHIFT ACTIVITIES.

Round all answers to the nearest 3 decimals.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A1-b (R)

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Complete OAP-100.6, Attachment IA.							
STEP STANDARD:							
Completes OAP-100.6, Attachment IA in accordance with the key.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
EVALUATOR CUE: Provides candidate with 23 NRC A1-b Handout 1 and 2 with the information on RCS Boron Concentration, Burnup, "A" Boric Acid Tank Boron Concentration, and "B" Boric Acid Tank Boron Concentration and OAP-100.6, Attachment IA with directions to show all work.							
EVALUATOR CUE: Provides candidate with paper copies of Curve Book figures 23 NRC A1-b Handout 3.							
EVALUATOR NOTE: Critical calculation items are noted by arrows on the answer key. Any difference in the non-critical items or transposition errors should be noted and discussed at the end of the JPM to ensure understanding and recorded as potential procedure adherence issues.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A1-b (R)

IC SET: N/A

INSTRUCTIONS:

Ensure that current procedures and curve book are available in hard copy or electronically.

Provide Handout 1 containing the following:

- RCS Boron Concentration: 185 ppm
- Core Burnup: 20150 MWD/MTU
- 'A' Boric Acid Tank in service @ 7565 ppm boron
- 'B' Boric Acid Tank is @ 7515 ppm boron

Provide Handout 2 OAP-100.6, Attachment IA.

Provide Handout 3 Copies of Appropriate Curve Book Figures.

COMMENTS:

None

REVISION HISTORY:

Rev. 0: This is a reformatted and modified version of JPA-006A. Updated data for changes to Station Curve Book.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is in MODE 1.
- It is Sunday day shift.

INITIATING CUES:

The US directs you to complete Attachment IA, Reactivity Control Parameters, of OAP-100.6, CONTROL ROOM CONDUCT AND CONTROL OF SHIFT ACTIVITIES.

Round all answers to the nearest 3 decimals.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A2 (R)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A2 (R)

DESCRIPTION: Perform Boration system flow path verification and determine operability.

TASK: 004-001-02-01 Perform Boration System Flow Path Verification

TASK STANDARD: Determines the flowpath operability, indicates the correct status in step 6.4 of attachment I and lists the deficiencies for attachments IIB, IIC:

- Attachment IIA: SAT
- Attachment IIB: UNSAT - XVD08323A-CS, BORIC ACID TANK A OUTLET ISOL VALVE should be CLOSED and XVD08323B-CS, BORIC ACID TANK B OUTLET ISOL VALVE should be OPEN.
- Attachment IIC: UNSAT -- XVD08323A-CS, BORIC ACID TANK A OUTLET ISOL VALVE should be CLOSED and XVD08323B-CS, BORIC ACID TANK B OUTLET ISOL VALVE should be OPEN.
- Indicates SAT for step 6.7 in Attachment I.

TERMINATING CUE: Attachment I is complete, and the candidate returns the completed Handouts and instruction sheet to the evaluator.

LOCATION:

CLASSROOM

METHOD:

PERFORM

REFERENCES:

STP-104.003 BORATION SYSTEM VALVE LINEUP VERIFICATION

K/A: 2.2.12 Knowledge of surveillance procedures. (RO 3.7)

TOOLS: 23 NRC A2 (R) Handout 1 (marked up STP-104.003, BORATION SYSTEM VALVE LINEUP VERIFICATION procedure and Attachment I, IIA, IIB, IIC and IID) and Handout 2 to document deficiencies.

VALIDATED TIME: 27 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE)

SAT

UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

JPM: 23 NRC A2 (R)

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- Operators are performing a plant startup in GOP-2, PLANT STARTUP AND HEATUP (MODE 5 TO MODE 3) after a refueling outage.
- Current RCS cold leg temperatures are 290°F.
- "B" boric acid tank is in service with a concentration of 7300 ppm.
- "A" boric acid tank is at a concentration of 6800 ppm.
- "A" boric acid tank was declared inoperable and is out of service.
- STP-104.003, BORATION SYSTEM VALVE LINEUP VERIFICATION is due.
- The valve lineups from Attachments IIA, IIB, IIC and IID of STP-104.003 have been completed.
- Operators have also verified the Gravity Drain Flowpath piping is full of water by performing venting and have returned the vent path to the required operable position.

INITIATING CUES:

The US directs you to review the completed valve lineup entries and determine boration flowpath operability by performing the remaining steps of STP-104.003 and completing Attachment I, TEST DATA SHEET through step 6.7.

List deficiencies that are noted during your review, if any, on Handout 2 provided to you.

***HAND JPM BRIEFING SHEET TO
OPERATOR AT THIS TIME!***

JPM: 23 NRC A2 (R)

CRITICAL:	NO	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	1						
6.3 Determine flowpath operability as follows: a. Evaluate the position, as appropriate, of components listed on Attachments IIA through IID.							
STEP STANDARD:							
Reviews Attachment IIA. Determines that the lineup for Attachment IIA is SAT.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
EVALUATOR CUE: Provide a copy of 23 NRC A2 (R) Handout 1 and 2 to candidate.							
EVALUATOR NOTES: • Candidate may comment on the fact that PVT-8146, NORM CHG TO RCS LP B is CLOSED with a Test Position of **OPEN and that PVT-8147, ALT CHG TO RCS LP A is OPEN with a Test Position of **CLOSED. The ** indicates a note that says, "that one valve, open, the other valve closed", and so the valve lineup is satisfactory. • This step is not marked as critical because it may not be observed. The critical step is to properly record if the attachment is SAT or UNSAT on Attachment I. This is step 6 of this JPM. • Step to review Attachments IIA through IID are not sequenced since the candidate is reviewing entries made by another operator. These reviews may take place in any order.							
COMMENTS:							

JPM: 23 NRC A2 (R)

CRITICAL:	NO	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	2						
6.3 Determine flowpath operability as follows: a. Evaluate the position, as appropriate, of components listed on Attachments IIA through IID.							
STEP STANDARD:							
Reviews Attachment IIB. Determines that the lineup for Attachment IIB is UNSAT.							
CUES:							
EVALUATOR NOTES: - Valve XVD08323A-CS, BORIC ACID TANK A OUTLET ISOL VALVE should be CLOSED since "A" tank is OOS with a low boron concentration and valve XVD08323B-CS, BORIC ACID TANK B OUTLET ISOL VALVE should be OPEN for the in-service BAT. - This step is not marked as critical because it may not be observed. The critical step is to properly record if the attachment is SAT or UNSAT on Attachment I. This is step 5 of this JPM.							
COMMENTS:							

JPM: 23 NRC A2 (R)

CRITICAL:	NO	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	3						
6.3 Determine flowpath operability as follows: a. Evaluate the position, as appropriate, of components listed on Attachments IIA through IID.							
STEP STANDARD:							
Reviews Attachment IIC. Determines that the lineup for Attachment IIC is UNSAT.							
CUES:							
EVALUATOR NOTES: - Valve XVD08323A-CS, BORIC ACID TANK A OUTLET ISOL VALVE should be CLOSED since "A" tank is OOS with a low boron concentration and valve XVD08323B-CS, BORIC ACID TANK B OUTLET ISOL VALVE should be OPEN for the in-service BAT. - This step is not marked as critical because it may not be observed. The critical step is to properly record if the attachment is SAT or UNSAT on Attachment I. This is step 5 of this JPM.							
COMMENTS:							

JPM: 23 NRC A2 (R)

CRITICAL:	NO	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	4						
6.3 Determine flowpath operability as follows: a. Evaluate the position, as appropriate, of components listed on Attachments IIA through IID.							
STEP STANDARD:							
Reviews Attachment IID. Determines that the lineup for Attachment IID is SAT or UNSAT.							
CUES:							
EVALUATOR NOTES:							
- LCV-115D is closed with no position indication and there is a note stating that the valve is tagged out electrically. This does not match the required position and the reason why they may mark this attachment as UNSAT and mark step 6.7 as UNSAT, however, in Mode 4 with RCS Cold Leg temperatures less than 300°F, only one flow path is required per step 8.2.a of the Acceptance Criteria. So if a candidate applies the knowledge of the acceptance criteria, they may mark this attachment as SAT. - Note that only one valve is required since the initial condition is Mode 4 with RCS Cold Leg temperatures less than 300°F. - This step is not marked as critical because it may not be observed. See step 6 of this JPM.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	5						
Step 6.3b. Verify the Gravity Drain Flowpath piping is full of water by venting as follows (AB-456):							
STEP STANDARD:							
No action required. Previously performed as stated in initial conditions:							
CUES:							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	6						
Step 6.4 Record results on Attachment I.							
STEP STANDARD:							
Determines the flowpath operability and indicates the correct status in step 6.4 of attachment I and lists the deficiencies for attachments IIB, IIC and IID: Attachment IIA: SAT Attachment IIB: UNSAT - XVD08323A-CS, BORIC ACID TANK A OUTLET ISOL VALVE should be CLOSED and XVD08323B-CS, BORIC ACID TANK B OUTLET ISOL VALVE should be OPEN. Attachment IIC: UNSAT -- XVD08323A-CS, BORIC ACID TANK A OUTLET ISOL VALVE should be CLOSED and XVD08323B-CS, BORIC ACID TANK B OUTLET ISOL VALVE should be OPEN. Attachment IID: SAT or UNSAT (See note below) - LCV-115D is tagged out electrically and does not match the required AUTO/CLOSED. NOT CRITICAL.							
CUES:							
EVALUATOR NOTES: • Both Attachments IIB and IIC are UNSAT because Valve XVD08323A-CS, BORIC ACID TANK A OUTLET ISOL VALVE should be CLOSED since "A" tank is OOS with a low boron concentration and valve XVD08323B-CS, BORIC ACID TANK B OUTLET ISOL VALVE should be OPEN for the in-service BAT. • Attachment IID can be marked SAT or UNSAT because there is some interpretation here. If you just use the words on Attachment IID, than a candidate may mark this attachment UNSAT because it does not include a note about only needing one flow path while in MODE 4 when one or more RCS cold legs are less than or equal to 300°F. A candidate may mark this attachment SAT if they know the MODE 4 requirement. The key to this is understanding that the STP overall is SAT for step 6.7 of Attachment I because within the acceptance criteria of STP-104.003, 8.2.a, you only need one flow path while in MODE 4 when one or more RCS cold legs are less than or equal to 300°F, which is where we are based on the initial conditions.							
COMMENTS:							

JPM: 23 NRC A2 (R)

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	7						
Step 6.5 Record the present Plant Mode on Attachment I:							
STEP STANDARD:							
Records present plant mode as FOUR (4) in step 6.5 on Attachment I.							
CUES:							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	8						
Step 6.6 Compare the operable flowpaths to the required operable flowpaths for the present Plant Mode.							
STEP STANDARD:							
Determines that the requirements for Modes 4**, 5 and 6 are applicable; IIA and IIB or IIC or IID are required to be operable.							
CUES:							
EVALUATOR NOTES:							
- Because the plant is in MODE 4 the * and ** differentiate the requirements based on whether RCS Cold Legs are greater than or less than 300°F. Since Tave is 290°F the requirement is Mode 4** which is in line with what is required for 4**, 5, 6. - This step is not critical since it may not be observed.							
COMMENTS:							

JPM: 23 NRC A2 (R)

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	9						
Step 6.7 Record results on Attachment I.							
STEP STANDARD:							
Compares the operable flowpaths to the required operable flowpaths for the present conditions and indicates SAT for step 6.7 in Attachment I.							
CUES:							
EVALUATOR NOTE:							
If the applicant does not indicate which attachments are used to determine that the lineup is overall SAT, ask a followup question as to how it was determined that the lineup verification was overall SAT.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A2 (R)

IC SET: N/A

INSTRUCTIONS:

Provide candidate with briefing sheet and copy of 23 NRC A2 (R) Handout 1 (marked up STP-104.003 BORATION SYSTEM VALVE LINEUP VERIFICATION procedure and Attachment I, IIA, IIB, IIC and IID) and Handout 2 to document deficiencies.

COMMENTS:

None

REVISION HISTORY:

Bank 2021 Audit A2 (R)

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- Operators are performing a plant startup in GOP-2, PLANT STARTUP AND HEATUP (MODE 5 TO MODE 3) after a refueling outage.
- Current RCS cold leg temperatures are 290°F.
- "B" boric acid tank is in service with a concentration of 7300 ppm.
- "A" boric acid tank is at a concentration of 6800 ppm.
- "A" boric acid tank was declared inoperable and is out of service.
- STP-104.003, BORATION SYSTEM VALVE LINEUP VERIFICATION is due.
- The valve lineups from Attachments IIA, IIB, IIC and IID of STP-104.003 have been completed.
- Operators have also verified the Gravity Drain Flowpath piping is full of water by performing venting and have returned the vent path to the required operable position.

INITIATING CUES:

The US directs you to review the completed valve lineup entries and determine boration flowpath operability by performing the remaining steps of STP-104.003 and completing Attachment I, TEST DATA SHEET through step 6.7.

List deficiencies that are noted during your review, if any, on Handout 2 provided to you.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A3 (R)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A3 (R)

DESCRIPTION: Determine worker exposure and apply administrative exposure limits.

TASK: 119-010-03-01 Apply radiation and contamination safety procedures

TASK Candidate determines the following:

- STANDARD:**
- The expected additional exposure for the performed task is 10 -11 mrem.
 - The total exposure of 1995.5 mrem (1995 - 1996 mrem is acceptable) does not exceed the 2000 mrem administrative exposure limit.

TERMINATING CUE: The candidate calculates exposure and returns the handout and briefing sheet to evaluator.

LOCATION:
CLASSROOM

METHOD:
PERFORM

REFERENCES:

VCS-HPP-0153, ADMINISTRATIVE EXPOSURE LIMITS

K/A: 2.3.12 Knowledge of radiological safety principles and procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, or alignment of filters (RO 3.2)

TOOLS: Access to paper or electronic copies of V.C. Summer procedures.
23 NRC A3 (R) Handout 1 containing survey maps of "B" RHR/Spray pump rooms.
23 NRC A3 (R) Handout 2 answer sheet.

VALIDATED TIME: 15 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is in mode 5 with an outage in progress.
- To support work, you will be required to stand in the “B” RHR pump room inside the contaminated area for 3.5 hours.
- You will stand inside the contaminated area boundary adjacent to the step-off pad where the lowest exposure will be received.
- You have signed NRC Form 4 and your total 2023 dose is 1985 mrem TEDE.

INITIATING CUES:

You are to calculate what your total exposure will be if you perform this activity and whether you will require an extension to any exposure limit.

Assume no exposure other than as stated above.

SHOW ALL WORK ON THE HANDOUT PROVIDED TO YOU.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A3 (R)

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Determines the administrative exposure limit.							
STEP STANDARD:							
Determines initial administrative exposure limit of 2000 mrem. (Section 5.1 VCS-HPP-153, ADMINISTRATIVE EXPOSURE LIMITS).							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
EVALUATOR CUE: Provide the candidate with 2023 NRC A3 Handout 1 and 2 before starting the JPM.							
EVALUATOR NOTE: This limit may be recalled from memory as long as work shown is correct.							
COMMENTS:							

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
Determines expected exposure for the activity to be performed.							
STEP STANDARD:							
Uses 3 mr/hr for the dose rate: $3 \text{ mr/hr} \times 3.5 \text{ hours} = 10.5 \text{ mrem}$ (10 -11 mrem acceptable).							
CUES:							
EVALUATOR NOTE: 3 mr/hr is the dose rate inside the boundary at the lower right entrance to the "B" RHR Pump room on the survey map. Using 6 mr/hr dose rate from the other entrance would make this step UNSAT since this doubles the exposure received.							
COMMENTS:							

JPM: 23 NRC A3 (R)

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
Calculates the total exposure after work is performed and compares to the limit.							
STEP STANDARD:							
Calculates that the total exposure of 1995.5 mrem (1995 - 1996 mrem is acceptable) does not exceed the 2000 mrem administrative exposure limit.							
CUES:							
EVALUATOR NOTE:							
• All work is required to be shown in the Handout provided • 1985 mrem previous exposure + 10.5 mrem for the work activity = 1995.5 mrem. • An Extension will not be required.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A3 (R)

IC SET: N/A

INSTRUCTIONS:

Provide a handout containing survey maps for the "B" RHR pump room with exposure at the step-off pads 3 mrem/hr and 6 mrem/hr.

Provide Handout 2 containing the following:

Name: _____ Date: _____

SHOW ALL WORK TO SUPPORT YOUR DETERMINATION BELOW:

Provide access to hard-copy or electronic station procedures.

COMMENTS:

None

REVISION HISTORY:

Rev.1: Modified version of 2019 NRC A3 (RO)

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is in mode 5 with an outage in progress.
- To support work, you will be required to stand in the “B” RHR pump room inside the contaminated area for 3.5 hours.
- You will stand inside the contaminated area boundary adjacent to the step-off pad where the lowest exposure will be received.
- You have signed NRC Form 4 and your total 2023 dose is 1985 mrem TEDE.

INITIATING CUES:

You are to calculate what your total exposure will be if you perform this activity and whether you will require an extension to any exposure limit.

Assume no exposure other than as stated above.

SHOW ALL WORK ON THE HANDOUT PROVIDED TO YOU.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A1-a (S)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A1-a (S)

DESCRIPTION: Determine conditions that must be corrected before starting core offload.

TASK: 341-029-03-02 SUPERVISE REFUELING OPERATIONS AS
REFUELING SUPERVISOR

TASK STANDARD: Candidate identifies the following discrepancies that must be corrected before core offload:

- STP-131.001 has not been performed within the last 100 hours and must be re-performed.
- The Audio Count Rate function must be turned ON.
- Refueling cavity level must be raised to meet the L.C.O limit of 461 feet.

TERMINATING CUE: 23 NRC A1-a (S) handouts 1 and 2 and the briefing sheet are returned to evaluator.

LOCATION:
CLASSROOM

METHOD:
PERFORM

REFERENCES:

V.C. Summer Technical Specifications.

STP-110.001 PRE-CORE ALTERATIONS VERIFICATIONS

GOP-7 CORE REFUELING (MODE 5 TO MODE 6 DEFUEL AND REFUEL TO MODE 6)

K/A: 2.1.40 Knowledge of refueling administrative requirements. (SRO 3.9)

TOOLS: 23 NRC A1-a (S) Handout 1. (Turnover Information)
23 NRC A1-a (S) Handout 2. (Answer Sheet)

VALIDATED TIME: 30 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The time is now 2300 on 12/15.
- The plant is in MODE 6 for a refueling outage.
- The Reactor Vessel Head is off and upper internals have been removed.
- Personnel are making preparations to begin the core off load.
- Additional turnover information for your use is contained in Handout 1.
- Conditions other than those stated in Handout 1 are as required for beginning the core off load.

INITIATING CUES:

As Shift Manager, determine if core offload can commence at the current time (2300 on 12/15) in accordance with V.C. Summer requirements.

If core offload cannot commence, list all conditions that must be corrected prior to refueling operations on Handout 2.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A1-a (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Candidate reviews information provided to determine discrepancies that would prevent moving fuel.							
STEP STANDARD:							
Identifies the following discrepancies that must be corrected before core offload:							
• STP-131.001 has not been performed within the last 100 hours and must be re-performed. • The Audio Count Rate function must be turned ON. • Refueling cavity level must be raised to meet the L.C.O limit of 461 feet.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet and 23 NRC A1-a (S) handouts 1 and 2 before starting the JPM.							
EVALUATOR NOTES:							
• Justifications and additional information are contained on the 23 NRC A1-a (S) Key. • Items that are CRITICAL for this step are identified as “<u>MUST BE CORRECTED</u>” on the key. • The turnover items can each be evaluated individually in accordance with Technical Specifications and procedures. STP-110.001, PRE-CORE ALTERATIONS VERIFICATIONS also provides a checklist that covers many of these items but reference to this surveillance is not required to complete the task. • If the candidate identifies an incorrect condition that they wrongly believe would prevent core offload, which would create a <u>new critical step</u>.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A1-a (S)

IC SET: N/A

INSTRUCTIONS:

Provide Candidate with 23 NRC A1-a (SRO) Handout 1 and 2.

Handout 1 contains the following:

Turnover information for plant conditions prior to core offload.

Turnover information:

The following events have occurred on the dates and times indicated:

2300 12/10 Reactor Trip Breakers were opened at the beginning of the refueling outage.

1700 12/11 STP-131.001, MANIPULATOR CRANE TEST complete SAT.

1530 12/15 STP-302.054, SOURCE RANGE N31 OPERATIONAL TEST complete SAT.

1900 12/15 STP-302.055, SOURCE RANGE N32 OPERATIONAL TEST complete UNSAT.

2000 12/15 STP-102.001, SOURCE RANGE ANALOG CHANNEL OPERATIONAL TEST N-33 complete SAT.

2230 12/15 Communications verified between Control Room and Refueling SRO.

Time is NOW 2300 on 12/15 with the following conditions present:

- The AUDIO COUNT RATE CHANNEL drawer CHANNEL SELECTOR switch is in OFF.
- Temperature of Component cooling on inlet of Spent Fuel Heat Exchangers is 92°F.
- "A" RHR loop is in service with flow at 2900 gpm.
- "B" RHR loop is out of service but OPERABLE.
- Refueling cavity level indication is at 459 feet.
- Offsite power sources to buses 1DA and 1DB are OPERABLE.
- The "A" and "B" Train ESF sequencers are deenergized.
- STP-506.005, DE-ENERGIZATION OF THE ESF LOAD SEQUENCER LOSS OF VOLTAGE AND DEGRADED VOLTAGE RELAYS A TRAIN, XEG0001A, is complete.
- STP-506.013, DE-ENERGIZATION OF THE ESF LOAD SEQUENCER LOSS OF VOLTAGE AND DEGRADED VOLTAGE RELAYS B TRAIN, XEG0001B, is complete.

Handout 2 contains a space for answer justification.

COMMENTS:

None

REVISION HISTORY:

Modified JPM from 2019 A1-b SRO. JPM was modified by changed the temperature of Component Cooling on inlet of Spent Fuel Heat exchanger from 104°F to 92°F. If a candidate

JPM: 23 NRC A1-a (S)

tried to recall the correct answers from the original JPM, they would be incorrect and would fail this JPM.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The time is now 2300 on 12/15.
- The plant is in MODE 6 for a refueling outage.
- The Reactor Vessel Head is off and upper internals have been removed.
- Personnel are making preparations to begin the core off load.
- Additional turnover information for your use is contained in Handout 1.
- Conditions other than those stated in Handout 1 are as required for beginning the core off load.

INITIATING CUES:

As Shift Manager, determine if core offload can commence at the current time (2300 on 12/15) in accordance with V.C. Summer requirements.

If core offload cannot commence, list all conditions that must be corrected prior to refueling operations on Handout 2.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A1-b (S)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A1-b (S)

DESCRIPTION: Review and calculate a Quadrant Power Tilt Ratio

TASK: 015-004-02-01 Perform a Quadrant Power Tilt Ratio (QPTR) Calculation Per STP-108.001.

TASK STANDARD: The candidate determines the following in accordance with STP-108.001:

- Determines max QPTR of 1.03 to 1.04. (This due to potential rounding errors.)
- Determines QPTR Acceptance Criteria is **not** met.
- Determines that power must be lowered to between 91% - 88% within 2 hours.

TERMINATING CUE: The candidate reviews the QPTR calculations and determines that a power reduction between 9% - 12% is required and returns them to the evaluator.

LOCATION:
CLASSROOM

METHOD:
PERFORM

REFERENCES:

STP-108.001, QUADRANT POWER TILT RATIO

V. C. SUMMER UNIT NUMBER ONE, STATION CURVE BOOK

K/A: 2.1.25 Ability to interpret reference materials, such as graphs, curves, and tables (reference potential) (SRO 4.2)

TOOLS: 23 NRC A1-b (S) Handout 1, (QPTR Calculation with errors).
23 NRC A1-b (S) Handout 2, (Tech Spec application)
Access to paper or electronic copies of V.C. Summer procedures
Calculator

VALIDATED TIME: 27 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- Rx PWR by NI's is 100%.
- Control Bank D position is 226 steps.
- IPCS is not available.
- A Quadrant Power Tilt Ratio calculation was performed.
- The following detector currents and indicated power readings exist on the power range NI's with them selected to 4000 μ A/SLOW:

	Detector A	Detector B	Power
N41	287	282	97%
N42	481	508	99%
N43	313	341	99%
N44	536	505	100%

INITIATING CUES:

The Shift Manager has directed you to perform a review of the Quadrant Power Tilt Ratio calculation that was performed.

A copy of the Calculation will be provided to you. If any errors are identified, line through the errors and insert the correct values using 4 decimal places.

QPTR was calculated 5 minutes prior to the start time of this JPM.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A1-b (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT																					
JPM STEP	1																										
6.2 a. Record the expected detector current for 100% power for each incore detector on Attachment II, from V.C. Station Curve Book Figure V-3A. (Detector A is the upper detector; Detector B is the lower detector.)																											
STEP STANDARD:																											
Locates detector currents from Station Curve Book and verifies correct data on Attachment II. Determines that an error has been made by the originator and that the N43 Expected Upper Current of 318 entered by the originator is <u>NOT</u> correct. Lines through the erroneous value and writes in 308 as the required Lower Current on Attachment II.																											
CUES:																											
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM. Provide 23 NRC A1-b (S) Handout 1.																											
EVALUATOR NOTE: Currents on page 115 of 310 of V.C. Station Curve Book. It is not critical for the candidate to display a step by step review of the attachment in the sequence of the steps in the JPM. The critical aspects of this JPM are to identify the errors in the attachment, correct the calculation to determine that Quadrant Power Tilt Ratio requirements are not met, and answer the question provided regarding surveillance requirements. EVALUATOR NOTE: It is critical to identify the error in this step. If the candidate fails to line through this item but later determines that QPTR is not met, the critical aspect of this step is satisfied. If the candidate decides to discontinue his verification at this point, provide a cue to continue to verify the rest of the Attachment prior to reporting the discrepancy.																											
<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Power</th> <th>Detector A (μA)</th> <th>Detector B (μA)</th> </tr> </thead> <tbody> <tr> <td>N41</td> <td>100%</td> <td>296.0</td> <td>298.5</td> </tr> <tr> <td>N42</td> <td>100%</td> <td>486.1</td> <td>516.3</td> </tr> <tr> <td>N43</td> <td>100%</td> <td>308.0</td> <td>334.4</td> </tr> <tr> <td>N44</td> <td>100%</td> <td>540.1</td> <td>510.5</td> </tr> </tbody> </table>									Power	Detector A (μ A)	Detector B (μ A)	N41	100%	296.0	298.5	N42	100%	486.1	516.3	N43	100%	308.0	334.4	N44	100%	540.1	510.5
	Power	Detector A (μ A)	Detector B (μ A)																								
N41	100%	296.0	298.5																								
N42	100%	486.1	516.3																								
N43	100%	308.0	334.4																								
N44	100%	540.1	510.5																								
COMMENTS:																											

JPM: 23 NRC A1-b (S)

CRITICAL:	NO	SEQUENCED:	NO	SAT		UNSAT		
JPM STEP	2							
6.2 b. Perform the following at the Nuclear Instrumentation Panel: 1) Ensure that all detector range selector switches are selected to 4000μA/SLOW.								
STEP STANDARD:								
Reviews turnover data which says that all detector range selector switches are selected to 4000μA/SLOW.								
CUES:								
COMMENTS:								

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT		
JPM STEP	3							
6.2 b. Perform the following at the Nuclear Instrumentation Panel: 2) Record the actual excore current readings from the digital meters on Attachment II.								
STEP STANDARD:								
Determines that an error has been made by the originator and that the N43 Expected Lower Current of 331 entered by the originator is <u>NOT</u> correct. Lines through the erroneous value and writes in 341 as the required Lower Current on Attachment II.								
CUES:								
EVALUATOR NOTE: It is critical to identify the error in this step. If the candidate fails to line through this item but later determines that QPTR is not met, the critical aspect of this step is satisfied. If the candidate decides to discontinue his verification at this point, provide a cue to continue to verify the rest of the Attachment prior to reporting the discrepancy.								
COMMENTS:								

JPM: 23 NRC A1-b (S)

CRITICAL:	NO	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	4						
6.2 b. Perform the following at the Nuclear Instrumentation Panel:							
3) Record Reactor Power on Attachment II.							
STEP STANDARD:							
Verifies power recoded on Attachment II.							
CUES:							
EVALUATOR NOTE: Based on JPM Briefing sheet, Rx PWR by NI's is 100%.							
COMMENTS:							

CRITICAL:	NO	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	5						
6.2 c. Record Control Bank D rod position on Attachment II.							
STEP STANDARD:							
Verifies Control Bank D rod position on Attachment II of 226 steps.							
CUES:							
EVALUATOR NOTE: Based on JPM Briefing sheet, all rods are at 226 steps.							
COMMENTS:							

JPM: 23 NRC A1-b (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	6						
6.2 d. Perform the following calculations for upper and lower detectors on Attachment II. 1) Divide actual readings by expected currents to get normalized readings.							
STEP STANDARD:							
Determines that based on previous error with Detector N43 Upper and Lower Currents, new normalized reading calculation will be required. Lines through the erroneous value, writes in 1.0162 as the required N43 Upper Current normalized reading on Attachment II and writes in 1.0197 as the required N43 Lower Current normalized reading on Attachment II.							
CUES:							
EVALUATOR NOTE: It is critical to identify the error in this step. If the candidate fails to line through this item but later determines that QPTR is not met, the critical aspect of this step is satisfied. If the candidate decides to discontinue his verification at this point, provide a cue to continue to verify the rest of the Attachment prior to reporting the discrepancy.							
COMMENTS:							

JPM: 23 NRC A1-b (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	7						
6.2 d. Perform the following calculations for upper and lower detectors on Attachment II. 2) Divide the sum of the normalized readings by the number of detectors to obtain average normalized reading.							
STEP STANDARD:							
Determines that based on previous error with Detector N43 Upper and Lower Currents, new average normalized reading calculations will be required.							
CUES:							
EVALUATOR NOTE: It is critical to identify the error in this step. If the candidate fails to line through this item but later determines that QPTR is not met, the critical aspect of this step is satisfied. If the candidate decides to discontinue his verification at this point, provide a cue to continue to verify the rest of the Attachment prior to reporting the discrepancy.							
COMMENTS:							

JPM: 23 NRC A1-b (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT	

JPM STEP	8

6.2 d. Perform the following calculations for upper and lower detectors on Attachment II.

3) Divide the highest normalized reading by the average normalized reading to obtain quadrant power tilt ratio.

STEP STANDARD:

Determines that based on previous error with Detector N43 Upper and Lower Currents, new quadrant power tilt ratio calculation will be required.

CUES:

EVALUATOR NOTE: It is critical to identify the error in this step. If the candidate fails to line through this item but later determines that QPTR is not met, the critical aspect of this step is satisfied. If the candidate decides to discontinue his verification at this point, provide a cue to continue to verify the rest of the Attachment prior to reporting the discrepancy.

COMMENTS:

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT	

JPM STEP	9

6.2 d. Perform the following calculations for upper and lower detectors on Attachment II.

4) Record the larger of the upper and lower quadrant power tilt ratio.

STEP STANDARD:

Determines that based on previous error with Detector N43 Upper and Lower Currents, new maximum quadrant power tilt ratio calculation will be required.

CUES:

EVALUATOR NOTE: It is critical to identify the error in this step. If the candidate fails to line through this item but later determines that QPTR is not met, the critical aspect of this step is satisfied. If the candidate decides to discontinue his verification at this point, provide a cue to continue to verify the rest of the Attachment prior to reporting the discrepancy.

COMMENTS:

JPM: 23 NRC A1-b (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	10						
6.2 e. Complete Attachment I and attach Attachments I and II to the STTS sheet.							
STEP STANDARD:							
Determines maximum quadrant power tilt ratio is above 1.02 and records Acceptance Criteria is not met on Attachment I.							
CUES:							
EVALUATOR CUE: If candidate asks for STTS sheet, inform him you will attach Attachment I and II after they are completed.							
EVALUATOR NOTE: It is critical that "Acceptance Criteria met" is <u>NOT</u> signed on Attachment I since it is not met.							
EVALUATOR NOTE: Maximum quadrant power tilt ratio is from lower detector; value must be between 1.03 and 1.04 to satisfy the critical step.							
COMMENTS:							

JPM: 23 NRC A1-b (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	11						
Answers the questions provided. 1. What actions must be performed assuming QPTR remains as calculated for the next 2 hours?							
STEP STANDARD:							
Answers: Determines that action "a." of TS 3.2.4 applies. a. With the QUADRANT POWER TILT RATIO determined to exceed 1.02 but less than or equal to 1.09: 1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either: a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or b) THERMAL POWER Is reduced to less than 50% of RATED THERMAL POWER. 2. Within 2 hours either: a) Reduce the QUADRANT POWER TILT RATIO to within its limit, or b) Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of Indicated QUADRANT POWER TILT RATIO in excess of 1.0 and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours.							
CUES:							
EVALUATOR CUE: After the candidate reports their Quadrant Power Tilt Ratio, hand the candidate the 23 NRC A1-b (S) Handout 2 and direct the candidate to answer the question.							
EVALUATOR NOTE: The Examinee may call up the GTP-702, SURVEILLANCE ACTIVITY TRACKING AND TRIGGERING, Attachments required to track compliance with TS. The applicable attachments are VI.E, VI.F. The correct answer should be between 91% and 88%, this power level is a potential Tech Spec interpretation that could involve Licensing. 1. Lower power to = $100\% - ((\text{Max QPTR} - 1) \times 300)$ within 2 hours. Thus if their maximum QPTR is 1.03 then it should be 91%, but if their maximum QPTR is 1.04 then it should be 88%.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A1-b (S)

IC SET: N/A

INSTRUCTIONS:

Candidate will be handed the briefing sheet and only Handout 1 to begin the JPM.

After the candidate completes the recalculation of QPTR and records the results, the candidate will be given Handout 2 to answer follow-up question.

COMMENTS:

None

REVISION HISTORY:

Modified JPM because of all the numbers changing with the curve book changes.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- Rx PWR by NI's is 100%.
- Control Bank D position is 226 steps.
- IPCS is not available.
- A Quadrant Power Tilt Ratio calculation was performed.
- The following detector currents and indicated power readings exist on the power range NI's with them selected to 4000 μ A/SLOW:

	Detector A	Detector B	Power
N41	287	282	97%
N42	481	508	99%
N43	313	341	99%
N44	536	505	100%

INITIATING CUES:

The Shift Manager has directed you to perform a review of the Quadrant Power Tilt Ratio calculation that was performed.

A copy of the Calculation will be provided to you. If any errors are identified, line through the errors and insert the correct values using 4 decimal places.

QPTR was calculated 5 minutes prior to the start time of this JPM.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A2 (S)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A2 (S)

DESCRIPTION: Review RHR valve surveillance.

TASK: 342-026-03-02 Review results of surveillance tests (SAP-134, GTP-301, AND GTP-302)

TASK STANDARD: Candidate identifies the following items in accordance with STP-205.004:

- Identifies that the stroke time for XVG08706B-RH is less than the MINIMUM limiting stroke time.
- Identifies that the stroke time for XVG08809B-SI is greater than the MAXIMUM limiting stroke time.
- Determines that acceptance criteria are not met, and either determines that one retest can be performed prior to declaring inoperability OR immediately declared inoperable.

TERMINATING CUE: The candidate returns JPM briefing sheet and Handout materials provided to the examiner.

LOCATION: CLASSROOM
METHOD: PERFORM

REFERENCES:

STP-205.004 RHR PUMP AND VALVE OPERABILITY TEST

K/A: 2.2.12 Knowledge of surveillance procedures. (SRO 4.1)

TOOLS: 23 NRC A2 (S) Handout 1: STP 205.004 and attached data sheets
23 NRC A2 Handout 2: Answer sheet

VALIDATED TIME: 42 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The Plant is in MODE 1 at 100% power.
- STP-205.004, RHR PUMP AND VALVE OPERABILITY has just been completed on "B" RHR train valves and handed to the Unit Supervisor for review.
- The Date is Today.

INITIATING CUES:

As the Unit Supervisor, review all entries made by the performers in STP-205.004 Attachments II.B and III.B (23 NRC A2 (S) Handout 1).

Record the required information as indicated on 23 NRC A2 (S) Handout 2 (Answer sheet)

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A2 (S)

CRITICAL:	NO	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Identifies that FCV-605B was found in the incorrect position as identified on Attachment IIB.							
STEP STANDARD:							
Identifies that FCV-605B was found in the incorrect position as identified on Attachment IIB.							
CUES:							
EVALUATOR CUE: Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM.							
EVALUATOR CUE: Ensure that the Examinee has a copy of 23 NRCA2 (S) Handout 1 and Handout 2.							
EVALUATOR NOTE: See 23 NRC A2 (S) - Key.							
EVALUATOR NOTE: It is NOT critical to identify FCV-605B OPEN under the as found column of Attachment IIB because STP-205.004 directs those components be returned to the required position after the test is complete. If the candidate does not note the discrepancy, it is evaluated as a non-critical performance error.							
COMMENTS:							

CRITICAL:	YES	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	2						
Determines that the Test Data does not meet the acceptance criteria of STP-205.004 for XVG08706B-RH.							
STEP STANDARD:							
Identifies that the stroke time for XVG08706B-RH is less than the MINIMUM limiting stroke time. The candidate enters the deficiency under Question 1 and the required action under Question 2 of 23 NRC A2 (S) HO 2.							
CUES:							
EVALUATOR NOTE: Determines that acceptance criteria are <u>not</u> met, and either determines that one retest can be performed prior to declaring inoperability OR immediately declared inoperable.							
COMMENTS:							

JPM: 23 NRC A2 (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	3						
Determines that the Test Data does not meet the acceptance criteria of STP-205.004 for XVG08809B-SI.							
STEP STANDARD:							
Identifies that the stroke time for XVG08809B-SI is greater than the MAXIMUM limiting stroke time. The candidate enters the deficiency under Question 1 and the required action under Question 2 of 23 NRC A2 (S) HO 2.							
CUES:							
EVALUATOR NOTE: Determines that acceptance criteria are <u>not</u> met, and either determines that one retest can be performed prior to declaring inoperability OR immediately declared inoperable.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A2 (S)

IC SET: N/A

INSTRUCTIONS:

Provide candidate with briefing sheet and copies of 23 NRC A2 (S) Handouts 1 and 2.

Provide Handout 2 containing the following:

Name _____ Date _____

1. Were there any discrepancies in the data recorded during your review of the STP-205.004 surveillance? Explain below:
2. If you identified a discrepancy in question 1, is there a requirement to declare any component inoperable in the current system status? Explain below: Provide access to hard-copy or electronic station procedures.

COMMENTS:

None

REVISION HISTORY:

Bank 2021 Audit A2 (S)

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The Plant is in MODE 1 at 100% power.
- STP-205.004, RHR PUMP AND VALVE OPERABILITY has just been completed on "B" RHR train valves and handed to the Unit Supervisor for review.
- The Date is Today.

INITIATING CUES:

As the Unit Supervisor, review all entries made by the performers in STP-205.004 Attachments II.B and III.B (23 NRC A2 (S) Handout 1).

Record the required information as indicated on 23 NRC A2 (S) Handout 2 (Answer sheet)

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A3 (S)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A3 (S)

DESCRIPTION: Review a release permit prior to approval/release.

TASK: 341-012-03-02 Approve radioactive waste discharge/release permits (HPP-0709 and HPP-0710)

TASK STANDARD: The candidate identifies the following errors:

- More than 24 hours have passed since the Gas Decay Tank was sampled.
- BYPASS is incorrectly entered for RM-A3 and RM-A10.
- Wind speed is not sufficient for release due to the 10m wind speed.

TERMINATING CUE: The candidate returns JPM briefing sheet and Handout materials provided to the examiner.

LOCATION:
CLASSROOM

METHOD:
PERFORM

REFERENCES:

HPP-0709 Sampling and Release of Radioactive Gaseous Effluents
SOP-119 WASTE GAS PROCESSING

K/A: 2.3.6 Ability to approve liquid or gaseous release permits (SRO 3.8)

TOOLS: Copies of 23 NRC A3 (S) Handouts 1, 2 and 3
Electronic or Hardcopy versions of station procedures

VALIDATED TIME: 15 Mins. **TIME CRITICAL:** NO **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE)

SAT

UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is in MODE 1.
- The AB Ventilation System is operating normally.
- A release of Gas Decay Tank G is to occur during the next shift.
- The DATE and TIME is now 0830, 10/22/23.

INITIATING CUES:

You are to review HPP-0709, ATTACHMENT I, GASEOUS WASTE RELEASE PERMIT (GWRP) and approve the GWRP by signing it, if the release can be commenced.

If the release is not allowed to commence, circle all discrepancies that prevent release and explain them on the worksheet provided.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A3 (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	NO	SAT		UNSAT	
JPM STEP	1						
Reviews the SOP-119, ATTACHMENT VA, GASEOUS WASTE RELEASE WORKSHEET-CONTROL ROOM and the HPP-0709, ATTACHMENT I, GASEOUS WASTE RELEASE PERMIT (GWRP).							
STEP STANDARD:							
Notes and records all the following discrepancies and does not sign the GWRP:							
• More than 24 hours have passed since the Gas Decay Tank was sampled. (HPP-0709, 4.16) • Notes that BYPASS is incorrectly entered for RM-A3 and RM-A10. (SOP-119, Attachment VA, step 3.b) • Notes that wind speed is not sufficient for release due to the 10m wind speed being less than the required 6.6 mph for stability class E. (SOP-119 Attachment VA, page 5 of 5)							
CUES:							
EVALUATOR CUES:							
• Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM. • Provide candidate with the 23 NRC A3 (S) Handouts 1, 2 and 3.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM SETUP SHEET

JPM: 23 NRC A3 (S)

IC SET: N/A

INSTRUCTIONS:

Ensure that current procedures are available in hard copy or electronically.

Provide candidates with the following:

- Partially completed GWRP and SOP-119, Att. VA (23 NRC A3 (S) Handout 1)
- Answer sheet (23 NRC A3 (S) Handout 2)
- A screen shot of IPCS METDATA screen (23 NRC A3 (S) Handout 3)

COMMENTS:

None

REVISION HISTORY:

Bank 2021 NRC SRO A3 JPM.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

- The plant is in MODE 1.
- The AB Ventilation System is operating normally.
- A release of Gas Decay Tank G is to occur during the next shift.
- The DATE and TIME is now 0830, 10/22/23.

INITIATING CUES:

You are to review HPP-0709, ATTACHMENT I, GASEOUS WASTE RELEASE PERMIT (GWRP) and approve the GWRP by signing it, if the release can be commenced.

If the release is not allowed to commence, circle all discrepancies that prevent release and explain them on the worksheet provided.

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **23 NRC A4 (S)**

CANDIDATE: _____

EVALUATOR: _____

JPM: 23 NRC A4 (S)

DESCRIPTION: Classify an emergency event in accordance with VCS-EPP-0001.

TASK: 343-063-03-02 Given several events, determine the Emergency Action level for each event per VCS-EPP-00001.

TASK STANDARD: Candidate classifies a FA1.1 Alert within 15 minutes based on the following:

- An automatic or manual ECCS (SI) actuation required by EITHER:
 - o UNISOLABLE RCS leakage
 - o SG tube RUPTURE

TERMINATING CUE: Candidate has finished classifying the event.

LOCATION:
CLASSROOM

METHOD:
PERFORM

REFERENCES:

VCS-EPP-0001 CLASSIFICATION OF EMERGENCIES.

K/A: 2.4.41 Knowledge of the emergency action level thresholds and classifications (SRO Only). (SRO 4.6)

TOOLS: 23 NRC A4 (S) HO 1 (Answer sheet)
Hardcopies of hardboard EAL Classification Matrices
Electronic or hardcopy station procedures

VALIDATED TIME: 15 Mins. **TIME CRITICAL:** YES **ALTERNATE PATH:** NO

PERFORMANCE RATING: (CIRCLE) SAT UNSAT

TIME START: _____ **TIME FINISH:** _____ **PERFORMANCE TIME:** _____

CANDIDATE: _____

EVALUATOR: _____

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

Before starting, I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues.

I will provide the necessary tools with which to perform this task.

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

Given the following plant conditions:

- 100% power initially.
- AOP-112.2, ARG-3, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI was in progress for a small tube leak on the "A" Steam Generator.
- An automatic Reactor Trip and Safety Injection occurred.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.
- **RB** Pressure is 35 psig and slowly decreasing.
- **RCS** pressure is 35 psig and slowly decreasing.
- No EFW pumps are running.
- Steam Generator Narrow Range levels are as follows:
 - o "A" SG level is 20% and decreasing.
 - o "B" SG level is 20% and stable.
 - o "C" SG level is 20% and stable.

INITIATING CUES:

You are directed to classify the event based on the above conditions.

- Do not use Shift Manager Judgment as the basis for your classification.
- The start time for classification will be the time that the Evaluator tells you to begin.
- When you have determined the classification, write the classification and the time you completed the classification on Handout 1 and inform the Evaluator.
- This is a **TIME CRITICAL JPM!**

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

JPM: 23 NRC A4 (S)

CRITICAL:	<u>YES</u>	SEQUENCED:	YES	SAT		UNSAT	
JPM STEP	1						
Candidate Evaluates plant conditions and the EALs to declare an emergency that is timely and accurate.							
STEP STANDARD:							
Classifies the event as an FA1.1 ALERT based on the following:							
• An automatic or manual ECCS (SI) actuation required by EITHER: - o UNISOLABLE RCS leakage - o SG tube RUPTURE							
CUES:							
EVALUATOR CUE:							
• Ensure that the candidate has the following: - o 23 NRC A4 (S) HO1 (Answer Sheet) - o EAL Classification matrices in hardcopy or hardboards • Instruct the candidates to write their name and the date on Handout 1 prior to providing the initial conditions brief. • Provide the candidate with a brief using the JPM Briefing Sheet before starting the JPM. • Instruct the candidates to write the time of the EAL declaration and the EAL declaration on Handout 1 and raise their hand. - o You will then immediately pick it up. • When ready to begin, announce the start time (T-0) based on the classroom clock. Record this time as T-0 for evaluation of the declaration time.							
EVALUATOR NOTE: Examinee has 15 minutes from T-0 to determine the event classification.							
COMMENTS:							

THE JPM IS TERMINATED AT THIS STEP.

JPM: 23 NRC A4 (S)

JPM SETUP SHEET

JPM: 23 NRC A4 (S)

IC SET: N/A

INSTRUCTIONS:

After the candidate brief, provide copies of 23 NRC A4 (S) Handout1

COMMENTS:

None

REVISION HISTORY:

This is a new JPM for the 2023 NRC Exam.

JPM BRIEFING SHEET

SAFETY CONSIDERATIONS: NONE

INITIAL CONDITIONS:

Given the following plant conditions:

- 100% power initially.
- AOP-112.1, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI was in progress for a small tube leak on the "A" Steam Generator.
- An automatic Reactor Trip and Safety Injection occurred.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.
- **RB** Pressure is 35 psig and slowly decreasing.
- **RCS** pressure is 35 psig and slowly decreasing.
- No EFW pumps are running.
- Steam Generator Narrow Range levels are as follows:
- "A" SG level is 20% and decreasing.
- "B" SG level is 20% and stable.
- "C" SG level is 20% and stable.

INITIATING CUES:

You are directed to classify the event based on the above conditions.

- Do not use Shift Manager Judgment as the basis for your classification.
- The start time for classification will be the time that the Evaluator tells you when told to begin.
- When you have determined the classification, write the classification and the time you completed the classification on Handout 1 and inform the Evaluator.
- This is a **TIME CRITICAL JPM!**

Hand this paper back to your Evaluator when you feel that you have satisfactorily completed the assigned task.