Facility: CPNPP JPM # NRC RA1 Task # RO1307 K/A # 2.1.25 3.9 / 4.2

Title: Restore Refueling Water Storage Tank Level

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1.
- Volume Control Tank level is stable at 60%.
- Current Refueling Water Storage Tank (RWST) Boron concentration is 2525 ppm.
- RWST level is 90%.
- Boric Acid Tank X-01 is at 97% and Boric Acid Tank X-02 is at 98%.
- Both Boric Acid Tanks have a concentration of 7450 ppm.
- OPERABLE boration flowpaths exist.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- CALCULATE the blended makeup to the Unit 1 Refueling Water Storage Tank to raise level from 90% to 97% per SOP-104A, Reactor Make-Up and Chemical Control System, Section 5.2.7, Makeup to RWST.
- DETERMINE the gallons of makeup required to raise RWST level from 90% to 97%.
- DETERMINE the required Boric Acid flowrate and Reactor Makeup Water flowrate for a makeup concentration of 2575 ppm at a total blended flowrate of 20 gpm.
- RECORD the following information:
  - RWST Makeup Required _____ gallons
  - Boric Acid Flowrate _____ gpm
  - Total Gallons of Boric Acid _____ gallons
  - POT Setting for 1-FK-110 _____
  - POT Setting for 1-FK-111 _____

Task Standard: Utilizing SOP-104A, TDM-201A, TDM-203A, and TDM-804A, calculated makeup required to the Refueling Water Storage Tank, including boric acid flowrate, reactor makeup water flowrate, total gallons of boric acid, and potentiometer settings for the Boric Acid and Reactor Makeup Water Flow Control Valves.

Required Materials: SOP-104A, Reactor Make-Up and Chemical Control System, Rev. 14-4.
TDM-201A, CVCS Calculations/ Blended Flow, Rev. 6.
TDM-203A, CVCS Controller Data. Rev. 3.
TDM-804A, Equipment Data Tank Height vs. Volume, Rev. 3.

Validation Time: 15 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **SOP-104A, Reactor Make-Up and Chemical Control System.**
- **TDM-201A, CVCS Calculations/ Blended Flow.**
- **TDM-203A, CVCS Controller Data.**
- **TDM-804A, Equipment Data Tank Height vs. Volume.**
- **Calculator and Ruler.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following step is from SOP-104A, Section 5.2.7.**
Examiner Note:	**RWST volumes found in TDM-804A, Page 16 of 56.**
Perform Step: 1√ 5.2.7.A	DETERMINE volume (VT) required to fill RWST to desired level using TDM-804A.
Standard:	REFERENCED Page 16 of TDM-804A and DETERMINED the following to raise RWST level from 90% to 97%: • 508220.9 – 472618.3 = **35602.6 ± 1000 gallons**.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Formula found in TDM-201A, Page 8 of 14.**
Perform Step: 2√	Determine required boric acid flowrate.
Standard:	CALCULATED Boric Acid Flowrate per TDM-201A as follows: • $F_b = C \times F_T / C_{bat} = 2575 \times 20 / 7450 =$ **6.91 ± 0.5 gpm**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	Determine total gallons of boric acid required.
Standard:	CALCULATED total gallons of boric acid as follows: • 35603 gallons x 6.91 / 20 = **12300.8 ± 500 gallons**.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Formula found in TDM-203A, Page 11 of 12.**
Perform Step: 4√	Determine potentiometer setting for 1-FK-110, Boric Acid Blender Flow Control Valve.
Standard:	CALCULATED potentiometer setting for 1-FK-110, Boric Acid Blender Flow Control Valve, per TDM-203A as follows: • 6.91 gpm = **1.73 ± 0.2**.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Formula found in TDM-203A, Page 12 of 12.**
Perform Step: 5√	Determine potentiometer setting for 1-FK-111, Reactor Makeup Water Blender Flow Control Valve.
Standard:	CALCULATED potentiometer setting for 1-FK-111, Reactor Makeup Water Blender Flow Control Valve, per TDM-203A as follows: • 20 gpm = **1.25 ± 0.2**.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is in MODE 1.**
- **Volume Control Tank level is stable at 60%.**
- **Current Refueling Water Storage Tank (RWST) Boron concentration is 2525 ppm.**
- **RWST level is 90%.**
- **Boric Acid Tank X-01 is at 97% and Boric Acid Tank X-02 is at 98%.**
- **Both Boric Acid Tanks have a concentration of 7450 ppm.**
- **OPERABLE boration flowpaths exist.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **CALCULATE the blended makeup to the Unit 1 Refueling Water Storage Tank to raise level from 90% to 97% per SOP-104A, Reactor Make-Up and Chemical Control System, Section 5.2.7, Makeup to RWST.**
- **DETERMINE the gallons of makeup required to raise RWST level from 90% to 97%.**
- **DETERMINE the required Boric Acid flowrate and Reactor Makeup Water flowrate for a makeup concentration of 2575 ppm at a total blended flowrate of 20 gpm.**
- **RECORD the following information:**
  - **RWST Makeup Required _____ gallons**
  - **Boric Acid Flowrate _____ gpm**
  - **Total Gallons of Boric Acid _____ gallons**
  - **POT Setting for 1-FK-110 _____**
  - **POT Setting for 1-FK-111 _____**

Facility: CPNPP JPM # NRC RA2 Task # RO5115 K/A # 2.1.23 4.3 / 4.4

Title: Perform Reactor Coolant System Pressure / Temperature Verification

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- ABN-905A, Loss of Control Room Habitability, Attachment 7, RCS Pressure / Temperature Verification, is in progress.
- Reactor Coolant System cooldown is in progress.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- UTILIZING the data provided, CALCULATE the identified parameters (shown with arrows) on Attachment 7, RCS Pressure/Temperature Verification, per ABN-905A, Loss of Control Room Habitability.

Task Standard: Utilizing ABN-905A, calculated saturation temperatures, Reactor Coolant System subcooling margin, and Reactor Coolant System cooldown rate during a Loss of Control Room Habitability.

Required Materials: ABN-905A, Loss of Control Room Habitability, Rev. 9-10.

Validation Time: 15 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-905A, Loss of Control Room Habitability.**
  - **Attachment 7, RCS Pressure / Temperature Verification with data inserted where appropriate.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following is from ABN-905A, Attachment 7.**
Perform Step: 1√	Calculate saturation temperature for Pressurizer pressure using Steam Tables at 0900 and 0930.
Standard:	CALCULATED saturation temperature for Pressurizer pressure using Steam Tables and ENTERED data at 0900 and 0930.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	Calculate subcooling for Reactor Coolant System using Steam Tables at 0900 and 0930.
Standard:	CALCULATED subcooling for Reactor Coolant System using Steam Tables and ENTERED data at 0900 and 0930.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	Calculate saturation temperature for Steam Generator 1 pressure using Steam Tables at 0900 and 0930.
Standard:	CALCULATED saturation temperature for Steam Generator 1 pressure using Steam Tables and ENTERED data at 0900 and 0930.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√	Calculate saturation temperature for Steam Generator 2 pressure using Steam Tables at 0900 and 0930.
Standard:	CALCULATED saturation temperature for Steam Generator 2 pressure using Steam Tables and ENTERED data at 0900 and 0930.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5√	Calculate saturation temperature for Steam Generator 3 pressure using Steam Tables at 0900 and 0930.
Standard:	CALCULATED saturation temperature for Steam Generator 3 pressure using Steam Tables and ENTERED data at 0900 and 0930.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√	Calculate saturation temperature for Steam Generator 4 pressure using Steam Tables at 0900 and 0930.
Standard:	CALCULATED saturation temperature for Steam Generator 4 pressure using Steam Tables and ENTERED data at 0900 and 0930.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7√	Calculate Reactor Coolant System cooldown rate from the Steam Generator with the largest pressure drop at 0930.
Standard:	CALCULATED Reactor Coolant System cooldown rate from Steam Generator 1 and ENTERED data at 0930.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **ABN-905A, Loss of Control Room Habitability, Attachment 7, RCS Pressure / Temperature Verification, is in progress.**
- **Reactor Coolant System cooldown is in progress.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **UTILIZING the data provided, CALCULATE the identified parameters (shown with arrows) on Attachment 7, RCS Pressure/Temperature Verification, per ABN-905A, Loss of Control Room Habitability.**

ATTACHMENT 7
PAGE 1 OF 2

RCS PRESSURE/TEMPERATURE VERIFICATION

Time	[redacted]	0900	0930					
PRZR PRESS	1-PI-455B	2085	1785					
Tsat from Steam Table (2)	→	643±3	621±3					
PRZR LVL	1-LI-459B	49%	46%					
NEUT FLUX SR	1-NI-50A-3	450	400					
RCS LOOP (4)	CL1	545	540					
1 & 2 TEMP	CL2	545	540					
1-TR-410F	HL1	550	545					
	HL2	550	545					
Calculated Subcooling °F	→	93±5	76±5					
SG 1 PRESS (2)	1-PI-514B	1010	960					
Tsat from Steam Table (2)	→	547±3	541±3					
SG 1 LVL (WR) (1)	1-LI-501A	79	78					
SG 2 LVL (WR) (1)	1-LI-502A	77	79					
SG 2 PRESS (2)	1-PI-524B	1020	970					
Tsat from Steam Table (2)	→	549±3	543±3					
RCS LOOP (4)	CL3	550	550					
3 & 4 TEMP	CL4	550	550					
1-TR-430F	HL3	555	555					
	HL4	555	555					
SG 3 PRESS (2)	1-PI-534B	1020	960					
Tsat from Steam Table (2)	→	549±3	541±3					
SG 3 LVL (WR) (1)	1-LI-503A	78	78					
SG 4 LVL (WR) (1)	1-LI-504A	76	76					
SG 4 PRESS (2)	1-PI-544B	1010	970					
Tsat from ST	→	547±3	543±3					
COOLDOWN RATE	(3) →	N/A	16±3					

(1) SG Level (WR) Cold Cal of approximately 74% corresponds to an AFW Pump Low Level Auto Start signal.

(2) Steam pressure converted to Tsat/Tcold is the best indication of temperature and temperature changes.

(3) Cooldown rate should be calculated based on most conservative SG Press reading. Calculate cooldown using Tsat values and steam tables, with SG Press reading that has dropped the largest amount from last reading.

(4) RCS indicated temperature response will be slow due to slow response time of strap on RTDs.

NOTE: When completed, this attachment shall be dispositioned by attaching it to the SMART Form generated as a result of this abnormal condition.

Facility: CPNPP JPM # NRC RA3 Task # RO1003 K/A # 2.2.1 4.5 / 4.4

Title: Perform a 1/M Plot and Predict Critical Conditions

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is performing a Reactor Startup per IPO-002A, Plant Startup from Hot Standby.
- Boron is at the Estimated Critical Boron Concentration of 1220 ppm.
- Shutdown Control Rod Banks are fully withdrawn.
- Critical Rod Height is predicted to be CBD at 78 steps.
- The +500 PCM Rod position is CBD at 210 steps.
- The -500 PCM Rod position is CBC at 123 or CBD at 8 steps.
- The Full Out Position (FOP) is 225 steps.
- CBA Rods have been withdrawn three times in increments of 50 steps.
- The Unit Supervisor wants to re-perform the Inverse Count Rate Ratio Calculation and re-plot the points on a 1/M Data Sheet to re-verify Predicted Critical Rod Height.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- DETERMINE the Inverse Count Rate Ratio Calculation (ICRR) for the readings shown on IPO-002A, Plant Startup from Hot Standby, Attachment 2, Inverse Count Rate Ratio Calculation.
- LOG the ICRR on IPO-002A, Attachment 2, and PLOT the points on the 1/M Data Sheet.
- LOG the Predicted Critical Rod Height for each 50 step Control Bank A withdrawal up to 150 steps on the 1/M Data Sheet.
- RECORD any required action based on 1/M Data obtained:
  - _____

Task Standard: Utilizing IPO-002A, calculated the Inverse Count Rate, performed a 1/M Plot using provided data, and determined criticality predicted below Rod Insertion Limit.

Required Materials: IPO-002A, Plant Startup from Hot Standby, Rev. 20-17.

ERX-11-002, COLR for CPNPP Unit 1 Cycle 16, Figure 2, Rod Bank Insertion Limits Versus Thermal Power, Rev. 0.

Straight edge or ruler.

Validation Time: 15 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **IPO-002A, Plant Startup from Hot Standby.**
  - **COMPLETE Attachment 2 though three sets of data.**
- **Straight edge or ruler.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from IPO-002A, Attachment 2.**
Perform Step: 1√	Calculate Inverse Count Rate Ratio calculation for Control Bank A at 50 steps and plot on 1/M Data Sheet.
Standard:	CALCULATED Inverse Count Rate Ratio for Control Bank A at 50 steps, PLOTTED on 1/M Data Sheet, and RECORDED Data: • RECORD an average Count Rate of **55.** • CALCULATE ICRR = 1/M = 50/55 = 0.91 ± 0.01. • RECORD ICRR = **0.91 ± 0.01.** • PLOT points for CBA @ 0 steps and CBA @ 50 steps. • DRAW a line from 1.00 to 0.91 that INTERSECTS with CBD at 190 ± 100 steps. • LOG an Estimated Critical Condition with **CBD at 190 ± 100 steps**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	Calculate Inverse Count Rate Ratio calculation for Control Bank A at 100 steps and plot on 1/M Data Sheet.
Standard:	CALCULATED Inverse Count Rate Ratio for Control Bank A at 100 steps, PLOTTED on 1/M Data Sheet, and RECORDED Data: • RECORD an average Count Rate of **65.** • CALCULATE ICRR = 1/M = 50/65 = 0.77 ± 0.01. • RECORD ICRR = **0.77 ± 0.01.** • PLOT points for CBA @ 50 steps and CBA @ 100 steps. • DRAW a line from 0.91 to 0.77 that INTERSECTS with CBD at 20 ± 50 steps. • LOG an Estimated Critical Condition with **CBD at 20 ± 50 steps**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	Calculate Inverse Count Rate Ratio calculation for Control Bank A at 150 steps and plot on 1/M Data Sheet.
Standard:	CALCULATED Inverse Count Rate Ratio for Control Bank A at 100 steps, PLOTTED on 1/M Data Sheet, and RECORDED Data: • RECORD an average Count Rate of **104.** • CALCULATE ICRR = 1/M = 50/104 = 0.48 ± 0.01. • RECORD ICRR = **0.48 ± 0.01.** • PLOT points for CBA @ 100 steps and CBA @ 150 steps. • DRAW a line from 0.77 to 0.48 that INTERSECTS with CBC at 5 ± 30 steps. • LOG an Estimated Critical Condition with **CBC at 5 ± 30 steps**.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following Standard is from IPO-002A, Step 5.2.10, 4th bullet.**
Perform Step: 4√	RECORD any required action based on 1/M Data obtained on Attachment 2, Page 3 of 4.
Standard:	DETERMINED Estimated Critical Condition occurs below the Rod Insertion Limit within the next reactivity addition and RECORDED the following on Attachment 2, Page 3 of 4: • **INSERT all Control Bank Rods to the CBO position (critical).**
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is performing a Reactor Startup per IPO-002A, Plant Startup from Hot Standby.**
- **Boron is at the Estimated Critical Boron Concentration of 1220 ppm.**
- **Shutdown Control Rod Banks are fully withdrawn.**
- **Critical Rod Height is predicted to be CBD at 78 steps.**
- **The +500 PCM Rod position is CBD at 210 steps.**
- **The -500 PCM Rod position is CBC at 123 or CBD at 8 steps.**
- **The Full Out Position (FOP) is 225 steps.**
- **CBA Rods have been withdrawn three times in increments of 50 steps.**
- **The Unit Supervisor wants to re-perform the Inverse Count Rate Ratio Calculation and re-plot the points on a 1/M Data Sheet to re-verify Predicted Critical Rod Height.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **DETERMINE the Inverse Count Rate Ratio Calculation (ICRR) for the readings shown on IPO-002A, Plant Startup from Hot Standby, Attachment 2, Inverse Count Rate Ratio Calculation.**
- **LOG the ICRR on IPO-002A, Attachment 2, and PLOT the points on the 1/M Data Sheet.**
- **LOG the Predicted Critical Rod Height for each 50 step Control Bank A withdrawal up to 150 steps on the 1/M Data Sheet.**
- **RECORD any required action based on 1/M Data obtained:**
  - **_____**

ATTACHMENT 2
PAGE 1 OF 4

INVERSE COUNT RATE RATIO CALCULATION

NOTE: This calculation is not required when Core Performance Engineering is performing ICRR calculations per NUC-111.

1.0 PREREQUISITES

- The scalar timer is available for use in the manual mode per SOP-703.

OR

- IF the scalar timer is out-of-service, THEN Nuclear Instrument indication shall be used.

2.0 LIMITATIONS

2.1 Rod withdrawal increments should be performed at approximately 50 steps. The Shift Manager may authorize withdrawal of rods at any other increment less than 50 steps as the Reactor approaches criticality.

3.0 INSTRUCTIONS

3.1 The following steps describe the method for determining the baseline reference count values.

NOTE: When count rate is greater than 50 counts/sec, a 10 second counting interval should be used. If count rate is less than or equal to 50 counts/sec, then a 30 second counting interval should be used. Once initiated, the same counting interval should be used throughout the ICRR.

A. Obtain ten separate reference counts for each Source Range channel and record values on the ICRR worksheet.

B For each Source Range channel, compute the average count from the 10 reference counts on the ICRR worksheet.

3.2 Mark the graph for the rod heights at + / - 500 pcm (if using OPT-308-1) or for the Expected Criticality Range (if using OPT-308-2).

ATTACHMENT 2
PAGE 2 OF 4

INVERSE COUNT RATE RATIO CALCULATION

3.3 The following steps describe the method used in determining the Inverse Count Rate Ratio (ICRR).

A. After obtaining the Shift Manager permission, withdraw the Control Rods a maximum of 50 steps. The Shift Manager may authorize withdrawals of less than 50 steps.

B. Monitor Source Range indication on recorder 1-NR-0045 to determine when the Source Range channels have stabilized.

C. Obtain three separate integral count measurements for each Source Range channel using the counting interval determined in Step 3.1.

D. Ensure audible Source Range counts is returned to service after completion of counting measurements.

E. Calculate the average of these counts for each Source Range channel on the ICRR worksheet.

F. Perform the following calculation and record the result on the ICRR worksheet.

$$\text{ICRR} = \frac{\text{Source Range Channel Reference Counts}}{\text{Source Range Channel Average Counts}}$$

G. Plot the ICRR values at the appropriate rod position on graph paper similar to the one attached.

3.4 Perform a linear extrapolation of the ICRR plot, using the last two data points, to the point at which the extrapolation intersects the horizontal axis. This point defines the rod position at which criticality is estimated.

3.5 List rod position estimation on the ICRR worksheet.

3.6 Continue to perform Steps 3.3 thru 3.5 until either of the following occurs:

A. The Reactor is critical

OR

B. The Shift Manager terminates ICRR data collection.

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ATTACHMENT 2
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INVERSE COUNT RATE RATIO CALCULATION

INVERSE COUNT RATE RATIO

Estimated Critical Condition:

Bank CBD at 78 steps

Boron Concentration 1220 ppm

Completed by _____

Date _____ Time _____

REFERENCE N-31	COUNTS N-32
50	49
49	50
49	51
51	49
50	49
51	51
48	52
50	50
51	49
51	50
50	50
AVE	AVE

BANK CBA AT 50 STEPS

N-31	N-32
55	55
56	54
54	56
55	**55**
0.91 AVE ICRR	**0.91** AVE ICRR
ECC BANK **CBD** STEP **190**	ECC BANK **CBD** STEP **190**

CBD 190 ± 100

BANK CBA AT 100 STEPS

N-31	N-32
65	64
65	67
65	64
65	**65**
0.77 AVE ICRR	**0.77** AVE ICRR
ECC BANK **CBD** STEP **20**	ECC BANK **CBD** STEP **20**

CBD 20 ± 50

BANK CBA AT 150 STEPS

N-31	N-32
104	103
103	104
105	105
104	**104**
0.48 AVE ICRR	**0.48** AVE ICRR
ECC BANK **CBC** STEP **5**	ECC BANK **CBC** STEP **5**

CBC 5 ± 30

BANK ____ AT ____ STEPS

N-31	N-32
AVE ICRR	AVE ICRR
ECC BANK ____ STEP ____	ECC BANK ____ STEP ____

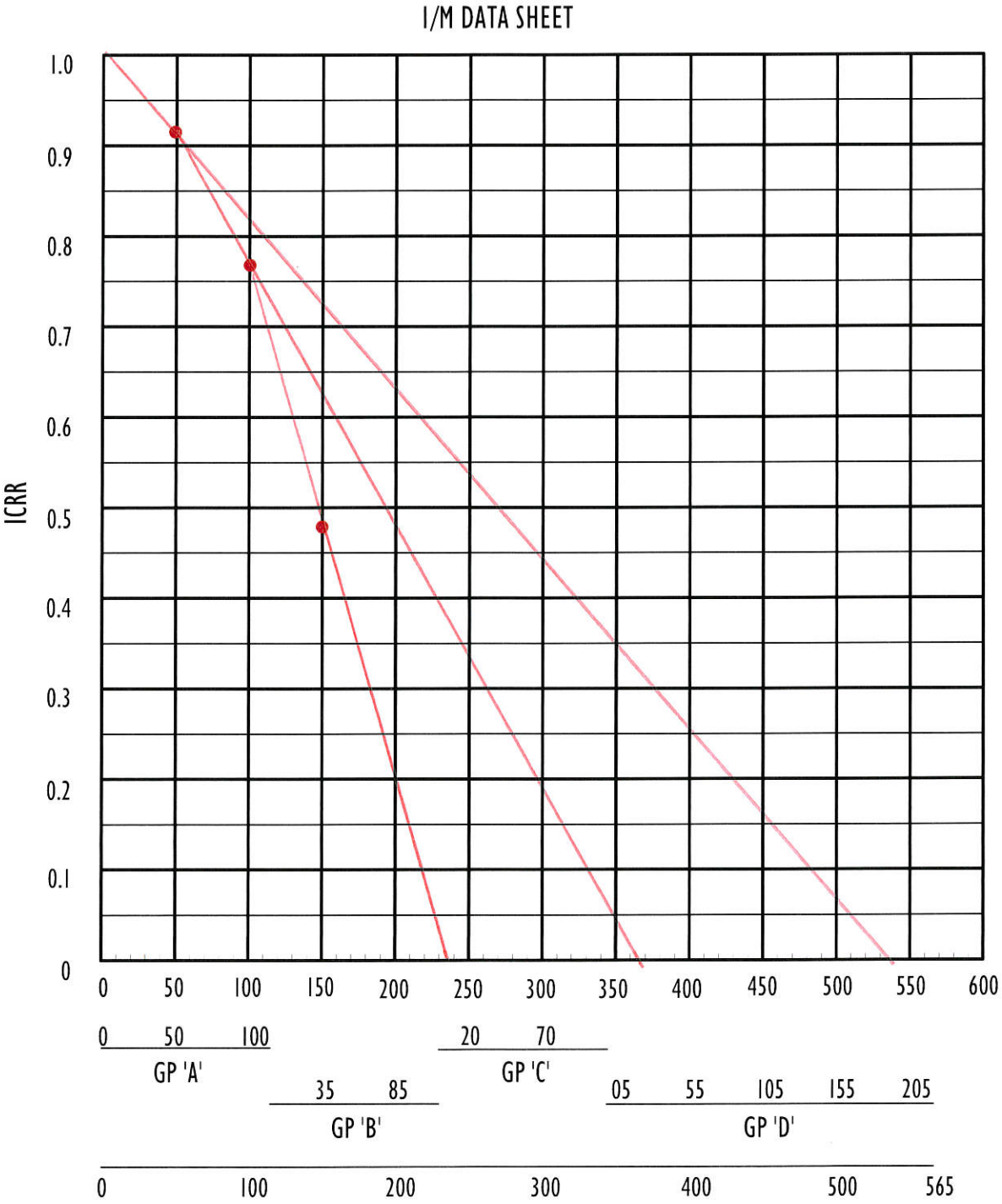
BANK ____ AT ____ STEPS

N-31	N-32
AVE ICRR	AVE ICRR
ECC BANK ____ STEP ____	ECC BANK ____ STEP ____

CPSES INTEGRATED PLANT OPERATING PROCEDURES MANUAL	UNIT 1	PROCEDURE NO. IPO-002A
PLANT STARTUP FROM HOT STANDBY	REVISION NO. 20	PAGE 69 OF 85

ATTACHMENT 2
PAGE 4 OF 4

INVERSE COUNT RATE RATIO CALCULATION



Facility: CPNPP JPM # NRC RA4 Task # RO4504 K/A # 2.3.13 3.4 / 3.8

Title: Perform Actions for Fuel Handling Accident in the Spent Fuel Pool

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Spent fuel re-racking is in progress in Spent Fuel Pool X-01.
- The following alarms were just received on PC-11, Digital Radiation Monitoring System:
  - X-RE-6274, SFP-003 LRAM SFP 1 E. WALL.
  - X-RE-5700, FBV-088 FB VENT EXH.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- IMPLEMENT the actions of ABN-908, Fuel Handling Accident.
- The Shift Manager has been NOTIFIED.

Task Standard: Utilizing ABN-908, initiated evacuation of the Fuel Building and placed Spent Fuel Pool Exhaust ventilation in service.

Required Materials: ABN-908, Fuel Handling Accident, Rev. 4-4.

Validation Time: 5 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to any MODE 1 Initial Condition and then ENSURE the following:

- **INSERT malfunction RM02D3 at 1E6, Area Radiation Monitor failure X-RE-6274/SFP003 into high alarm.**
- **INSERT malfunction RM03V at 1E6, Process Radiation Monitor failure X-RE-5700/FBV088 into high alarm.**
- **ENSURE both Unit 1 Spent Fuel Pool Exhaust Fans 33 and 34 are OFF.**

BOOTH OPERATOR NOTE:

- **After each JPM, VERIFY both Unit 1 Spent Fuel Pool Exhaust Fans 33 and 34 are OFF.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-908, Fuel Handling Accident.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**Wording of the announcement does NOT need to be verbatim.**
Examiner Note:	**The following steps are from ABN-908, Section 3.0.**
Perform Step: 1 3.3.1	Notify the Shift Manager of the incident and location.
Standard:	DETERMINED Shift Manager was notified per the Initial Conditions.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Performing either Step 2 or Step 4 is critical, not both.**
Perform Step: 2√ 3.3.2 & 3.3.2.a	Evacuate the Fuel Building as follows: • Announce the Fuel Building evacuation over the Gai-tronics.
Standard:	ANNOUNCED the following using the GAI-TRONICS: THIS IS NOT A DRILL. ATTENTION ALL PERSONNEL IN THE FUEL BUILDING. EVACUATE THE FUEL BUILDING. PROCEED INTO THE AUXILIARY BUILDING CORRIDOR. THIS IS NOT A DRILL.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The Control Room credenza is located behind the Unit Supervisor's desk and the Communication Control Station is located adjacent to the Main Fire Panel.**
Perform Step: 3√ 3.3.2 & 3.3.2.b	Evacuate the Fuel Building as follows: • Sound the Radiological Emergency Alarm.
Standard:	DEPRESSED **<u>either</u>** of the RADIOLOGICAL EMERGENCY ALARM pushbuttons: • Yellow RADIATION ALARM pushbutton on the Control Room credenza. • Yellow RADIATION ALERT pushbutton at the Communication Control Station.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ 3.3.2 & 3.3.2.c	Evacuate the Fuel Building as follows: • Repeat the announcement.
Standard:	ANNOUNCED the following using the GAI-TRONICS: THIS IS NOT A DRILL. ATTENTION ALL PERSONNEL IN THE FUEL BUILDING. EVACUATE THE FUEL BUILDING. PROCEED INTO THE AUXILIARY BUILDING CORRIDOR. THIS IS NOT A DRILL.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Starting either Spent Fuel Pool Exhaust Fan meets the requirement.**
Perform Step: 5√ 3.3.3 & 1st bullet	Ensure one spent fuel pool exhaust fan is running for the affected spent fuel pool. • SFP No. 1 • X-HS-5731, SFP EXH FAN 33
Standard:	DETERMINED a Fan is NOT running and PERFORMED the following: • PLACED X-HS-5731, SFP EXH FAN 33 in START (**critical**) • OBSERVED red START light LIT **(NOT critical)**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√ 3.3.3 & 2nd bullet	Ensure one spent fuel pool exhaust fan is running for the affected spent fuel pool. • SFP No. 1 • X-HS-5733, SFP EXH FAN 34
Standard:	DETERMINED a Fan is NOT running and PERFORMED the following: • PLACED X-HS-5733, SFP EXH FAN 34 in START (**critical**) • OBSERVED red START light LIT **(NOT critical)**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 3.3.4	Refer to EPP-201.
Standard:	REPORTED to the Unit Supervisor that EPP-201 must be referenced.
Examiner Cue:	**The Unit Supervisor is referring to EPP-201.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8 3.3.1	Notify Radiation Protection of the incident AND ensure all personnel who were in Fuel Building are being surveyed for possible contamination.
Standard:	CONTACTED Radiation Protection and NOTIFIED them of the fuel handling accident.
Terminating Cue:	**Radiation Protection has been contacted. This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Spent fuel re-racking is in progress in Spent Fuel Pool X-01.**
- **The following alarms were just received on PC-11, Digital Radiation Monitoring System:**
  - **X-RE-6274, SFP-003 LRAM SFP 1 E. WALL.**
  - **X-RE-5700, FBV-088 FB VENT EXH.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **IMPLEMENT the actions of ABN-908, Fuel Handling Accident.**
- **The Shift Manager has been NOTIFIED.**

Facility: CPNPP JPM # NRC SA1 Task # SO1211 K/A # 2.1.25 3.9 / 4.2

Title: Restore Refueling Water Storage Tank Level and Evaluate Technical Specifications

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1.
- Volume Control Tank level is stable at 60%.
- Current Refueling Water Storage Tank (RWST) Boron concentration is 2525 ppm.
- RWST level is 90%.
- Boric Acid Tank X-01 is at 97% and Boric Acid Tank X-02 is at 98%.
- Both Boric Acid Tanks have a concentration of 7450 ppm.
- OPERABLE boration flowpaths exist.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- CALCULATE the blended makeup to the Unit 1 Refueling Water Storage Tank to raise level from 90% to 97% per SOP-104A, Reactor Make-Up and Chemical Control System, Section 5.2.7, Makeup to RWST.
- DETERMINE the gallons of makeup required to raise RWST level from 90% to 97%.
- DETERMINE the required Boric Acid flowrate and Reactor Makeup Water flowrate for a makeup concentration of 2575 ppm at a total blended flowrate of 20 gpm.
- RECORD the following information:
  - RWST Makeup Required _____ gallons
  - Boric Acid Flowrate _____ gpm
  - Total Gallons of Boric Acid _____ gallons
  - POT Setting for 1-FK-110 _____
  - POT Setting for 1-FK-111 _____
- EVALUATE Technical Specification LCO impacted when Chemistry reports current RWST temperature is 122°F.
  - LCO Impacted _____
  - REQUIRED ACTION _____
  - COMPLETION TIME _____

Task Standard: Utilizing SOP-104A, TDM-201A, TDM-203A, and TDM-804A, calculated makeup required to the Refueling Water Storage Tank, including boric acid flowrate, reactor makeup water flowrate, total gallons of boric acid, and potentiometer settings for the Boric Acid and Reactor Makeup Water Flow Control Valves. Utilizing Technical Specifications identified LCO 3.5.4.A REQUIRED ACTION and COMPLETION TIME.

Required Materials: SOP-104A, Reactor Make-Up and Chemical Control System, Rev. 14-4.
TDM-201A, CVCS Calculations/ Blended Flow, Rev. 6.
TDM-203A, CVCS Controller Data. Rev. 3.
TDM-804A, Equipment Data Tank Height vs. Volume, Rev. 3.
Unit 1 Technical Specifications, Amendment 158.

Validation Time: 20 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **SOP-104A, Reactor Make-Up and Chemical Control System.**
- **TDM-201A, CVCS Calculations/ Blended Flow.**
- **TDM-203A, CVCS Controller Data.**
- **TDM-804A, Equipment Data Tank Height vs. Volume.**
- **Calculator and Ruler.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following step is from SOP-104A, Section 5.2.7.**
Examiner Note:	**RWST volumes found in TDM-804A, Page 16 of 56.**
Perform Step: 1√ 5.2.7.A	DETERMINE volume (VT) required to fill RWST to desired level using TDM-804A.
Standard:	REFERENCED Page 16 of TDM-804A and DETERMINED the following to raise RWST level from 90% to 97%: • 508220.9 – 472618.3 = **35602.6 ± 1000 gallons**.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Formula found in TDM-201A, Page 8 of 14.**
Perform Step: 2√	Determine required boric acid flowrate.
Standard:	CALCULATED Boric Acid Flowrate per TDM-201A as follows: • $F_b = C \times F_T / C_{bat} = 2575 \times 20 / 7450 =$ **6.91 ± 0.5 gpm**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	Determine total gallons of boric acid required.
Standard:	CALCULATED total gallons of boric acid as follows: • 35603 gallons x 6.91 / 20 = **12300.8 ± 500 gallons**.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Formula found in TDM-203A, Page 11 of 12.**
Perform Step: 4√	Determine potentiometer setting for 1-FK-110, Boric Acid Blender Flow Control Valve.
Standard:	CALCULATED potentiometer setting for 1-FK-110, Boric Acid Blender Flow Control Valve, per TDM-203A as follows: • 6.91 gpm = **1.73 ± 0.2**.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Formula found in TDM-203A, Page 12 of 12.**
Perform Step: 5√	Determine potentiometer setting for 1-FK-111, Reactor Makeup Water Blender Flow Control Valve.
Standard:	CALCULATED potentiometer setting for 1-FK-111, Reactor Makeup Water Blender Flow Control Valve, per TDM-203A as follows: • 20 gpm = **1.25 ± 0.2**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√	EVALUATE Technical Specification LCO impacted.
Standard:	DETERMINE Technical Specification **LCO 3.5.4**, **Refueling Water Storage Tank** is applicable: • **CONDITION A: RWST borated water temperature not within limits per SR 3.5.4.1.** • **REQUIRED ACTION: Restore RWST to OPERABLE status within 8 hours.**
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is in MODE 1.**
- **Volume Control Tank level is stable at 60%.**
- **Current Refueling Water Storage Tank (RWST) Boron concentration is 2525 ppm.**
- **RWST level is 90%.**
- **Boric Acid Tank X-01 is at 97% and Boric Acid Tank X-02 is at 98%.**
- **Both Boric Acid Tanks have a concentration of 7450 ppm.**
- **OPERABLE boration flowpaths exist.**

INITIATING CUE: **The Shift Manager directs you to PERFORM the following:**

- **CALCULATE the blended makeup to the Unit 1 Refueling Water Storage Tank to raise level from 90% to 97% per SOP-104A, Reactor Make-Up and Chemical Control System, Section 5.2.7, Makeup to RWST.**
- **DETERMINE the gallons of makeup required to raise RWST level from 90% to 97%.**
- **DETERMINE the required Boric Acid flowrate and Reactor Makeup Water flowrate for a makeup concentration of 2575 ppm at a total blended flowrate of 20 gpm.**
- **RECORD the following information:**
  - **RWST Makeup Required _____ gallons**
  - **Boric Acid Flowrate _____ gpm**
  - **Total Gallons of Boric Acid _____ gallons**
  - **POT Setting for 1-FK-110 _____**
  - **POT Setting for 1-FK-111 _____**
- **EVALUATE Technical Specification LCO impacted when Chemistry reports current RWST temperature is 122°F.**
  - **LCO Impacted _____**
  - **REQUIRED ACTION _____**
  - **COMPLETION TIME _____**

Facility: CPNPP JPM # NRC SA2 Task # SO1005 K/A # 2.1.23 4.3 / 4.4

Title: Perform RCS Pressure / Temperature Verification and Evaluate Technical Specifications

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- ABN-905A, Loss of Control Room Habitability, Attachment 7, RCS Pressure / Temperature Verification, is in progress.
- Reactor Coolant System cooldown is in progress.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- UTILIZING the data provided, CALCULATE the identified parameters (shown with arrows) on Attachment 7, RCS Pressure/Temperature Verification, per ABN-905A, Loss of Control Room Habitability.
- When complete, IDENTIFY any Technical Specification CONDITION, REQUIRED ACTION, and COMPLETION TIME.

_____
_____
_____

Task Standard: Utilizing ABN-905A, calculated saturation temperatures, Reactor Coolant System subcooling margin, and Reactor Coolant System cooldown rate during a Loss of Control Room Habitability.

Utilizing Unit 1 Technical Specifications, identified LCO 3.4.3 CONDITION A, REQUIRED ACTIONS, and COMPLETION TIME.

Required Materials: ABN-905A, Loss of Control Room Habitability, Rev. 9-10.

Unit 1 Technical Specifications, Amendment 158.

Pressure and Temperature Limits Report, ERX-07-003, Rev. 2.

Validation Time: 17 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-905A, Loss of Control Room Habitability.**
  - **Attachment 7, RCS Pressure / Temperature Verification with data inserted where appropriate.**

MAKE the following available in the classroom:

- **Unit 1 Technical Specifications.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following is from ABN-905A, Attachment 7.**
Perform Step: 1√	Calculate saturation temperature for Pressurizer pressure using Steam Tables at 0900, 0930, and 1000.
Standard:	CALCULATED saturation temperature for Pressurizer pressure using Steam Tables and ENTERED data at 0900, 0930, and 1000.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	Calculate subcooling for Reactor Coolant System using Steam Tables at 0900, 0930, and 1000.
Standard:	CALCULATED subcooling for Reactor Coolant System using Steam Tables and ENTERED data at 0900, 0930, and 1000.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	Calculate saturation temperature for Steam Generator 1 pressure using Steam Tables at 0900, 0930, and 1000.
Standard:	CALCULATED saturation temperature for Steam Generator 1 pressure using Steam Tables and ENTERED data at 0900, 0930, and 1000.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√	Calculate saturation temperature for Steam Generator 2 pressure using Steam Tables at 0900, 0930, and 1000.
Standard:	CALCULATED saturation temperature for Steam Generator 2 pressure using Steam Tables and ENTERED data at 0900, 0930, and 1000.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5√	Calculate saturation temperature for Steam Generator 3 pressure using Steam Tables at 0900, 0930, and 1000.
Standard:	CALCULATED saturation temperature for Steam Generator 3 pressure using Steam Tables and ENTERED data at 0900, 0930, and 1000.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√	Calculate saturation temperature for Steam Generator 4 pressure using Steam Tables at 0900, 0930, and 1000.
Standard:	CALCULATED saturation temperature for Steam Generator 4 pressure using Steam Tables and ENTERED data at 0900, 0930, and 1000.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7√	Calculate Reactor Coolant System cooldown rate from the Steam Generator with the largest pressure drop at 0930 and 1000.
Standard:	CALCULATED Reactor Coolant System cooldown rate from Steam Generator 1 and ENTERED data at 0930 and 1000.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8√	Identify any Technical Specification CONDITION, REQUIRED ACTION, and COMPLETION TIME.

Standard:	DETERMINED Technical Specification **LCO 3.4.3**, **RCS Pressure and Temperature Limits** is applicable:
	• **CONDITION A: Requirements of the LCO not met in MODE 1, 2, 3, or 4.**
	• **REQUIRED ACTION and COMPLETION TIME:**
	  • **A.1 – Restore parameter(s) to within limits in 30 minutes.**
	  AND
	  • **A.2 – Determine RCS is acceptable for continued operation within 72 hours.**

Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **ABN-905A, Loss of Control Room Habitability, Attachment 7, RCS Pressure / Temperature Verification, is in progress.**
- **Reactor Coolant System cooldown is in progress.**

INITIATING CUE: **The Shift Manager directs you to PERFORM the following:**

- **UTILIZING the data provided, CALCULATE the identified parameters (shown with arrows) on Attachment 7, RCS Pressure/Temperature Verification, per ABN-905A, Loss of Control Room Habitability.**
- **When complete, IDENTIFY any Technical Specification CONDITION, REQUIRED ACTION, and COMPLETION TIME.**

_____

_____

_____

ATTACHMENT 7
PAGE 1 OF 2

RCS PRESSURE/TEMPERATURE VERIFICATION

Time		0900	0930	1000				
PRZR PRESS	1-PI-455B	2085	1785	885				
Tsat from Steam Table (2)	→	643±3	621±3	532±3				
PRZR LVL	1-LI-459B	49%	46%	39%				
NEUT FLUX SR	1-NI-50A-3	450	400	330				
RCS LOOP (4)	CL1	545	540	430				
1 & 2 TEMP	CL2	545	540	430				
1-TR-410F	HL1	550	545	445				
	HL2	550	545	445				
Calculated Subcooling °F	→	93±5	76±5	87±5				
SG 1 PRESS (2)	1-PI-514B	1010	960	335				
Tsat from Steam Table (2)	→	547±3	541±3	432±3				
SG 1 LVL (WR) (1)	1-LI-501A	79	78	79				
SG 2 LVL (WR) (1)	1-LI-502A	77	79	77				
SG 2 PRESS (2)	1-PI-524B	1020	970	345				
Tsat from Steam Table (2)	→	549±3	543±3	435±3				
RCS LOOP (4)	CL3	550	550	430				
3 & 4 TEMP	CL4	550	550	430				
1-TR-430F	HL3	555	555	445				
	HL4	555	555	445				
SG 3 PRESS (2)	1-PI-534B	1020	960	335				
Tsat from Steam Table (2)	→	549±3	541±3	432±3				
SG 3 LVL (WR) (1)	1-LI-503A	78	78	78				
SG 4 LVL (WR) (1)	1-LI-504A	76	76	78				
SG 4 PRESS (2)	1-PI-544B	1010	970	345				
Tsat from ST	→	547±3	543±3	435±3				
COOLDOWN RATE	(3) →	N/A	16±3	117±3				

(1) SG Level (WR) Cold Cal of approximately 74% corresponds to an AFW Pump Low Level Auto Start signal.

(2) Steam pressure converted to Tsat/Tcold is the best indication of temperature and temperature changes.

(3) Cooldown rate should be calculated based on most conservative SG Press reading. Calculate cooldown using Tsat values and steam tables, with SG Press reading that has dropped the largest amount from last reading.

(4) RCS indicated temperature response will be slow due to slow response time of strap on RTDs.

NOTE: When completed, this attachment shall be dispositioned by attaching it to the SMART Form generated as a result of this abnormal condition.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 RCS Pressure and Temperature (P/T) Limits

LCO 3.4.3 RCS pressure, RCS temperature, and RCS heatup and cooldown rates shall be maintained within the limits specified in the PTLR.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Required Action A.2 shall be completed whenever this Condition is entered. ---------- Requirements of LCO not met in MODE 1, 2, 3, or 4.	A.1 Restore parameter(s) to within limits. AND A.2 Determine RCS is acceptable for continued operation.	30 minutes 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5 with RCS pressure < 500 psig.	6 hours 36 hours

2.1 RCS Temperature Rate-of-Change Limits (LCO 3.4.3)

2.1.1 Maximum Heatup Rate

The RCS heatup rate limit is 100°F in any 1-hour period.

2.1.2 Maximum Cooldown Rate

The RCS cooldown rate limit is 100°F in any 1-hour period.

2.1.3 Maximum Temperature Change During Inservice Leak and Hydrostatic Testing

During inservice leak and hydrostatic testing operations above the heatup and cooldown limit curves, the RCS temperature change limit is 10°F in any 1-hour period.

2.2 P/T Limits for Heatup, Cooldown, Inservice Leak & Hydrostatic Testing, and Criticality (LCO 3.4.3)

The limiting materials and adjusted reference temperatures at the 1/4t and 3/4t locations for each unit's reactor vessel are extracted from Reference 4 and are presented in Table 2-1. These values are based on the evaluation of two surveillance capsule specimens for each unit which include evaluations of the credibility of data per Regulatory Guide 1.99, Revision 2. All surveillance data for Unit 1 is credible. For Unit 2, the surveillance plate data (for the intermediate shell plate R3807-1) is not credible, while the surveillance weld data is credible.

The limiting reference temperatures for pressurized thermal shock (RT_{PTS}) values for each unit's reactor vessel were previously docketed in accordance with 10CFR50.61 and are extracted from References 8 and 9 for presentation in Table 2-1. Analyses of the withdrawn surveillance capsules from the Unit 1 and Unit 2 reactor vessels have confirmed the similarity between the two vessels in irradiated and non-irradiated material properties. The results of these surveillance capsule evaluations have confirmed that the early projections for CPNPP vessel materials were conservative. In addition, the majority of the irradiation-induced shift in vessel material properties occurs early in life. Therefore, with substantial margin to the RT_{PTS} screening criteria, the conservative fluence projections for the CPNPP vessel materials, and the

Facility: CPNPP JPM # NRC SA3 Task # SO1048 K/A # 2.2.14 3.9 / 4.3

Title: Determine Fire Compensatory Measures for an Emergent Condition

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- A Fire Protection Impairment has been identified and submitted by the Fire Protection Group using STA-738-2, Fire Protection System/Equipment Impairment Form.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- COMPLETE the **Compensatory Measure Review / Authorization** Section of STA-738-2, Fire Protection System/Equipment Impairment Form per STA-738, Fire Protection Systems/Equipment Impairments.

Task Standard: Utilizing STA-738, determined Fire Compensatory Measures for a disabled Spray/Sprinkler System in a Zone V Radiation Area.

Required Materials: STA-738, Fire Protection Systems / Equipment Impairments, Rev. 6-6.

STA-738-2, Fire Protection System / Equipment Impairment Form, Rev. 6.

Validation Time: 25 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **STA-738, Fire Protection Systems/Equipment Impairments.**
- **Partially COMPLETED STA-738-2, Fire Protection System / Equipment Impairment Form.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following information is from STA-783-2.**
Perform Step: 1	Enter information for SCHEDULED IMPAIRED DATE.
Standard:	ENTERED date of 04/01/2013.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2	Enter information for SCHEDULED COMPLETION DATE.
Standard:	ENTERED date of 04/03/2013.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	Determine if CONTINUOUS FIRE WATCH is required.
Standard:	DETERMINED the affected area is Unit 1 Cable Spreading Room North Half and a CONTINUOUS FIRE WATCH is required within one hour per STA-738, Attachment 8.A, Page 3 of 6, Step 4).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√	Determine if OTHER Compensatory Measures are required.
Standard:	DETERMINED that backup fire suppression equipment must be established within 1 hour and ENTER this information in the OTHER **or** INSTRUCTIONS / ADDITIONAL INFORMATION box per STA-738, Attachment 8.A, Page 3 of 6, Step 4).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5	Sign and date Compensatory Measure Review/Authorization form.
Standard:	SIGNED and DATED Compensatory Measure Review/Authorization form.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **A Fire Protection Impairment has been identified and submitted by the Fire Protection Group using STA-738-2, Fire Protection System/Equipment Impairment Form.**

INITIATING CUE: **The Shift Manager directs you to PERFORM the following:**

- **COMPLETE the **Compensatory Measure Review / Authorization** Section of STA-738-2, Fire Protection System/Equipment Impairment Form per STA-738, Fire Protection Systems/Equipment Impairments.**

FIRE PROTECTION SYSTEM/EQUIPMENT IMPAIRMENT FORM

IMPAIRMENT # _____ **WORK DOCUMENT NUMBER** (S) _____

CLEARANCE/MTO# _____

Completed by Fire Protection

****IMPAIRED FIRE PROTECTION SYSTEM/EQUIPMENT****

SUPPRESSION SYSTEM ID Number (i.e., affected valves, system no., etc.) Unit 1 Cable Spreading Room
ISOLATION POINT(S): N/A
DETECTION SYSTEM ID Number (i.e., panel no., zone, detector) Fire Zone 63
FIRE PUMP: Electric, ☐ Diesel ☐ ID Number N/A
FIRE PROTECTION WATER SUPPLY ☐ ID Number (i.e. tank, loop piv) N/A
FIRE RATED ASSEMBLY ☐ Description/ID Number N/A
(i.e. walls, floors, ceilings, penetrations seals, fire doors, fire dampers, radiant energy shield, thermolag, etc.)
OTHER SPECIFY: Reserve Halon Bottles
AFFECTED LOCATION: BLDG. Electric Control ELEV. 807 ROOM/OTHER North Half

GENERAL ACTIVITY DESCRIPTION: Reserve Halon Bottles at less than required pressure on 04/01/13 @ 0600.
Detection Systems remain OPERABLE.Expected Return-to-Service on 04/03/13.

REQUESTED BY: J. Jones RWO _____ EXT.: 2121 DATE: 04/01/13

Completed by Fire Protection/Shift Operations (normally performed during the impact review process)

****COMPENSATORY MEASURE REVIEW/AUTHORIZATION****

SCHEDULED IMPAIRED DATE: 04/01/13 SCHEDULED COMPLETION DATE: 04/03/13

_X_ CONTINUOUS FIRE WATCH POST NO.: _____
____ ROVING FIRE WATCH (route change required) YES NO ROUTE NO. _____
____ ROVING FIRE WATCH(with operable detection) (route change required) YES NO ROUTE NO._____
____ NONE REQUIRED _____
_X_ OTHER Establish continuous fire watch and backup fire suppression equipment within one (1) hour.

INSTRUCTIONS/ADDITIONAL INFORMATION _____

AUTHORIZED BY: Applicant Signature DATE: Date

Completed by Fire Protection/Shift Operations
(This section should be completed just prior to impairing any fire protection systems/equipment)
**** IMPAIRMENT/COMPENSATORY MEASURES INITIATION****

***** COMPENSATORY MEASURES INITIATED/VERIFIED: YES NO N/A (circle one) *****

BY:_____ DATE: _____ TIME: _____

Completed by FP/Shift Ops. ****RESTORATION****

FIRE PROTECTION SYSTEM/EQUIPMENT BACK IN-SERVICE YES NO (circle one)

BY: _____ DATE: _____ TIME: _____

STA-738-2
PAGE 1 of 1
R. 6

Facility: CPNPP JPM # NRC SA4 Task # SO1039 K/A # 2.3.6 2.0 / 3.8

Title: Approve a Liquid Waste Release Permit

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Unit 1 is shutdown for REFUELING and the following conditions exist:

- Circulating Water Pumps 1-01 and 1-03 are operating and the Waterboxes are open on the other two Circulating Water Pumps.
- Waste Water Holdup Tank (WWHT) #1 is being released.
- Unit 2 is operating at 5% with all systems in normal alignments.
- The permit has just been received in the Control Room to release WWHT #1 and the Unit 1 Circulating Water System has been selected as the discharge path.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- REVIEW the Liquid Release Permit and Plant Conditions and CIRCLE the results:
  - STA-603-13 REQUIRED? YES / NO
  - Recirculation time SATISFACTORY? YES / NO
  - Unit #1 Discharge flowpath ALLOWED? YES / NO
  - Sample times SATISFACTORY? YES / NO
  - Sample ID data SATISFACTORY? YES / NO
  - Sample pH SATISFACTORY? YES / NO

Task Standard: Utilizing STA-603 and STA-603-10, reviewed the Liquid Release Permit and evaluated required parameters.

Required Materials: STA-603, Control of Station Radioactive Effluents, Rev. 21-1.
STA-603-10, Batch Liquid Radioactive Effluent Release Data Sheet, Rev. 18.

Validation Time: 15 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **STA-603, Control of Station Radioactive Effluents.**
- **COMPLETE STA-603-10, Batch Liquid Radioactive Effluent Release Data Sheet up to the Shift Manager review.**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1√	Review Release Permit, STA-603-10, Batch Liquid Radioactive Effluent Release Data Sheet.
Standard:	REVIEWED STA-603-10, Release Permit and DETERMINED the following: • STA-603-13 is NOT required and CIRCLED **NO**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	Review Release Permit, STA-603-10, Batch Liquid Radioactive Effluent Release Data Sheet.
Standard:	REVIEWED STA-603-10, Release Permit and DETERMINED the following: • Recirculation time is > 0.5 hours and CIRCLED **YES**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	Based on the initial conditions determine the required minimum dilution requirements are met for a release via Unit 1.
Standard:	DETERMINED that a minimum of two Circulating Water Pumps (CWP) are required for a release: • Unit #1 Discharge flowpath has 2 CWPs and CIRCLED **YES**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√	Determine if Sample times are satisfactory.
Standard:	DETERMINED Sample times are > 15 minutes apart and CIRCLED **YES**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5√	Determine if Sample ID Data are satisfactory.
Standard:	DETERMINED Sample ID Data are NOT ± 25% and CIRCLED **NO**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√	Determine if Sample pH is satisfactory.
Standard:	DETERMINED Sample pH is less than 6.0 and CIRCLED **NO**.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Unit 1 is shutdown for REFUELING and the following conditions exist:**

- **Circulating Water Pumps 1-01 and 1-03 are operating and the Waterboxes are open on the other two Circulating Water Pumps.**
- **Waste Water Holdup Tank (WWHT) #1 is being released.**
- **Unit 2 is operating at 5% with all systems in normal alignments.**
- **The permit has just been received in the Control Room to release WWHT #1 and the Unit 1 Circulating Water System has been selected as the discharge path.**

INITIATING CUE: **The Shift Manager directs you to PERFORM the following:**

- **REVIEW the Liquid Release Permit and Plant Conditions and CIRCLE the results:**
  - **STA-603-13 REQUIRED? YES / NO**
  - **Recirculation time SATISFACTORY? YES / NO**
  - **Unit #1 Discharge flowpath ALLOWED? YES / NO**
  - **Sample times SATISFACTORY? YES / NO**
  - **Sample ID data SATISFACTORY? YES / NO**
  - **Sample pH SATISFACTORY? YES / NO**

Facility: CPNPP JPM # NRC SA5 Task # SO1140 K/A # 2.4.44 2.4 / 4.4

Title: Determine Protective Action Recommendations

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Comanche Peak Unit 2 has experienced a Large Break Loss of Coolant Accident with multiple failures of Safeguards equipment and a breach of Containment.
- The Site is in a GENERAL EMERGENCY, a radiological release is in progress, and the following information is provided:
  - Core Exit Thermocouple highest reading is 1300ºF.
  - Containment pressure is 2 psig.
  - Meteorological Tower Data:
    - Wind Speed 5 mph.
    - Wind Direction from 180º.
  - Pasquill Stability Class is D.
  - Field Dose results are:
    - TEDE 1200 mrem at 5 miles and 400 mrem at 10 miles.
    - CDE Thyroid is 6250 mrem at 5 miles and 1500 mrem at 10 miles.
- Weather conditions include freezing rain and a temperature of 30°F throughout Somervell and Hood counties.
- The duration of the release cannot be determined at this time.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- COMPLETE an Initial PAR per EPP-304, Protective Action Recommendations.
- HIGHLIGHT the Decision Path on Attachment 1.
- COMPLETE Attachment 2, Minimum Affected Area - Three (3) Sectors **or** Attachment 2A, Minimum Affected Area - Five (5) Sectors, as appropriate.

Task Standard: Utilizing EPP-304, determined Protective Action Recommendations during an accident.

Required Materials: EPP-304, Protective Action Recommendations, Rev. 21.

Validation Time: 20 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **EPP-304, Protective Action Recommendations.**
- **Highlight pen.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from EPP-304, Attachment 1.**
Perform Step: 1	Enter Attachment 1 at GENERAL EMERGENCY declared: • Is this the Initial PAR?
Standard:	ENTERED Attachment 1 at GENERAL EMERGENCY declared and DETERMINED that this is the Initial PAR and CHOSE "**YES**" path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	SEVERE FUEL DAMAGE Indicators: • ≥ 1000 R/hr CTE / CTW Or • ≥ 1200° auctioneered High CET
Standard:	DETERMINED SEVERE FUEL DAMAGE Indicator due to 1300°F Core Exit Thermocouple temperature and CHOSE "**YES**" path.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Reference Inset Table[1] on Attachment 1.**
Perform Step: 3	**[1]SHELTER OR EVACUATE?**
Standard:	REFERRED to Inset Table[1].
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√	Has there been severe core damage AND is a Rad release in progress?
Standard:	DETERMINED severe core damage exists due to Core Exit Thermocouple temperature with a radiation release in progress and CHOSE "**YES**" path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5√	Can release duration be accurately determined AND will the release be of short duration?
Standard:	DETERMINED release duration can NOT be accurately determined and will NOT be of short duration based on breach of Containment and CHOSE "**NO**" path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√	**Impediments?** (ice, roads, hostile threat)
Standard:	DETERMINED impediments exist from the Initial Conditions due to weather conditions and CHOSE "**YES**" path to **SHELTER**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7√	**[1]SHELTER OR EVACUATE?**
Standard:	CHOSE **SHELTER** path to Box **D** and SHELTERED 2 mile radius and Downwind Sectors to 10 miles **AND** ADVISED remainder of EPZ to go indoors and LISTEN to EAS.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from EPP-304, Attachment 2.**
Examiner Note:	**The first sequence of steps on either Attachment is used to determine if Attachment 2 or 2A is appropriate.**
Perform Step: 8 Step 1	To identify Minimum Affected Area, use instruction below to determine appropriate Attachment (Attachment 2 or Attachment 2A).
Standard:	REFERRED to Attachment 2 or 2A.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9 Step 1	IF conditions are: • ON-SITE Pasquill Stability Class C, D, E, F, or G and ON-SITE Wind Direction (From) is available THEN use Attachment 2
Standard:	DETERMINED that Stability Class D allows Attachment 2 use.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 10 Step 2	Circle ON-SITE Pasquill Stability Class C D E F G
Standard:	CIRCLED Pasquill Stability Class D.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 11 Step 3	Enter Wind Direction (From): _____ degrees
Standard:	ENTERED Wind Direction from 180 degrees.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 12√ Step 4	Circle applicable Centerline Sector in the Table below
Standard:	CIRCLED Centerline Sector A.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 13√ Step 5	Knowing Centerline Sector, GO TO applicable subsequent page to identify affected sectors and Emergency Response Zones (ERZ).
Standard:	Knowing Centerline Sector is A, CIRCLED or HIGHLIGHTED the following: • AFFECTED SECTORS are RAB. • EMERGENCY RESPONSE ZONES from 0 to < 5 miles are 2A, 4B, 4C, 4A, 1B. • EMERGENCY RESPONSE ZONES from > 5 to < 10 miles are 1D, 4E, 4F, 1C.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Comanche Peak Unit 2 has experienced a Large Break Loss of Coolant Accident with multiple failures of Safeguards equipment and a breach of Containment.**
- **The Site is in a GENERAL EMERGENCY, a radiological release is in progress, and the following information is provided:**
  - **Core Exit Thermocouple highest reading is 1300ºF.**
  - **Containment pressure is 2 psig.**
  - **Meteorological Tower Data:**
    - **Wind Speed 5 mph.**
    - **Wind Direction from 180º.**
  - **Pasquill Stability Class is D.**
  - **Field Dose results are:**
    - **TEDE 1200 mrem at 5 miles and 400 mrem at 10 miles.**
    - **CDE Thyroid is 6250 mrem at 5 miles and 1500 mrem at 10 miles.**
- **Weather conditions include freezing rain and a temperature of 30°F throughout Somervell and Hood counties.**
- **The duration of the release cannot be determined at this time.**

INITIATING CUE: **The Shift Manager directs you to PERFORM the following:**

- **COMPLETE an Initial PAR per EPP-304, Protective Action Recommendations.**
- **HIGHLIGHT the Decision Path on Attachment 1.**
- **COMPLETE Attachment 2, Minimum Affected Area - Three (3) Sectors or Attachment 2A, Minimum Affected Area - Five (5) Sectors, as appropriate.**

Facility: CPNPP JPM # NRC S-1 Task # RO1335 K/A # 004.A2.14 3.8 / 3.9 SF-1

Title: Emergency Boration from the Refueling Water Storage Tank

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Current RCS boron concentration is 908 ppm.
- 1/1-APBA2, BA XFER PMP 2, is tagged out.
- A Reactor trip has just occurred and two (2) Control Rods B10 and H14 have failed to fully insert.
- Immediate actions of EOP-0.0A, Reactor Trip or Safety Injection, have been verified.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Emergency Borate in accordance with ABN-107, Emergency Boration, for two Control Rods not fully inserted.

Task Standard: Utilizing ABN-107, determined normal Boration flowpath not available and referred to ABN-107, Attachment 4, and initiated an Emergency Boration via the Refueling Water Storage Tank.

Required Materials: ABN-107, Emergency Boration, Rev. 9-1.

Validation Time: 15 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC-18 and LOAD scenario file "LC-21 NRC JPM S1" or PERFORM the following:

- **ENSURE Centrifugal Charging Pump 1-01 is running.**
- **INSERT malfunction CV23, Boric Acid Filter clogging at 100%.**
- **INSERT malfunctions for Control Rods CBB B-10 and CBC H-14 stuck at 20 steps.**
  - **IMF RD04B10 f:20 AND IMF RD04H14 f:20.**
- **OVERRIDE and HANG clearance tag on 1/2-APBA2, Boric Acid Transfer Pump 1-02.**
  - **IOR DICVAPBA2 f:0.**
- **Manually TRIP the Reactor.**
- **ACKNOWLEDGE all annunciators.**
- **SET out EOP-0.0A, Reactor Trip or Safety Injection, Attachment 1.A, Foldout Page.**
- **FREEZE the simulator.**
- **When examinee is ready, PLACE simulator in RUN.**

BOOTH OPERATOR NOTE:

After each JPM, REPLACE ABN-107 inside the Control Board Job Aid orange folder and ENSURE the Emergency Boration Hard Card and EOP-0.0A Foldout Page are clean.

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-107, Emergency Boration.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**This JPM is designed to demonstrate Operating Experience from Comanche Peak wherein the Boric Acid Filter was isolated for maintenance without opening its associated bypass valve.**
Examiner Note:	**The first attempt to emergency borate should be via ABN-107, Emergency Boration, Attachment 1, Emergency Boration through Emergency Borate Valve u-8104. This flowpath is unsuccessful.**
Examiner Note:	**During validation, it was shown that Attachment 2, Normal Boration and Attachment 3, Manual Emergency Boration Valve may be attempted. These flowpaths are also unsuccessful.**
Examiner Note:	**The following steps are from ABN-107, Section 2.0.**

CAUTION: CCP runout may occur with simultaneous flow through both charging and SI flowpaths.

NOTE: Attachment 1 and Attachment 4 have been developed into Operator Aids for use during emergency boration and may be entered independently of this procedure.

Perform Step: 1 2.3.1	Check RWST TO CHRG PMP SUCT VLVs, 1/u-LCV-112D AND 1/u-LCV-112E - CLOSED.
Standard:	VERIFIED RWST TO CHRG PMP SUCT VLVs, 1/1-LCV-112D AND 1/1-LCV-112E are both CLOSED.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The applicant may determine at this point that the Boric Acid Pump, while available, is not providing flow and RNO to Step 2.3.6.**
Perform Step: 2 2.3.2	Verify BA pump - AT LEAST ONE AVAILABLE.
Standard:	DETERMINED the following: • PLACED 1/1-APBA1, Boric Acid Pump 1, in START and OBSERVED red START light LIT. • OBSERVED 1/1-APBA2, Boric Acid Pump 2 is TAGGED OUT.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Attempts to establish Emergency Boration flow using Attachments 1, 2, or 3 will be unsuccessful.**

NOTE: Attachment 1 is the preferred method of Emergency Boration. Train B Safeguards electrical power is required for operation of 1/u-8104.

NOTE: Attachment 2 utilizes the normal boration flow path, which requires 1/u-LCV-112B and 1/u-LCV-112C to be open.

Perform Step: 3 2.3.3 & 1st 3 bullets	Initiate and Continue EMERGENCY BORATION using one of the following methods: • Attachment 1 – 1/u-8104 • Attachment 2 – Normal Boration • Attachment 3 – Manual Emergency Boration Valve (uCS-8439)
Standard:	REFERRED to Attachment 1, Emergency Boration through Emergency Borate Valve u-8104.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from ABN-107, Attachment 1.**
Perform Step: 4 1	Ensure a charging pump is running: • 1/u-APCH1, CCP 1 • 1/u-APCH2, CCP 2 • 1/u-APPD, PDP
Standard:	DETERMINED Centrifugal Charging Pump 1-01 is running.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5 2	Start a boric acid transfer pump: • 1/u-APBA1, BA XFER PMP 1 - AUTO (AFTER START) • 1/u-APBA2, BA XFER PMP 2 - AUTO (AFTER START)
Standard:	PLACED 1/1- APBA1, BA XFER PMP 1 in START and OBSERVED red START light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6 3	Open 1/u-8104, EMER BORATE VLV.
Standard:	PLACED 1/1-8104, EMER BORATE VLV in OPEN and OBSERVED red OPEN light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 4	Verify flow on u-FI-183A, EMER BORATE FLO.
Standard:	DETERMINED 1-FI-183A, EMER BORATE FLO indicates zero flow.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8 5	Verify flow on u-FI-121A, CHRG FLO.
Standard:	DETERMINED 1-FI-121A, CHRG FLO indicates ~ 140 gpm flow.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**During validation, it was shown that Attachment 2, Normal Boration and Attachment 3, Manual Emergency Boration Valve may be attempted. These flowpaths are also unsuccessful. Applicable steps from these Attachments are included at the back of this JPM for reference (if performed).**
Perform Step: 9 6	IF EMER BORATE FLOW OR CHRG FLOW can NOT be verified, THEN initiate Emergency Boration Flow per another method of ABN-107.
Standard:	
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are continued from ABN-107, Section 2.0.**
Examiner Note:	**The following steps represent the Alternate Path for this JPM.**
Perform Step: 10 2.3.4 & 2.3.4 RNO	Verify EMERGENCY BORATION flow • GO TO Step 6.
Standard:	DETERMINED no Boric Acid flow available and TRANSITIONED to Step 6 per the RNO column.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 11 2.3.6	Verify RWST - AVAILABLE
Standard:	VERIFIED RWST available by level indications on CB-04: • 1-LI-930, RWST LVL CHAN I • 1-LI-931, RWST LVL CHAN II • 1-LI-932, RWST LVL CHAN III • 1-LI-933, RWST LVL CHAN IV
Comment:	**SAT ☐ UNSAT ☐**

NOTE: Attachment 4 is the preferred method to EMERGENCY BORATE from the RWST.

Perform Step: 12 2.3.7 & 1st bullet	Initiate and Continue EMERGENCY BORATION using one of the following methods: • From the RWST via 1/u-LCV-112D OR 1/u-LCV-112E per Attachment 4.
Standard:	INITIATED Attachment 4, Transfer of Charging Pump Suction to the RWST.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from ABN-107, Attachment 4.**

CAUTION: Injecting through a CCP SI ISOL VLV (8801A/B) requires CCP SI injection check valve leak test within 24 hours per SR 3.4.14.1 (requires MODE 3, 4, or 5).

Perform Step: 13 1	IF Safety Injection actuated (1/u-LCV-112D OR 1/u-LCV-112E OPEN), THEN perform the following steps:
Standard:	DETERMINED Safety Injection NOT actuated and N/A'd Step 1.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 14 2	IF Safety Injection NOT actuated (1/u-LCV-112D AND 1/u-LCV-112E CLOSED), THEN perform the following steps:
Standard:	DETERMINED Safety Injection NOT actuated.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Either 1/1-LCV-112D OR 1/1-LCV-112E can be opened.**
Perform Step: 15√ 2.a & bullets	OPEN ONE of the following: • 1/u-LCV-112D, RWST TO CHRG PMP SUCT VLV. OR • 1/u-LCV-112E, RWST TO CHRG PMP SUCT VLV.
Standard:	PERFORMED ONE of the following: • PLACED 1/1-LCV-112D, RWST TO CHRG PMP SUCT VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**). **OR** • PLACED 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Both 1/1-LCV-112B AND 1/1-LCV-112C must be closed.**
Perform Step: 16√ 2.b & bullets	CLOSE BOTH of the following: • 1/u-LCV-112B, VCT TO CHRG PMP SUCT VLV. AND • 1/u-LCV-112C, VCT TO CHRG PMP SUCT VLV
Standard:	PERFORMED BOTH of the following: • PLACED 1/1-LCV-112B, VCT TO CHRG PMP SUCT VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**). **AND** • PLACED 1/1-LCV-112C, VCT TO CHRG PMP SUCT VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Either 1/1/1-8110 OR 1/1-8111 can be closed.**
Perform Step: 17√ 2.c & bullets	CLOSE ONE of the following: • 1/u-8110, CCP 1 & 2 MINIFLOW VLV. OR • 1/u-8111, CCP 1 & 2 MINIFLOW VLV.
Standard:	PERFORMED ONE of the following: • PLACED 1/1-8110, CCP 1 & 2 MINIFLOW VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**). **OR** • PLACED 1/1-8111, CCP 1 & 2 MINIFLOW VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**If 1-LCV-112B (112C) is NOT closed then Vent Valve 8220 (8221) will also not close and 1-ZL-8220 (8221) will indicate OPEN.**
Perform Step: 18 2.d & bullets	Verify CLOSED BOTH of the following: • u-ZL-8220, CHRG PMP SUCT HI POINT VENT VLV. AND • u-ZL-8221, CHRG PMP SUCT HI POINT VENT VLV.
Standard:	VERIFIED BOTH of the following: • OBSERVED 1-ZL-8220, CHRG PMP SUCT HI POINT VENT VLV green CLOSE light LIT. AND • OBSERVED 1-ZL-8221, CHRG PMP SUCT HI POINT VENT VLV green CLOSE light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 19 2.e & bullets	CLOSE BOTH of the following: • 1/u-8202A, VENT VLV. AND • 1/u-8202B, VENT VLV.
Standard:	VERIFIED BOTH of the following: • OBSERVED 1/1-8202A, VENT VLV green CLOSE light LIT. AND • OBSERVED 1/1-8202B, VENT VLV green CLOSE light LIT
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Examiner Note:	**If performed, the following steps are from ABN-107, Attachment 2.**

NOTE: Attachment 2 utilizes the normal boration flow path, which requires 1/u-LCV-112B and 1/u-LCV-112C to be open.

Perform Step: 1 1	Place 1/u-MU, RCS MU MAN ACT switch in – STOP.
Standard:	PLACED 1/1-MU, RCS MU MAN ACT switch in STOP.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2 2	Open 1/u-FCV-110B, RCS MU TO CHRG PMP SUCT ISOL VLV.
Standard:	OPENED 1/1-FCV-110B, RCS MU TO CHRG PMP SUCT ISOL VLV and OBSERVED red OPEN light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3 3	Start a boric acid transfer pump: • 1/u-APBA1, BA XFER PMP 1 - AUTO (AFTER START) • 1/u-APBA2, BA XFER PMP 2 - AUTO (AFTER START)
Standard:	PLACED 1/1- APBA1, BA XFER PMP 1 in START and OBSERVED red START light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4 4	Open 1/u-FCV-110A, BA BLNDR FLO CTRL VLV.
Standard:	OPENED 1/1-FCV-110A, BA BLNDR FLO CTRL VLV and OBSERVED red OPEN light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5 5	Verify flow on u-FR-110 (RED PEN), BA FLOW TO BLNDR.
Standard:	DETERMINED 1-FR-110, BA FLOW TO BLNDR indicates zero gpm flow and TRANSITIONED to the next applicable Attachment.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**If performed, the following steps are from ABN-107, Attachment 3.**

NOTE: Attachment 2 utilizes the normal boration flow path, which requires 1/u-LCV-112B and 1/u-LCV-112C to be open.

Perform Step: 1 1	Locally open affected unit emergency borate manual valve. • uCS-8439-RO, Uu CVCS CHRG PMP EMER BORATE MAN VLV RMT OPER [AB 822 Blndr Rm X-209(X-208)]	
Standard:	DETERMINED Centrifugal Charging Pump 1-01 is running.	
Comment:		**SAT ☐ UNSAT ☐**

Perform Step: 2 2	Verify a charging pump is running: • 1/u-APCH1, CCP 1 • 1/u-APCH2, CCP 2 • 1/u-APPD, PDP	
Standard:	DETERMINED Centrifugal Charging Pump 1-01 is running.	
Comment:		**SAT ☐ UNSAT ☐**

Perform Step: 3 3	Place 1/u-MU, RCS MU MAN ACT switch in – STOP.	
Standard:	PLACED 1/1-MU, RCS MU MAN ACT switch in STOP.	
Comment:		**SAT ☐ UNSAT ☐**

Perform Step: 4 4	Place 1/u-MU, RCS MU MAN ACT switch in – STOP.	
Standard:	PLACED 1/1-MU, RCS MU MAN ACT switch in STOP.	
Comment:		**SAT ☐ UNSAT ☐**

Perform Step: 5 5	Open 1/u-FCV-110B, RCS MU TO CHRG PMP SUCT ISOL VLV.	
Standard:	OPENED 1/1-FCV-110B, RCS MU TO CHRG PMP SUCT ISOL VLV and OBSERVED red OPEN light LIT.	
Comment:		**SAT ☐ UNSAT ☐**

Perform Step: 6 6	Start a boric acid transfer pump: • 1/u-APBA1, BA XFER PMP 1 - AUTO (AFTER START) • 1/u-APBA2, BA XFER PMP 2 - AUTO (AFTER START)
Standard:	PLACED 1/1- APBA1, BA XFER PMP 1 in START and OBSERVED red START light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 7	Open 1/u-FCV-110A, BA BLNDR FLO CTRL VLV.
Standard:	OPENED 1/1-FCV-110A, BA BLNDR FLO CTRL VLV and OBSERVED red OPEN light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8 8	Verify flow on u-FR-110 (RED PEN), BA FLOW TO BLNDR.
Standard:	DETERMINED 1-FR-110, BA FLOW TO BLNDR indicates zero gpm flow and TRANSITIONED to the next applicable Attachment.
Comment:	**SAT ☐ UNSAT ☐**

INITIAL CONDITIONS: **Given the following conditions:**

- **Current RCS boron concentration is 908 ppm.**
- **1/1-APBA2, BA XFER PMP 2, is tagged out.**
- **A Reactor trip has just occurred and two (2) Control Rods B10 and H14 have failed to fully insert.**
- **Immediate actions of EOP-0.0A, Reactor Trip or Safety Injection, have been verified.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **Emergency Borate in accordance with ABN-107, Emergency Boration, for two Control Rods not fully inserted.**

Facility: CPNPP JPM # NRC S-2 Task # RO1824 K/A # 010.A4.03 4.0 / 3.8 SF-3

Title: Wide Range Pressure Transmitter Failure in MODE 5

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 5.
- The Residual Heat Removal System is being controlled by another operator.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESPOND to any Primary Side alarms.

Task Standard: Utilizing ALM-0053A or ABN-715, responded to a Wide Range Pressure Transmitter failure while in MODE 5, attempted to close the PORV and then closed the associated Block Valve.

Required Materials: ALM-0053A, 1-ALB-5C, Window 1.4 – PORV 455A/456 NOT CLOSE, Rev. 7-1.
ABN-715, Wide Range RCS Pressure Instrument Malfunction, Rev. 5-2.
TDM-301A, RCS Temperature and Pressure Limits, Rev. 9-3.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC-4 or any MODE 5 Initial Condition and LOAD scenario file "LC-21 NRC JPM S2" or PERFORM the following:

- **When directed, EXECUTE malfunction RX13B, RCS Loop 1 Pressure Transmitter (PT-405) failure to 3000 PSIG.**
  - **EXECUTE malfunction RX16A, PCV-455A to 100% OPEN.**
- **HANG Control Board Tags on the following components:**
  - **1/1-APPD, PDP handswitch.**
- **PLACE CB07 Computer Screen to MODE 5.**

BOOTH OPERATOR NOTE:

- **After each JPM, VERIFY 1-ALB-5C, Window 1.4 – PORV 455A/456 NOT CLOSE pages are clean.**

EXAMINER:

When referenced, PROVIDE the examinee with a copy of:

- **ALM-0053A, 1-ALB-5C, Window 1.4 – PORV 455A/456 NOT CLOSE.**

If referenced, PROVIDE the examinee with a copy of:

- **ABN-715, Wide Range RCS Pressure Instrument Malfunction, or**
- **TDM-301A, RCS Temperature and Pressure Limits.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**This JPM may be performed using steps from ALM-0053A or ABN-715. Locate the applicable steps within this JPM.**
Examiner Note:	**The following steps are from ALM-0053A, 1-ALB-5C, Window 1.4.**

CAUTION: When a safety valve actuation has resulted in plant shutdown, subsequent Mode 4 operation shall not be commenced until affected safety valve has been inspected.

Perform Step: 1 1	DETERMINE affected PORV.
Standard:	DETERMINED 1/1-PCV-455A, PRZR PORV is the affected PORV.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2 2 & 2.A	MONITOR pressurizer pressure. • IF one channel is indicating >60 psig difference between the remaining operable channels, THEN GO to ABN-705.
Standard:	DETERMINED ABN-705 is not applicable and REMAINED in ALM-0053A.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3 2 & 2.B	Monitor pressurizer pressure. • IF reactor is in Mode 1, 2 or 3 with pressurizer pressure <2335 psig, THEN CLOSE affected PORV. • 1/1-PCV-455A, PRZR PORV
Standard:	DETERMINED Unit 1 is in MODE 5.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Provide TDM-301A, RCS Temperature and Pressure Limits, if referenced.**
Perform Step: 4 3	WITH reactor in Mode 4, 5 OR 6, THEN REFER to TDM-301A to determine RCS pressure AND temperature limits. • 1-PI-405, HL 4 PRESS (WR)
Standard:	REFERRED to TDM-301A, PRESSURIZER PORV LTOP SETPOINTS and DETERMINED 1-PI-405, HL 4 PRESS (WR) has failed HIGH.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Perform Step: 5 3.A & 1st bullet	IF RCS pressure is within the limits based on current RCS temperature, THEN CLOSE affected PORV. • 1/1-PCV-455A, PRZR PORV
Standard:	PERFORMED the following: • PLACED 1/1-PCV-455A, PRZR PORV in CLOSE. • OBSERVED red OPEN light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√ 4, 4.A, & 1st bullet	VERIFY pressurizer OR RCS wide range pressure stabilizes. • IF pressure continues to decrease due to PORV leakage, THEN CLOSE both PORV block valves and determine affected PORV. • 1/1-8000A, PRZR PORV BLK VLV
Standard:	PERFORMED the following: • PLACED 1/1-8000A, PRZR PORV Block Valve in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Terminating Cue:	**This JPM is complete (if ALM-0053A is referenced).**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from ABN-715, Section 2.0.**
Perform Step: 7 1 & 1st bullet	Verify LTOP not actuated – PORVs NOT OPEN. • 1/u-PCV-455A, PRZR PORV
Standard:	DETERMINED 1/1-PCV-455A, PRZR PORV is OPEN.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Perform Step: 8 1 RNO	Manually close the affected PORV.
Standard:	PERFORMED the following: • PLACED 1/1-PCV-455A, PRZR PORV in CLOSE. • OBSERVED red OPEN light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9√ 1 RNO	Manually close the affected PORV.
Standard:	DETERMINED 1/1-PCV-455A, PRZR PORV will NOT close and PERFORMED the following: • PLACED 1/1-8000A, PRZR PORV Block Valve in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Terminating Cue:	**This JPM is complete (if ABN-715 is referenced).**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is in MODE 5.**
- **The Residual Heat Removal System is being controlled by another operator.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **RESPOND to any Primary Side alarms.**

Facility: CPNPP JPM # NRC S-3 Task # RO1118 K/A # 015.AA1.22 4.0 / 4.2 SF-4P

Title: Respond to a Reactor Coolant Pump Seal Failure

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is operating at 100% power with all controls in AUTOMATIC.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESPOND to any Primary Side alarms.

Task Standard: Utilizing ABN-101, evaluated RCP seal leakoff flow condition, tripped the Reactor and affected RCP, and isolated affected RCP seal water leakoff flow.

Required Materials: ABN-101, Reactor Coolant Pump Trip/Malfunction, Rev. 10-6.

ALM-0051A, 1-ALB-5A, Window 1.2 – ANY RCP SEAL 1 LKOFF FLO HI, Rev. 5-4.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC-18 and LOAD scenario file "LC-21 NRC JPM S3" or PERFORM the following:

- **When directed, INSERT malfunction CV27C, RCP 1-03 Seal #1 failure at 36%.**

EXAMINER:

When referenced, PROVIDE the examinee with a copy of:

- **ABN-101, Reactor Coolant Pump Trip/Malfunction.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Booth Operator:	**When directed, EXECUTE malfunction CV27C at 36%.**
Perform Step: 1	EVALUATE alarms and SELECT appropriate Alarm Procedure.
Standard:	ACKNOWLEDGED alarm 1-ALB-5A, Window 1.2 – ANY RCP SEAL 1 LKOFF FLO HI and REFERRED to ABN-101, Reactor Coolant Pump Trip/Malfunction.
Examiner Note:	**When referenced, PROVIDE copy of ABN-101.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from ABN-101, Section 4.0.**

NOTE:
- Step 1 is a continuous action step.
- The No. 1 Seal Leakoff Valve should not be closed before taking pump handswitch to stop.

Perform Step: 2 4.3.1	Determine appropriate action step.
Standard:	OBSERVED 1-FR-0155, RCP 3 SEAL LKOFF FLO (NR) at 1.0 gpm and 1-FR-0159, RCP 3 SEAL LKOFF FLO (WR) at > 8 gpm.
Comment:	**SAT ☐ UNSAT ☐**

Note:
- Total #1 Seal Flow = #1 Leakoff plus #2 Leakoff indications
- For immediate shutdown required, a manual plant trip must precede RCP Shutdown.
- #2 seal leakoff is read locally in containment. If containment entry is not practicable it is acceptable to assume a #2 seal leakoff of 1 gpm if the "ANY SEAL 2 LEAKOFF FLO HI", u-ALB-5A, window 3.2 is DARK.
- Attachment 1 lists computer points for temperature monitoring.

#1 Seal Leakoff Flow	OR	Total #1 Seal Flow	AND	Pump Bearing/Seal Inlet Temperature	THEN	RCP Shutdown Step
>6.0 gpm		>6.0 gpm		Increasing		Immediate Step 2
>6.0 gpm		>6.0 gpm and <8.0 gpm		Stable		Orderly Step 3
		>8.0 gpm		NA		Immediate Step 2
<0.8 gpm		<0.8 gpm		Stable		Orderly Step 3
<0.8 gpm		<0.8 gpm		Increasing		Immediate Step 2

Perform Step: 3 4.3.1	Determine appropriate action step.
Standard:	DETERMINED Total #1 Seal Leak Off Flow greater than 8.0 gpm and IMMEDIATELY PERFORMED Step 2 of ABN-101.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ 4.3.2.a	Trip the Reactor and GO TO EOP-0.0A/B while other operators continue this procedure.
Standard:	PLACED 1/1-RTC, RX TRIP BKR Switch **or** 1/1-RT, RX TRIP Switch in TRIP position and VERIFIED the following: • Reactor Trip Breakers - at least one OPEN. • Neutron flux - DECREASING. • All Control Rod position rod bottom lights - ON.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from EOP-0.0A.**
Perform Step: 4.a 1	Verify Reactor Trip:
Standard:	VERIFIED the following: • Reactor Trip Breakers - at least one OPEN. • Neutron flux - DECREASING. • All Control Rod position rod bottom lights - ON.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4.b 2	Verify Turbine Trip:
Standard:	VERIFIED the following: • All HP Turbine Stop Valves – CLOSED.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4.c 3	Verify Power to AC Safeguards Busses:
Standard:	VERIFIED the following: • Both AC Safeguards Buses – ENERGIZED.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4.d 4	Check SI Status:
Standard:	VERIFIED the following: • DETERMINED SI is not actuated.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from ABN-101, Section 4.0.**
Perform Step: 5√ 4.3.2.b	STOP affected RCP(s).
Standard:	PERFORMED the following: • PLACED 1/1-PCPX3, RCP 3 to STOP (**critical**)**.** • OBSERVED green STOP light LIT (**NOT critical**). • OBSERVED 1-II-RCP 3, RCP MOT CURRENT at zero (0) amps (**NOT critical**). • OBSERVED 1-FI-434/435/436 RC LOOP 3 FLO CHAN I/II/III to zero (0) flow (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Cue:	**When applicant verbalizes time requirement, REPORT 4 minutes have passed.**
Perform Step: 6√ 4.3.2.c	Between 3 to 5 minutes after RCP stopped, CLOSE No. 1 Seal Leakoff Valve for affected RCP(s).
Standard:	PERFORMED the following: • PLACED 1/1-8141C, RCP 3 SEAL 1 LKOFF VLV to CLOSE **(critical).** • OBSERVED green CLOSE light LIT (**NOT critical**).
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is operating at 100% power with all controls in AUTOMATIC.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **RESPOND to any Primary Side alarms.**

Facility: CPNPP JPM # NRC S-4 Task # RO3516 K/A # 061.A2.04 3.4 / 3.8 SF-4S

Title: Respond to a Motor Driven AFW Pump Trip

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is at approximately 2% power.
- Preparations to start a Main Feedwater Pump are underway.
- Both Motor Driven Auxiliary Feedwater Pumps are in service maintaining narrow range Steam Generator levels between 60% and 75%.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESPOND to any Secondary Side alarms.

Task Standard: Utilizing ABN-305, started the Turbine Driven Auxiliary Feedwater Pump and fed Steam Generators 1-01 and 1-02 upon loss of the Train A Motor Driven Auxiliary Feedwater Pump.

Required Materials: ALM-0082A, 1-ALB-8B, Window 4.3 – MD AFWP 1/2 OVRLOAD/TRIP, Rev. 8-10.
ABN-305, Auxiliary Feedwater System Malfunction, Rev. 7-4.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC-9 or any at low power Initial Condition and PERFORM the following:

- **VERIFY both Motor Driven Auxiliary Feedwater (MDAFW) Pumps are in service.**
- **ENSURE Steam Generator narrow range levels are between 60% and 75%.**
- **When directed, EXECUTE malfunction FW24A, MDAFW Pump 1-01 trip.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-305, Auxiliary Feedwater System Malfunction.**
  - **Section 3.0, Motor Driven Auxiliary Feedwater Pump Malfunction.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**Applicant may take actions per ABN-305 without consulting the Alarm Procedure. In this case, actions will start at Perform Step 3.**
Examiner Note:	**The following steps are from ALM-0082A, 1-ALB-8B, Window 4.3 – MD AFWP 1/2 OVRLOAD/TRIP.**

CAUTION: Do not place the pump handswitch in STOP if the pump is tripped (white TRIP light). This will reset the 86M relay (white TRIP light) and may result in an automatic restart.

Perform Step: 1 1	Determine affected pump. • 1-HS-2450A, MD AFWP 1 • 1-HS-2451A, MD AFWP 2
Standard:	OBSERVED 1-HS-2450A, MD AFWP 1 white TRIP light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2 1.A	If a pump is tripped, go to ABN-305 for Motor Driven Auxiliary Feedwater Pump Malfunction.
Standard:	CONTINUED actions per ABN-305.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from ABN-305, Section 3.0.**

CAUTION: Placing the pump handswitch in STOP OR PULL-OUT with the pump tripped (white TRIP light) will reset the 86M relay (white TRIP light) and may result in an automatic restart if the handswitch is returned to AUTO.

Perform Step: 3 3.3.1	Determine which MD AFW Pump is malfunctioning AND verify affected pump – TRIPPED.
Standard:	OBSERVED 1-HS-2450A, MD AFWP 1 white TRIP light LIT.
Comment:	**SAT ☐ UNSAT ☐**

CAUTION: Do not exceed 800 gpm total flow on one Motor Driven Auxiliary Feedwater Pump.

Perform Step: 4 3.3.2	Verify at least one AFW pump RUNNING.
Standard:	DETERMINED 1-HS-2451A, MD AFWP 2 is running supplying Steam Generators 1-03 and 1-04.
Comment:	**SAT ☐ UNSAT ☐**

CAUTION: Do NOT operate both Motor-Driven Auxiliary Feedwater Pumps at the same time with the trains cross-connected.

Perform Step: 5 3.3.3	Verify Steam Generator levels – NORMAL.
Standard:	DETERMINED Steam Generator 1-01 and 1-02 narrow range levels are lowering.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Examiner Note:	**Operating either switch meets the critical portion of this step.**
Perform Step: 6√ 3.3.3 RNO	IF the TD AFW Pump is available, THEN start the TD AFW Pump AND feed the two steam generators NOT being supplied by the MD AFW Pump.
Standard:	PERFORMED the following: • PLACED 1-HS-2452-1, AFWPT STM SPLY VLV MSL 4 from SG 1-04 to START (**critical**). **and/or** • PLACED 1-HS-2452-2, AFWPT STM SPLY VLV MSL 1 from SG 1-01 to START (**critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**At this time the applicant may choose to feed all 4 SGs using the TDAFW Pump. A Precaution in SOP-304A, AFW System, states that damage to the TDAFW Pump may result from continuous operation (more than 20 minutes) at flows less than 130 gpm.**
Perform Step: 7√ 3.3.3 RNO	IF the TD AFW Pump is available, THEN start the TD AFW Pump AND feed the two steam generators NOT being supplied by the MD AFW Pump.
Standard:	PERFORMED the following: • ESTABLISHED flow to Steam Generator 1-01 by DEPRESSING the red RAISE (▲) or green LOWER (▼) pushbuttons on 1-FK-2459A, TD AFWP SG 1 FLO CTRL (**critical**). • OBSERVED 1-FI-2463A **or** 1-FI-2463C, SG 1 AFW FLO indication (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8√ 3.3.3 RNO	IF the TD AFW Pump is available, THEN start the TD AFW Pump AND feed the two steam generators NOT being supplied by the MD AFW Pump.
Standard:	PERFORMED the following: • ESTABLISHED flow to Steam Generator 1-02 by DEPRESSING the red RAISE (▲) or green LOWER (▼) pushbuttons on 1-FK-2460A, TD AFWP SG 2 FLO CTRL (**critical**). • OBSERVED 1-FI-2464A **or** 1-FI-2464C, SG 2 AFW FLO indication (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9 3.3.4 & 1st bullet	Dispatch a Nuclear Equipment Operator to check breaker status of affected auxiliary feedwater pump. • 1EA1/5/BKR, 1APMD1, AUXILIARY FEEDWATER PUMP 1-01 BKR (SFGD 810 Rm 1-83)
Standard:	DISPATCHED a Nuclear Equipment Operator.
Terminating Cue:	**An operator has been dispatched to check the Train A Motor Driven Auxiliary Feedwater Pump Breaker. This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is at approximately 2% power.**
- **Preparations to start a Main Feedwater Pump are underway.**
- **Both Motor Driven Auxiliary Feedwater Pumps are in service maintaining narrow range Steam Generator levels between 60% and 75%.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **RESPOND to any Secondary Side alarms.**

Facility: CPNPP JPM # NRC S-5 Task # RO2002C K/A # 026.A4.01 4.5 / 4.3 SF-5

Title: Transfer Containment Spray From Injection to Recirculation

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- A Large Break LOCA has occurred and Containment Spray has actuated.
- The Emergency Core Cooling System has been aligned for Cold Leg Recirculation per EOS-1.3A, Transfer to Cold Leg Recirculation.
- Refueling Water Storage Tank (RWST) level is 10%.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- When RWST level reaches 6%, TRANSFER Containment Spray to the Containment Sumps per EOS-1.3A, Transfer to Cold Leg Recirculation, Attachment 1.H, Containment Spray Switchover Criterion.

Task Standard: Utilizing EOS-1.3A, transferred Containment Spray from the Injection Mode to the Recirculation Mode from the Containment Sumps. Stopped Train B Containment Spray Pumps when alignment to the Containment Sump could not be performed.

Required Materials: EOS-1.3A, Transfer to Cold Leg Recirculation, Rev. 8-3.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC #33 and LOAD scenario file "LC21 NRC JPM S5", or any Post LOCA with RHR Swapover completed IC and PERFORM the following:

- **INSERT Remote Function to fail 1-HS-4783 in CLOSE position [DISCH4783.CB02 12.09 switch for HS-4783 CLS (current CLS) (final CLS)].**

If IC #33 is not available, RESET to any at power IC and PERFORM the following:

- **INSERT malfunction RC08A2 (or equivalent Large Break LOCA).**
- **PLACE Simulator in RUN.**
- **REDUCE AFW Flow to all SGs.**
- **RESET SI, SIS, Containment and Isolation Phases A & B and Containment Spray.**
- **STOP both Emergency Diesel Generators.**
- **STOP all Reactor Coolant Pumps.**
- **When RWST level reaches LO-LO level, TRANSFER ECCS to Cold Leg Recirculation by performing Steps 1-3 of EOS-1.3A.**
- **INSERT Remote Function to fail 1-HS-4783 in the CLOSE position.**
- **FREEZE simulator when RWST level is 10%.**

BOOTH OPERATOR NOTE:

- **After each JPM, VERIFY keys for the RWST Suction Valves are REMOVED and RETURNED to the top of the Key Locker.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **EOS-1.3A, Transfer to Cold Leg Recirculation.**
  - **Attachment 1.H, Containment Spray Switchover Criterion.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from EOS-1.3, Attachment 1.H.**
Examiner Note:	**CUE the Booth Operator to PLACE the Simulator in RUN.**

> CAUTION: Any Containment Spray pump taking suction from the RWST should be stopped when RWST level reaches 0%

Perform Step: 1 4.a.	Check RWST level – LESS THAN 6%.
Standard:	OBSERVED 1-LI-930, RWST LVL CHAN I or 1-LI-931, RWST LVL CHAN II and VERIFY level is less than 6%.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Steps 2 and 3 may be performed in any order.**
Perform Step: 2√ 4.b.1) & 1st bullet	Open CNTMT SMP TO CSP 1 & 3 AND 2 & 4 SUCT ISOL VLVs: • 1-HS-4782
Standard:	PERFORMED the following: • PLACED 1-HS-4782, CNTMT SMP TO CSP 1 & 3 SUCT ISOL VLV to OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√ 4.b.1) & 2nd bullet	Realign Containment Spray System as follows: • Open CNTMT SMP TO CSP 1 & 3 AND 2 & 4 SUCT ISOL VLVs: • 1-HS-4783
Standard:	PERFORMED the following: • PLACED 1-HS-4783, CNTMT SMP TO CSP 2 & 4 SUCT ISOL VLV to OPEN (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following three steps represent the Alternate Path of this JPM.**
Perform Step: 4√ 4.b.1) RNO & 4.b.1) A) RNO	IF CNTMT SMP TO CSP VLV(s) can NOT be open, THEN perform the following: • Place affected CSPs in PULL-OUT.
Standard:	PERFORMED the following prior to 1% RWST level: • PLACED 1-HS-4766, CSP 2 in STOP then PULLOUT (**critical**). • OBSERVED red FAN light LIT (**NOT critical**). • PLACED 1-HS-4767, CSP 4 in STOP then PULLOUT (**critical**). • OBSERVED red FAN light LIT (**NOT critical**).
Examiner Note:	**1% RWST level is based on anti-vortexing calculation MEB 389.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5√ 4.b.1) RNO & 4.b.1).B) RNO	IF CNTMT SMP TO CSP VLV(s) can NOT be open, THEN perform the following: • Place affected CS HX OUT VLV(s) in PULL-OUT.
Standard:	PERFORMED the following: • PLACED 1-HS-4777, CS HX 2 OUT VLV to PULLOUT (**critical**). • OBSERVED all lights OFF (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6 4.b.1) RNO & 4.b.1).C RNO	IF CNTMT SMP TO CSP VLV(s) can NOT be open, THEN perform the following: • Consult Plant Staff to determine contingency actions.
Standard:	CONSULTED Plant Staff to determine contingency actions.
Examiner Cue:	**Another operator will consult with Plant Staff. The Unit Supervisor directs you to continue with the procedure.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Perform Steps 7 and 8 may be performed in any order.**
Perform Step: 7√ 4.b.2) & 1st bullet	Close RWST TO CSP 1 & 3 AND 2 & 4 SUCT VLVs: • 1-HS-4758
Standard:	PERFORMED the following: • PLACED 1-HS-4758, RWST TO CSP 1 & 3 SUCT VLV to CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8√ 4.b.2) & 2nd bullet	Close RWST TO CSP 1 & 3 AND 2 & 4 SUCT VLVs: • 1-HS-4759
Standard:	PERFORMED the following: • PLACED 1-HS-4759, RWST TO CSP 2 & 4 SUCT VLV to CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9 4.b.3)	IF containment spray pumps have been stopped due to RWST level, THEN perform the following:
Standard:	DETERMINED Containment Spray Pumps were NOT stopped due to low RWST Level.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 10 4.b.4)	Verify containment spray flows.
Standard:	OBSERVED Containment Spray flows on: • 1-FI-4772-1, CSP 1 DISCH FLO at ~3600 GPM. • 1-FI-4772-2, CSP 3 DISCH FLO at ~3700 GPM.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **A Large Break LOCA has occurred and Containment Spray has actuated.**
- **The Emergency Core Cooling System has been aligned for Cold Leg Recirculation per EOS-1.3A, Transfer to Cold Leg Recirculation.**
- **Refueling Water Storage Tank (RWST) level is 10%.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **When RWST level reaches 6%, TRANSFER Containment Spray to the Containment Sumps per EOS-1.3A, Transfer to Cold Leg Recirculation, Attachment 1.H, Containment Spray Switchover Criterion.**

Facility: CPNPP JPM # NRC S-6 Task # RO4302E K/A # 064.A4.06 3.9 / 3.9 SF-6

Title: Loss of Both 6900 Volt Safeguard Buses

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1.
- ABN-601, Response to a 138/345 KV System Malfunction, is in progress.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESPOND to a loss of both 6900 Volt Safeguards Buses per ABN-601, Response to a 138/345 KV System Malfunction, Section 7.0, Loss of Both Safeguards Buses – MODE 1, 2, 3, or 4.

Task Standard: Utilizing ABN-601, tripped the Reactor, stopped Reactor Coolant Pumps, and paralleled Train A(B) Emergency Diesel Generator to Safeguard Bus 1EA1(1EA2).

Required Materials: ABN-601, Response to a 138/345 KV System Malfunction, Rev. 11-18.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC-31 and LOAD scenario file "LC-21 NRC JPM S6" or PERFORM the following:

- **INITIALIZE to IC-18 at 100% power.**
- **EXECUTE malfunction EG16A, Disable DG-1 Breaker 1EG1 Auto Closure.**
- **EXECUTE malfunction EG16B, Disable DG-2 Breaker 1EG2 Auto Closure.**
- **EXECUTE malfunction ED02, Loss of 345 KV Transformer XST1 and RED tag.**
- **CS-1EA1-1, INCOMING BKR 1EA1-1 handswitch in PULLOUT and RED tag.**
- **CS-1EA2-1, INCOMING BKR 1EA2-1 handswitch in PULLOUT and RED tag.**
- **PLACE Simulator in RUN then FREEZE until ready.**

BOOTH OPERATOR NOTE:

- **After each JPM, VERIFY Synchroscope Switch is in any position other than for the 1EG1 Breaker.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-601, Response to a 138/345 KV System Malfunction.**
  - **Section 7.0, Loss of Both Safeguard Buses – MODE 1, 2, 3, or 4.**

EXAMINER NOTE:

During JPM verification it was determined that the plant would continue to operate with both 1E Safeguards Buses deenergized in excess of 10 minutes.

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from ABN-601, Section 7.0.**
Booth Operator:	**When applicant is ready to begin, PLACE Simulator in RUN.**

CAUTION: Loads shall not be placed on offsite power without the TGM Transmission Grid Controller's concurrence.

NOTE: Security card readers are equipped with a one hour battery pack. Entry into areas after this time may require use of hard keys. Security key rings may be obtained from the Key Control Facility (KCF) at the PAP. In addition, loss of normal lighting and ventilation may require use of portable lighting or heat stress equipment while performing local actions.

Perform Step: 1 7.3.1	Verify Reactor – TRIPPED.
Standard:	DETERMINED Reactor is NOT tripped.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Perform Step: 2√ 7.3.1 RNO	Manually trip the Reactor.
Standard:	PLACED 1/1-RTC, RX TRIP BKR Switch **or** 1/1-RT, RX TRIP Switch in TRIP position and VERIFIED the following: • Reactor Trip Breakers - at least one OPEN. • Neutron flux - DECREASING. • All Control Rod position rod bottom lights - ON.
Examiner Cue:	**Another operator will complete actions of EOP-0.0A.** **Continue with actions in accordance with ABN-601, Section 7.0.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3 7.3.2	Verify all RCPs – STOPPED.
Standard:	DETERMINED all Reactor Coolant Pumps are RUNNING.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ 7.3.2 RNO	Manually stop all RCPs.
Standard:	PERFORMED the following: • PLACED 1/1-PCPX1, RCP 1 in STOP (**critical**). • OBSERVED green STOP light LIT (**NOT critical**). • PLACED 1/1-PCPX2, RCP 2 in STOP (**critical**). • OBSERVED green STOP light LIT (**NOT critical**). • PLACED 1/1-PCPX3, RCP 3 in STOP (**critical**). • OBSERVED green STOP light LIT (**NOT critical**). • PLACED 1/1-PCPX4, RCP 4 in STOP (**critical**). • OBSERVED green STOP light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5 7.3.3	Check all Unit 6.9 KV Non-Safeguard Buses - ALL REMAINED ENERGIZED WITH LOADS CONNECTED TO THE BUS
Standard:	PERFORMED the following and DETERMINED all Unit 6.9 KV Non-Safeguard Buses are ENERGIZED: • TURNED VS-1A, 6.9 KV BUS VOLT/FREQ SELECT to 1A1, 1A2, 1A3, and 1A4 positions and OBSERVED V-1A, 6.9 KV NON-SFGD BUS VOLT and F-1A, 6.9 KV NON-SFGD BUS FREQ normal.
Comment:	**SAT ☐ UNSAT ☐**

NOTE:
- With the Diesel Generator Starting Air Receivers fully charged, there is sufficient air pressure for approximately five (5) start attempts.
- Performance of an Emergency Start will allow the diesel generator breaker to automatically close on a phase to ground bus fault (LOR 86-2/uEA1 or 86-2/uEA2). The diesel generator breaker will not automatically close and can not be manually closed on a phase to phase bus fault (LOR 86-1/uEA1 or 86-1/uEA2).
- When a fault exists on the 6.9 KV safeguard bus, the Station Service Water pump will not be running to supply cooling water to the diesel generator. The time this condition exists should be minimized (approximately 15 minutes) to prevent damage to the diesel generator.

Perform Step: 6 7.3.4.a	Restore power to any 6.9 KV Safeguard bus: • Verify DG – RUNNING
Standard:	OBSERVED Train A (B) Emergency Diesel Generator parameters: • V-1EG1(1EG2), DG 1(2) VOLT at 6900 Volts. • F-1EG1(1EG2), DG 1(2) FREQ at 60 Hertz. • CS-1DG1N(1DG2N), DG 1(2) NORM STOP/START red light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 7.3.4.b	Check DG supply breaker – CLOSED • CS-uEG1, DG 1 BKR uEG1 • CS-uEG2, DG 2 BKR uEG2
Standard:	DETERMINED CS-1EG1(1EG2), DG 1(2) BKR 1EG1(1EG2) is OPEN.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8√ 7.3.4.b RNO	Perform the following: • Manually close the supply breaker.
Standard:	PERFORMED the following: • INSERTED Sync Switch into SS-1EG1(1EG2), BKR EG1(EG2) SYNCHROSCOPE and TURNED to ON position (**critical**). • PLACED CS-1EG1(1EG2), DG 1(2) BKR 1EG1(1EG2) in CLOSE (**critical**). • OBSERVED red CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9 7.3.4.c	Check DG voltage – 6900 Volts (6500 - 7100 Volts) • V-uEG1, DG 1 VOLT
Standard:	VERIFIED V-1EG1(1EG2), DG 1(2) VOLT at approximately 6900 Volts.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 10 7.3.4.d	Check DG frequency – 60 Hz (59.9 - 60.1 Hz) • F-uEG1, DG 1 FREQ
Standard:	VERIFIED F-1EG1(1EG2), DG 1(2) FREQ at approximately 60 Hertz.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 11 7.3.4.e	Verify at least one 6.9 KV Safeguard Bus – ENERGIZED.
Standard:	DETERMINED Train A(B) Safeguard Bus 1EA1(1EA2) is ENERGIZED.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is in MODE 1.**
- **ABN-601, Response to a 138/345 KV System Malfunction, is in progress.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **RESPOND to a loss of both 6900 Volt Safeguards Buses per ABN-601, Response to a 138/345 KV System Malfunction, Section 7.0, Loss of Both Safeguards Buses – MODE 1, 2, 3, or 4.**

Facility: CPNPP JPM # NRC S-7 Task # RO4405 K/A # 068.AA1.22 4.0 / 4.3 SF-8

Title: Respond to a Fire in the Safeguards Building

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- ABN-804A, Response to a Fire in the Safeguards Building, is in progress.
- Other operators are performing ABN-804A, Attachments 5 and 6, which include isolation of Letdown flow.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESPOND to a fire in the Safeguards Building per ABN-804A, Response to a Fire in the Safeguards Building, Section 5.0, Fire Affecting Safeguards Building Fire Area 1SD.
- START at Step 5.3.6.

Task Standard: Utilizing ABN-804A, responded to a fire in the Safeguards Building, started the Train B Emergency Diesel Generator, transferred Charging Pump suction to the RWST, started the Train B Centrifugal Charging Pump, and secured Charging flow to the Reactor Coolant System.

Required Materials: ABN-804A, Respond to a Fire in the Safeguards Building, Rev. 5-11.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC-18 and LOAD scenario file "LC-21 NRC JPM S7" or PERFORM the following:

- **ALARM ON for these Safeguards Fire Protection Panel annunciators:**
  - **AFP09_16 for Window 4.2 – 810' SWGR RM TRN A.**
  - **AFP09_17 for Window 5.2 – 810' SWGR RM TRN A WTR FLO.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-804A, Response to a Fire in the Safeguards Building.**
  - **Section 5.0, Fire Affecting Safeguards Building Fire Area 1SD.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following is from ABN-804A, and Section 5.0, Step 5.3.6.**
Perform Step: 1√ 5.3.6 & bullet	Perform an emergency start on Trn B Diesel Generator: • CS-1DG2E, DG 2 EMER STOP/ START – START
Standard:	PERFORMED the following: • PLACED CS-1DG2E, DG 2 EMER STOP/ START switch in START (**critical**). • OBSERVED V-1EG2, DG 2 VOLTS at ~6900 Volts (**NOT critical**). • OBSERVED F-1EG2, DG 2 FREQ at 60 Hertz (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√ 5.3.7	Place 1/1-APRH 1, RHRP 1 – PULL OUT
Standard:	PERFORMED the following: • PLACED 1/1-APRH 1, RHRP 1 in PULLOUT (**critical**). • OBSERVED red FAN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√ 5.3.8	CLOSE 1/1-8812A, RWST TO RHRP 1 SUCT VLV
Standard:	PERFORMED the following: • PLACED 1/1-8812A, RWST TO RHRP 1 SUCT VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ 5.3.9	CLOSE 1/1-8100, RCP SEAL WTR RET ISOL VLV
Standard:	PERFORMED the following: • PLACED 1/1-8100, RCP SEAL WTR RET ISOL VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Either 1/1-LCV-112D OR 1/1-LCV-112E can be opened.**
Perform Step: 5√ 5.3.10 & 5.3.10.a	Transfer Charging Pump suction to the RWST : • Ensure 1/1-LCV-112D OR 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV – OPEN.
Standard:	PERFORMED ONE of the following: • PLACED 1/1-LCV-112D, RWST TO CHRG PMP SUCT VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**). **OR** • PLACED 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Both 1/1-LCV-112B AND 1/1-LCV-112C must be closed.**
Perform Step: 6√ 5.3.10 & 5.3.10.b	Transfer Charging Pump suction to the RWST : • Ensure 1/1-LCV-112B AND 1/1-LCV-112C, VCT TO CHRG PMP SUCT VLV - CLOSED.
Standard:	PERFORMED BOTH of the following: • PLACED 1/1-LCV-112B, VCT TO CHRG PMP SUCT VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**). **AND** • PLACED 1/1-LCV-112C, VCT TO CHRG PMP SUCT VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 5.3.10 & 5.3.10.c	Transfer Charging Pump suction to the RWST : • Verify 1-ZL-8220 AND 1-ZL-8221, CHRG PMP SUCT HI POINT VENT VLV - CLOSED.
Standard:	OBSERVED 1-ZL-8220 **and** 1-ZL-8221, CHRG PMP SUCT HI POINT VENT VLVs green CLOSE lights LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8 5.3.10 & 5.3.10.d	Transfer Charging Pump suction to the RWST : • Ensure 1/1-8202A AND 1/1-8202B, VENT VLV – CLOSED.
Standard:	VERIFIED 1/1-8202A **and** 1/1-8202B, VENT VLVs in CLOSE and OBSERVED green CLOSE lights LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9√ 5.3.11	Ensure 1/1-APCH2, CCP 2 – RUNNING.
Standard:	PERFORMED the following: • PLACED 1/1-APCH2, CCP 2 in START (**critical**). • OBSERVED red PUMP and FAN lights LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Applicant may be hesitant to isolate Charging flow with Letdown still in service, therefore, provide the following cue as stated in the Initial Conditions.**
Examiner Cue:	**Another operator is locally isolating Letdown flow.**
Perform Step: 10√ 5.3.12	CLOSE 1/1-8105, CHRG PMP TO RCS ISOL VLV.
Standard:	PERFORMED the following: • PLACED 1/1-8105, CHRG PMP TO RCS ISOL VLV in CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **ABN-804A, Response to a Fire in the Safeguards Building, is in progress.**
- **Other operators are performing ABN-804A, Attachments 5 and 6, which include isolation of Letdown flow.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **RESPOND to a fire in the Safeguards Building per ABN-804A, Response to a Fire in the Safeguards Building, Section 5.0, Fire Affecting Safeguards Building Fire Area 1SD.**
- **START at Step 5.3.6.**

Facility: CPNPP JPM # NRC S-8 Task # RO4006 K/A # 060.AA2.05 3.7 / 4.2 SF-9

Title: Perform a Containment Pressure Reduction

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- A Containment pressure reduction is required.
- All applicable Containment Ventilation System permits have been processed and the Prerequisites of SOP-801A, Containment Ventilation System, Section 2.6, have been met.
- The Unit Supervisor has completed all applicable steps associated with the Release Permit and the Permit is approved.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- PLACE the Containment Pressure Relief System in operation per SOP-801A, Containment Ventilation System.
- START at Step 5.6.5.B

Task Standard: Utilizing SOP-801A, commenced a Containment pressure reduction then isolated the release per ALM-0032A due to high radiation.

Required Materials: SOP-801A, Containment Ventilation System, Rev. 14.
ALM-0032A, 1-ALB-3B, Window 4.1, Rev. 7-10.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

BOOTH OPERATOR:

INITIALIZE to IC-34 and LOAD scenario file "LC-21 NRC JPM S8" or PERFORM the following:

- **OVERRIDE 1-PI-5470A & 1-PI-5470B, Containment Pressure Narrow Range indications to 1.1 psig on CB03 as follows:**
  - **SET CHR12A, Permissive to Change Containment Pressure to ON.**
  - **SET CHR12, Change Containment Pressure to 1.1 PSIG.**
  - **SET CHR12A, Permissive to Change Containment Pressure to OFF.**
- **EXECUTE remote function RMR02 to OFF (maintains 1-HV-5548 & 5549 OPEN).**
- **EXECUTE malfunction RM197, 1-RE-5503 / CAG-197, PRM Radiation Monitor Failure @ $1E^6$ 30 seconds after 1-HV-5548 is OPEN.**
- **EXECUTE remote function AN3B_4 to ALARM 1-ALB-03B-4.1, CNTMT AIR RAD HI when malfunction is activated with 45 second time delay.**
- **EXECUTE malfunction RP18C, Manual Containment Ventilation Isolation failure.**
- **ENSURE PC-11 is RESET and CAG-197 is green.**
- **ALIGN PC-11, Digital Radiation Monitoring System to Grid #2.**
- **HANG the CONTAINMENT VENT IN PROGRESS sign on CB02.**

BOOTH OPERATOR NOTE:

- **After each JPM, ENSURE PC-11 is reset and CAG197 is green.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **SOP-801A, Containment Ventilation System.**
  - **INITIALS and N/As as appropriate up to Step 5.6.5.B.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SOP-801A, Step 5.6.5.B.**
Perform Step: 1 5.6.5.B	LOG the time the containment vent is started.
Standard:	RECORDED start time of Containment vent in SOP-801A or DIRECTED the Unit Supervisor to log the start time in the release package.
Examiner Cue:	**If contacted as the Unit Supervisor, REPORT that the start time has been recorded in the release package.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√ 5.6.5.C	OPEN 1-HS-5574, AIR PRG EXH DMPR.
Standard:	PERFORMED the following: • PLACED 1-HS-5574, AIR PRG EXH DMPR to OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√ 5.6.5.D	OPEN 1-HS-5549, CNTMT PRESS RLF ISOL VLV.
Standard:	PERFORMED the following: • PLACED 1-HS-5549, CNTMT PRESS RLF ISOL VLV to OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ 5.6.5.E	OPEN 1-HS-5548, CNTMT PRESS RLF ISOL VLV.
Standard:	PERFORMED the following: • PLACED 1-HS-5548, CNTMT PRESS RLF ISOL VLV to OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5 5.6.5.F	Verify containment pressure has been reduced to within the limits specified in Section 4.0.
Standard:	DETERMINED Containment pressure is lowering by OBSERVING the following Containment pressure indications: • 1-PI-5470A, CNTMT PRESS (NR) on CB03. • 1-PI-5470b, CNTMT PRESS (NR) on CB03.
Comment:	**SAT ☐ UNSAT ☐**

Booth Operator:	**EXECUTE malfunction RM197, PRM Radiation Monitor failure.**
Perform Step: 6	RECOGNIZE Annunciator in alarm.
Standard:	ACKNOWLEDGED and RESPONDED to Annunciator 1-ALB-3B, Window 4.1 – CNTMT AIR RAD HI.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Due to ESFAS automatic actions associated with this alarm, the applicant may immediately isolate valves listed in Perform Steps 9 and 10.**
Examiner Note:	**The following steps are from ALM-0032A, 1-ALB-3B, Window 4.1 – CNTMT AIR RAD HI.**

NOTE: Containment Ventilation Isolation may be reset after this alarm is illuminated. This will allow Containment to be purged, if desired, with radiation levels above setpoint.

Perform Step: 7 1 & 1st bullet	VERIFY the alarm on PC-11: • CAG-197, GASEOUS
Standard:	PERFORMED the following at PC-11: • DEPRESSED F7 then 197 then ENTER. • OBSERVED high radiation on 1-RE-5503, CNTMT AIR PIG GAS, CAG-197.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8 2 & bullets	Verify Containment Ventilation Isolation has occurred. (1-CB-02) • 1-MLB-45A, SI/CNTMT VENT ISOL • 1-MLB-45B, SI/CNTMT VENT ISOL
Standard:	DETERMINED Containment Ventilation Isolation has NOT occurred on 1-MLB-45A, SI/CNTMT VENT ISOL or 1-MLB-45B, SI/CNTMT VENT ISOL and OBSERVED 1-HV-5548 and 1-HV-5549 green lights DARK and green lights for remaining CVI valves LIT.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Examiner Note:	**At this point the applicant can reference either SOP-801A or 1-ALB-03B to perform Containment Ventilation Isolation actions.**
Perform Step: 9√ 2.A	If Containment Ventilation Isolation is NOT complete, manually align components as necessary.
Standard:	PERFORMED the following: • PLACED 1-HS-5548, CNTMT PRESS RLF ISOL VLV to CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 10√ 2.A	If Containment Ventilation Isolation is NOT complete, manually align components as necessary.
Standard:	PERFORMED the following: • PLACED 1-HS-5549, CNTMT PRESS RLF ISOL VLV to CLOSE (**critical**). • OBSERVED green CLOSE light LIT (**NOT critical**).
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **A Containment pressure reduction is required.**
- **All applicable Containment Ventilation System permits have been processed and the Prerequisites of SOP-801A, Containment Ventilation System, Section 2.6, have been met.**
- **The Unit Supervisor has completed all applicable steps associated with the Release Permit and the Permit is approved.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **PLACE the Containment Pressure Relief System in operation per SOP-801A, Containment Ventilation System.**
- **START at Step 5.6.5.B**

Facility: CPNPP JPM # NRC P-1 Task # RO5112 K/A # 004.A4.01 4.1/ 3.9 SF-2

Title: Perform Actions to Restart Positive Displacement Pump

Examinee (Print): _____

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	X
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions on Unit 2:

- ABN-301, Instrument Air System Malfunction, is in progress.
- Restart of the Positive Displacement Charging Pump (PDP) is required to re-establish Charging flow.
- Boron concentration and T_{AVE} have not changed.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESET control air to the Unit 2 PDP Fluid Drive per ABN-301, Instrument Air System Malfunction, Step 3.3.4.n.
- RESTORE the Unit 2 PDP to operation per SOP-103B, Chemical and Volume Control System, Section 5.3.1, Positive Displacement Pump Startup.
- START at Step 5.3.1.E.

Task Standard: Utilizing SOP-103B, reset the PDP per ABN-301 and prepared PDP for restart per SOP-103B.

Required Materials: ABN-301, Instrument Air System Malfunction, Rev. 12.

SOP-103B, Chemical and Volume Control System, Rev. 12-26.

Validation Time: 20 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

PLANT SETUP

EXAMINER:

PROVIDE examinee with a copy of:

- **ABN-301, Instrument Air System Malfunction.**
  - **Step 3.3.4.n.**
- **SOP-103B, Chemical and Volume Control System, Sections 2.5 and 5.3.1 for Unit 2.**
  - **INITIAL and N/A Steps as appropriate up to Step 5.3.1.E.**
- **Flashlight for Charging Pump Remote Operator Room.**

EXAMINER NOTE:

This JPM will be performed on Unit 2 due to access restrictions in Unit 1.

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following step is from ABN-301, Step 3.3.4.n.**
Perform Step: 1√ 3.3.4.n	Reset air to PDP hydraulic speed changer by pushing the brass button on the P/A Converter.
Standard:	DEPRESSED brass control air RESET button on P/A Converter located atop Positive Displacement Pump Fluid Drive in PDP Room.
Examiner Cue:	**The button is recessed.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SOP-103B, Step 5.3.1.E.**
NOTE: If the Stuffing Box Coolant Tank is overfilled, the PDP Charging Pump Room will become contaminated.	
Perform Step: 2 5.3.1.E	IF Stuffing Box Coolant Tank is low, THEN fill per the following steps:
Standard:	OBSERVED Stuffing Box Coolant Tank sightglass level.
Examiner Cue:	**The sight glass is EMPTY. Another operator will monitor sight glass level as the tank is filled.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Fill Valve is located in the Charging Pump Remote Operator Room.**
Perform Step: 3√ 5.3.1.E.1)	Slowly crack OPEN 2CS-0119, PD PMP 2-01 STUFFING BOX COOLANT TK MU ISOL VLV until desired fill rate is achieved.
Standard:	Slowly CRACKED OPEN 2CS-0119, PD PMP 2-01 STUFFING BOX COOL TK MU ISOL VLV, until desired fill rate is achieved.
Examiner Cue:	**The PDP operator reports sight glass is half-full.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ 5.3.1.E.2)	When the desired tank level has been established, CLOSE 2CS-0119.
Standard:	CLOSED 2-CS-0119, PD PMP 2-01 STUFFING BOX COOL TK MU ISOL VLV when level is OBSERVED in the Stuffing Box Coolant Tank.
Examiner Cue:	**The valve is rotated fully clockwise.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The remote operator is located in the Charging Pump Remote Operator Room. Unit 2 covers are <u>yellow</u>.**
Perform Step: 5√ 5.3.1.F	Ensure 2-8388-RO, PD CHRG PMP 2-01 DISCH VLV RMT OPER is OPEN.
Standard:	PERFORMED the following in the Charging Pump Remote Operator Room: • REMOVED the yellow cover for 2-8388-RO, PD CHRG PMP 2-01 DISCH VLV RMT OPER. • LOCATED a Remote Operator hand tool for 2-8388-RO. • PLACED hand tool on 2-8388-RO and TURNED in clockwise direction a small amount. • TURNED 2-8388-RO in the counter clockwise direction until operator will not turn, indicating valve is fully opened. • TURNED 2-8388-RO in the clockwise direction at least ¼ turn but no more than 1 turn to move off backseat.
Examiner Cue:	**When initially turned clockwise, REPORT valve is turning.** **When returned to full-open position, REPORT valve will not move.** **When taken off backseat, REPORT valve is turning.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6 5.3.1.G	OPEN the following valves: • 1/2-8202A, VENT VLV (MCB) • 1/2-8202B, VENT VLV (MCB)
Standard:	CONTACTED the Control Room to ENSURED 1/2-8202A <u>and</u> 1/2-8202B, VENT VLVs are OPEN.
Terminating Cue:	**The Control Room reports vent valves OPEN. This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions on Unit 2:**

- **ABN-301, Instrument Air System Malfunction, is in progress.**
- **Restart of the Positive Displacement Charging Pump (PDP) is required to re-establish Charging flow.**
- **Boron concentration and T_{AVE} have not changed.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **RESET control air to the Unit 2 PDP Fluid Drive per ABN-301, Instrument Air System Malfunction, Step 3.3.4.n.**
- **RESTORE the Unit 2 PDP to operation per SOP-103B, Chemical and Volume Control System, Section 5.3.1, Positive Displacement Pump Startup.**
- **START at Step 5.3.1.E.**

Facility: CPNPP JPM # NRC P-2 Task # RO1818 K/A # G 2.1.30 4.4 / 4.0 SF-7

Title: Respond to Loss of Source Range Instrumentation

Examinee (Print): _____

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	X
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is in MODE 3 with no Reactor Coolant Pumps running.
- ABN-701, Source Range Instrument Malfunction, is in progress.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following on Unit 2:

- PERFORM actions to isolate dilution flowpaths per ABN-701, Source Range Instrument Malfunction, Attachment 1, Actions Required When SR Instrumentation Cannot Be Restored.
- START at Step 6.

Task Standard: Utilizing ABN-701, isolated potential dilution flow paths per Attachment 1.

Required Materials: ABN-701, Source Range Instrument Malfunction, Rev. 11-3.

Validation Time: 15 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

PLANT SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-701, Source Range Instrument Malfunction.**
  - **Attachment 1, Actions Required When SR Instrumentation Cannot Be Restored.**
- **Flashlight.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from ABN-701, Attachment 1, Step 6.**
Perform Step: 1 6	IF NO RCP is running in MODE 3, MODE 4 or MODE 5, THEN perform the following as required:
Standard:	DETERMINED no Reactor Coolant Pumps are running per the Initial Conditions.
Examiner Cue:	**Another operator will independently verify position and hang tags.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Valve is located in the Charging Pump Remote Operator Room.**
Perform Step: 2 6.a & 1st bullet	CLOSE and TAG the following valves to prevent inadvertent dilution of the RCS: • uCS-8455, RMUW TO CVCS BA BLNDR u-01 UPSTRM ISOL VLV
Standard:	PERFORMED the following: • ROTATED 2CS-8455, RMUW TO CVCS BA BLNDR 2-01 UPSTRM ISOL VLV handwheel in the clockwise direction.
Examiner Cue:	**Valve handle turns freely, valve stem will not move.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Valve is located in the Charging Pump Remote Operator Room.**
Perform Step: 3√ 6.a & 2nd bullet	CLOSE and TAG the following valves to prevent inadvertent dilution of the RCS: • uCS-8560-RO, Uu CVCS CHRG PMP SUCT MU ISOL VLV RMT OPER
Standard:	PERFORMED the following: • ROTATED 2CS-8560-RO, U2 CVCS CHRG PMP SUCT MU ISOL VLV RMT OPER handwheel in the clockwise direction.
Examiner Cue:	**Remote operator has rotated fully clockwise and stopped.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Valve is located in the Charging Pump Remote Operator Room.**
Perform Step: 4√ 6.a & 3rd bullet	CLOSE and TAG the following valves to prevent inadvertent dilution of the RCS: • uCS-8439-RO, Uu CVCS CHRG PMP EMER BORATE MAN VLV RMT OPER
Standard:	PERFORMED the following: • ROTATED 2CS-8439-RO, U2 CVCS CHRG PMP EMER BORATE MAN VLV RMT OPER handwheel in the clockwise direction.
Examiner Cue:	**Remote operator has rotated fully clockwise and stopped.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Valve is located in the Charging Pump Remote Operator Room.**
Perform Step: 5√ 6.a & 4th bullet	CLOSE and TAG the following valves to prevent inadvertent dilution of the RCS: • uCS-8441, Uu RMUW TO EMER BORATE FLSH VLV
Standard:	PERFORMED the following: • ROTATED 2CS-8441, U2 RMUW TO EMER BORATE FLSH VLV handwheel in the clockwise direction.
Examiner Cue:	**Handwheel has rotated fully clockwise and stopped.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Valve is located in the Charging Pump Remote Operator Room.**
Perform Step: 6√ 6.a & 5th bullet	CLOSE and TAG the following valves to prevent inadvertent dilution of the RCS: • uCS-8453, CVCS CHEM MIX TK u-01 ISOL VLV
Standard:	PERFORMED the following: • ROTATED 2CS-8453, CVCS CHEM MIX TK 2-01 ISOL VLV handwheel in the clockwise direction.
Examiner Cue:	**Handwheel has rotated fully clockwise and stopped.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Guidance for manually operating an air operated Flow Control Valve is contained in OWI-206, Guidelines for Operation of Manual and Power Operated Valves, Step 6.3.2.G.**
Examiner Note:	**Valve is located in the VCT Valve Room 2-090, Elev. 832'.**
Perform Step: 7√ 6.a & 6th bullet	CLOSE and TAG the following valves to prevent inadvertent dilution of the RCS: • u-FCV-0111B, RCS MU TO VCT u-01 ISOL VLV
Standard:	PERFORMED the following: • CLOSED 2-FCV-0111B-AS1, RCS MU TO VCT 2-01 ISOL VLV AS in the clockwise direction. • OPENED Pressure Regulator Petcock Valve on bottom of 2-FCV-0111B-PRI, RCS MU TO VCT 2-01 ISOL VLV PRESS REG, in the counterclockwise direction. • OBSERVED pressure gauge on 2-FCV-0111B bleeds to 0 psig. • OBSERVED 2-FCV-0111B, RCS MU TO VCT 2-01 ISOL VLV moving to closed position.
Terminating Cue:	**Air supply valve handwheel has rotated fully clockwise and stopped. Petcock Valve rotated fully counterclockwise and stopped. Pressure gauge indicates 0 psig and Air Operated Valve is closed. This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is in MODE 3 with no Reactor Coolant Pumps running.**
- **ABN-701, Source Range Instrument Malfunction, is in progress.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following on Unit 2:**

- **PERFORM actions to isolate dilution flowpaths per ABN-701, Source Range Instrument Malfunction, Attachment 1, Actions Required When SR Instrumentation Cannot Be Restored.**
- **START at Step 6.**

Facility: CPNPP JPM # NRC P-3 Task # RO5115 K/A # 068.AA1.01 4.3 / 4.5 SF-4P

Title: Control Transfer of Steam Generator Atmospheric Relief Valves

Examinee (Print): _____

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	X
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 Control Room has been evacuated due to a toxic gas.
- Manual control of the Steam Generator Atmospheric Relief Valves is required at the Remote Shutdown Panel.
- An operator has been dispatched to transfer connections in Unit 2 Junction Box JB2S-1053O.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- ALIGN Steam Generator Atmospheric Relief Valves to the Remote Shutdown Panel per ABN-905B, Loss of Control Room Habitability, Attachment 9, Control Transfer of Steam Generator Atmospheric Relief Valves.
- TRANSFER connections in Unit 2 Junction Box JB2S-1051G.

Task Standard: Utilizing ABN-905B, transferred control of the Steam Generator Atmospheric Relief Valves to the Remote Shutdown Panel.

Required Materials: ABN-905B, Loss of Control Room Habitability, Rev. 4-9.

Validation Time: 10 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

PLANT SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-905B, Loss of Control Room Habitability.**
  - **Attachment 9, Control Transfer of Steam Generator Atmospheric Relief Valves.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from ABN-905B, Attachment 9.**
NOTE: Tools needed to open the following junction boxes are located in the Safe Shutdown Repair Kit (located in the SFGD 790 N-S Hallway across from Chem Add Tank Area).	
Perform Step: 1 1	Obtain RSP manual control of SG Atmos Rlf valves as follows:
Standard:	TRANSITED to SFGD 852', SG High Pressure Feed Area and LOCATED junction boxes JB2S-1051G and JB2S-1276 on the wall.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Junction boxes should be opened to allow applicant to describe their actions.**
Examiner Note:	**Junction box JB2S-1051G is located above JB2S-1276.**
Perform Step: 2√ 1.a, & 2nd bullet	Open appropriate junction boxes: • JB2S-1276 JB2S-1051G SFGD 852 SG High Pressure Chemical Feed Area (W. wall)
Standard:	PERFORMED the following: • Using crescent wrench or similar tool, LOOSENED junction box cover hold down tabs. • OPENED JB2S-1051G and JB2S-1276.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The disconnect switches are toggled between ON (red on top) and OFF (red on bottom). There is no other labeling.**
Perform Step: 3√ 1.b	Place disconnect switches in OFF.
Standard:	PLACED both disconnect switches inside JB2S-1051G in OFF position.
Examiner Cue:	**The disconnect switches are toggled such that red is showing on the bottom.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ 1.c	Route cable through conduit from junction box listed under CONNECTOR to junction box listed under SWITCHES.
Standard:	ROUTED connector cable from the lower junction box (JB2S-1276) through conduit to the upper junction box (JB2S-1051G).
Examiner Cue:	**The cable is routed to the upper junction box.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5√ 1.d	Connect prefabricated connector.
Standard:	ALIGNED the male and female ends of the connector and SECURED.
Examiner Cue:	**The cable ends are aligned and secured.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6 1.e	Close junction boxes.
Standard:	PERFORMED the following: • CLOSED the junction box doors JB2S-1051G and JB2S-1276. • SLID the junction box cover hold down tabs. • TIGHTENED tabs using crescent wrench or similar tool.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 Control Room has been evacuated due to a toxic gas.**
- **Manual control of the Steam Generator Atmospheric Relief Valves is required at the Remote Shutdown Panel.**
- **An operator has been dispatched to transfer connections in Unit 2 Junction Box JB2S-1053O.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **ALIGN Steam Generator Atmospheric Relief Valves to the Remote Shutdown Panel per ABN-905B, Loss of Control Room Habitability, Attachment 9, Control Transfer of Steam Generator Atmospheric Relief Valves.**
- **TRANSFER connections in Unit 2 Junction Box JB2S-1051G.**

Appendix D	Scenario Outline	Form ES-D-1

Facility:	CPNPP 1 & 2	Scenario No.:	1	Op Test No.:	April 2013 NRC
Examiners:		Operators:			

Initial Conditions: 100% power MOL - RCS Boron is 908 ppm (by sample).

Turnover: Maintain steady-state power conditions.

Critical Tasks:
- Control Pressurizer Pressure to Avoid RPS or ESFAS Actuation per ABN-705, Pressurizer Pressure Malfunction.
- Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-708, Feedwater Flow Instrument Malfunction.
- Identify and Isolate the Faulted Steam Generator Prior to Exiting EOP-2.0A, Faulted Steam Generator Isolation.

Event No.	Malf. No.	Event Type*	Event Description
1 +10 min	RX08A	I (RO, SRO) TS (SRO)	Pressurizer Pressure Channel (PT-455) Fails Low.
2 +20 min	RX02A	I (BOP, SRO)	Steam Generator (1-01) Steam Flow Instrument (FT-512) Fails High.
3 +25 min	CV31A	C (RO, SRO) TS (SRO)	Centrifugal Charging Pump (1-01) Sheared Shaft.
4 +40 min	FW22	R (RO) N (BOP, SRO) TS (SRO)	Low Pressure Feedwater Heater Bypass Valve (PV-2286) Fails Open.
5 +45 min	FW25A	M (RO, BOP, SRO)	Feedwater Line Leak to Steam Generator (1-01) Outside Containment After Feedwater Isolation Valve (600 second ramp).
6 +50 min	CS02F CS02H	C (RO)	Train B Containment Spray Pumps 1-02 & 1-04 Safety Injection Sequencer Start Failure.
7 +50 min	FW38A OVRDE	I (BOP)	Steam Generator 1-01 Feedwater Isolation Valve (HS-2134) Actuation Failure.

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

Actual	Target Quantitative Attributes
7	Total malfunctions (5-8)
2	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
1	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

SCENARIO SUMMARY NRC #1

The crew will assume the watch at 100% power with no scheduled activities per IPO-003A, Power Operations. The first event is a Pressurizer Pressure Channel (PT-455) that fails low. The crew will enter ABN-705, Pressurizer Pressure Malfunction, Section 2.0, place the Pressurizer Master Pressure Controller in MANUAL, transfer to an Alternate Channel, and restore Pressurizer Pressure Control to AUTO. The SRO will refer to Technical Specifications.

The next event is a high failure of Steam Generator (1-01) Steam Flow Instrument, FT-512. Operator actions are per ABN-707, Steam Flow Instrument Malfunction, Section 2.0. The crew must manually control Steam Generator level, transfer to an Alternate Channel, and restore Steam Generator (SG) Feedwater Flow Control to AUTO.

The next event is a sheared shaft of the running Centrifugal Charging Pump (CCP). When low flow alarms are received, the initial operator actions of ABN-105, Chemical and Volume Control System Malfunction, Section 3.0, will be performed (start the standby CCP). Any delay in determining the cause of the low Charging flow will result in the isolation of Letdown which will be restored prior to proceeding. The SRO will refer to Technical Specifications.

When Technical Specifications have been referenced, the Low Pressure Heater Bypass Valve fails open. Entry into ABN-302, Feedwater, Condensate, Heater Drain System Malfunction, Section 7.0, is required and Rod Control is returned to AUTO and a Manual Turbine Runback to 900 MWe is performed. During this event, Control Rod position may drop below the Rod Insertion Limit (RIL) and when informed, the SRO will refer to Technical Specifications.

When plant conditions are stable, a Feed Line Break will commence on a 600 second ramp outside Containment downstream of Steam Generator (SG) 1-01 Feed Line Isolation Valve HS-2134. The crew will observe lowering Pressurizer pressure and level and manually initiate a Reactor Trip and Safety Injection. EOP-0.0A, Reactor Trip or Safety Injection, is entered and actions implemented until it is determined that SG 1-01 pressure is lower than the other Steam Generators and a transition into EOP-2.0A, Faulted Steam Generator Isolation, is performed.

The scenario includes a Feedwater Isolation Signal actuation failure on HS-2134, Main Feedwater Line Isolation Valve which fails to close when the P-4 interlock is satisfied. Additionally, the Train B Containment Spray Pumps must be manually started due to a Safety Injection Sequencer failure.

This scenario is terminated when the Faulted Steam Generator is identified and isolated per EOP-2.0A and Letdown flow is established per EOS-1.1A, Safety Injection Termination.

Risk Significance:

- Failure of risk important system prior to trip: Centrifugal Charging Pump Trip
- Risk significant core damage sequence: Feed Line Break Outside Containment
- Risk significant operator actions: Manually Initiate Turbine Runback
  Start Train B Containment Spray Pumps
  Isolate Faulted Steam Generator
  Terminate Safety Injection Flow

Scenario Event Description
NRC Scenario #1

BOOTH OPERATOR INSTRUCTIONS for SIMULATOR SETUP

Initialize to IC #18 and LC21 NRC Scenario 1.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP		CS02F CS02H	Train B Containment Spray Pumps 1-02 & 1-04 SI Sequencer Start Failure	FAIL	K0 Reactor Trip
		FW38A	Main Feedwater Line Isolation Valve (HV-2134) Failure	OPEN	K0 Reactor Trip
1		RX08A	PRZR Pressure Transmitter (PT-455) Failure	1700 PSIG	K1
2		RX02A	SG (1-01) Steam Flow (FT-512) Failure	$5E^6$ lbm/hr	K2
3		CV31A	Centrifugal Charging Pump (1-01) Sheared Shaft	FAIL	K3
3	CVR05		CCP (1-01) Auxiliary Lube Oil Pump	OFF	K11
3	CVR06		CCP (1-02) Auxiliary Lube Oil Pump	AUTO	K11
4		FW22	LP Feedwater Heater Bypass Valve Failure	OPEN	K4
5		FW25A	Feed Line Break Outside Containment	$1E^7$ lbm/hr	K5 (600 sec. ramp)
6		CS02F CS02H	Train B Containment Spray Pumps 1-02 & 1-04 SI Sequencer Start Failure	FAIL	K0 Reactor Trip
7		FW38A	Main Feedwater Line Isolation Valve (HV-2134) Failure	OPEN	K0 Reactor Trip
7			HV-2134 Closes with Handswitch {DIFWHS2134 Value=1} DMF FW38A f:1	CLOSE	-

Scenario Event Description
NRC Scenario #1

Booth Operator: **INITIALIZE to IC #18 and LC21 NRC Scenario 1.**
ENSURE all Simulator Annunciator Alarms are ACTIVE.
ENSURE all Control Board Tags are removed.
ENSURE Operator Aid Tags reflect current boron conditions.
ENSURE Rod Bank Update (RBU) is performed.
ENSURE Turbine Load Rate set at 10 MWe/minute.
ENSURE 60/90 buttons DEPRESSED on ASD.
ENSURE ASD speakers are ON to half volume.
ENSURE Reactivity Briefing Sheet printout provided with Turnover.
ENSURE procedures in progress are on SRO desk:
- **COPY of IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load.**

ENSURE Control Rods are in AUTO with Bank D at 215 steps.

Control Room Annunciators in Alarm:

PCIP-1.1 – SR TRN A RX TRIP BLK
PCIP-1.2 – IR TRN A RX TRIP BLK
PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9
PCIP-1.6 – RX ≥ 10% PWR P-10
PCIP-2.1 – SR TRN B RX TRIP BLK
PCIP-2.2 – IR TRN B RX TRIP BLK
PCIP-2.5 – SR RX TRIP BLK PERM P-6
PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK
PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK

Operating Test :	NRC	Scenario #	1	Event #	1	Page	5	of	31
Event Description:	Pressurizer Pressure Channel Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 1 (Key 1). - RX08A, Pressurizer Pressure Channel (PT-455) fails low.		
Indications Available: **5B-3.4 – PRZR 1 OF 4 PRESS LO** **5B-4.4 – PRZR 1 OF 4 SI PRESS LO** **5C-3.3 – PRZR PRESS LO BACKUP HTRS ON** **5C-2.5 – 1 of 4 OT N16 HI** **1-PI-455A,PRZR PRESS CHAN I indication failed high**		
+1 min	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE PRZR pressure channel PI-455A has failed low.
	US	DIRECT performance of ABN-705, Pressurizer Pressure Malfunction, Section 2.0.
Examiner Note: Diamond steps (◊) are Initial Operator Actions.		
NOTE: • Diamond steps denote initial action. • A PORV is not considered INOPERABLE when its actuation instrumentation is not functioning. • Power should NOT be removed from a block valve closed in accordance with this procedure section.		
	◊ RO ◊	VERIFY PORV – CLOSED. [Step 2.3.1 - YES]
CRITICAL TASK STATEMENT		**Control Pressurizer Pressure to Avoid RPS or ESFAS Actuation per ABN-705, Pressurizer Pressure Malfunction.**
CRITICAL TASK	◊ RO ◊	PLACE 1-PK-455A, PRZR MASTER PRESS CTRL in MANUAL. [Step 2.3.2 - YES]
	◊ RO ◊	ADJUST 1-PK-455A for current RCS pressure. [Step 2.3.3 - YES]

Operating Test :	NRC	Scenario #	1	Event #	1	Page	6	of	31
Event Description:	Pressurizer Pressure Channel Failure								

Time	Position	Applicant's Actions or Behavior
	RO	TRANSFER 1/1-PS-455F, PRZR PRESS CTRL CHAN SELECT to an Alternate Controlling Channel. [Step 2.3.4 - YES]
	RO	PLACE 1-PK-455A, PRZR MASTER PRESS CTRL in AUTO. [Step 2.3.5 - YES]
	RO	VERIFY automatic control restoring Pressurizer pressure to 2235 psig. [Step 2.3.6 - YES]
	RO	ENSURE valid channel to recorder 1/1-PS-455G, 1-PR-455 PRZR PRESS SELECT. [Step 2.3.7 - YES]
	RO	ENSURE 1/1-PCV-455A, PRZR PORV in AUTO. [Step 2.3.8 - YES]
	RO	ENSURE 1/1-8000A, PRZR PORV BLK VLV in OPEN position. [Step 2.3.9 - YES]
	US/RO	Within one hour, VERIFY PCIP Window 2.6 - PRZR PRESS SI BLK PERM P-11 – DARK. [Step 2.3.10 - YES]
	US/RO	VERIFY other instruments on common instrument line - NORMAL. [Step 2.3.11 - YES]
		• VERIFY Loop 1 Instruments LT-459 responding normally per Attachment 1.

Operating Test :	NRC	Scenario #	1	Event #	1	Page	7	of	31
Event Description:	Pressurizer Pressure Channel Failure								

Time	Position	Applicant's Actions or Behavior
		NOTE: • If the failed channel temperature was reading lower than the substituted channel, then AVE Tave will increase when the channel is defeated due to another channel being substituted for the defeated signal to maintain accurate averaging. • Rod Control is not required to be placed in MANUAL until a Tave loop is defeated using u-TS-412T. As long as a Tave loop is defeated, Rod Control should remain in MANUAL. This does not preclude placing rods in AUTO during rapidly changing transient conditions such as runbacks, etc. as long as rod control is returned to MANUAL when the plant is stabilized. The affected Tave loop does not need to be defeated until just prior to tripping bistables (tripping bistables will cause the N16 and Tave loop to fail low).
		Examiner Note: The next two (2) steps are only performed following I&C maintenance.
		Within 72 hours, PERFORM the following: [Step 2.3.12 - YES]
		• PLACE 1/1-RBSS, CONTROL ROD BANK SELECT in MANUAL. [Step 2.3.12.a - YES]
		• SELECT the failed channel on following switches: [Step 2.3.12.b - YES]
		• 1-TS-412T, T_{AVE} CHAN DEFEAT • 1/1-JS-411E, N16 PWR CHAN DEFEAT
		• ENSURE valid N16 channel is supplying recorder: [Step 2.3.12.c - YES]
		• 1/1-TS-411E, 1-TR-411 CHAN SELECT
		• CONTACT I&C to place bistable test switches for PT-455 in CLOSE. [Step 2.3.12.d - YES]
		VERIFY appropriate alarms and trip status lights ON per Attachment 4. [Step 2.3.13 - YES]
		• OBSERVE TSLB-1, Window 1.7 – PRZR PRESS LO PB-455D is LIT.
		• OBSERVE TSLB-5, Window 1.2 – PRZR PRESS LO PB-455C is LIT.
		• OBSERVE TSLB-5, Window 1.8 – RC LOOP 1 OT N16 TB-411C is LIT.
		• OBSERVE TSLB-9, Window 1.4 – OT N16 ROD STOP & TURB RUNBACK TB-411D is LIT.

Operating Test : NRC	Scenario # 1	Event # 1	Page 8 of 31
Event Description: Pressurizer Pressure Channel Failure			

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Specifications. [Step 2.3.14 - YES]
		• LCO 3.3.1.E, Reactor Trip System Instrumentation (Function 6, Overtemperature N-16 & 8.b, Pressurizer Pressure High).
		• CONDITION E - One channel inoperable. • ACTION E.1 - Place channel in trip within 72 hours, OR • ACTION E.2 - Be in MODE 3 within 78 hours.
		• LCO 3.3.1.M, Reactor Trip System Instrumentation (Function 8.a, Pressurizer Pressure Low).
		• CONDITION M - One channel inoperable. • ACTION M.1 - Place channel in trip within 72 hours, OR • ACTION M.2 - Reduce THERMAL POWER to < P-7 within 78 hours.
		• LCO 3.3.2.D, ESFAS Instrumentation (Function 1.d, Safety Injection, Pressurizer Pressure - Low).
		• CONDITION D - One channel inoperable. • ACTION D.1 - Place channel in trip within 72 hours, OR • ACTION D.2.1 - Be in MODE 3 within 78 hours, AND • ACTION D.2.2 - Be in MODE 4 within 84 hours.
		• LCO 3.3.2.L, ESFAS Instrumentation (Function 8.b, ESFAS Interlocks, Pressurizer Pressure - P-11).
		• CONDITION L - One or more required channel(s) inoperable. • ACTION L.1 - Verify interlock is in required state for existing unit condition within one hour, OR • ACTION L.2.1 - Be in MODE 3 within 7 hours, AND • ACTION L.2.2 - Be in MODE 4 within 13 hours.
	US	INITIATE a work request per STA-606. [Step 2.3.15 - YES]
+10 min	US	INITIATE a Condition Report per STA-421. [Step 2.3.16 - YES]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 2.		

Operating Test :	NRC	Scenario #	1	Event #	2	Page	9	of	31
Event Description:	Steam Generator Steam Flow Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 2 (Key 2). - RX02A, SG 1-01 Steam Flow Transmitter (FT-512) fails high.		
Indications Available: **8A-1.8 – SG 1 STM & FW FLO MISMATCH** **1-FI-512A, SG 1 STM FLO indication fails high**		
+30 sec	BOP	REFER to Annunciator Alarm Procedures.
	BOP	RECOGNIZE SG 1-01 Steam Flow Transmitter (FT-512) failed high.
Examiner Note: A Steam Flow Channel failing HIGH will cause feedwater flow and Feedwater Pump speed to rise due to a larger programmed differential pressure between feedwater pressure and steam pressure. Without operator action, the Turbine will trip at 84% Steam Generator level.		
	US	DIRECT implementation of ABN-707, Steam Flow Instrument Malfunction, Section 2.0.
	BOP	DETERMINE controlling Steam Flow Channel FT-512 has failed. [Step 2.3.1 - YES]
CRITICAL TASK STATEMENT		**Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-707, Steam Flow Instrument Malfunction.**
CRITICAL TASK	BOP	• PLACE 1-FK-510, SG 1 FW FLO CTRL in MANUAL and CONTROL level. [Step 2.3.1.a RNO - YES]
		• If necessary, PLACE 1-SK-509A, FWPT MASTER SPD CTRL FLO CTRL in MANUAL and CONTROL level. [Step 2.3.1.b RNO - N/A]
	BOP	VERIFY 1-FI-513A, SG 1 STM FLO channel indicating – NORMAL: [Step 2.3.2 - YES]
	BOP	VERIFY 1-LI-517, SG 1 LVL (NR) CHAN IV channel indicating – NORMAL: [Step 2.3.3 - YES]
	BOP	VERIFY 1-FI-512A, SG 1 STM FLO channel indicating – NORMAL: [Step 2.3.4 - NO]

Operating Test :	NRC	Scenario #	1	Event #	2	Page	10	of	31
Event Description:	Steam Generator Steam Flow Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
	BOP	• SELECT alternate channel and PLACE 1-FS-512C, SG 1 STM FLO CHAN SELECT to FY-513B. [Step 2.3.4 RNO - YES]
	BOP	VERIFY SG 1-01 level control restored to – NORMAL: [Step 2.3.5 - YES]
		• VERIFY Feedwater and Steam Flows matched. [Step 2.3.5.a - YES]
		• VERIFY Steam Generator level stable at program. [Step 2.3.5.a - YES]
	BOP	• PLACE 1-FK-510, SG 1 FW FLO CTRL in AUTO and MONITOR operation. [Step 2.3.5.b - YES]
	BOP	• VERIFY SG 1-01 level control channel responding normally. [Step 2.3.5.b - YES]
		• ENSURE 1-SK-509A, FWPT MASTER SPD CTRL FLO CTRL in AUTO and controlling normally: [Step 2.3.5.c - YES]
	US	INITIATE a Condition Report per STA-421. [Step 2.3.6 - YES]
+10 min	US	INITIATE repairs per STA-606. [Step 2.3.7 - YES]
When Feedwater Control is restored, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	1	Event #	3	Page	11	of	31
Event Description:	Centrifugal Charging Pump Sheared Shaft								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 3 (Key 3). - CV31A, Centrifugal Charging Pump 1-01 sheared shaft.		
Indications Available: **5A-1.6 – ANY RCP SEAL WTR INJ FLO LO** **6A-1.4 – REGEN HX LTDN OUT TEMP HI** **6A-3.4 – CHG FLO HI / LO** **1-FI-121A, CHRG FLO lowers to zero (0) GPM**		
+1 min	RO	RESPOND to Annunciator Procedure Alarms.
	RO	RECOGNIZE Charging Pump 1-01 sheared shaft due to loss of Charging flow.
	US	DIRECT performance of ABN-105, Chemical and Volume Control System Malfunction, Section 3.0.
Examiner Note: Diamond steps (◊) are Initial Operator Actions.		
CAUTION: With NO Seal Injection flow AND NO Thermal Barrier cooling the affected RCP must be secured within ONE minute. Consideration should be given to ensure gas binding not a factor before starting a charging pump. Indications of potential gas binding are: • PDP SUCT STAB LVL HI-HI (6A-1.8) • CHRG FLO HI/LO (6A-3.4) • VCT LVL LO-LO (6A-4.5) • Fluctuating charging header pressure/flow prior to pump trip. Section 7.0 provides for recovery from gas binding of a charging pump.		
NOTE: Diamond steps 1 denotes Initial Operator Action. Step 1 RNO actions may be performed concurrently.		
	◊ RO ◊	START Centrifugal Charging Pump 1-02. [Step 3.3.1 - YES]

Time	Position	Applicant's Actions or Behavior
		NOTE: IF NO Charging Pump available, THEN Plant Management should be notified prior to shutdown due to NO boration path.
	RO	VERIFY one Centrifugal Charging Pump – RUNNING. [Step 3.3.2 - YES]
	RO	VERIFY Seal Injection Flow to each RCP – BETWEEN 6 GPM AND 13 GPM. [Step 3.3.3 - YES]
Booth Operator: When contacted, REPORT shaft of CCP 1-01 is sheared between the motor and speed increaser.		
Booth Operator: When contacted, EXECUTE remote functions CVR05 and CVR06 for the Centrifugal Charging Pump (1-01 & 1-02) Auxiliary Lube Oil Pumps (Key 11).		
	RO	VERIFY RCP parameters in – NORMAL OPERATING RANGE. [Step 3.3.4 - YES]

PARAMETER	RCP 1	RCP 2	RCP 3	RCP 4
LOW SEAL WTR BEARING TEMP (Pump Radial)	T0417A	T0437A	T0457A	T0477A
SEAL WTR IN TEMP	T0181A	T0182A	T0183A	T0184A
SEAL LKOFF FLO	u-FR-157	u-FR-156	u-FR-155	u-FR-154

	RO	VERIFY PRZR level – GREATER THAN 17% AND RISING. [Step 3.3.5 - YES]
Examiner Note: ABN-706, Attachment 6 is used in the event Letdown is isolated in Step 1. Letdown flow is re-established using the Letdown Restoration Job Aid.		
	RO	When Pressurizer level is greater than 17%, RESTORE Letdown per Attachment 6. [Step 3.3.6 RNO – YES/NO]
		• OPEN or VERIFY OPEN Letdown Isolation Valves 1/1-LCV-460 & 1/1-LCV 459. [Step 1 - YES]
		• Manually OPEN 1-PK-131, LTDN HX OUT PRESS CTRL to 30% (75 GPM) or 50% (120 GPM) DEMAND. [Step 2 - YES]

Operating Test : NRC	Scenario # 1	Event # 3	Page 13 of 31
Event Description: Centrifugal Charging Pump Sheared Shaft			

Time	Position	Applicant's Actions or Behavior
		• Manually OPEN 1-TK-130, LTDN HX OUT TEMP CTRL to 50% DEMAND. [Step 3 - YES]
		• ADJUST Charging to desired flow and MAINTAIN Seal Injection flow between 6 and 13 GPM. [Step 4 - YES]
		• OPEN selected Orifice Isolation Valves. [Step 5 - YES]
		• 1/1-8149A, LTDWN ORIFICE ISOL VLV (45 GPM) • 1/1-8149B, LTDWN ORIFICE ISOL VLV (75 GPM) • 1/1-8149C, LTDWN ORIFICE ISOL VLV (75 GPM)
		• ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to ~310 psig on 1-PI-131, LTDN HX OUT PRESS then PLACE in AUTO. [Step 6 - YES]
		• ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain ~95ºF on 1-TI-130, LTDN HX OUT TEMP, then PLACE in AUTO. [Step 7 - YES]
	RO	VERIFY RCS leakage – NORMAL: [Step 3.3.7 - YES]
		• VERIFY PRZR level stable at or trending to program. [Step 3.3.7.a - YES]
		• VERIFY Charging flow less than 15 GPM above Letdown flow. [Step 3.3.7.b - YES]
<u>Examiner Note</u>: Technical Requirements Manual (TRM) TR LCO 13.1.31, Borating Injection System – Operating, may also be referenced.		
	US	EVALUATE Technical Specifications. [Step 3.3.8 - YES]
		• LCO 3.5.2.A, ECCS - Operating.
		• CONDITION A - One train inoperable because of the inoperability of a centrifugal charging pump. • ACTION A.1 - Restore pump to OPERABLE status within 7 days.
	US	INITIATE a work request per STA-606. [Step 3.3.9 - YES]
+5 min	US	INITIATE a Condition Report per STA-421. [Step 3.3.10 - YES]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 4.		

Operating Test :	NRC	Scenario #	1	Event #	4	Page	14	of	31
Event Description:	Low Pressure Feedwater Heater Bypass Valve Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 4 (Key 4). - FW22, Low Pressure Feedwater Heater Bypass Valve fails open.		
Indications Available: 8B-3.8 – CNDS LP HTR BYP VLV OPEN PV-2286 Reactor Power rising and Main Feedwater temperature lowering		
+1 min	BOP	RESPOND to Annunciator Alarm Procedures.
	RO/BOP	OBSERVE rising Reactor Power and lowering Main Feedwater temperatures.
	US	DIRECT performance of ABN-302, Feedwater, Condensate, Heater Drain System Malfunction, Section 7.0.
Examiner Note: Diamond steps (◊) are Initial Operator Actions.		
CAUTION: • LP FW HTR BYP VLV opening at power will cause reactor power to increase. • Using Load Target to reduce load without rods in AUTO can result in excessive TAVE-TREF mismatch before C-7 activates. This mismatch may cause an SI when steam dumps trip open.		
NOTE: Diamond step 1 denotes Initial Operator Actions.		
	◊ US ◊	ENSURE Turbine Power – LESS THAN OR EQUAL TO 900 MWe. [Step 7.3.1 - YES]
	◊ RO ◊	• PLACE 1/1-RBSS, CONTROL ROD BANK SELECT Switch in AUTO.
	◊ BOP ◊	• MANUALLY RUNBACK Turbine Power to 900 MWe.
		• DEPRESS "900 MWe" Manual Runback button.
		• CLICK on "0/1" button.
		• CLICK on "EXECUTE" then VERIFY Runback in progress.
Booth Operator: If contacted to inspect 1-PV-2286 for cause of failure, REPORT that Instrument Air piping to 1-PV-2286 has been severed and the valve has FAILED OPEN.		

Operating Test :	NRC	Scenario #	1	Event #	4	Page	15	of	31
Event Description:	Low Pressure Feedwater Heater Bypass Valve Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: After 3 minutes, REPORT no indication of piping or hanger damage.		
	US	Locally INSPECT Heater Drain System for signs of water hammer induced damage. [Step 7.3.2 - YES]
	BOP	ENSURE Feedwater Pump suction pressure > 250 PSIG. [Step 7.3.3 - YES]
		• 1-PI-2295, FWP A SUCT PRESS
		• 1-PI-2297, FWP B SUCT PRESS
	US/BOP	If required, RESET Turbine Runback per ABN-401. [Step 7.3.4 - YES]
Examiner Note: The following steps are from ABN-401, Main Turbine Malfunction, Section 8.0, Turbine Reloading after Runback.		
		• VERIFY alarm 6D-1.9, ANY TURB RUNBACK EFFECTIVE – DARK. [Step 8.3.1 - YES]
		• In the Load Control Section, ENSURE Load Rate Setpoint Controller is SET to support reload or current plant conditions. [Step 8.3.2 - YES]
		• In the Load Control Section, ENSURE Load Target Setpoint Controller is set for actual MWe. [Step 8.3.3 - YES]
		• If Manual Runback was used, TURN OFF the appropriate Subloop Controller on the TG Control Display in the MANUAL RUNBACKS Section. [Step 8.3.4 - YES]
		• VERIFY Runback is RESET. [Step 8.3.5 - YES]
		• VERIFY Runback – GREATER THAN 15% WITHIN ONE HOUR and CONTACT Chemistry. [Step 8.3.6 - YES]
		• CONTROL Turbine Load as required per IPO-003A. [Step 8.3.7 - YES]
Examiner Note: Combination of events prior to / during this scenario will result in exceeding the Rod Insertion Limits (RIL). The RO should inform the SRO when ALB-6D, Window 2.7 – ANY CONTROL ROD BANK AT LO-LO LIMIT is LIT. Technical Specifications must be referenced.		

Operating Test :	NRC	Scenario #	1	Event #	4	Page	16	of	31
Event Description:	Low Pressure Feedwater Heater Bypass Valve Failure								

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Specifications.
		• LCO 3.1.6.A, Control Bank Insertion Limits.
		• CONDITION A - Control bank insertion limits not met. • ACTION A.1.1 - Verify SDM to be within the limits provided in the COLR within one (1) hour, OR • ACTION A.1.2 - Initiate Boration to restore SDM to within limit within one (1) hour, AND • ACTION A.2 - Restore control bank(s) to within limits within 2 hours.
	BOP	When Steam Dumps have closed - RESET C-7. [Step 7.3.5 - YES]
		• Momentarily PLACE 43/1-SD, STM DMP MODE SELECT in RESET.
		• VERIFY PCIP, Window 3.4 – TURB LOAD REJ STM DMP ARMED C-7 is DARK.
		NOTE: Isolating the LP FW HTR BYP VLV will cause RCS temperature to initially decrease and steam flow to increase as more extraction steam is drawn from the turbine. Subsequently, this will cause feedwater temperatures increase which will result in an increase in RCS temperature and a decrease in reactor power.
+15 min	BOP	Locally SLOWLY CLOSE one manual isolation valve for 1-CV-2286, while adjusting Turbine Load to maintain Reactor Power stable. [Step 7.3.6 - YES]
		• 1CO-0148, U1 CNDS LP HTR BYP VLV 2286 UPSTRM ISOL VLV.
		• 1CO-0149, U1 CNDS LP HTR BYP VLV 2286 DNSTRM ISOL VLV.
		Examiner Note: The Shift Manager must be contacted and a Crew Brief conducted prior to isolating PV-2286. This evolution takes significant time and is performed locally, therefore, it is desirable to proceed with the next scenario event.
		When Technical Specifications have been referenced, or at Lead Examiner discretion, PROCEED to Events 5, 6, and 7.

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	17	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Events 5, 6, and 7 (Key 5). **- MS03C, SG 1-03 Feed Line Break outside Containment at $1E^7$ lbm/hr on 600 second ramp.** **- FW38A, Main Feedwater Line Isolation Valve (HV-2134) fails to close.** **- CS02F, Containment Spray Pump 1-02 SI Sequencer start failure.** **- CS02H, Containment Spray Pump 1-04 SI Sequencer start failure.**		
Indications Available: **8A-1.8 – SG 1 STM & FW FLO MISMATCH** **5C-3.3 – PRZR PRESS LO BACKUP HTRS ON**		
+30 sec	RO/BOP	RECOGNIZE lowering RCS temperature and pressure.
Booth Operator: If asked, REPORT water in the Turbine Building.		
	RO/BOP	DETERMINE Reactor Trip required and manually TRIP Reactor.
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
Examiner Note: The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.		
	RO	VERIFY Reactor Trip: [Step 1 - YES]
		• VERIFY Reactor Trip Breakers – OPEN. [Step 1.a - YES]
		• VERIFY Neutron flux – DECREASING. [Step 1.a - YES]
		• VERIFY all Control Rod Position Rod Bottom Lights – ON. [Step 1.b - YES]
	BOP	VERIFY Turbine Trip: [Step 2 - YES]
		• VERIFY all HP Turbine Stop Valves – CLOSED. [Step 2 - YES]
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3 - YES]
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a - YES]
		• VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b - YES]

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	18	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
	RO	CHECK SI status: [Step 4 - YES]
	RO	• CHECK if SI is actuated. [Step 4.a - NO]
	RO	• CHECK if SI is required. [Step 4.a RNO - YES]
		• VERIFY Steam Line Pressure < 610 PSIG. [Step 4.a RNO - NO]
		• VERIFY Pressurizer Pressure < 1820 PSIG. [Step 4.a RNO - NO]
		• VERIFY Containment Pressure > 3.0 PSIG. [Step 4.a RNO - NO]
	RO	• PLACE 1/1-SIA2, SI MAN ACT Switch to ACT position at CB-07 and DETERMINE SI has actuated. [Step 4.a RNO - YES]
	RO	• VERIFY Both Trains SI Actuated: [Step 4.b - YES]
		• SI Actuated blue status light – ON NOT FLASHING.
Examiner Note: EOP-0.0A, Attachment 2 steps performed by BOP are identified later in the scenario. The RCPs may be tripped if subcooling is observed to be < 25ºF.		
CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.		
NOTE: Attachment 2 is required to be completed before FRGs are implemented.		
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5 - YES]
	RO	VERIFY AFW Alignment: [Step 6 - YES]
		• VERIFY both MDAFW Pumps – RUNNING. [Step 6.a - YES]
		• PLACE TDAFW Pump in PULLOUT per Foldout Page. [Step 6.b - YES]
		• VERIFY AFW total flow – GREATER THAN 460 GPM. [Step 6.c - YES]

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	19	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
		• VERIFY AFW valve alignment - PROPER ALIGNMENT. [Step 6.d - YES]
	RO	VERIFY Containment Spray NOT Required: [Step 7 - YES]
		• VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY Containment pressure – LESS THAN 18.0 PSIG. [Step 7.a - YES]
		• VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED. [Step 7.b - YES]
		• VERIFY Containment Spray Pumps – RUNNING. [Step 7.c - NO]
	RO	• START Containment Spray Pumps 1-02 & 1-04. [Step 7.a RNO - YES]
Examiner Note: During validation, criteria for isolating the Main Steam Lines was NOT met, however, a Main Steam Isolation Signal may be initiated by the applicant.		
	RO	CHECK if Main Steam lines should be ISOLATED: [Step 8 - YES]
		• VERIFY Containment pressure – GREATER THAN 6.0 PSIG. [Step 8.a - NO]
		• VERIFY Steam Line pressure – LESS THAN 610 PSIG. [Step 8.a - NO]
		• VERIFY Main Steam Line Isolation – COMPLETE. [Step 8.b - NO]
	RO	CHECK RCS Temperature: [Step 9 - no]
		• VERIFY RCS Average Temperature – STABLE AT OR TRENDING TO 557°F. [Step 9 - NO]
		• STOP dumping steam. [Step 9.a RNO - YES]
		• REDUCE AFW flow as necessary to minimize cooldown. [Step 9.b RNO - YES]
		• CLOSE Main Steam Isolation Valves. [Step 9.c RNO - YES]

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	20	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
	RO	Manually INITIATE a Main Steam Line Isolation. [Step 9.c RNO - YES]
		• PLACE 1-HS-2337A, MSL ISOL MAN ACT / RESET in CLOSE position and VERIFY Main Steam Line Isolation Actuation.
		• PLACE 1-HS-2337B, MSL ISOL MAN ACT / RESET in CLOSE position and VERIFY Main Steam Line Isolation Actuation.
	RO	CHECK PRZR Valve Status: [Step 10 - YES]
		• VERIFY PRZR Safeties – CLOSED. [Step 10.a - YES]
		• VERIFY Normal PRZR Spray Valves – CLOSED. [Step 10.b - YES]
		• VERIFY PORVs – CLOSED. [Step 10.c - YES]
		• VERIFY Power to at least 1 Block Valve – AVAILABLE. [Step 10.d - YES]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 10.e - YES]
	RO	CHECK if RCPs Should Be Stopped: [Step 11 - NO]
		• VERIFY RCS subcooling – LESS THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 11.a - NO]
		• GO to Step 12. [Step 11.a RNO - YES]
	US/RO	CHECK if any SG is Faulted: [Step 12 - YES]
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 12.a - YES]
		• VERIFY Steam Generator 1-01 pressure – COMPLETELY DEPRESSURIZED. [Step 12.a - NO]
		• GO to EOP-2.0A, Faulted Steam Generator Isolation, Step 1. [Step 12.b - YES]
Examiner Note: EOP-2.0A, Faulted Steam Generator Isolation, steps begin here.		
CAUTION: At least one SG must be maintained available for RCS cooldown.		

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	21	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: Any faulted SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown.
+15 min	US/RO	CHECK Main Steam Line Isolation Valves – CLOSED. [Step 1 - YES]
	US/RO	CHECK at Least One Steam Generator Pressure – STABLE OR INCREASING. [Step 2 - YES]
	US/RO	IDENTIFY Faulted Steam Generator 1-01. [Step 3 - YES]
		CAUTION: If the turbine-driven AFW pump is the only available source of feed flow, steam supply to the turbine-driven AFW pump must be maintained from at least one SG.
CRITICAL TASK STATEMENT		**Identify and Isolate Faulted Steam Generator Prior to Exiting EOP-2.0A, Faulted Steam Generator Isolation.**
CRITICAL TASK	RO/BOP	ISOLATE Faulted Steam Generator 1-01. [Step 4 - YES]
		• ISOLATE Main Feed Line to Steam Generator 1-01. [Step 4 - YES]
		• ISOLATE AFW flow to Steam Generator 1-01. [Step 4 - YES]
		• CLOSE 1-HS-2491, AFWIV 1.
		• PLACE 1-HS-2452-2, AFWPT STM SPLY VLV MSL 1 in PULLOUT. [Step 4 - DONE]
		• ISOLATE Blowdown and Sample Lines to Steam Generator 1-01. [Step 4 - DONE]
		• ENSURE Steam Generator 1-01 Atmospheric Relief Valve – CLOSED. [Step 4 - DONE]
		• ENSURE Main Steam Line Drip Pot Isolation Valve – CLOSED. [Step 4 - DONE]

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	22	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
	RO	CHECK CST Level – GREATER THAN 10%. [Step 5 - YES]
	US/BOP	VERIFY Faulted Steam Generator 1-01 Break Inside Containment. [Step 6 - NO]
		• PERFORM Attachment 2. [Step 6 RNO - YES]
Examiner Note: EOP-2.0A, Attachment 2, MSIV Electrical Requirement Verification, is NOT performed in the Simulator.		
	US/RO	CHECK Secondary Radiation: [Step 7 - YES]
		• REQUEST periodic activity samples of all Steam Generators. [Step 7.a - YES]
		• CHECK available secondary radiation monitors – NORMAL. [Step 7.b - YES]
	US/RO	CHECK if ECCS Flow to Should Be Reduced: [Step 8 - YES]
		• VERIFY Secondary heat sink: [Step 8.a - YES]
		• DETERMINE Total AFW Flow to intact SGs > 460 GPM.
		• DETERMINE Narrow Range Level in SGs 1-02, 1-03, & 1-04 > 50%.
		• DETERMINE RCS subcooling – GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 8.b - YES]
		• VERIFY RCS pressure – STABLE OR INCREASING. [Step 8.c - YES]
		• VERIFY PRZR level - GREATER THAN 13% (34% FOR ADVERSE CONTAINMENT). [Step 8.d - YES]
		• GO to EOS-1.1A, Safety Injection Termination, Step 1. [Step 8.e - YES]
Examiner Note: EOS-1.1A, Safety Injection Termination steps begin here.		
Examiner Note: The following six (6) steps are performed per EOS-1.1A, Attachment 1.D.		

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	23	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
	BOP	[1.D] PLACE both Diesel EMER START/STOP handswitches in START. [Step 1 - YES]
Examiner Note:		**When Safety Injection is properly RESET, Annunciator 1-ALB-2B, Window 2.8, SFGD SEQR TRN A/B AUTO TEST TRBL, will RESET.**
	BOP	[1.D] RESET SI. [Step 2 - YES]
		• DEPRESS 1/1-SIRA, TRAIN A SI RESET pushbutton.
		• DEPRESS 1/1-SIRB, TRAIN A SI RESET pushbutton.
	BOP	[1.D] RESET SI Sequencers. [Step 3 - YES]
		• At SI Sequencer Train A Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
		• At SI Sequencer Train B Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
	BOP	[1.D] RESET Containment Isolation Phase A and B. [Step 4 - YES]
		• DEPRESS 1/1-C1PARA, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PARB, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PBRA, CNTMT ISOL – PHASE B RESET pushbutton.
		• DEPRESS 1/1-C1PBRB, CNTMT ISOL – PHASE B RESET pushbutton.
	BOP	[1.D] RESET Containment Spray Signal. [Step 5 - YES]
		• DEPRESS 1/1-CSRA, TRAIN A CS RESET pushbutton.
		• DEPRESS 1/1-CSRB, TRAIN B CS RESET pushbutton.

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	24	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
	RO/BOP	[1.D] ESTABLISH Instrument Air and Nitrogen to Containment. [Step 6 - YES]
		• ESTABLISH instrument air. [Step 6.a - YES]
		• VERIFY air compressor running. [Step 6.a.1) - YES]
		• OPEN 1-HS-3487, Containment Instrument Air Isolation Valve. [Step 6.a.2) - YES]
		• ESTABLISH Nitrogen: [Step 6.b - YES]
		• VERIFY 1-HC-3943, ACCUM 1●4 VENT CTRL Valve – CLOSED. [Step 6.b.1) - YES]
		• OPEN 1/1-8880, SI/PORV ACCUM N_2 ISOL VLV. [Step 6.b.2) - YES]
	RO	STOP all but one CCP and PLACE in Standby. [Step 7 - NO]
	US/RO	CHECK RCS Pressure – STABLE OR INCREASING. [Step 8 - YES]
Examiner Note: The following two (2) steps are performed per EOS-1.1A, Attachment 1.J.		
	RO	[1.J] ISOLATE CCP Injection Line Flow Path: [Step 9 - YES]
		• VERIFY CCP – SUCTION ALIGNED TO RWST. [Step 9.a - YES]
		• ALIGN CCP Miniflow Valves: [Step 9.b - YES]
		• OPEN 1/1-8110 and 1/1-8111, CCP Miniflow Valves. [Step 9.b.1) - YES]
		• CLOSE 1/1-8511A and 1/1-8511B, CCP Alternate Miniflow Isolation Valves. [Step 9.b.2) - YES]
		• PLACE Charging Flow Control Valve in MANUAL and 35% demand. [Step 9.c - YES]
		• CLOSE 1/1-8801A and 1/1-8801B, CCP Injection Line Isolation Valves. [Step 9.d - YES]
	RO	[1.J] ESTABLISH Charging Flow Path: [Step 10 - YES]
		• OPEN 1/1-8105 and 1/1-8106, Charging Line Isolation Valves. [Step 10.a - YES]

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	25	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
		• ADJUST Charging Flow Control Valve to establish Charging flow. [Step 10.b - YES]
		• ADJUST RCP seal flow to maintain between 6 gpm and 13 gpm. [Step 10.c - YES]
	RO	CONTROL Charging Flow to maintain PRZR Level. [Step 11 - YES]
	RO	CHECK IF SI Pumps Should Be Stopped: [Step 12 - YES]
		• CHECK RCS pressure: [Step 12.a - YES]
		• Pressure – STABLE OR INCREASING. [Step 12.a - YES]
		• Pressure – GREATER THAN 1700 PSIG. [Step 12.a - YES]
		• STOP SI pumps and PLACE in standby. [Step 12.b - YES]
	RO	CHECK If RHR Pumps Should Be Stopped: [Step 13 - YES]
		• RHR pumps – RUNNING with suction aligned to RWST. [Step 13.a - YES]
		• STOP RHR pumps and place in standby. [Step 13.b - YES]
		• RESET RHR auto switchover. [Step 13.c - YES]
	RO	VERIFY ECCS Flow Not Required: [Step 14 - YES]
		• RCS subcooling – GREATER THAN 25°F. [Step 14.a - YES]
		• PRZR level – GREATER THAN 13%.[Step 14.b - YES]
	RO	CHECK If Letdown Can Be Established: [Step 15 - YES]
		• PRZR level – GREATER THAN 30%. [Step 15.a - YES]
		• ESTABLISH Letdown: [Step 15.b - YES]
		• NOTIFY Plant Staff Letdown is being established. [Step 15.b.1) - YES]
		• ENSURE Letdown Orifice Isolation Valves – CLOSED. [Step 15.b.2) - YES]

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	26	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
		• 1/1-8149A, LTDWN ORIFICE ISOL VLV (45 GPM) • 1/1-8149B, LTDWN ORIFICE ISOL VLV (75 GPM) • 1/1-8149C, LTDWN ORIFICE ISOL VLV (75 GPM)
		• ENSURE 1-ALB-3B, Window 1.16, SEAL WTR HX CCW RET FLO LO – DARK. [Step 15.b.3) - YES]
		• OPEN Letdown Containment Isolation Valves. [Step 15.b.4) - YES]
		• 1/1-8152, LTDWN CNTMT ISOL VLV • 1/1-8160, LTDWN CNTMT ISOL VLV
		• OPEN Letdown Isolation Valves. [Step 15.b.5) - YES]
		• 1/1-LCV-460, LTDWN ISOL VLV • 1/1-LCV-459, LTDWN ISOL VLV
		• PLACE 1-PK-131, LTDN HX OUT PRESS CTRL in MANUAL to 30% (75 GPM) or 50% (120 GPM) DEMAND. [Step 15.b.6) - YES]
		• PLACE 1-TK-130, LTDN HX OUT TEMP CTRL to 50% DEMAND. [Step 15.b.7) - YES]
		• ESTABLISH Charging flow and MAINTAIN Seal Injection flow to Reactor Coolant Pumps between 6 and 13 GPM. [Step 15.b.8) - YES]
		• OPEN desired Orifice Isolation Valves. [Step 15.b.9) - YES]
		• 1/1-8149A, LTDWN ORIFICE ISOL VLV (45 GPM) • 1/1-8149B, LTDWN ORIFICE ISOL VLV (75 GPM) • 1/1-8149C, LTDWN ORIFICE ISOL VLV (75 GPM)
		• ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to ~310 psig on 1-PI-131, LTDN HX OUT PRESS then PLACE in AUTO. [Step 15.b.10) - YES]
		• ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain ~95ºF on 1-TI-130, LTDN HX OUT TEMP, then PLACE in AUTO. [Step 15.b.11) - YES]
When Letdown flow is established, TERMINATE the scenario.		

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	27	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.		
		CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment.
	BOP	VERIFY SSW Alignment: [Step 1 - YES]
		• VERIFY SSW Pumps – RUNNING. [Step 1.a - YES]
		• VERIFY EDG Cooler SSW return flow. [Step 1.b - YES]
	BOP	VERIFY Safety Injection Pumps – RUNNING. [Step 2 - YES]
	BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3 - YES]
	BOP	VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4 - YES]
	BOP	VERIFY CCW Pumps – RUNNING. [Step 5 - YES]
	BOP	VERIFY RHR Pumps – RUNNING. [Step 6 - YES]
	BOP	VERIFY Proper CVCS Alignment: [Step 7 - YES]
		• VERIFY Train B CCP – RUNNING. [Step 7.a - YES]
		• VERIFY Letdown Relief Valve Isolation: [Step 7.b - YES]
		• Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1) - YES]
		• Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2) - YES]
	BOP	VERIFY ECCS flow: [Step 8 - YES]

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	28	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
		• CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a - NO]
		• RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b - NO]
		• SIP discharge flow indicator – CHECK FOR FLOW. [Step 8.c - NO]
		• RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.d - NO]
		• GO to Step 9. [Step 8.d RNO - YES]
	BOP	VERIFY Feedwater Isolation Complete: [Step 9 - NO]
		• Feedwater Isolation Valves – CLOSED.
	BOP	• PLACE 1-HS-2134, FWIV 1 in CLOSE. [Step 9 RNO - YES]
		• Feedwater Isolation Bypass Valves – CLOSED.
		• Feedwater Bypass Control Valves – CLOSED.
		• Feedwater Control Valves – CLOSED.
	BOP	VERIFY Diesel Generators – RUNNING. [Step 10 - YES]
	BOP	VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB-10 – LIT. [Step 11 - YES]
		NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.
	BOP	VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12 - YES]
	BOP	INITIATE periodic monitoring of Spent Fuel Cooling. [Step 13 - YES]
		• Spent Fuel Pool temperature (T2900A, T2901A).
		• Spent Fuel Pool level (L4800A, L4801A, L4802A, L4803A).

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	29	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

BOP — VERIFY Components on Table 1 are Properly Aligned. [Step 14 - YES]

Location	Equipment	Description	Condition
CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED
CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED
CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED
CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	30	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior

	CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED {NO}
	CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
	CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
	CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
	CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
	CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
	CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
	CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
	CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
	CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
	CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
	CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
	CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED
<u>Examiner Note</u>: The next four (4) steps would be performed on Unit 2.				
	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED

Operating Test :	NRC	Scenario #	1	Event #	5, 6, & 7	Page	31	of	31
Event Description:	Feed Line Break Outside Containment / Main Feedwater Isolation Failure / Train B Containment Spray Pumps SI Sequencer Start Failure								

Time	Position	Applicant's Actions or Behavior
	CB-03	2-HS-5536 AIR PRG SPLY ISOL DMPR CLOSED
	BOP	NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. [Step 14 - YES]
EOP-0.0A, Attachment 2 steps are now complete.		

Appendix D	Scenario Outline	Form ES-D-1

Facility:	CPNPP 1 & 2	Scenario No.:	2	Op Test No.:	April 2013 NRC
Examiners:		Operators:			

Initial Conditions: 100% power MOL - RCS Boron is 908 ppm (by sample).

Turnover: Maintain steady-state power conditions. Positive Displacement Charging Pump and 75 GPM Letdown Orifice in service per Radiation Protection request for maintenance.

Critical Tasks:
- Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-709, Feed Header Pressure Instrument Malfunction.
- Identify and Isolate the Faulted Steam Generator Prior to Exiting EOP-2.0A, Faulted Steam Generator Isolation.
- Trip Reactor Coolant Pumps within 10 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection, Foldout Page.
- Initiate Cooldown of Reactor Coolant System Prior to Exiting ECA-3.1A, SGTR With Loss of Reactor Coolant - Subcooled Recovery Desired.

Event No.	Malf. No.	Event Type*	Event Description
1 +25 min		N (RO)	Start Centrifugal Charging Pump 1-01, Raise Letdown Flow to 120 GPM, and Secure Positive Displacement Charging Pump.
2 +30 min	RX18	I (BOP, SRO)	Feed Header Pressure Transmitter (PT-508) Fails High.
3 +40 min	RP05D	I (RO, SRO) TS (SRO)	Reactor Coolant System Loop (1-04) Narrow Range Cold Leg Temperature Instrument (TI-441A) Fails High.
4 +60 min	SG01A	R (RO) N (BOP, SRO) TS (SRO)	Steam Generator (1-01) Tube Leak at 10 GPM. Rapid Down Power Required.
5 +65 min	SG01A	M (RO, BOP, SRO)	Steam Generator (1-01) Tube Rupture at 400 GPM (300 second ramp).
6 +65 min	MS10A1 MS10A2	M (RO, BOP, SRO)	Main Steam Safety Valves (MS-021 & MS-022) on Steam Generator (1-01) Fail Open Upon Reactor Trip.
7 +65 min	RX16A	C (RO)	Power Operated Relief Valve (PCV-455A) Fails Open Upon Reactor Trip.
8 +65 min	RH01C	C (BOP)	Residual Heat Removal Pump (1-01) Safety Injection Sequencer Start Failure.

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

Actual	Target Quantitative Attributes
6	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
3	Abnormal events (2-4)
2	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
1	EOP contingencies requiring substantive actions (0-2)
4	Critical tasks (2-3)

SCENARIO SUMMARY NRC #2

The crew will assume the watch at 100% power with no scheduled activities per IPO-003A, Power Operations. The Positive Displacement Charging Pump (PDP) is in service and Letdown flow is 75 GPM per Radiation Protection while maintenance is performed. The scenario begins by placing Centrifugal Charging Pump 1-01 in service, raising Letdown flow to 120 GPM, and securing the Positive Displacement Charging Pump (PDP) per SOP-103A, Chemical and Volume Control System.

When the PDP is secured, a Main Feedwater (MFW) Header Pressure Transmitter will fail high. Entry into ABN-709, Feedwater Header Pressure Instrument Malfunction, Section 5.0, is required and the MFW Pump Turbine Master Speed Controller is placed in MANUAL. This controller will remain in MANUAL for the duration of the scenario and require monitoring/adjustment during the subsequent down power.

When plant parameters are restored to normal, a Reactor Coolant System (RCS) Loop 4 T_{COLD} Instrument will fail high. The crew enters ABN-704, T_C/N-16 Instrumentation Malfunction, Section 2.0, places Rod Control in MANUAL and defeats the affected channel. The SRO will refer to Technical Specifications.

When Technical Specifications have been referenced, a 10 GPM Steam Generator (SG) Tube Leak will ensue. The crew will enter ABN-106, High Secondary Activity, Section 3.0, and determine that a Rapid Downpower is required. The SRO will refer to Technical Specifications. When power has been reduced 3% to 5%, a 400 GPM Steam Generator Tube Rupture will commence on a 300 second ramp.

When control of the power reduction is no longer feasible, the crew will trip the Reactor, initiate a Safety Injection, and enter EOP-0.0A, Reactor Trip or Safety Injection. Two Main Steam Safety Valves and a Power Operated Relief Valve (PORV) will fail open upon Reactor Trip. The PORV should be closed once identified at Step 10 of EOP-0.0A if not already recognized. When SG 1-01 is identified as faulted, the crew will transition from EOP-0.0A to EOP-2.0A, Faulted Steam Generator Isolation. When SG 1-01 is isolated in EOP-2.0A, a transition to EOP-3.0A, Steam Generator Tube Rupture, will be made.

When it is determined that Ruptured Steam Generator 1-01 pressure is less than 420 psig in EOP-3.0A, a transition to ECA-3.1A, SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired, will be made. The scenario includes Train A Residual Heat Removal Pump that fails to start upon initiation of the Safety Injection Sequencer.

This scenario is terminated when a cooldown is commenced via the Atmospheric Relief Valves in ECA-3.1A.

Risk Significance:

- Risk significant core damage sequence: Steam Generator Tube Rupture
  Failed Open Main Steam Safety Valves
- Risk significant operator actions: Restore Steam Generator Level Control
  Close Pressurizer PORV
  Start Residual Heat Removal Pump
  Identify & Isolate Faulted/ Ruptured SG
  Initiate RCS Cooldown

Scenario Event Description
NRC Scenario #2

BOOTH OPERATOR INSTRUCTIONS for SIMULATOR SETUP

Initialize to IC #41 and LC21 NRC Scenario 2.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP		MS10A1	MS-021, Main Steam Safety Valve Failure	100%	RX TRIP
		MS10A2	MS-022, Main Steam Safety Valve Failure	100%	RX TRIP
		RX16A	PORV (PCV-455A) Fails Open	100%	RX TRIP
		RH01C	RHR Pump (1-01) Auto Start Failure on SI Signal	-	K0
1			Centrifugal Charging Pump (1-01) Start	-	-
1	CVR05		CCP (1-01) Auxiliary Lube Oil Pump	ON	K1
2		RX18	MFW Header Pressure (PT-508) Failure	1500 PSIG	K2
3		RP05D	RCS Loop 4 T_{COLD} Instrument (TI-441A) Failure	630°F	K3
4		SG01A	Steam Generator (1-01) Tube Leak	10 GPM	K4
5		SG01A	Steam Generator (1-01) Tube Rupture	400 GPM	K5 (300 sec. ramp)
6		MS10A1	MS-021, Main Steam Safety Valve Failure	100%	RX TRIP
6		MS10A2	MS-022, Main Steam Safety Valve Failure	100%	RX TRIP
7		RX16A	PORV (PCV-455A) Fails Open	100%	RX TRIP
8		RH01C	RHR Pump (1-01) Auto Start Failure on SI Signal	-	K0

Scenario Event Description
NRC Scenario #2

Booth Operator: **INITIALIZE to IC #18 and LC21 NRC Scenario 2.**
ENSURE all Simulator Annunciator Alarms are ACTIVE.
ENSURE all Control Board Tags are removed.
ENSURE Operator Aid Tags reflect current boron conditions.
ENSURE Rod Bank Update (RBU) is performed.
ENSURE Turbine Load Rate set at 10 MWe/minute.
ENSURE 60/90 buttons DEPRESSED on ASD.
ENSURE ASD speakers are ON at half volume.
ENSURE Reactivity Briefing Sheet printout provided with Turnover.
ENSURE procedures in progress are on SRO desk:
- **COPY of IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load.**
- **COPY of SOP-103A, Chemical and Volume Control System, Sections 5.2.2, 5.2.3, 5.3.2, and 5.3.3.**

ENSURE Control Rods are in AUTO with Bank D at 215 steps.

Control Room Annunciators in Alarm:

PCIP-1.1 – SR TRN A RX TRIP BLK
PCIP-1.2 – IR TRN A RX TRIP BLK
PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9
PCIP-1.6 – RX ≥ 10% PWR P-10
PCIP-2.1 – SR TRN B RX TRIP BLK
PCIP-2.2 – IR TRN B RX TRIP BLK
PCIP-2.5 – SR RX TRIP BLK PERM P-6
PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK
PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK

Operating Test :	NRC	Scenario #	2	Event #	1	Page	5	of	38
Event Description:	Start Centrifugal Charging Pump / Raise Letdown Flow / Secure Positive Displacement Charging Pump								

Time	Position	Applicant's Actions or Behavior
		Booth Operator: When crew has the watch, PLACE Simulator in RUN.
		Examiner Note: The procedural flow path for performing this evolution is as follows: **- SOP-103A, Section 5.3.3, Start a Centrifugal Charging Pump (CCP) 1-01.** **- SOP-103A, Section 5.3.2, Secure Positive Displacement Charging Pump.** **- SOP-103A, Section 5.3.3, Place Charging Flow Control Valve in AUTO.** **- SOP-103A, Section 5.2.2, Raise Charging Flow with CCP.** **- SOP-103A, Section 5.2.3, Raising/Lowering Letdown Flow.**
		Examiner Note: The following steps are from SOP-103A, Chemical and Volume Control System, Section 5.3.3, Centrifugal Charging Pump Startup.
	US	DIRECT performance of SOP-103A, Chemical and Volume Control System, Section 5.3.3, Centrifugal Charging Pump Startup.
	RO	ENSURE Prerequisites in Section 2.6 are met. [Step 5.3.3.A - YES]
	RO	ENSURE selected CCP breaker is racked in to the CONNECT position. [Step 5.3.3.B - YES]
		• 1APCH1, CENTRIFUGAL CHARGING PUMP 1-01 MOTOR BREAKER (1EA1 CUB 11).
	RO	IF NO CCPs are in operation, PLACE 1-FK-121, CCP CHRG FLO CTRL, in MANUAL with 0% DEMAND. [Step 5.3.3.C - DONE]
	RO	ENSURE following valves are OPEN. [Step 5.3.3.D - YES]
		• 1/1-8110, CCP 1 & 2 MINIFLO VLV
		• 1/1-8111, CCP 1 & 2 MINIFLO VLV
	RO	IF CCP suction is desired from the VCT, THEN PERFORM the following: [Step 5.3.3.E - YES]
	RO	ENSURE following valves are OPEN. [Step 5.3.3.E.1) - YES]
		• 1/1-LCV-112B, VCT TO CHRG PMP SUCT VLV
		• 1/1-LCV-112C, VCT TO CHRG PMP SUCT VLV

Operating Test :	NRC	Scenario #	2	Event #	1	Page	6	of	38
Event Description:	Start Centrifugal Charging Pump / Raise Letdown Flow / Secure Positive Displacement Charging Pump								

Time	Position	Applicant's Actions or Behavior
	RO	ENSURE following valves are CLOSED. [Step 5.3.3.E.2) - YES]
		• 1/1-LCV-112D, RWST TO CHRG PMP SUCT VLV
		• 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV
	RO	ENSURE following valves are OPEN. [Step 5.3.3.E.3) - YES]
		• 1-ZL-8220, CHRG PMP SUCT HI POINT VENT VLV
		• 1-ZL-8221, CHRG PMP SUCT HI POINT VENT VLV
	RO	IF CCP suction is desired from the RWST, THEN PERFORM the following: [Step 5.3.3.F - NO]
NOTE: In an emergency, the CCP may be started without starting the aux lube oil pump.		
Booth Operator: When contacted, EXECUTE remote function CVR05 (Key 1), CCP 1-01 Auxiliary Lube Oil Pump to ON and REPORT pump is operating properly.		
	RO	PLACE handswitch for Aux Lube Oil Pump for CCP 1-01 in AUTO and VERIFY it starts (locally at Pump Room). [Step 5.3.3.G - YES]
		• 1/1 APCH1-LP, CCP 1-01 AUX LUBE OIL PUMP
CAUTION: The train associated station service water pump should be in operation prior to starting a CCP.		
	RO	PLACE 1/1-APCH1, CCP 1 in START. [Step 5.3.3.H - YES]
	RO	If CCP was started without operating aux lube oil pump, RECORD emergency start in Unit Log [Step 5.3.3.I - N/A]

Operating Test :	NRC	Scenario #	2	Event #	1	Page	7	of	38
Event Description:	Start Centrifugal Charging Pump / Raise Letdown Flow / Secure Positive Displacement Charging Pump								

Time	Position	Applicant's Actions or Behavior
		NOTE: • Increasing CCP flow quickly can cause the PDP to trip on low oil pressure due to an RPM drop when CCP raises discharge pressure. • Charging flow through the Regenerative Heat Exchanger is limited to 300 gpm.
	RO	PERFORM the following to place Positive Displacement Pump in STANDBY: [Step 5.3.3.J - YES]
		• Alternately SLOWLY RAISE 1-FK-121, CCP CHRG FLO CTRL, and LOWER 1-SK-459A, PDP SPD CTRL, until 1-SK-459A is approximately 55% demand. [Step 5.3.3.J.1) - YES]
		• SHUT DOWN PDP per Section 5.3.2. [Step 5.3.3.J.2) - YES]
Examiner Note:		**The following steps are from SOP-103A, Chemical and Volume Control System, Section 5.3.2, Positive Displacement Pump Shutdown.**
	RO	PLACE 1-LK-459, PRZR LVL CTRL, in MANUAL and REDUCE demand to less than or equal to 55%. [Step 5.3.2.A - DONE]
	RO	PLACE 1/1-APPD, PDP in STOP. [Step 5.3.2.B - YES]
	RO	If RCS pressure < 150 psig, CLOSE 1-8388-RO, PD CHRG PMP 1-01 DISCH VLV RMT OPER. [Step 5.3.2.C - NO]
	RO	CLOSE the following valves: [Step 5.3.2.D - YES]
		• 1/1-8210A, H2/N2 SPLY VLV (MCB) [Step 5.3.2.D - DONE]
		• 1/1-8210B, H2/N2 SPLY VLV (MCB) [Step 5.3.2.D - DONE]
		• 1/1-8202A, VENT VLV (MCB) [Step 5.3.2.D - YES]
		• 1/1-8202B, VENT VLV (MCB) [Step 5.3.2.D - YES]
Booth Operator:		**If asked, REPORT that the PDP will not be removed from service.**
Examiner Note:		**The following steps are from SOP-103A, Chemical and Volume Control System, Section 5.3.3, Centrifugal Charging Pump Startup.**

Operating Test :	NRC	Scenario #	2	Event #	1	Page	8	of	38
Event Description:	Start Centrifugal Charging Pump / Raise Letdown Flow / Secure Positive Displacement Charging Pump								

Time	Position	Applicant's Actions or Behavior
	RO	OPERATE 1-FK-121, CCP CHRG FLO CTRL for current plant conditions: [Step 5.3.3.K - YES]
		• Slowly ADJUST 1-FK-121, CCP CHRG FLO CTRL, in MANUAL to desired flow rate. [Step 5.3.3.K.1) - YES]
		• WHEN PRZR level is approximately equal to program level, PLACE 1-FK-121, CCP CHRG FLO CTRL, in AUTO. [Step 5.3.3.K.2) - YES]
Examiner Note:		**The following steps are from SOP-103A, Chemical and Volume Control System, Section 5.2.2, Raising/Lowering Charging with a CCP in Operation.**
NOTE:		• Charging flow through the Regenerative Heat Exchanger is limited to 300 gpm. • When letdown is in service, charging flow must be maintained high enough to avoid flashing and water hammer in the Regenerative Heat Exchanger. To accomplish this, maintain 1-TI-0127, REGEN HX LTDN OUT TEMP, less than saturation temperature for current letdown pressure (1-PI-0131). • To avoid thermal shock of the reactor coolant piping when operating at elevated temperature, charging flow should first be preheated in the regenerative heat exchanger. Letdown flow should not be stopped without also reducing charging flow to maintain RCP seal injection only when RCS cold leg temperature is > 350°F.
	RO	PLACE 1-LK-121, CCP CHRG FLO CTRL in MANUAL and RAISE flow in preparation for placing the 45 GPM Letdown Orifice in service. [Step 5.2.2.A - YES]
	RO	ADJUST 1-HC-182, RCP SEAL WTR PRESS CTRL, to maintain 8 gpm seal injection flow to each RCP No. 1 seal as Charging flow is changed. [Step 5.2.2.B - YES]
NOTE:		1-LK-459, PRZR LVL CTRL has a long time constant. For this reason, 1-LK-459, PRZR LVL CTRL is usually raised in order to increase charging flow, and then immediately returned to AUTO. Pressurizer level will NOT be at programmed level.
	RO	When 120 GPM of flow is established, PLACE 1-FK-121, CCP CHRG FLO CTRL in AUTO. [Step 5.2.2.C - YES]

Operating Test :	NRC	Scenario #	2	Event #	1	Page	9	of	38
Event Description:	Start Centrifugal Charging Pump / Raise Letdown Flow / Secure Positive Displacement Charging Pump								

Time	Position	Applicant's Actions or Behavior
Examiner Note:		**The following steps are from SOP-103A, Chemical and Volume Control System, Section 5.2.3, Raising/Lowering Letdown Flow.**
		CAUTION: • When letdown is in service, charging flow must be maintained high enough to avoid flashing and water hammer in the Regenerative Heat Exchanger. To accomplish this, maintain 1-TI-0127, REGEN HX LTDN OUT TEMP, less than saturation temperature for current letdown pressure (1-PI-0131). • Cycling Pressurizer B/U heaters will minimize RCS transients while shifting letdown.
	RO	NOTIFY Radiation Protection of Letdown flow change. [Step 5.2.3.1.A - YES]
	RO	NOTIFY Chemistry of Letdown flow change. [Step 5.2.3.1.B - YES]
	RO	RAISE Charging flow. [Step 5.2.3.1.C - DONE]
	RO	ENSURE 1-PK-131, LTDN HX OUT PRESS CTRL in AUTO. [Step 5.2.3.1.D - YES]
	RO	CYCLE Pressurizer Heaters as needed to maintain RCS pressure. [Step 5.2.3.1.E - YES]
	RO	OPEN 1/1-8149A, LTDN ORIFICE ISOL VLV (45 GPM) to RAISE Letdown flow to 120 GPM. [Step 5.2.3.1.F - YES]
	RO	ENSURE 1-PK-131, LTDN HX OUT PRESS CTRL maintaining ~310 psig on 1-PI-131, LTDN HX OUT PRESS. [Step 5.2.3.1.G - YES]
	RO	ENSURE 1-TK-130, LTDN HX OUT TEMP CTRL maintaining ~95ºF on 1-TI-130, LTDN HX OUT TEMP. [Step 5.2.3.1.H - YES]
+25 min	RO	COMPLETE adjustment of Charging flow as required. [Step 5.2.3.1.I - YES]
When the Charging and Letdown flows are stable, or at Lead Examiner discretion, PROCEED to Event 2.		

Operating Test :	NRC	Scenario #	2	Event #	2	Page	10	of	38
Event Description:	Feed Header Pressure Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 2 (Key 2). - RX18, Feed Header Pressure Transmitter (PT-508) fails high.		
Indications Available: **Plant Computer Alarm for low Feed Header pressure 1-PI-508, FWP DISCH HDR PRESS indication fails high**		
+1 min	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE Feed Header Pressure 1-PT-508 transmitter failure.
Examiner Note: Feed header pressure failing high will cause Feedwater Pump speed to lower. The Main Feedwater Pump Master Speed Controller will remain in MANUAL for the subsequent down power during Event 4.		
	US	DIRECT performance of ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 5.0.
CRITICAL TASK STATEMENT		**Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-709, Feed Header Pressure Instrument Malfunction.**
CRITICAL TASK	BOP	PLACE 1-SK-509A, FWPT Master Speed Controller in MANUAL. [Step 5.3.1 - YES]
NOTE: Computer point P5446A, FW STM FLOW SETPOINT may aid the operator.		
CRITICAL TASK	BOP	ADJUST 1-SK-509A, FWPT Master Speed Controller to MAINTAIN ΔP between FWP Discharge Pressure and Steam Line Pressure. [Step 5.3.2 - YES]
		• From 20% to 100% power, RAMP ΔP from 80 PSIG to 170 PSIG.
	US	INITIATE a Condition Report per STA-421. [Step 5.3.3 - YES]

Operating Test :	NRC	Scenario #	2	Event #	2	Page	11	of	38
Event Description:	Feed Header Pressure Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
+5 min	US	INITIATE a work request per STA-606. [Step 5.3.4. - YES]
When control of Feedwater is restored, or at Lead Examiner discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	2	Event #	3	Page	12	of	38
Event Description:	Reactor Coolant Loop Cold Leg Temperature Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 3 (Key 3). - RP05D, Loop 4 T_{COLD} NR temperature instrument (TI-441A) fails high.		
Indications Available: **5C-1.5 – ANY N16 DEV HI / LO** **5C-2.5 – 1 OF 4 OT N16 HI** **5C-3.5 – ANY T_{AVE} DEV HI / LO** **6D-1.10 – AVE T_{AVE} T_{REF} DEV** **6D-2.10 – AVE T_{AVE} HI** **6D-2.13 – 1 OF 4 OP N16 ROD STOP & TURB RUNBACK** **6D-3.14 – 1 OF 4 OT N16 ROD STOP & TURB RUNBACK** **1-TI-441A, CL 4 TEMP (NR) CHAN IV indication failed high** **1-TI-442, RC LOOP 4 T_{AVE} CHAN IV indication failed high**		
+10 secs	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE Control Rods inserting due to T_{COLD} failed high.
	US	DIRECT performance of ABN-704, Tc / N-16 Instrumentation Malfunction, Section 2.0.
NOTE: • If the failed channel was reading lower than the substituted channel, then AVE Tave will increase when the failed channel is defeated due to another channel being substituted for the failed signal to maintain accurate averaging. • Rod Control should remain in MANUAL until all channels are operable. This does not preclude placing rods in AUTO during rapidly changing transient conditions such as runbacks, etc. as long as rod control is returned to MANUAL when the plant is stabilized.		
	RO	PLACE 1/1-RBSS, CONTROL ROD BANK SELECT Switch in MANUAL. [Step 2.3.1 - YES]
	RO	SELECT LOOP 4 on 1-TS-412T, T_{AVE} Channel Defeat. [Step 2.3.2 - YES]
	RO/BOP	VERIFY Steam Dump System is NOT actuated and NOT armed. [Step 2.3.3 - YES]

Operating Test :	NRC	Scenario #	2	Event #	3	Page	13	of	38
Event Description:	Reactor Coolant Loop Cold Leg Temperature Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note: Crew will withdraw rods to 215 steps in 5 step increments to restore T_{AVE}.		
	RO	RESTORE T_{AVE} to within 1ºF of T_{REF}. [Step 2.3.4 - YES]
		• WITHDRAW Control Rods in ≤ 5 step increments until Control Bank D is at 215 steps.
	RO/BOP	SELECT LOOP 4 on 1/1-JS-411E, N16 Power Channel Defeat. [Step 2.3.5 - YES]
	RO	ENSURE a valid N16 channel supplying recorder on 1/1-TS-411E, 1-TR-411 CHAN SELECT. [Step 2.3.6 - YES]
	RO/BOP	VERIFY PCIP, Window 3.4 – TURB LOAD REJ STM DMP ARMED C-7, not ARMED (DARK). [Step 2.3.7 - N/A]
	US/BOP	VERIFY Steam Dumps were NOT blocked. [Step 2.3.8 - YES]
Examiner Note: The next two (2) steps are only performed following I&C maintenance.		
		Within 72 hours, CONTACT I&C to place Bistable Test Switches for TT-421 in CLOSE. [Step 2.3.9 - YES]
		VERIFY appropriate alarms and trip status lights ON per Attachment 3 and NOTE verification in Unit Log. [Step 2.3.10 - YES]
		• OBSERVE TSLB-5, Window 4.8 – RC LOOP 4 OT N16 TB-441C is LIT.
		• OBSERVE TSLB-9, Window 4.4 – OT N16 ROD STOP & TURB RUNBACK TB-441D is LIT.
		• OBSERVE TSLB-9, Window 4.5 – OP N16 ROD STOP & TURB RUNBACK JB-441C is LIT.

Operating Test :	NRC	Scenario #	2	Event #	3	Page	14	of	38
Event Description:	Reactor Coolant Loop Cold Leg Temperature Failure								

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Specifications. [Step 2.3.11 - YES]
		• LCO 3.3.1.E, Reactor Trip System Instrumentation (Function 6, Overtemperature N-16 & Function 7, Overpower N-16).
		• CONDITION E - One channel inoperable. • ACTION E.1 - Place channel in trip within 72 hours, OR • ACTION E.2 - Be in MODE 3 within 78 hours.
	US	INITIATE a work request per STA-606. [Step 2.3.12 - YES]
+10 min	US	INITIATE a Condition Report per STA-421. [Step 2.3.13 - YES]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 4.		

Operating Test :	NRC	Scenario #	2	Event #	4	Page	15	of	38
Event Description:	Steam Generator Tube Leak								

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE Event 4 (Key 4).** **- SG01A, Steam Generator 1-01 Tube Leak at 10 GPM.**
Indications Available:		**PC-11 – MSL-178 (1-RE-2325) is RED and RISING** **PC-11 – N16-174 MSL #1 (1-RE-2325A) is RED and RISING** **PC-11 – COG-182 (1-RE-2959) is RED and RISING (Condenser Off Gas is delayed)**
+1 min	RO/BOP	RESPOND to PC-11, Digital Radiation Monitoring System alarms.
	RO/BOP	RECOGNIZE radiation monitor alarms associated with Steam Generator 1-01.
	US	DIRECT performance of ABN-106, High Secondary Activity, Section 3.0.
	RO/BOP	DETERMINE Main Steam Line 1-01 radiation alarm 1-RE-2325 is RED on PC-11. [Step 3.3.1 - YES]
	US	• REDUCE power to ≤ 50% in 1 hour AND be in MODE 3 in the next 2 hours. [Step 3.3.1.a RNO - YES]
	US	• GO to Step 4.b. [Step 3.3.1.b RNO - YES]
Examiner Note:		**Crew may implement Reactivity Briefing Sheet for a Rapid Plant Shutdown within one (1) hour. This guidance includes a boration of ~ 650 gallons at ~20 GPM and a Main Turbine load reduction to 200 MWe at ~20 MWe/min.**
	RO/BOP	CHECK plant conditions: [Step 3.3.4 - YES]
	BOP	• VERIFY Turbine Generator Load – STEADY AT DESIRED POWER. [Step 3.3.4.a - YES]
NOTE:		Operation with charging flow exceeding combined Letdown and VCT Makeup flow may result in Charging Pump suction shifting to RWST.
	RO	• VERIFY PRZR level – STABLE OR TRENDING TO NORMAL LEVEL. [Step 3.3.4.b - YES]

Operating Test :	NRC	Scenario #	2	Event #	4	Page	16	of	38
Event Description:	Steam Generator Tube Leak								

Time	Position	Applicant's Actions or Behavior
		Note: Step 5 is a continuous action step.
	US	VERIFY Condenser Off Gas Radiation Monitor OR Main Steam Line Leak Rate Radiation Monitor on Affected Steam Generator – OPERABLE. [Step 3.3.5 - YES]
		NOTE: • A preferred sampling sequence may be specified if one Steam Generator is suspected of leaking. • Sample isolation valves will have to be held open while sampling if isolated due to high radiation on u-RE-4200 (SGS-u64).
	US	DIRECT Chemistry to implement CHM-113. [Step 3.3.6 - YES]
	BOP	ADJUST Steam Generator 1-01 Atmospheric Relief Controller setpoint to 1160 PSIG per TDM-501A. [Step 3.3.7 - YES]
	BOP	VERIFY Affected Steam Generator – SG 1-01. [Step 3.3.8 - YES]
		• PLACE 1-HV-2452-2, TDAFW Pump Steam Supply Valve from SG 1-01 in PULLOUT. [Step 3.3.8.a - YES]
+10 min	US	EVALUATE Technical Specifications. [Step 3.3.8.b - YES]
		• LCO 3.7.5.A, Auxiliary Feedwater System
		• CONDITION A - One steam supply to turbine driven AFW pump inoperable. • ACTION A.1 - Restore steam supply to OPERABLE status within 7 days.
		• LCO 3.4.13, RCS Operational Leakage
		• CONDITION B - Primary to secondary LEAKAGE not within limits. • ACTION B.1 - Be in MODE 3 within 6 hours. • ACTION B.2 - Be in MODE 5 within 36 hours.

Operating Test :	NRC	Scenario #	2	Event #	4	Page	17	of	38
Event Description:	Steam Generator Tube Leak								

Time	Position	Applicant's Actions or Behavior
		Examiner Note: The following steps are from IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to MODE 3.
	US	DIRECT load reduction to 200 MWe per IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to MODE 3.
		NOTE: Chemistry will specify Demineralizers to be placed in service based on RCS conditions. BTRS or CVCS demineralizers may be used. NOTE: For power reductions to approximately 700 MWE, Attachment 6A may be used.
	RO	CONTACT Chemistry and PLACE specified demineralizers in service. [Step 5.6.1 - YES]
	RO	NOTIFY QSC Generation Controller prior to reducing load. [Step 5.6.2 - YES]
		NOTE: For power changes greater than 5%, a reactivity plan should be developed using one of the sources below. (Listed in order of preference) • IF time and resources support generation of a BEACON projection (for a pre-planned power maneuver), THEN contact Core Performance Engineering for support, and utilize the approved results as the reactivity plan. • During operation at BOL with a zero or small negative moderator temperature coefficient, very little reactivity feedback will result from changes in RCS temperature. During a shutdown, significant rod movement can occur when relatively small changes in RCS temperature occurs. This could result in large transients in Pressurizer level and RCS pressure. Care should be taken to ensure changes in steam flow and SG level control are done gradually to minimize RCS transients. • IF the power change closely matches one of the down-power scenarios available in the Reactivity Briefing Sheets (printed from CHORE), THEN utilize the appropriate reactivity plan (interpolation between values on the Boration Matrix is allowed). • IF the above two options are not available or do not fit the current scenario, THEN perform a NDR based reactivity calculation per Attachment 3 or equivalent CHORE output.

Time	Position	Applicant's Actions or Behavior
	RO	NOTIFY Chemistry and Radiation Protection that power will be lowered ≥ 15% within a one hour period. [Step 5.6.3 - YES]

NOTE:

- During the initial reduction in power, a combination of control rod insertion and boration should be used to compensate for changes in reactivity due to power defect. This will allow the control rods to be available to compensate for the reactivity due to Xenon following the power reduction.
- Primary plant should lead secondary plant during Main Turbine load changes.
- During a down power, operators should adjust the pots (1-SK-0509B and 1-SK-0509C) to maintain the difference between the FWPT speeds within the desirable range.
- FWPT speed deviation from commanded speed during a normal shutdown may be an indication of binding in a FWPT control valve, guidance for this event is located in ABN-302 Sect. 9.0, FEEDWATER PUMP CONTROL SYSTEM MALFUNCTION.
- The TSE, within the digital turbine control system, is constantly measuring temperatures at critical sections of the turbine and will limit the ramp up/ramp down as deemed necessary by internal stress calculations performed by TSE. If TSE determines that the allowable temperature margin is being approached or exceeded, alarm annunciation will occur and the ramp up/ ramp down will be limited. The following alarms may be received:

  TSE Lower Temp Margin <0
  TSE Lower Temp Margin <20
  TSE Upper Temp Margin <0
  TSE Upper Temp Margin <60
  TSE Lower Margin HP Shaft <0
  TSE Lower Margin HP Shaft <60
  TSE Upper Margin HP Shaft <0
  TSE Upper Margin HP Shaft <60

- While TSE Influence is off, with a TSE fault present, the following limits apply:
  - Turbine load decreases (excluding runbacks) should be limited to a load rate of 10 MW/min while > 400 MWe, THEN limited to 5MW/min while ≤ 400 MWe (during rapid cooldown, a 2-hour HOLD at 400 MWe is required for temperature equalization)
  - Automatic TSE influence to the EHC should not be switched from OFF to ON if any TSE related faults are active.

	RO	PERFORM the following to reduce Turbine Load to ~200 MWe: [Step 5.6.4 - YES]

Time	Position	Applicant's Actions or Behavior
		• DETERMINE the amount of Boration required to reduce Reactor Power to 200 MWe (~15% power). [Step 5.6.4.A - YES]
	RO	If desired, DETERMINE the rate of Boration required to allow slow Control Rod inward motion as Turbine load lowers. [Step 5.6.4.B - NO]
	RO	REFER to Attachment 2 for guidance in controlling AFD during power ramp. [Step 5.6.4.C - YES]
	RO	INITIATE RCS boration per SOP-104A, Reactor Make-up and Chemical Control System. [Step 5.6.4.D - YES]
Examiner Note:		**The following steps are from SOP-104A, Reactor Make-up and Chemical Control System, Section 5.1.2, Borate Mode.**
		CAUTION: Initial RCS makeup boron concentration will be the concentration added from the previous RCS makeup evolution. NOTE: • This procedure assumes prior automatic operation. • TDM-201A and TDM-203A contain information to aid in obtaining correct values for setting pots and counters. • Attachment 2, BOL Boration for Long Term Use provides instructions for periodic borations while keeping the Makeup System in Borate Mode.
	RO	PERFORM the following to COMMENCE RCS boration:
		• ENSURE Prerequisites of Section 2.1 and 2.2 or met. [Step 5.1.2.A - YES]
		• ENSURE 1/1-MU, RCS MU MAN ACT is in STOP. [Step 5.1.2.B - YES]
		• PLACE 43/1-MU, RCS MU MODE SELECT in BORATE. [Step 5.1.2.C - YES]
		• SET 1-FK-110, BA BLNDR FLO CTRL to ~3.5 pot setting for ~14 GPM. [Step 5.1.2.D - YES]
		• SET 1-FY-110B, BA BATCH FLO counter for ~700 gallons. [Step 5.1.2.E - YES]

Time	Position	Applicant's Actions or Behavior
		NOTE: 1/1-FCV-110A may be in CLOSE if RCS Boron Concentration is < 250 ppm to prevent inadvertent boration of RCS..
		• ENSURE 1/1-FCV-110A, BA BLNDR FLO CTRL VLV in AUTO. [Step 5.1.2.F – AS IS]
		• PLACE 1/1-MU, RCS MU MAN ACT in START. [Step 5.1.2.G - YES]
		• VERIFY 1/1-APBA1, BA XFR PMP 1 STARTS. [Step 5.1.2.H - YES]
		• VERIFY 1/1-FCV-110A, BA BLNDR FLO CTRL VLV throttles to ~14 GPM. [Step 5.1.2.I - YES]
		• VERIFY 1/1-FCV-110B, RCS MU TO CHG PMP SUCT ISOL VLV OPEN. [Step 5.1.2.I - YES]
		• VERIFY 1-FY-110B, BA BATCH FLO counter operating properly. [Step 5.1.2.J - YES]
		• VERIFY 1-FR-110, BA BATCH FLO TO BLNDR red pen operating properly. [Step 5.1.2.J - YES]
		NOTE: The following step is intended to reduce the severity of VCT pressure and level transients which can significantly impact RCS Hydrogen concentration. The applicability of this step is dependent on the expected magnitude of the makeup.
		• OPERATE 1/1-LCV-112A, VCT LVL CTRL VLV as necessary to maintain proper VCT level. [Step 5.1.2.K – YES]
		• When desired amount of boric acid is added, PLACE 1/1-MU, RCS MU MAN ACT in STOP. [Step 5.1.2.L – N/A]
Examiner Note: The following steps continue from IPO-003A, Power Operations, Section 5.6.		
	BOP	SET Turbine Load Rate Setpoint Controller to ~18 MWe/min. [Step 5.6.4.E - YES]
		• OPEN "Load Rate Setpoint" OSD.
		• SELECT blue bar and ENTER 18 MWe/min.
		• CLOSE "Load Rate Setpoint" OSD.
		NOTE: The load will immediately begin decreasing to the setpoint value at the rate set on the Load Rate Setpoint Controller. The LOAD RATE may be readjusted as necessary.

Operating Test :	NRC	Scenario #	2	Event #	4	Page	21	of	38
Event Description:	Steam Generator Tube Leak								

Time	Position	Applicant's Actions or Behavior
	BOP	SET Turbine Load Target to 200 MWe. [Step 5.6.4.F - YES]
		• OPEN "Load Target" OSD.
		• SELECT blue bar and ENTER 200 MWe.
		• DEPRESS "Accept" then VERIFY value in blue bar is desired "Load Target" (magnitude and direction).
		• DEPRESS "Execute" then VERIFY "Load Target" changes to desired load.
		• CLOSE "Load Target" OSD.
+20 min	CREW	MONITOR load change.
When power has been reduced 3% to 5%, or at Lead Examiner discretion, PROCEED to Events 5, 6, 7, and 8.		

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	22	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Events 5, 6, 7, and 8. **- SG01A, SG 1-01 Tube Rupture at 400 GPM on 300 second ramp (Key 5).** **- MS10A1 & MS10A2, MS-021 & MS-022, Main Steam Safety Valves fail open.** **- RX16A, Power Operated Relief Valve (PCV-455A) fails open.** **- RH01C, Residual Heat Removal Pump 1-01 SI Sequencer start failure.**		
Indications Available: **6A-3.4 – CHRG FLO HI / LO** **5C-1.2 – PRZR LVL DEV LO** **5C-3.3 – PRZR PRESS LO BACKUP HTRS ON** **PC-11 – MSL-178 (1-RE-2325) is RED** **Main Steam Line Radiation level rising** **Pressurizer pressure lowering**		
+2 min	RO/BOP	RECOGNIZE Pressurizer level and pressure LOWERING at a rising rate.
	RO/BOP	RECOGNIZE PRZR pressure decreasing with Steam Line Radiation Monitors in alarm and steam / feed mismatch.
	RO	Manually INITIATE a Reactor Trip.
		• PLACE 1/1-RTC, RX TRIP BKR Switch in TRIP.
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip: [Step 1 - YES]
		• VERIFY Reactor Trip Breakers – OPEN. [Step 1.a - YES]
		• VERIFY Neutron flux – DECREASING. [Step 1.a - YES]
		• VERIFY all Control Rod Position Rod Bottom Lights – ON. [Step 1.b - YES]
	BOP	VERIFY Turbine Trip: [Step 2 - YES]
		• VERIFY all HP Turbine Stop Valves – CLOSED. [Step 2 - YES]
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3 - YES]
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a - YES]

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	23	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
		• VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b - YES]
	RO	CHECK SI status: [Step 4 - YES]
	RO	• CHECK if SI is actuated. [Step 4.a - YES]
	RO	• PLACE 1/1-SIA2, SI MAN ACT Switch to ACT position at CB-07 and DETERMINE SI has actuated.
	RO	• VERIFY Both Trains SI Actuated: [Step 4.b - YES]
	RO	• SI Actuated blue status light – ON NOT FLASHING.
Examiner Note: EOP-0.0A, Attachment 2 steps performed by the BOP are identified later in the scenario.		
CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.		
NOTE: Attachment 2 is required to be completed before FRGs are implemented.		
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5 - YES]
	RO	VERIFY AFW Alignment: [Step 6 - YES]
		• VERIFY both MDAFW Pumps – RUNNING. [Step 6.a - YES]
		• PLACE TDAFW Pump in PULLOUT per Foldout Page. [Step 6.b - YES]
		• VERIFY AFW total flow – GREATER THAN 460 GPM. [Step 6.c - YES]
		• VERIFY AFW valve alignment - PROPER ALIGNMENT. [Step 6.d - YES]
	RO	DETERMINE Containment Spray NOT Required: [Step 7 - YES]

Time	Position	Applicant's Actions or Behavior
		• VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY Containment pressure – LESS THAN 18.0 PSIG. [Step 7.a - YES]
		• VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED. [Step 7.b - YES]
		• VERIFY Containment Spray Pumps – RUNNING. [Step 7.c - YES]
Examiner Note: The crew should be able to determine (via Plant Computer System) that two Main Steam Safety Valves are open.		
	RO	CHECK if Main Steam lines should be ISOLATED: [Step 8 - YES]
		• VERIFY Containment pressure – GREATER THAN 6.0 PSIG. [Step 8.a - NO]
		• VERIFY Steam Line pressure – LESS THAN 610 PSIG. [Step 8.a - NO]
		• GO to Step 9. [Step 8.a RNO - YES]
Examiner Note: When the Main Steam Isolation Valves are closed, the crew should be able to identify Faulted Steam Generator 1-01.		
	RO	CHECK RCS Temperature:
		• VERIFY RCS Average Temperature – STABLE AT OR TRENDING TO 557°F. [Step 9 - NO]
		• STOP dumping steam. [Step 9.a RNO - YES]
		• REDUCE AFW flow as necessary to minimize cooldown. [Step 9.b RNO - YES]
		• CLOSE Main Steam Isolation Valves. [Step 9.c RNO - YES]
	RO	CHECK PRZR Valve Status: [Step 10 - YES]
		• VERIFY PRZR Safeties – CLOSED. [Step 10.a - YES]
		• VERIFY Normal PRZR Spray Valves – CLOSED. [Step 10.b - YES]
		• VERIFY PORVs – CLOSED. [Step 10.c - NO]

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	25	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
	RO	• PLACE 1/1-PCV-455A, PRZR PORV in CLOSE. [Step 10.c RNO - YES]
	RO	• PLACE 1/1-8000A, PRZR PORV BLK VLV in CLOSE. [Step 10.c RNO - YES]
		• VERIFY Power to at least 1 Block Valve – AVAILABLE. [Step 10.d - YES]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 10.e - YES]
Examiner Note:		**A loss of subcooling and subsequent trip of the Reactor Coolant Pumps will be required if the PORV is not isolated until EOP-0.0A, Step 10. If the PORV is closed prior to reaching Step 10, subcooling may not be lost.**
CRITICAL TASK STATEMENT		**Trip Reactor Coolant Pumps within 10 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection, Foldout Page.**
CRITICAL TASK	RO	VERIFY RCS subcooling less than 25ºF (55ºF FOR ADVERSE CONTAINMENT) and STOP all RCPs.
		• VERIFY RCS subcooling – LESS THAN 25°F. [Step 11.a - YES]
		• VERIFY ECCS Pumps (CCP or SI) – AT LEAST ONE RUNNING. [Step 11.b - YES]
		• STOP all RCPs. [Step 11.c - YES]
	US/RO	CHECK if any SG is Faulted: [Step 12 - YES]
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 12.a - YES]
		• VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 12.a - NO]
		• GO to EOP-2.0A, Faulted Steam Generator Isolation, Step 1. [Step 12.b - YES]
Examiner Note:		**EOP-2.0A, Faulted Steam Generator Isolation, steps begin here.**

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

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	26	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: Any faulted SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown.
+15 min	US/RO	CHECK Main Steam Line Isolation Valves – CLOSED. [Step 1 - YES]
	US/RO	CHECK at Least One Steam Generator Pressure – STABLE OR INCREASING. [Step 2 - YES]
	US/RO	IDENTIFY Faulted Steam Generator 1-01 – COMPLETELY DEPRESSURIZED. [Step 3 - YES]
		CAUTION: If the turbine-driven AFW pump is the only available source of feed flow, steam supply to the turbine-driven AFW pump must be maintained from at least one SG.
CRITICAL TASK STATEMENT		**Identify and Isolate Faulted Steam Generator Prior to Exiting EOP-2.0A, Faulted Steam Generator Isolation.**
CRITICAL TASK	RO/BOP	ISOLATE Faulted Steam Generator 1-01. [Step 4 - YES]
		• ISOLATE Main Feed Line to Steam Generator 1-01. [Step 4 - DONE]
		• CLOSE 1-HS-2491, AFWIV 1 to Steam Generator 1-01. [Step 4 - YES]
		• PLACE 1-HS-2452-2, AFWPT STM SPLY VLV MSL 1 in PULLOUT. [Step 4 - DONE]
		• ISOLATE Blowdown and Sample Lines to Steam Generator 1-01. [Step 4 - DONE]
		• ENSURE Steam Generator 1-01 Atmospheric Relief Valve – CLOSED. [Step 4 - DONE]
		• ENSURE Main Steam Line Drip Pot Isolation Valve – CLOSED. [Step 4 - DONE]

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	27	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
	RO	CHECK CST Level – GREATER THAN 10%. [Step 5 - YES]
	US/BOP	VERIFY Faulted Steam Generator 1-01 Break Inside Containment. [Step 6 - NO]
		• PERFORM Attachment 2. [Step 6 RNO - YES]
Examiner Note: EOP-2.0A, Attachment 2, MSIV Electrical Requirement Verification, is NOT performed in the Simulator.		
	US/RO	CHECK Secondary Radiation: [Step 7 - YES]
		• REQUEST periodic activity samples of all Steam Generators. [Step 7.a - YES]
		• CHECK available secondary radiation monitors – NORMAL. [Step 7.b - NO]
		• DETERMINE SG 1-01 is ruptured and TRANSITION to EOP-3.0A, Steam Generator Tube Rupture, Step 1. [Step 7 RNO - YES]
Examiner Note: EOP-3.0A, Steam Generator Tube Rupture, steps begin here.		
	US/RO	CHECK If RCPs Should Be Stopped: [Step 1 - DONE]
	US/BOP	IDENTIFY Steam Generator 1-01 as ruptured. [Step 2 - YES]
		• OBSERVE rise in Steam Generator 1-01 narrow range level.
		• OBSERVE high radiation from Steam Generator 1-01 Main Steam Line.

CAUTION: If the TDAFW pump is the only available source of feed flow, steam supply to the TDAFW pump must be maintained from at least one SG.

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	28	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: At least one SG must be maintained available for RCS cooldown.
		NOTE: If any SG atmospheric opens the Plant Staff should be notified.
	RO/BOP	ISOLATE flow from Ruptured Steam Generator 1-01: [Step 3 - YES]
		• ADJUST SG 1-01 Atmospheric Controller Setpoint to 1160 PSIG. [Step 3.a - YES]
		• CHECK SG 1-01 Atmospheric Relief Valve – CLOSED. [Step 3.b - YES]
		• CLOSE SG 1-01 Main Steam Line Isolation Valve. [Step 3.c - DONE]
		• CLOSE SG 1-01 Drip Pot Isolation Valves. [Step 3.c - DONE]
		• PLACE 1-HS-2452-2, SG 1-01 TDAFW Pump Steam Supply Valve in PULLOUT. [Step 3.d - DONE]
		• VERIFY SG 1-01 Blowdown Valves – CLOSED. [Step 3.e - DONE]
		CAUTION: If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless needed for RCS cooldown.
	RO/BOP	CHECK Ruptured SG 1-01 Level: [Step 4 - YES]
		• VERIFY narrow range level - GREATER THAN 43%. [Step 4.a – NO]
		• STOP AFW flow to SG 1-01. [Step 4.b - YES per above CAUTION]

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	29	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: Major steam flow paths from the ruptured SG(s) should be isolated before initiating RCS cooldown.
	RO/BOP	CHECK SG 1-01 Pressure – GREATER THAN 420 PSIG. [Step 5 - NO]
		• DETERMINE SG 1-01 is ruptured with pressure less than 420 PSIG and TRANSITION to ECA-3.1A, SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired, Step 1. [Step 5 RNO - YES]
		CAUTION: When time permits, Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset.
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
		Examiner Note: The following steps are from ECA-3.1A, SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired.
		Examiner Note: The following six (6) steps are performed per ECA-3.1A, Attachment 1.D.
	BOP	[1.D] PLACE Diesel EMER START/STOP handswitches in START. [Step 1 - YES]
		Examiner Note: When Safety Injection is properly RESET, Annunciator 1-ALB-2B, Window 2.8, SFGD SEQR TRN A/B AUTO TEST TRBL, will RESET.
	BOP	[1.D] RESET SI. [Step 2 - YES]
		• DEPRESS 1/1-SIRA, TRAIN A SI RESET pushbutton.
		• DEPRESS 1/1-SIRB, TRAIN A SI RESET pushbutton.

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	30	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
	BOP	[1.D] RESET SI Sequencers. [Step 3 - YES]
		• At SI Sequencer Train A Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
		• At SI Sequencer Train B Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
	BOP	[1.D] RESET Containment Isolation Phase A and B. [Step 4 - YES]
		• DEPRESS 1/1-C1PARA, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PARB, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PBRA, CNTMT ISOL – PHASE B RESET pushbutton.
		• DEPRESS 1/1-C1PBRB, CNTMT ISOL – PHASE B RESET pushbutton.
	BOP	[1.D] RESET Containment Spray Signal. [Step 5 - YES]
		• DEPRESS 1/1-CSRA, TRAIN A CS RESET pushbutton.
		• DEPRESS 1/1-CSRB, TRAIN B CS RESET pushbutton.
	RO/BOP	[1.D] ESTABLISH Instrument Air and Nitrogen to Containment. [Step 6 - YES]
		• ESTABLISH instrument air. [Step 6.a - YES]
		• VERIFY air compressor running. [Step 6.a.1) - YES]
		• OPEN 1-HS-3487, Containment Instrument Air Isolation Valve. [Step 6.a.2) - YES]
		• ESTABLISH Nitrogen: [Step 6.b - YES]
		• VERIFY 1-HC-3943, ACCUM 1●4 VENT CTRL Valve – CLOSED. [Step 6.b.1) - YES]
		• OPEN 1/1-8880, SI/PORV ACCUM N_2 ISOL VLV. [Step 6.b.2) - YES]
	RO/BOP	VERIFY All AC Buses – ENERGIZED BY OFFSITE POWER. [Step 7 - YES]

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	31	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: PRZR heaters should not be energized until PRZR water level indicates greater than minimum level recommended by Plant Staff to ensure heaters are covered.
	RO	DEENERGIZE Pressurizer Heaters: [Step 8 - YES]
		• PLACE All Pressurizer Heaters Switches in OFF. [Step 8.a - YES]
		• CONSULT plant staff for recommended minimum indicated PRZR water level that will ensure Heaters are covered [Step 8.b - YES]
		CAUTION: If any ruptured SG is faulted, AFW flow to that SG should remain isolated during subsequent recovery action unless needed for RCS cooldown.
	RO/BOP	CHECK Ruptured SG 1-01 Level: [Step 9 - YES]
		• VERIFY narrow range level - GREATER THAN 43%. [Step 9.a - NO]
		• STOP AFW flow to SG 1-01. [Step 9.b - DONE]
		CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT), the RHR pumps must be manually restarted to supply water to the RCS.
	RO	CHECK If RHR Pumps Should Be Stopped: [Step 10 - YES]
		• VERIFY RHR pumps – RUNNING with suction aligned to RWST. [Step 10.a - YES]
		• VERIFY RCS pressure greater than 325 PSIG and STABLE and INCREASING. [Step 10.b - YES]
		• STOP RHR pumps and PLACE in Standby. [Step 10.c - YES]

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	32	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
		• RESET RHR Auto Switchover. [Step 10.d - YES]
	US	INITIATE Evaluation of Plant Status. [Step 11 - YES]
	RO/BOP	• CHECK Auxiliary Building and Safeguards Building radiation – NORMAL: [Step 11.a - YES]
		• CHECK PC-11 monitors – NORMAL (Grid 4). [Step 11.a.1) - YES]
		• NOTIFY Radiation Protection to PERFORM local Radiation Surveys. [Step 11.a.2) - YES]
	US	• NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident. [Step 11.b - YES]
	US	• CONTACT Plant Staff to EVALUATE plant equipment. [Step 11.c - YES]
	US/RO	CHECK if any SG is Faulted: [Step 12 - YES]
		• VERIFY Steam Generator 1-01 pressure – COMPLETELY DEPRESSURIZED. [Step 12.a - YES]
		• VERIFY Steam Generator 1-01 ISOLATED and NOT needed for cooldown. [Step 12.b - YES]
	US	CHECK Intact SG Levels: [Step 13 - YES]
		• VERIFY narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT): [Step 13.a - YES]
		• CONTROL AFW flow to maintain narrow range level between 43% and 60%. [Step 13.b - YES]
		NOTE: Shutdown margin should be monitored during RCS cooldown.
		NOTE: After the low steamline pressure SI signal is blocked, main steamline isolation will occur if the high steam pressure rate setpoint is exceeded.

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	33	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
CRITICAL TASK STATEMENT		**Initiate Cooldown of Reactor Coolant System Prior to Exiting ECA-3.1A, SGTR With Loss of Reactor Coolant - Subcooled Recovery Desired.**
CRITICAL TASK	RO/BOP	INITIATE RCS Cooldown using Atmospheric Dump Valves. [Step 14 - YES]
+45 min	US	INITIATE RCS Cooldown to Cold Shutdown: [Step 14 - YES]
		• MAINTAIN cooldown rate in RCS Cold Legs – LESS THAN 100°F/HR. [Step 14.a - YES]
		• USE Residual Heat Removal System if in service. [Step 11.b - NO]
		• BLOCK Low Main Steam Pressure SI signal when Pressurizer pressure – LESS THAN 1960 PSIG. [Step 11.c - YES]
		• DUMP steam to Condenser from intact Steam Generators. [Step 11.d - YES]
		• DUMP steam from intact Steam Generators via ARVs. [Step 11.d RNO - YES]
		• MAKE plant announcement and NOTIFY Plant Staff of steam release. [Step 11.d.1) RNO - YES]
		• PERFORM following to release steam while maintaining cooldown rate. [Step 11.d.2) RNO - YES]
		• PLACE Steam Generator Atmospheric Controllers in MANUAL and RAISE demand. [Step 11.d.2) RNO - YES]
		• PLACE Steam Generator ARV CONTROL OVERRIDE to OPEN. [Step 11.d.2) RNO - YES]
When cooldown is initiated via the Atmospheric Relief Valves, TERMINATE the scenario.		

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	34	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.		
		CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment.
	BOP	VERIFY SSW Alignment: [Step 1 - YES]
		• VERIFY SSW Pumps – RUNNING. [Step 1.a - YES]
		• VERIFY EDG Cooler SSW return flow. [Step 1.b - YES]
	BOP	VERIFY Safety Injection Pumps – RUNNING. [Step 2 - YES]
	BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3 - YES]
	BOP	VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4 - YES]
	BOP	VERIFY CCW Pumps – RUNNING. [Step 5 - YES]
	BOP	VERIFY RHR Pumps – RUNNING. [Step 6 - NO]
		• Manually START Train A RHR Pump 1-01. [Step 6 RNO - YES]
	BOP	VERIFY Proper CVCS Alignment: [Step 7 - YES]
		• VERIFY both CCPs – RUNNING. [Step 7.a - YES]
		• VERIFY Letdown Relief Valve Isolation: [Step 7.b - YES]
		• Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1) - YES]
		• Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2) - YES]

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	35	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY ECCS flow: [Step 8 - YES]
		• CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a - YES]
		• RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b - YES]
		• SIP discharge flow indicator – CHECK FOR FLOW. [Step 8.c - YES]
		• RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.d - NO]
		• GO to Step 9. [Step 8.d RNO - YES]
	BOP	VERIFY Feedwater Isolation Complete: [Step 9 - YES]
		• Feedwater Isolation Valves – CLOSED.
		• Feedwater Isolation Bypass Valves – CLOSED.
		• Feedwater Bypass Control Valves – CLOSED.
		• Feedwater Control Valves – CLOSED.
	BOP	VERIFY Diesel Generators – RUNNING. [Step 10 - YES]
	BOP	VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB-10 – LIT. [Step 11 - YES]
		NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.
	BOP	VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12 - YES]
	BOP	INITIATE periodic monitoring of Spent Fuel Cooling. [Step 13 - YES]
		• Spent Fuel Pool temperature (T2900A, T2901A).
		• Spent Fuel Pool level (L4800A, L4801A, L4802A, L4803A).

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	36	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

	BOP	VERIFY Components on Table 1 are Properly Aligned. [Step 14 - YES]

Location	Equipment	Description	Condition
CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED
CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED
CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED
CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED

	CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
	CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
	CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
	CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
	CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
	CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
	CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
	CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
	CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
	CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
	CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
	CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED
<u>Examiner Note</u>: The next four (4) steps would be performed on Unit 2.				
	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	38	of	38
Event Description:	Steam Generator Tube Rupture / Main Steam Safety Valves Failure / Power Operated Relief Valve Failure / Residual Heat Removal Pump Safety Injection Sequencer Failure								

Time	Position	Applicant's Actions or Behavior

		CB-03	2-HS-5536	AIR PRG SPLY ISOL DMPR	CLOSED
	BOP	NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. [Step 14 - YES]			
EOP-0.0A, Attachment 2 steps are now complete.					

Appendix D	Scenario Outline	Form ES-D-1

Facility:	CPNPP 1 & 2	Scenario No.:	3	Op Test No.:	April 2013 NRC
Examiners:		Operators:			

Initial Conditions: 100% power MOL - RCS Boron is 908 ppm (by sample).

Turnover: Maintain steady-state power conditions.

Critical Tasks:
- Control Reactor Coolant System Pressure to Avoid RPS or ESFAS Actuation per ABN-603, Loss of Protection or Instrument Bus.
- Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-603, Loss of Protection or Instrument Bus.
- Restore Component Cooling Water Flow Prior to Tripping the Reactor per ABN-502, Component Cooling Water System Malfunctions.
- Initiate Train A and/or Train B Containment Isolation Phase B due to Failure to Automatically Actuate Prior to Exiting FRZ-0.1A, Response to High Containment Pressure.

Event No.	Malf. No.	Event Type*	Event Description
1 +20 min	ED07A	C (RO, BOP, SRO) TS (SRO)	Loss of Inverter (IV1PC1).
2 +30 min	CC02A CC03A	C (BOP, SRO) TS (SRO)	Train A Component Cooling Water Pump 1-01 Trip. Train B Component Cooling Water Pump 1-02 Auto Start Failure.
3 +35 min	CV16A	I (RO, SRO)	Volume Control Tank Level Transmitter (LT-112) Fails Low.
4 +45 min	RC17B	C (RO, SRO)	Reactor Coolant Leak Inside Containment on Loop 2 Hot Leg of 600 GPM on 600 second ramp.
5 +60 min	RC08B2	M (RO, BOP, SRO)	Large Break Loss of Coolant Accident Inside Containment on Loop 2 Hot Leg Upon Reset of Containment Spray Signal in EOP-1.0A.
6 +60 min	SI04D	C (BOP)	Safety Injection Pump (1-02) Auto Start Failure on Safety Injection Signal.
7 +60 min	RP10A RP10B	I (BOP)	Automatic Train A and B Containment Isolation Phase B Failure.

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

Actual	Target Quantitative Attributes
7	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
1	Major transients (1-2)
1	EOPs entered/requiring substantive actions (1-2)
1	EOP contingencies requiring substantive actions (0-2)
4	Critical tasks (2-3)

SCENARIO SUMMARY NRC #3

The crew will assume the watch at 100% power with no scheduled activities per IPO-003A, Power Operations.

The first event is a loss of Inverter IV1PC1. Actions are per ABN-603, Loss of Protection or Instrument Bus, Section 2.0, and include placing Rod Control in MANUAL, controlling Steam Generator (SG) level and RCS pressure, and adjusting Charging flow due to a loss of Letdown. Affected systems will be restored to normal when the Alternate Power Supply is aligned. The SRO will refer to Technical Specifications.

When Technical Specifications are referenced, the Train A Component Cooling Water (CCW) Pump will trip and the Train B CCW Pump will fail to start. The crew will enter ABN-502, Component Cooling Water System Malfunction, Section 2.0, and transfer CCW flow to Train B. The SRO will refer to Technical Specifications.

The next event is a low failure of the Volume Control Tank Level Transmitter. The crew will reference annunciator ALM-0061A-4.5, VCT LEVEL LO, and ABN-105, Chemical and Volume Control System Malfunction, and establish an Alternate Operating Mode for the Reactor Makeup System.

When plant conditions are stable, a Reactor Coolant Leak inside Containment will commence. Once it is determined that Pressurizer level cannot be maintained, the Reactor must be manually tripped and Safety Injection manually initiated. The crew will enter EOP-0.0A, Reactor Trip or Safety Injection, and then transition to EOP-1.0A, Loss of Reactor or Secondary Coolant.

The scenario is complicated by a Train A and B Containment Isolation Phase B automatic actuation failure. Additionally, the Train B Safety Injection Pump will fail to auto start upon actuation of the Safety Injection Sequencer.

While in EOP-1.0A, a Large Break Loss of Coolant Accident will occur when the Containment Spray Signal is RESET during performance of Step 7. At that point, the Unit Supervisor should recognize that entry into FRZ-0.1A, Response to High Containment Pressure, is required due to a Critical Safety Function Status Tree ORANGE path inside Containment. When the actions of FRZ-0.1A are completed a transition to FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition, is required. FRP-0.1A will be exited at Step 1 RNO when it is determined that Reactor Coolant System pressure is less than 425 psig and Residual Heat Removal System flow is greater than 750 GPM.

The crew will return to EOP-1.0A, Loss of Reactor or Secondary Coolant, Step 8, as this is the current procedure and step in effect. This scenario is terminated when the conditions are reached for a Transfer to Cold Leg Recirculation.

Risk Significance:

- Failure of risk important system prior to trip: Loss of Protection System Inverter
  Loss of Component Cooling Water
- Risk significant core damage sequence: Small then Large Break LOCA
- Risk significant operator actions: Restore Steam Generator Level Control
  Restore Pressurizer Pressure Control
  Start Train B Safety Injection Pump
  Actuate Phase B Containment Isolation

Scenario Event Description
NRC Scenario #3

BOOTH OPERATOR INSTRUCTIONS for SIMULATOR SETUP

Initialize to IC #18 and LC21 NRC Scenario 3.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP		SI04D	Safety Injection Pump 1-02 Auto Start Failure	FAIL	K0
		RP10A	Train A Containment Isolation Phase B Failure	FAIL	K0
		RP10B	Train B Containment Isolation Phase B Failure	FAIL	K0
1		ED07A	Loss of Inverter (IV1PC1)	OFF	K1
1	EDR01		Inverter (IV1PC1) Alternate Power Supply		K11
2		CC02A	Train A CCW Pump 1-01 Failure	TRIP	K2
2		CC03A	Train B CCW Pump 1-02 Start Failure	FAIL	K2
3		CV16A	Volume Control Tank Transmitter LT-112 Failure	0%	K3
4		RC17B	Reactor Coolant Leak inside Containment	600 GPM	K4 600 sec. ramp
5		RC08B2	LOCA on RESET of CS During EOP-1.0A, Step 7 DIR PCSRD iiv Panel = 1 TRN B CS RESET	-	-
6		SI04D	Safety Injection Pump 1-02 Auto Start Failure	FAIL	K0
7		RP10A	Train A Containment Isolation Phase B Failure	FAIL	K0
7		RP10B	Train B Containment Isolation Phase B Failure	FAIL	K0

Scenario Event Description
NRC Scenario #3

Booth Operator: **INITIALIZE to IC #18 and LC21 NRC Scenario 3.**
ENSURE all Simulator Annunciator Alarms are ACTIVE.
ENSURE all Control Board Tags are removed.
ENSURE Operator Aid Tags reflect current boron conditions.
ENSURE Rod Bank Update (RBU) is performed.
ENSURE Turbine Load Rate set at 10 MWe/minute.
ENSURE 60/90 buttons DEPRESSED on ASD.
ENSURE ASD speakers are ON to 50%.
ENSURE Containment Fan Cooler (1-01) is OFF to support trip of Fan 1-04.
ENSURE Reactivity Briefing Sheet printout provided with Turnover.
ENSURE procedures in progress are on SRO desk:
- **COPY of IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load.**

ENSURE Control Rods are in AUTO with Bank D at 215 steps.

Control Room Annunciators in Alarm:

PCIP-1.1 – SR TRN A RX TRIP BLK
PCIP-1.2 – IR TRN A RX TRIP BLK
PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9
PCIP-1.6 – RX ≥ 10% PWR P-10
PCIP-2.1 – SR TRN B RX TRIP BLK
PCIP-2.2 – IR TRN B RX TRIP BLK
PCIP-2.5 – SR RX TRIP BLK PERM P-6
PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK
PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK

Operating Test :	NRC	Scenario #	3	Event #	1	Page	5	of	33
Event Description:	Loss of Protection Bus IV1PC1								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 1 (Key 1). - ED07A, Loss of Protection Bus IV1PC1.		
Indications Available: **10B-1.16 – 118V CHAN I INV TRBL** **Channel 1 Windows on TSLB 1 through 7 and 9** **Numerous Loss of Protection Bus 1PC1 Alarms**		
+30 secs	RO/BOP	RESPOND to Annunciator Alarm Procedures.
	RO/BOP	RECOGNIZE loss of Protection Bus 1PC1.
Booth Operator: If contacted, REPORT Fan Failure Alarm is lit on 1PC1 Inverter.		
Examiner Note: Primary side actions include controlling Pressurizer pressure due to an increase in Charging flow and a loss of Letdown. Secondary side actions include controlling Steam Generator (SG) levels in SGs 1-01 and 1-04 when Main Feedwater Pump speed lowers.		
	US	DIRECT performance of ABN-603, Loss of Protection or Instrument Bus, Section 2.0.
	US/RO	VERIFY Reactor did NOT trip. [Step 2.3.1 - YES]
	US	DETERMINE Unit in MODE 1. [Step 2.3.2 - YES]
NOTE: Step 3 is a continuous action step.		
	RO/BOP	Manually CONTROL parameters to MAINTAIN or RESTORE to normal: [Step 2.3.3 - YES]
	RO	• PLACE 1/1-RBSS, CONTROL ROD BANK SELECT Switch in MANUAL. [Step 2.3.3.a - YES]
NOTE: Step b. RNO should be performed for loss of uPC1 since HCV-182 is failed open. Alignment of charging to RCP seals only may be performed prior to this step and should be verified as part of step b. performance		

Operating Test :	NRC	Scenario #	3	Event #	1	Page	6	of	33
Event Description:	Loss of Protection Bus IV1PC1								

Time	Position	Applicant's Actions or Behavior
	RO	• VERIFY RCP Seal Injection Flow – WITHIN NORMAL OPERATING RANGE. [Step 2.3.3.b - NO]
		• Manually CONTROL 1-FK-121, CCP CHG FLO CTRL Valve. [Step 2.3.3.b RNO - YES]
		• DETERMINE 1-HCV-182 failed OPEN and CLOSE 1/1-8105 OR 1/1-8106 Charging Pump to RCS Isolation Valve AND ADJUST Charging flow to RCP seals. [Step 2.3.3.b RNO - YES]
	RO	• VERIFY Pressurizer level controlled – BETWEEN 25% and 70%. [Step 2.3.3.c - YES]
NOTE: Step 3.d. RNO should be performed (pressurizer master controller in manual) if uPC1 is the lost bus. This will preclude potential PORV lift when the bus is re-energized.		
	RO	• VERIFY Pressurizer pressure – WITHIN NORMAL OPERATING RANGE. [Step 2.3.3.d - NO]
CRITICAL TASK STATEMENT		**Control Reactor Coolant System Pressure to Avoid RPS or ESFAS Actuation per ABN-603, Loss of Protection or Instrument Bus.**
CRITICAL TASK		• PLACE 1-PK-455A, PRZR MASTER PRESS CTRL in MANUAL. [Step 2.3.3.d RNO - YES]
	BOP	• VERIFY Steam Generator levels being controlled – BETWEEN 60% AND 70%. [Step 2.3.3.e RNO - NO]
		• PLACE 1-SK-509A, FWPT MASTER SPD CTRL in MANUAL. [Step 2.3.3.e RNO - YES]
CRITICAL TASK STATEMENT		**Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-603, Loss of Protection or Instrument Bus.**
CRITICAL TASK		• PLACE 1-FK-510, SG 1 FW FLO CTRL in MANUAL and CONTROL SG 1-01 level. [Step 2.3.3.e RNO - YES]
CRITICAL TASK		• PLACE 1-FK-540, SG 4 FW FLO CTRL in MANUAL and CONTROL SG 1-04 level. [Step 2.3.3.e RNO - YES]
		• GO to Step 6. [Step 2.3.3.f - YES]

Operating Test :	NRC	Scenario #	3	Event #	1	Page	7	of	33
Event Description:	Loss of Protection Bus IV1PC1								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When contacted to reenergize 1PC1, EXECUTE remote function EDR01 (Key 5), Inverter IV1PC1 Alternate Power Supply.		
CAUTION: Reenergizing the affected protection bus may cause instrumentation spikes on controlling channels which may in turn initiate unwanted actions.		
	RO	VERIFY Unit – IN MODE 1. [Step 2.3.6 - YES]
NOTE: Rod Control should remain in MANUAL until all Tave channels are operable.		
	RO	• PLACE 1/1-RBSS, CONTROL ROD BANK SELECT Switch in MANUAL. [Step 2.3.6.a - DONE]
	RO	• SELECT LOOP 1 on 1-TS-412T, T_{AVE} CHAN DEFEAT Switch. [Step 2.3.6.b - YES]
	RO/BOP	• DISPATCH an operator to REENERGIZE Protection Bus 1PC1. [Step 2.3.6.c - YES]
	BOP	• VERIFY PCIP, Window 3.4 – TURB LOAD REJ STM DMP ARMED C-7, not ARMED. [Step 2.3.6.d - YES]
	RO	• MAINTAIN 1-TS-412T, T_{AVE} CHAN DEFEAT Switch in Loop 1 Position. [Step 2.3.6.e - YES]
CAUTION: To prevent rods from potentially stepping, allow a minimum of 2 minutes for Tavg circuitry to stabilize following manipulation of u-TS-412T before returning rod control to Auto.		
	RO	• PLACE 1/1-RBSS, CONTROL ROD BANK SELECT Switch in AUTO. [Step 2.3.6.f - YES]
	US/RO	• INVESTIGATE and INITIATE Corrective Action on loss of power to Protection Bus. [Step 2.3.6.g - YES]
	US	GO to Step 9. [Step 2.3.7 - YES]
	US/RO	VERIFY Unit – IN MODE 1. [Step 2.3.9 - YES]
Examiner Note: The following actions will be performed upon Bus 1PC1 restoration.		
	US	CHECK Status of Affected Control Systems and Instrumentation. [Step 2.3.10 - YES]

Operating Test :	NRC	Scenario #	3	Event #	1	Page	8	of	33
Event Description:	Loss of Protection Bus IV1PC1								

Time	Position	Applicant's Actions or Behavior
	BOP	• RESTORE Feedwater System to normal operation. [Step 2.3.10.a - YES]
		• PLACE 1-FK-510, SG 1 FW FLO CTRL in AUTO.
		• PLACE 1-FK-540, SG 4 FW FLO CTRL in AUTO.
		• PLACE 1-SK-509A, FWPT MASTER SPD CTRL in AUTO.
	RO	• PLACE N-41A, RATE MODE Switch to RESET on Drawer N-41A, Power Range Flux Rate Mode Selector and VERIFY Positive Rate Mode alarm light – DARK. [Step 2.3.10.b - YES]
	RO	• RESTORE Charging and Letdown. [Step 2.3.10.c - YES]
		• CLOSE 1-HC-182, Seal Flow Control Valve. [Step 2.3.10.c.1) - YES]
		• OPEN 1/1-8105 **or** 1/1-8106, Charging Isolation Valves. [Step 2.3.10.c.2) – YES]
		• ADJUST 1-HC-182, Seal Flow Control Valve and 1-FK-121, Charging Flow Control Valve to CONTROL RCP seal flow. [Step 2.3.10.c.3) - YES]
		• RESTORE Letdown flow per Control Board Job Aid **or** ABN-105. [Step 2.3.10.c.4) - YES]
Examiner Note: Letdown flow is re-established using the Letdown Restoration Job Aid.		
	RO	Reestablishing Normal Letdown Following Letdown Isolation. [Job Aid]
		• OPEN or VERIFY OPEN Letdown Isolation Valves 1/1-LCV-460 & 1/1-LCV 459. [Step 1 - YES]
		• Manually OPEN 1-PK-131, LTDN HX OUT PRESS CTRL to 30% (75 GPM) or 50% (120 GPM) DEMAND. [Step 2 - YES]
		• Manually OPEN 1-TK-130, LTDN HX OUT TEMP CTRL to 50% DEMAND. [Step 3 - YES]
		• ADJUST Charging to desired flow and MAINTAIN Seal Injection flow between 6 and 13 GPM. [Step 4 - YES]
		• OPEN selected Orifice Isolation Valves. [Step 5 - YES]
		• 1/1-8149A, LTDWN ORIFICE ISOL VLV (45 GPM)
		• 1/1-8149B, LTDWN ORIFICE ISOL VLV (75 GPM)
		• 1/1-8149C, LTDWN ORIFICE ISOL VLV (75 GPM)

Operating Test : NRC	Scenario # 3	Event # 1	Page 9 of 33
Event Description: Loss of Protection Bus IV1PC1			

Time	Position	Applicant's Actions or Behavior
		• ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to ~310 psig on 1-PI-131, LTDN HX OUT PRESS then PLACE in AUTO. [Step 6 - YES]
		• ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain ~95°F on 1-TI-130, LTDN HX OUT TEMP, then PLACE in AUTO. [Step 7 - YES]
	US	EVALUATE Technical Specifications. [Step 2.3.11 - YES]
		• LCO 3.8.7.A, Inverters - Operating.
		• CONDITION A - One required inverter inoperable. • ACTION A.1 - Restore inverter to OPERABLE status within 24 hours.
<u>Examiner Note</u>: LCO 3.8.9.B is entered when power is lost and exited when power is restored.		
		• LCO 3.8.9.B, Distribution Systems - Operating.
		• CONDITION B - One AC vital bus subsystem inoperable. • ACTION B.1 - Restore AC vital bus subsystem to OPERABLE status within 2 hours.
	US	REFER to EPP-201. [Step 2.3.12 – N/A]
	US	NOTIFY Engineering to expedite repairs. [Step 2.3.13 - YES]
	US	INITIATE a work request per STA-606, as necessary. [Step 2.3.14 - YES]
+20 min	US	INITIATE a Condition Report per STA-421. [Step 2.3.15 - YES]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 2.		

Operating Test :	NRC	Scenario #	3	Event #	2	Page	10	of	33
Event Description:	Train A Component Cooling Water (CCW) Pump Trip / Train B CCW Pump Start Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 2 (Key 2). - CC02A, Train A CCW Pump (1-01) trip. - CC03A, Train B CCW Pump (1-02) start failure.		
Indications Available: 3B-2.3 – CCWP 1 / 2 OVRLOAD TRIP 3B-3.3 – CCW TRN B SFGD LOOP PRESS LO Multiple CCW low flow alarms		
+1 min	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE Train A CCW Pump trip with failure of Train B CCW Pump to start.
	US	DIRECT implementation of ABN-502, Component Cooling Water System Malfunctions, Section 2.0.
	BOP	VERIFY Train B CCW Pump – RUNNING. [Step 2.3.1 - NO]
CRITICAL TASK STATEMENT		**Restore Component Cooling Water Flow Prior to Tripping the Reactor per ABN-502, CCW System Malfunctions.**
CRITICAL TASK	RO	Manually START Train B CCW Pump 1-02. [Step 2.3.1 RNO - YES]
	BOP	VERIFY Train B Station Service Water Pump – RUNNING. [Step 2.3.2 - YES]
	RO/BOP	VERIFY Train B Safety Chiller Recirc Pump 1-06 – RUNNING. [Step 2.3.3 - YES]
	BOP	VERIFY CCW Heat Exchanger outlet flow – LESS THAN 17,500 GPM PER HEAT EXCHANGER. [Step 2.3.4 - YES]
		• 1-FI-4536A, CCW HX 1 OUT FLO
		• 1-FI-4537A, CCW HX 2 OUT FLO
	BOP	VERIFY required Train B equipment for existing plant conditions – IN OPERATION. [Step 2.3.5 - YES]

Operating Test : NRC	Scenario # 3	Event # 2	Page 11 of 33
Event Description: Train A Component Cooling Water (CCW) Pump Trip / Train B CCW Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
		• Control Room Air Conditioning Units
		• Containment Spray System
		• UPS HVAC Unit
		• Excess Letdown
		• RHR System
<u>Examiner Note</u>: Equipment may be turned over to Unit 2.		
	BOP	STOP Train A equipment – AS NECESSARY. [Step 2.3.6 - YES]
		• Control Room Air Conditioning Units [Step 2.3.6 - YES]
		• Containment Spray System [Step 2.3.6 - NO]
		• UPS HVAC Unit [Step 2.3.6 - YES]
		• RHR System [Step 2.3.6 - NO]
		• Safety Chiller Recirculation Pump [Step 2.3.6 - YES]
	BOP	VERIFY CCW Heat Exchanger outlet temperature did NOT exceed 122ºF with pump running. [Step 2.3.7 - YES]
	US	INITIATE a Work Request per STA-606. [Step 2.3.8 - YES]
	US	EVALUATE Technical Specifications. [Step 2.3.9 - YES]
		• LCO 3.7.7.A, Component Cooling Water System.
		• CONDITION A - One CCW train inoperable. • ACTION A.1 - Restore CCW train to OPERABLE status within 72 hours.
+10 min	US	REFER to EPP-201. [Step 2.3.10 - NO]
When the Technical Specification actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	3	Event #	3	Page	12	of	33
Event Description:	Volume Control Tank Level Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 3 (Key 3). - CV16A, Volume Control Tank (LT-112) fails low.		
Indications Available: **6A-3.5 – VCT LVL LO** **6A-4.5 – VCT LVL LO-LO** **1-LI-112A – VCT LVL level indication fails low**		
+1 min	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE VCT level transmitter (LT-112) failed low.
Examiner Note: The following step is from 1-ALB-6A, Window 4.5 – VCT LVL LO-LO.		
	RO	STOP Auto Makeup; PLACE 1/1-MU, RCS MU MAN ACT in STOP. [Step 5.B.1) – YES]
	US	DIRECT performance of ALM-0061A, 1-ALB-6A, Window 4.5 – VCT LVL LO-LO **or** ABN-105, Chemical and Volume Control System Malfunction, Section 6.0.
Booth Operator: When maintenance is contacted, DELETE malfunction CV16A and REPORT I&C vented the transmitter and it appears to be operating normally.		
Examiner Note: The following steps are from 1-ALB-6A, Window 4.5 – VCT LVL LO-LO.		
	RO	DETERMINE Charging Pump suction has NOT shifted to RWST and Positive Displacement Pump is NOT operating. [Step 1 - YES]
	RO	MONITOR VCT level on 1-LI-112A, VCT LVL and 1-LI-185, VCT LVL. [Step 2 - YES]
		• DETERMINE 1-LI-185, VCT LVL is NOT failed low. [Step 2.A - YES]
		• DETERMINE no indication of gas intrusion into Charging Pump. [Step 2.B - YES]
	RO	MONITOR Charging flow on 1-FI-121A, CHRG FLO and Letdown flow on 1-FI-132, LTDN FLO. [Step 3 - YES]

Operating Test :	NRC	Scenario #	3	Event #	3	Page	13	of	33
Event Description:	Volume Control Tank Level Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
	RO	DETERMINE only 1-LI-112A, VCT LVL is failed low. [Step 4 - YES]
	RO	If VCT levels indicate different, PERFORM the following:
		• VERIFY 1-PI-115, VCT PRESS is approximately 30 psig. [Step 5.A - YES].
		• CHECK 1-LT-112, CVCS VCT Level Transmitter for malfunction. [Step 5.B - YES]
		• STOP Auto Makeup; PLACE 1/1-MU, RCS MU MAN ACT in STOP. [Step 5.B.1) - DONE]
		• If necessary, REDUCE VCT level to between 46% and 56% and PLACE 1/1-LCV-112A, VCT LVL CTRL VLV in HUT position. [Step 5.B.2) - N/A]
		• ENSURE 1-LI-185, VCT LVL and 1-PI-115, VCT PRESS are both lowering. [Step 5.B.3) – YES]
		• REFER to ABN-105, Chemical and Volume Control System Malfunction. [Step 5.B.4) – YES]
Examiner Note:		**The following steps are from ABN-105, Chemical and Volume Control System Malfunction, Section 6.0, Reactor Makeup System Malfunction.**
NOTE: Normal Operating Mode of the Reactor Makeup System includes the following Modes: • Automatic Mode • Borate Mode • Dilute Mode • Alternate Dilute Mode		
	RO	DETERMINE Reactor Makeup System NOT in Normal Operating Mode. [Step 6.3.1) – YES]
		• If makeup is required, ESTABLISH Alternate Operating Mode per SOP-104A, Reactor Make-up and Chemical Control System. [Step 6.3.1 RNO – YES]
	RO	VERIFY Automatic Operating Mode in service per SOP-104A, Reactor Makeup and Chemical Control System. [Step 6.3.1.a) – YES]

Operating Test :	NRC	Scenario #	3	Event #	3	Page	14	of	33
Event Description:	Volume Control Tank Level Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note: The following steps are from SOP-104A, Reactor Make-up and Chemical Control System, Section 5.2.4, Manual Blended Makeup (Alternate).		
		• PLACE 1/1-MU, RCS MU MAN ACT in STOP. [Step 5.2.4.C - YES]
		• PLACE 43/1-MU, RCS MU MODE SELECT in MAN. [Step 5.2.4.D - YES]
		• SET 1-FK-111, RMUW BLNDR FLO CTRL to total flowrate required. [Step 5.2.4.F.1) - YES]
		• SET 1-FK-110, BA BLNDR FLO CTRL to obtain a blended flow. [Step [5.2.4.F.2) - YES]
		• SET 1-FY-111B, RCS MU BATCH FLO to obtain desired total volume. [5.2.4.F.3) - YES]
		• SET 1-FY-110B, BA BATCH FLO as required. [5.2.4.F.4) - YES]
+5 min	RO	When VCT Level Transmitter is vented, PLACE 1/1-MU, RCS MU MAN ACT in AUTO.
When VCT level control is restored, or at Lead Examiner discretion, PROCEED to Event 4.		

Operating Test :	NRC	Scenario #	3	Event #	4	Page	15	of	33
Event Description:	Reactor Coolant System Leak								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 4 (Key 4). - RC17B, Reactor Coolant Leak inside Containment of 1000 GPM on 600 second ramp.		
Indications Available: **CAG197, Containment Air Gaseous Radiation Monitor in ALERT on PC-11** **2B-4.12 – CNTMT FAN CLR 1 & 2 CNDS FILL RATE HI** **2A-2.8 – ANY CNTMT SMP PMP RUN** **2B-3.12 – CNTMT FAN CLR 3 & 4 CNDS FILL RATE HI** **Containment Sump Pump AUTO start**		
+1 min	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE RCS leak into Containment.
	US	DIRECT performance of ABN-103, Excessive Reactor Coolant Leakage, Section 2.0.
NOTE: The symbol [R] has been located throughout this procedure where real or potential radiation hazards are positively identified. This identification technique should not preclude workers from following good radiation work practices throughout this procedure to ensure their occupational exposure is maintained As Low As Is Reasonably Achievable (ALARA).		
	RO	VERIFY Charging Pump – AT LEAST ONE RUNNING. [Step 2.3.1 - YES]
	RO	ENSURE Pressurizer level – AT OR TRENDING TO PROGRAM LEVEL SETPOINT. [Step 2.3.2 - NO]
		• PLACE Charging Pump Flow Controller in MANUAL and ADJUST Charging flow to maintain Pressurizer level let setpoint [Step 2.3.2 RNO - YES]
	US	• If Pressurizer level decreases in an uncontrolled manner, PERFORM the following: [Step 2.3.2 RNO - YES]
	RO	• TRIP the Reactor. [Step 2.3.2 RNO - YES]
		• PLACE 1/1-RTC, RX TRIP BKR Switch in TRIP position and VERIFY Reactor Trip at CB-07.

Operating Test :	NRC	Scenario #	3	Event #	4	Page	16	of	33
Event Description:	Reactor Coolant System Leak								

Time	Position	Applicant's Actions or Behavior
	RO	• ACTUATE Safety Injection. [Step 2.3.2 RNO - YES]
		• PLACE 1/1-SIA2, SI MAN ACT Switch to ACT position at CB-07 and DETERMINE SI has actuated.
	US	• GO to EOP-0.0A. [Step 2.3.2 RNO - YES]
When Reactor is tripped, or at Lead Examiner discretion, PROCEED to Events 5, 6, and 7.		

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	17	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Events 5, 6, and 7. **- RC08B2, Large Break LOCA on Loop 2 Hot Leg when Containment Spray is RESET at Step 7 of EOP-1.0A, Loss of Reactor or Secondary Coolant.** **- SI04D, Safety Injection Pump 1-02 AUTO start failure on SI sequencer.** **- RP10A, Train A Containment Isolation Phase B Auto Actuation failure.** **- RP10B, Train B Containment Isolation Phase B Auto Actuation failure.**		
Indications Available: **Multiple Reactor Trip alarms**		
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
Examiner Note: The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.		
	RO	VERIFY Reactor Trip: [Step 1 - YES]
		• VERIFY Reactor Trip Breakers – OPEN. [Step 1.a - YES]
		• VERIFY Neutron flux – DECREASING. [Step 1.a - YES]
		• VERIFY all Control Rod Position Rod Bottom Lights – ON. [Step 1.b - YES]
	BOP	VERIFY Turbine Trip: [Step 2 - YES]
		• VERIFY all HP Turbine Stop Valves – CLOSED. [Step 2 - YES]
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3 - YES]
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a - YES]
		• VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b - YES]
	RO	CHECK SI status: [Step 4 - YES]
		• CHECK if SI is actuated. [Step 4.a - YES]
		• VERIFY SI Actuated blue status light – ON: [Step 4.a - YES]
		• VERIFY Both Trains SI Actuated: [Step 4.b - YES]
		• SI Actuated blue status light – ON NOT FLASHING.

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	18	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
		Examiner Note: EOP-0.0A, Attachment 2 steps performed by BOP are identified later in the scenario. The RCPs may be tripped if subcooling is observed to be < 25ºF.
		CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.
		NOTE: Attachment 2 is required to be completed before FRGs are implemented.
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5 - YES]
	RO	VERIFY AFW Alignment: [Step 6 - YES]
		• VERIFY both MDAFW Pumps – RUNNING. [Step 6.a - YES]
		• PLACE TDAFW Pump in PULLOUT per Foldout Page. [Step 6.b - YES]
		• VERIFY AFW total flow – GREATER THAN 460 GPM. [Step 6.c - YES]
		• VERIFY AFW valve alignment - PROPER ALIGNMENT. [Step 6.d - YES]
	RO	VERIFY Containment Spray NOT Required: [Step 7 - YES]
		• VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY Containment pressure – LESS THAN 18.0 PSIG. [Step 7.a - YES]
		• VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED. [Step 7.b - YES]
		• VERIFY Containment Spray Pumps – RUNNING. [Step 7.c - YES]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	19	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
	RO	CHECK if Main Steam lines should be ISOLATED: [Step 8 - YES]
		• VERIFY Containment pressure – GREATER THAN 6.0 PSIG. [Step 8.a - NO]
		• GO to Step 9. [Step 8.a RNO - YES]
	RO	CHECK RCS Temperature: [Step 9 - YES]
		• VERIFY RCS Average Temperature – STABLE AT OR TRENDING TO 557°F. [Step 9 - YES]
	RO	CHECK PRZR Valve Status: [Step 10 - YES]
		• VERIFY PRZR Safeties – CLOSED. [Step 10.a - YES]
		• VERIFY Normal PRZR Spray Valves – CLOSED. [Step 10.b - YES]
		• VERIFY PORVs – CLOSED. [Step 10.c - YES]
		• VERIFY Power to at least 1 Block Valve – AVAILABLE. [Step 10.d - YES]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 10.e - YES]
	RO	CHECK if RCPs Should Be Stopped: [Step 11 - YES]
		• VERIFY RCS subcooling less than 25ºF (55ºF FOR ADVERSE CONTAINMENT). [Step 11.a - NO]
		• GO to Step 12. [Step 11.a RNO - YES]
	RO/BOP	CHECK if Any Steam Generator Is Faulted: [Step 12 - NO]
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 12.a - NO]
		• VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 12.a - NO]
		• GO to Step 13. [Step 12.a RNO - YES]
	RO/BOP	CHECK if Steam Generator Tubes Are NOT Ruptured: [Step 13 - YES]
		• VERIFY Condenser Off Gas radiation – NORMAL.
		• VERIFY Main Steam Line radiation – NORMAL.
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL.
		• VERIFY levels in all Steam Generators – NORMAL.

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	20	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
	RO/BOP	CHECK if RCS is Intact: [Step 14 - NO]
		• VERIFY Containment pressure – LESS THAN 1.3 PSIG. [Step 14 - NO]
		• VERIFY Containment recirculation sump levels – NORMAL. [Step 14 - NO]
		• VERIFY Containment radiation levels – NORMAL. [Step 14 - NO]
		• GO to EOP-1.0A, Loss of Reactor or Secondary, Step 1. [Step 14 RNO - YES]
	US	TRANSITION to EOP-1.0A, Loss of Reactor or Secondary Coolant, Step 1.
Examiner Note:		**EOP-1.0A, Loss of Reactor or Secondary Coolant, steps begin here.**
Examiner Note:		**At some point during EOP-1.0A, FRZ-0.1A, Response to High Containment Pressure, must be entered due to an ORANGE path. Those steps are addressed later in the scenario.**
		CAUTION: Following a high energy line rupture inside containment, the operator should not rely upon steam generator water level indications in any depressurized steam generators.
		NOTE: As PRZR Temperature decreases the error on indicated PRZR level will increase. Attachment 2 may be used to determine actual PRZR level.
	US/RO	CHECK If RCPs Should Be Stopped: [Step 1 - YES]
		• VERIFY RCS subcooling less than 25ºF (55ºF FOR ADVERSE CONTAINMENT). [Step 1.a - NO]
		• GO to Step 2. [Step 1.a RNO - YES]
	RO/BOP	CHECK if Any Steam Generator Is Faulted: [Step 2 - NO]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	21	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 2.a - NO]
		• VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 2.a - NO]
		• GO to Step 3. [Step 2.a RNO - YES]
	US	CHECK Intact Steam Generator Levels: [Step 3 - YES]
		• VERIFY Narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT). [Step 3.a - NO]
		• MAINTAIN total AFW flow greater than 460 GPM until narrow range level GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT). [Step 3.a RNO - YES]
	US	CHECK Secondary Radiation NORMAL: [Step 4 - YES]
		• VERIFY Condenser off gas radiation – NORMAL. [Step 4 - YES]
		• VERIFY Main Steam Line radiation – NORMAL. [Step 4 - YES]
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL. [Step 4 - YES]
		• VERIFY levels in all Steam Generators – NORMAL. [Step 4 - YES]
		CAUTION: If any PRZR PORV opens because of high PRZR pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint.
	US	CHECK PRZR PORVs and Block Valves: [Step 5 - YES]
		• VERIFY power Block Valves – AVAILABLE. [Step 5.a - YES]
		• VERIFY PORVs – CLOSED. [Step 5.b - YES]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 5.c - YES]
	US/RO	CHECK if ECCS Flow Should Be Reduced: [Step 6 - NO]
		• VERIFY Secondary heat sink conditions – SATISFIED. [Step 6.a - YES]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	22	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
		• VERIFY RCS subcooling – GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 6.b - NO]
		• GO to Step 7 and OBSERVE CAUTIONS Prior to Step 7. [Step 6.b RNO - YES]
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
		CAUTION: When time permits, Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset.
	RO/BOP	RESET ESF Actuation Signals. [Step 7 - YES]
	RO/BOP	PLACE both EDG EMERG STOP/START handswitches in START. [Step 7.a - YES]
Examiner Note: When Safety Injection is properly RESET, Annunciator 1-ALB-2B, Window 2.8, SFGD SEQR TRN A/B AUTO TEST TRBL, will RESET.		
	RO/BOP	RESET SI. [Step 7.b - YES]
		• DEPRESS 1/1-SIRA, TRAIN A SI RESET pushbutton.
		• DEPRESS 1/1-SIRB, TRAIN A SI RESET pushbutton.
	RO/BOP	RESET SI Sequencers. [Step 7.c - YES]
		• At SI Sequencer Train A Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
		• At SI Sequencer Train B Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	23	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
	RO/BOP	RESET Containment Isolation Phase A and Phase B. [Step 7.d - YES]
		• DEPRESS 1/1-C1PARA, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PARB, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PBRA, CNTMT ISOL – PHASE B RESET pushbutton.
		• DEPRESS 1/1-C1PBRB, CNTMT ISOL – PHASE B RESET pushbutton.
Examiner Note: When the Containment Spray Signal is RESET, a Large Break Loss of Coolant Accident will initiate. The Unit Supervisor should immediately exit EOP-1.0A and enter FRZ-0.1A, Response to High Containment Pressure.		
	RO/BOP	RESET Containment Spray Signal. [Step 7.e - YES]
		• DEPRESS 1/1-CSRA, TRAIN A CS RESET pushbutton.
		• DEPRESS 1/1-CSRB, TRAIN B CS RESET pushbutton.
Examiner Note: FRZ-0.1A, Response to High Containment Pressure, steps begin here.		
	US/RO	CHECK Containment pressure – GREATER THAN 50 PSIG. [Step 1 - NO]
	RO/BOP	• DETERMINE proper Containment Spray alignment was NOT verified in EOP-0.A. [Step 1 RNO - YES]
Examiner Note: The crew must perform a Containment Spray Alignment because it was NOT verified at Step 7 of EOP-0.0A, Reactor Trip or Safety Injection.		
	RO/BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION. [Step 2 - YES]
	RO/BOP	VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION. [Step 3 - YES]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	24	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
		NOTE: Component Cooling Water supply to the unit instrument air compressors isolates on a Phase B isolation signal.
	RO	CHECK if Containment Spray is Required: [Step 4 - YES]
		• VERIFY Containment pressure – GREATER THAN 18.0 PSIG. [Step 4.a - YES]
		• STOP all RCPs. [Step 4.b - YES]
		• VERIFY Containment Isolation Phase B Valves – CLOSED. [Step 4.c - NO]
CRITICAL TASK STATEMENT		**Initiate Train A and/or Train B Containment Isolation Phase B due to Failure to Automatically Actuate Prior to Exiting FRZ-0.1A, Response to High Containment Pressure.**
CRITICAL TASK	BOP	• Manually INITIATE Train A and/or Train B of Containment Isolation Phase B. [Step 4.c RNO - NO]
		• PLACE 1/1-CIPBA1A CS/CNTMT ISOL – PHASE B MAN ACT Switch in ACT position.
		• PLACE 1/1-CIPBA2A CS/CNTMT ISOL – PHASE B MAN ACT Switch in ACT position.
		• VERIFY appropriate MLB indication for CNTMT SPRAY (blue windows) AND PHASE B (orange windows). [Step 4.c - YES]
		• VERIFY ECA-1.1A, Loss of Emergency Coolant Recirculation – NOT IN EFFECT. [Step 4.d - YES]
		• VERIFY Containment Spray Pumps – RUNNING. [Step 4.e - YES]
		• VERIFY Containment Spray System valve alignment – PROPER EMERGENCY ALIGNMENT PER ATTACHMENT 4. [Step 4.f - YES]
		• VERIFY Containment Spray flow. [Step 4.g - YES]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	25	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
		Examiner Note: FRZ-0.1A, Attachment 4, Containment Spray Alignment - Injection Phase, steps begin here.
		NOTE: The following steps are used to verify proper alignment for the injection phase of Containment Spray.
	RO/BOP	VERIFY 1-MLB-4A3 AND 4B3 - BLUE LIGHTS LIT. [Step 1 - YES]
	RO/BOP	VERIFY 1-HS-4753 and 1-HS-4752, CHEM ADD TK DISCH VLVs - OPEN [Step 2 - YES]
	RO/BOP	VERIFY 1-HS-4782 and 1-HS-4783, CNTMT SMP TO CSP 1 & 3 AND 2 & 4 SUCT ISOL VLVs – CLOSED. [Step 3 - YES]
	RO/BOP	VERIFY 1-HS-4758 and 1-HS-4759, RWST TO CSP 1 & 3 AND 2 & 4 SUCT VLVs – OPEN. [Step 4 - YES]
	RO/BOP	NOTIFY Unit Supervisor Attachment 4 instructions – COMPLETE. [Step NOT numbered - YES]
		Examiner Note: FRZ-0.1A, Response to High Containment Pressure, steps continue here.
	US/RO	VERIFY Main Steam Line Isolation Valves – CLOSED. [Step 5 - YES]
		CAUTION: At least one SG must be maintained available for RCS cooldown.
		CAUTION: If all SGs are faulted, at least 100 gpm AFW flow should be maintained to each SG.

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	26	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
	RO/BOP	CHECK IF Feedwater Flow should be isolated to any SG. [Step 6 - NO]
		• GO to Step 7 [Step 6.a RNO - YES]
Examiner Note:		**The Unit Supervisor should exit FRZ-0.1A, Response to High Containment Pressure and enter FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition due to a Critical Safety Function Status Tree ORANGE path.**
	US	RETURN to Procedure and Step in Effect.
Examiner Note:		**FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition, steps begin here.**
	US	VERIFY RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 1 - NO]
	RO/BOP	• VERIFY RHR Pump flow greater than 750 GPM and RETURN to procedure and step in effect. [Step 1 RNO - YES]
Examiner Note:		**The Unit Supervisor should exit FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition and return to EOP-1.0A, Loss of Reactor or Secondary Coolant.**
Examiner Note:		**EOP-1.0A, Loss of Reactor or Secondary Coolant, Step 8 begins here.**
		CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) the RHR pumps must be manually restarted to supply water to the RCS.
	US	CHECK If RHR Pumps Should Be Stopped: [Step 8 - YES]
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.a.1) - NO]
		• GO to Step 10. [Step 8.a.1) RNO - YES]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	27	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
	US	CHECK If Diesel Generators Should Be Stopped: [Step 10 - YES]
	RO/BOP	• VERIFY both AC Safeguards Buses ENERGIZED by Offsite Power. [Step 10.a - YES]
	RO/BOP	• PLACE both EDG EMERG STOP/START handswitches in STOP. [Step 10.b - YES]
		NOTE: Verification of at least one flowpath from a RHR pump to the RCS via a SI pump or CCP is sufficient to verify cold leg recirculation capability.
	US	INITIATE Evaluation of Plant Status. [Step 11 - YES]
	RO	• VERIFY Cold Leg Recirculation capability: [Step 11.a - YES]
		• VERIFY Train A RHR Pump – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY CCW to Train A RHR Pump – AVAILABLE. [Step 11.a.1) - NO]
		• VERIFY 1/1-8811A, CNTMT SMP TO RHRP 1 SUCT ISOL VLV AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY Train B RHR Pump – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY CCW to Train B RHR Pump – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY 1/1-8804A, RHRP 1 TO CCP SUCT VLV – AVAILABLE. [Step 11.a.2) - YES]
		• VERIFY 1/1-8804B, RHRP 2 TO SIP SUCT VLV – AVAILABLE. [Step 11.a.2) - YES]
	RO/BOP	• CHECK Auxiliary Building and Safeguards Building radiation – NORMAL: [Step 11.b - YES]
		• CHECK PC-11 monitors – NORMAL OR Notify Radiation Protection to take local Radiation Surveys. [Step 11.b - YES]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	28	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
	US	• NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident. [Step 11.c - YES]
	US	• CONTACT Plant Staff to EVALUATE plant equipment. [Step 11.d - YES]
	US	CHECK if RCS Cooldown and Depressurization Is Required: [Step 12 - YES]
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 12.a - NO]
	RO/BOP	• VERIFY RHR Pump flow greater than 750 GPM and GO to Step 13. [Step 12.a RNO - YES]
	US	CHECK If Transfer to Cold Leg Recirculation Is Required. [Step 13 - YES]
	RO/BOP	• VERIFY RWST Level – LESS THAN LO-LO LEVEL. [Step 13.a – YES/NO]
When RWST LO-LO Level alarm annunciates, TERMINATE the scenario.		

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	29	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.		
CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment.		
	BOP	VERIFY SSW Alignment: [Step 1 - YES]
		• VERIFY SSW Pumps – RUNNING. [Step 1.a - YES]
		• VERIFY EDG Cooler SSW return flow. [Step 1.b - YES]
	BOP	VERIFY Safety Injection Pumps – RUNNING. [Step 2 - NO]
		• Manually START Train B SIP 1-02. [Step 2 RNO - YES]
	BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3 - YES]
	BOP	VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4 - YES]
	BOP	VERIFY Train B CCW Pump – RUNNING. [Step 5 - YES]
	BOP	VERIFY RHR Pumps – RUNNING. [Step 6 - YES]
	BOP	VERIFY Proper CVCS Alignment: [Step 7 - YES]
		• VERIFY both CCPs – RUNNING. [Step 7.a - YES]
		• VERIFY Letdown Relief Valve Isolation: [Step 7.b - YES]
		• Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1) - YES]
		• Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2) - YES]

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	30	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY ECCS flow: [Step 8 - YES]
		• CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a - YES]
		• RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b - NO]
		• SIP discharge flow indicator – CHECK FOR FLOW. [Step 8.c - NO]
		• RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.d - NO]
		• GO to Step 9. [Step 8.d RNO - YES]
	BOP	VERIFY Feedwater Isolation Complete: [Step 9 - YES]
		• Feedwater Isolation Valves – CLOSED.
		• Feedwater Isolation Bypass Valves – CLOSED.
		• Feedwater Bypass Control Valves – CLOSED.
		• Feedwater Control Valves – CLOSED.
	BOP	VERIFY both Diesel Generators – RUNNING. [Step 10 - YES]
	BOP	VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB-10 – LIT. [Step 11 - YES]
		NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.
	BOP	VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12 - YES]
	BOP	INITIATE periodic monitoring of Spent Fuel Cooling. [Step 13 - YES]
		• Spent Fuel Pool temperature (T2900A, T2901A).
		• Spent Fuel Pool level (L4800A, L4801A, L4802A, L4803A).

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	31	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

BOP — VERIFY Components on Table 1 are Properly Aligned. [Step 14 - YES]

Location	Equipment	Description	Condition
CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED
CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED
CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED
CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	32	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior

	CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
	CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
	CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
	CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
	CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
	CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
	CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
	CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
	CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
	CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
	CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
	CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED
<u>Examiner Note</u>: The next four (4) steps would be performed on Unit 2.				
	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED

Operating Test :	NRC	Scenario #	3	Event #	5, 6, & 7	Page	33	of	33
Event Description:	Large Break Loss of Coolant Accident / Train B Safety Injection Pump Auto Start Failure / Train A and B Containment Isolation Phase B Failure								

Time	Position	Applicant's Actions or Behavior

		CB-03	2-HS-5536	AIR PRG SPLY ISOL DMPR	CLOSED
	BOP	NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. [Step 14 - YES]			
EOP-0.0A, Attachment 2 steps are now complete.					

Appendix D	Scenario Outline	Form ES-D-1

Facility:	CPNPP 1 & 2	Scenario No.: 4	Op Test No.: April 2013 NRC
Examiners:		Operators:	

Initial Conditions: ~3% power BOL - RCS Boron is 1659 ppm by Chemistry sample. Steam Dump System in service for Reactor Coolant System Temperature Control.

Turnover: Recirculate the Refueling Water Storage Tank prior to MODE 1 entry then raise Reactor Power from 3% to 8% in preparation for Turbine Startup.

Critical Tasks:
- Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-710, Steam Generator Level Instrument Malfunction.
- Manually Trip Reactor Due to Reactor Protection System Failure Prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection.
- Trip Reactor Coolant Pumps within 10 minutes upon a Loss of Subcooling per EOP-1.0A, Loss of Reactor or Secondary Coolant, Foldout Page.

Event No.	Malf. No.	Event Type*	Event Description
1 +10 min		N (BOP)	Recirculate the Refueling Water Storage Tank with Containment Spray Pump 1-01.
2 +20 min	RX12	C (RO)	Main Steam Header Pressure (PT-507) Fails High on 360 second ramp.
3 +40 min		R (RO) N (BOP, SRO)	Raise Power to 6% to 8% in Preparation for Synchronizing Main Generator to Electrical Grid.
4 +50 min	RX04A	I (BOP, SRO) TS (SRO)	Steam Generator (1-01) Level Channel (LT-551) Fails Low.
5 +55 min	CS02A	TS (SRO)	Containment Spray Pump (1-01) Trip.
6 +60 min	RP14B	C (RO)	Spurious Train B Safety Injection Actuation Signal.
7 +60 min	RP01	M (RO, BOP, SRO)	Automatic Reactor Trip Failure. RPS Failure requires Manual Reactor Trip.
8 +60 min	RP09B	C (BOP)	Train B Containment Isolation Phase A Automatic Actuation Failure.
9 +80 min	RC08C1	M (RO, BOP, SRO)	Small Break Loss of Coolant Accident Inside Containment When Safety Injection Pump 1-02 is Secured in EOS-1.1A.

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

Actual	Target Quantitative Attributes
7	Total malfunctions (5-8)
2	Malfunctions after EOP entry (1-2)
2	Abnormal events (2-4)
2	Major transients (1-2)
1	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

SCENARIO SUMMARY NRC #4

The crew will assume the watch with power at approximately 3% per IPO-003A, Power Operations. Prior to raising power, the crew will recirculate the Refueling Water Storage Tank (RWST) using Containment Spray Pump 1-01 per SOP-204A, Containment Spray System, Section 5.1.3, Recirculation through the Recirculation Header.

The next event is a high failure of Main Steam Header Pressure Transmitter (PT-507) on a 360 second ramp. The crew enters ABN-709, Steam Header Pressure Instrument Malfunction, Section 3.0, and places the Steam Dump System in MANUAL to regain control of Reactor Coolant System (RCS) temperature. The controller will remain in MANUAL for the duration of the scenario.

When RCS temperature control is restored, the crew will continue with IPO-003A, Section 5.1, Warmup and Synchronization of the Turbine Generator, Step 5.1.16, and perform a power ascension using the Rod Control and Steam Dump Systems.

The next event is a Steam Generator Level Transmitter failure. Actions are per ABN-710, Steam Generator Level Instrumentation Malfunction. The BOP will be required to take manual control of the Feedwater Bypass Control Valve and then select an alternate controlling channel to return the Feedwater System to automatic control. The SRO will refer to Technical Specifications.

When conditions are stable, Containment Spray Pump 1-01 will trip. Actions are per ALM-0022A, 1-ALB-2B, Window 1.3 – ANY CSP OVRLD TRIP. The SRO will refer to Technical Specifications.

When Technical Specifications have been referenced, a spurious Train B Safety Injection Signal will actuate. The crew will determine that the Reactor did not automatically trip and initiate a Reactor Trip and Safety Injection and enter EOP-0.0A, Reactor Trip or Safety Injection. This scenario is complicated by Train B Containment Isolation Phase A Automatic actuation failure.

The crew will exit EOP-0.0A at Step 15 and enter EOS-1.1A, Safety Injection Termination. While in EOS-1.1A, Safeguards Signals are reset, the Charging flow path is realigned, and Safety Injection (SI) Pumps are stopped. When SI Pump 1-02 is stopped, a Small Break Loss of Coolant Accident will initiate. At this point, the crew will follow guidance on the EOS-1.1A Foldout Page that requires a transition to EOP-1.0A, Loss of Reactor or Secondary Coolant.

The scenario is terminated when it is determined in EOP-1.0A that Pressurizer pressure continues to slowly lower, and a transition to EOS-1.2 A, Post LOCA Cooldown and Depressurization, is required.

Risk Significance:

- Failure of risk important system prior to trip: Containment Spray Pump Trip
- Risk significant core damage sequence: Automatic Reactor Trip Failure
  Small Break Loss of Coolant Accident
- Risk significant operator actions: Manually Trip Reactor
  Manually Initiate Safety Injection
  Initiate Train B Containment Isolation

Scenario Event Description
NRC Scenario #4

BOOTH OPERATOR INSTRUCTIONS for SIMULATOR SETUP

Initialize to IC #10 and LC21 NRC Scenario 4.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP		RP01	Automatic Reactor Trip Failure	FAIL	K0
		RP09B	Train B Containment Isolation Phase A Failure	FAIL	K0
1		-	Recirculate the RWST	-	N/A
2		RX12	Main Steam Header Pressure (PT-507) Failure	1500 psig	K2 (360 sec ramp)
3		-	Raise power to 6% to 8%	-	N/A
4		RX04A	SG (1-01) Level Channel (LT-551) Failure	0%	K4
5		CS02A	Containment Spray Pump (1-01) Trip	TRIP	K5
6		RP14B	Spurious Train B Safety Injection Actuation	-	K6
7		RP01	Automatic Reactor Trip Failure	FAIL	K0
8		RP09B	Train B Containment Isolation Phase A Failure	FAIL	K0
9		RC08C1	Small Break LOCA in EOS-1.1A.	3"	SIP 1-02 Stopped
9	DISIAPSI2 Value = 1 IMF RC08C1 f:1				

Scenario Event Description
NRC Scenario #4

Booth Operator: **INITIALIZE to IC #10 and LC21 NRC Scenario 4.**
ENSURE all Simulator Annunciator Alarms are ACTIVE.
ENSURE all Control Board Tags are removed.
ENSURE Operator Aid Tags reflect current boron conditions.
ENSURE Control Rods are in MANUAL with Control Rod Bank C @ 224 steps and Bank D @ 109 steps.
ENSURE Rod Bank Update (RBU) is performed.
REMOVE N-16 detectors from POLL on PC-11.
ENSURE 1-HS-2484 & 1-HS-2485, Condensate Storage Tank Isolation Valves are OPEN.
SET Plant Computer screen for MODE 2.
ENSURE Reactivity Briefing Sheet printout provided with Turnover.
PLACE Plant Computer, right hand RO and US Computer screens for MODE 2.
PLACE Group Display LPTDIFF on the BOP Desktop Computer.
ENSURE all PRZR Heaters energized.
ENSURE procedures in progress are on SRO desk:
- COPY of IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator, INITIALED to Step 5.1.15.
- COPY of IPO-003A, Power Operations, Attachment 17, MODE 1 Bubble Chart.
- COPY of SOP-204A, Containment Spray System, Section 5.1.3, Recirculation Through the Recirculation Header, INITIALED to Step 5.1.3.A.

Significant Control Room Annunciators in Alarm:

PCIP-1.1 – SR TRN A RX TRIP BLK
PCIP-1.3 – AMSAC BLK TURB < 40% PWR C-20
PCIP-1.4 – CNDNSR AVAIL STM DUMP ARMED C-9
PCIP-1.7 – RX ≤ 50% PWR TURB TRIP PERM P-9
PCIP-2.1 – SR TRN B RX TRIP BLK
PCIP-2.4 – LO TURB PWR ROD WTHDRWL BLK C-5
PCIP-2.5 – SR RX TRIP BLK PERM P-6
PCIP-3.4 – TURB LOAD REJ STM DMP ARMED C-7
PCIP-3.5 – RX & TURB ≤ 10% PWR P-7
PCIP-4.5 – RX ≤ 48% PWR 3-LOOP FLO PERM P-8
PCIP-4.6 – TURB ≤ 10% PWR P-13
6D-1.1 – SR HI VOLT FAIL
7B-4.8 – FWP A/B RECIRC VLV NOT CLOSED
8A-1.3 – FWPT B TRIP
8A-1.10 – 1 OF 4 TURB STOP VLV CLOSE
Numerous 9A Feedwater alarms

Operating Test :	NRC	Scenario #	4	Event #	1	Page	6	of	33
Event Description:	Recirculate Refueling Water Storage Tank With Containment Spray Pump								

Time	Position	Applicant's Actions or Behavior
Booth Operator: ENSURE Simulator in RUN when crew is ready to assume the watch.		
Examiner Note: The Refueling Water Storage Tank is recirculated using a Containment Spray Pump per SOP-204A, Containment Spray System.		
+1 min	US	DIRECT performance of SOP-204A, Containment Spray System, Section 5.1.3, Recirculation Through the Recirculation Header.
NOTE: IF the containment spray system is being started for performance of OPT-205A, THEN the following valves will be positioned as directed by the performance of the operability test. • 1CT-0150, U1 CS CHEM EDUCT TST HDR ISOL VLV • 1CT-0137, CS PMP 1-01/1-03 CHEM EDUCT TST LN ISOL VLV • 1CT-0183, CS PMPS 1-02/1-04 CHEM EDUCT TST LN ISOL VLV • 1CT-0075, CS PMP 1-03 EDUCT SUCT ISOL VLV • 1CT-0023, CS PMP 1-04 EDUCT SUCT ISOL VLV • 1CT-0079, CS PMP 1-01 EDUCT SUCT ISOL VLV • 1CT-0027, CS PMP 1-02 EDUCT SUCT VLV		
	BOP	ENSURE the system is in standby per Section 5.1.1. [Step 5.1.3.A – DONE]
	BOP	VERIFY Train A Chemical Additive Tank Discharge Valve – CLOSED. [Step 5.1.3.B – YES]
		• 1-HS-4754, CHEM ADD TK DISCH VLV, Train A
Booth Operator: When the trend is initiated for the Containment Spray Pump, EXECUTE malfunction RX12, Main Steam Header Pressure (PT-507) failure (Key 2).		
	BOP	INITIATE trend of Containment Spray Pump 1-01 parameters on Plant Computer. [Step 5.1.3.C – YES]

Time	Position	Applicant's Actions or Behavior

DESCRIPTION	CSP 1-01	CSP 1-02	CSP 1-03	CSP 1-04
CSP MOT OUTBD BRG TEMP	T9313A	T9318A	T9323A	T9328A
CSP MOT INBD BRG TEMP	T9314A	T9319A	T9324A	T9329A
CSP INBD BRG TEMP	T9315A	T9320A	T9325A	T9330A
CSP OUTBD BRG TEMP	T9316A	T9321A	T9326A	T9331A
CSP STAT WNDG TEMP	T9340A	T9341A	T9342A	T9343A

	BOP	VERIFY CS Pump 1-01 Recirculation Valve – OPEN. [Step 5.1.3.D – YES]
		• 1-HS-4772-1, CSP 1 RECIRC VLV
	BOP	START Containment Spray Pump 1-01. [Step 5.1.3.E – YES]
		• PLACE 1-HS-4764, CSP 1 in START position.

NOTE: The Containment Spray system is designed to operate with system temperature up to 300°F. When the system temperature exceeds 150°F; however, CCW flow must be aligned to the pump seal coolers to maintain integrity of the mechanical seals. In all cases, CCW flow must be available to both the Containment Spray Heat Exchanger and the mechanical seal cooler to declare the system operable per TS 3.6.6.

+10 min	BOP	IF CCW flow is NOT available, STOP Containment Spray Pump 1-01 when system temperature reaches 150°F. [Step 5.1.3.F – N/A]

When Containment Spray Pump flow and pressure are verified, or at Lead Examiner discretion, PROCEED to Event 2.

Operating Test :	NRC	Scenario #	4	Event #	2	Page	8	of	33
Event Description:	Main Steam Header Pressure Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: VERIFY Event 2 in progress. - RX12, Steam Header Pressure Transmitter (PT-507) fails high on 360 second ramp.		
Indications Available: 6D-1.10 – AVE T_{AVE} - T_{REF} DEV 6D-3.10 – 1 OF 4 T_{AVE} LO-LO (WHEN $T_{AVE} \leq 553°F$) PCIP- 3.6 – RCS TAVE LO-LO P-12 (WHEN $T_{AVE} < 553°F$, Steam Dump Valves will close) Steam Dump Valves opening then closing (IF $T_{AVE} < 553°F$) Reactor Coolant System temperature lowering 1-PI-507 – MS HDR PRESS indication fails high		
+30 secs	RO	RESPOND to Annunciator Alarm Procedures.
	RO	REPORT Reactor Coolant System temperature lowering, Steam Dump Valves opening, and PT-507, Steam Header Pressure Channel failure.
	US	DIRECT implementation of ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 3.0.
	RO	CHECK 1-PI-507, MS HDR PRESS indicating HIGHER than Main Steam Line Pressure. [Step 3.3.1 - YES]
NOTE: Computer point P5446A, FW STM FLOW SETPOINT may aid the operator.		
	RO	MANUALLY CONTROL Feedwater Pumps. [Step 3.3.2 – N/A]
		• PLACE 1-SK-509A, FWPT MASTER SPD CTRL in MANUAL. [Step 3.3.2.a - N/A]
	RO	MONITOR Steam Generator Levels: [Step 3.3.3 - YES]
		• VERIFY SG levels – STABLE AT OR TRENDING TO NORMAL PROGRAM. [Step 3.3.3.a - NO]
		• Manually CONTROL Auxiliary Feedwater flow as necessary to maintain levels. [Step 3.3.3.b.2) RNO - YES]

Operating Test :	NRC	Scenario #	4	Event #	2	Page	9	of	33
Event Description:	Main Steam Header Pressure Failure								

Time	Position	Applicant's Actions or Behavior
	US/RO	DETERMINE Required Operational Mode of Steam Dumps: [Step 3.3.4 - YES]
	RO	• CHECK 43/1-SD, STM DMP MODE SELECT Switch in – T_{AVE}. [Step 3.3.4.a - YES]
	US/RO	• VERIFY T_{AVE} and steam pressure – STABLE. [Step 3.3.4.b - NO]
	RO	• If T_{AVE} and steam pressure less than normal for conditions then PLACE both STM DMP INTLK SELECT switches in OFF – RESET. [Step 3.3.4.b.1).a RNO - YES]
		• 43/1-SDA in OFF – RESET.
		• 43/1-SDB in OFF – RESET.
	RO	• PLACE 1-PK-507, STM DMP PRESS CTRL in MANUAL and 0% DEMAND. [Step 3.3.4.b.1).b RNO - YES]
	RO	• PLACE both STM DMP INTLK SELECT switches in ON. [Step 3.3.4.b.1).c RNO - YES]
		• 43/1-SDA in ON.
		• 43/1-SDB in ON.
	RO	• PLACE 43/1-SD, STM DMP MODE SELECT Switch in RESET then in STM PRESS position. [Step 3.3.4.b.1).d RNO - YES]
	RO/BOP	• Manually CONTROL 1-PK-507, STM DMP PRESS CTRL as necessary for conditions. [Step 3.3.4.b.2) RNO - YES]
<u>Examiner Note</u>: 1-PK-57, STM DMP PRESS CTRL, will remain in MANUAL for the duration of the scenario.		
	US	MANUALLY CONTROL 1-SK-509A, FWPT MASTER SPD CTRL to MAINTAIN differential pressure. [Step 3.3.5 – N/A]
	US	INITIATE a Condition Report per STA-421. [Step 3.3.6 - YES]
+10 min	US	INITIATE repairs per STA-606. [Step 3.3.7 - YES]
When plant conditions are stable, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	4	Event #	3	Page	10	of	33
Event Description:	Raise Reactor Power								

Time	Position	Applicant's Actions or Behavior
		Booth Operator: MONITOR Simulator parameters while the crew transitions to IPO-003A.
		Examiner Note: The following steps are from IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator, Step 5.1.16.
		NOTE: • During operation at BOL with a zero or small negative moderator temperature coefficient, very little reactivity feedback will result from changes in temperature. During a startup significant temperature transients can occur with relatively little change to power. This could result in large transients in Pressurizer level and RCS pressure. Care should be taken to ensure changes in steam flow are done gradually to prevent transients in the RCS. • Steam dumps in automatic should be used to raise power. Steam drains and blowdown are not the preferred method as Operator action is required to change the steam flow. Using Steam Dumps in automatic can reduce the transients in the primary systems since the automatic control will reduce steam dump flow as the turbine speed/load is increased. • Nuclear Instrumentation may be conservatively calibrated following an extended outage period. Other indication of thermal power, such as calorimetric data, steam dump demand, etc., should also be monitored during the power increase. N-16 should be monitored as an indication of power along with NIS and Calorimetric power. N-16 may be the most accurate indicator of power during a transient since it is temperature compensated. During transient conditions, the highest indication of Reactor power (N-16, NIS, or Calorimetric) should always be maintained within limits. • If 1-ALB-6D, 1.14 IR HI FLUX ROD STOP C-1 is received prior to 1-PCIP, 1.6 RX ≥10% PWR P-10, Core Performance Engineering and I&C should be notified to evaluate.
	BOP	If desired, ENSURE Feedwater Bypass Control Valve Controllers in AUTO. [Step 5.1.16.A – YES]
	US	VERIFY Attachment 1 was COMPLETED & REVIEWED by the Shift Manager per the Turnover Sheet prior to exceeding 5% power. [Step 5.1.16.B – DONE]
	BOP	As Reactor power rises, manually ADJUST Steam Dump System to maintain Main Steam pressure at approximately 1092 psig. [Step 5.1.16.C – YES]

Operating Test :	NRC	Scenario #	4	Event #	3	Page	11	of	33
Event Description:	Raise Reactor Power								

Time	Position	Applicant's Actions or Behavior
Examiner Note: The next three (3) steps are guidance from the Unit Supervisor per OPGD-3, Operations Standards and Expectations, Section 5.0, Operating Tactics.		
	US	Direct WITHDRAWAL of Control Rods in no more than five (5) step increments to raise power.
	RO	WITHDRAW Control Rods in no more than five (5) step increments while monitoring Reactor power level.
	RO	VERIFY Power Range Channels respond appropriately as power level rises.
Examiner Note: Crew will likely use N-16 power indication from Plant Computer System.		
	US	When reactor power is greater than 5%, LOG entry into MODE 1. [Step 5.1.16.D – YES]
	US	PERFORM OPT-102A for MODE 1 Surveillances. [Step 5.1.16.E – YES]
Floor Cue: If requested, REPORT OPT-102A, Operations Shiftly Routine Tests was completed last shift.		
+15 min	RO	Slowly RAISE Reactor power to between 6% and 8%. [Step 5.1.16.F – YES]
When power level is stabilized at 6% to 8%, or at Lead Examiner discretion, PROCEED to Event 4.		

Operating Test :	NRC	Scenario #	4	Event #	4	Page	12	of	33
Event Description:	Steam Generator Level Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 4 (Key 4). - RX04A, Steam Generator 1-01 Level Transmitter (LT-551) fails low.		
Indications Available: **8A-1.6 – SG 1 LVL LO** **8A-1.8 – SG 1 STM & FW FLO MISMATCH (power level dependent)** **8A-1.12 – SG 1 LVL DEV (power level dependent)** **8A-1.14 – SG 1 1 OF 4 LVL LO-LO** **1-LI-551, SG 1 LVL (NR) CHAN I indication failed low**		
+30 sec	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE Steam Generator 1-01 Level Transmitter (LT-551) failed low.
Examiner Note: Steam Generator level channel failing LOW will cause the Feedwater Control Bypass Valve to OPEN. Unit 1 SG High Level Turbine Trip occurs at 84%.		
	US	DIRECT performance of ABN-710, Steam Generator Level Instrumentation Malfunction, Section 2.0.
	BOP	RECOGNIZE Steam Generator 1-01 Level Transmitter (LT-551) controlling level channel failed LOW. [Step 2.3.1 – YES]
CRITICAL TASK STATEMENT		**Control Steam Generator Level to Avoid RPS or ESFAS Actuation per ABN-710, Steam Generator Level Instrumentation Malfunction.**
CRITICAL TASK	BOP	PLACE 1-LK-550, SG 1 BYP CTRL in MANUAL and CONTROL Steam Generator 1-01 at programmed level. [Step 2.3.2 - YES]
	BOP	VERIFY instruments on common instrument line indicate NORMAL. [Step 2.3.3 – YES]
		• VERIFY Loop 1 Instrument LT-501 responding normally per Attachment 1.

Operating Test :	NRC	Scenario #	4	Event #	4	Page	13	of	33
Event Description:	Steam Generator Level Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: • Turbine Trip AND Feedwater Isolation will occur if 2 or more of the 3 HI-HI level bistables for the SAME steam generator are TRIPPED. **[C]** • IF preferred level control channel has failed (551, 552, 553, or 554) AND automatic steam generator water level control is restored using alternate level control channel, THEN Step 9 must be completed within 72 hours for required channel protection coincidence.
	BOP	DETERMINE all HI-HI level bistable windows on Trip Status Light Box (TSLB-3) for Steam Generator 1-01 are DARK. [Step 2.3.4 – YES]
		• OBSERVE TSLB-3, Window 2.2 – SG 1 LVL HI-HI LB-519A is DARK.
		• OBSERVE TSLB-3, Window 3.2 – SG 1 LVL HI-HI LB-518A is DARK.
		• OBSERVE TSLB-3, Window 4.2 – SG 1 LVL HI-HI LB-517A is DARK.
		NOTE: Preferred level control channel switch positions are LQY-551, 552, 553, and 554. Alternate level control channel switch positions are LY-519, 529, 539, and 549. IF an alternate level control channel that is selected for control has failed, THEN the preferred level control channel may be substituted for "alternate" in the following steps.
	BOP	VERIFY automatic SG level control available: [Step 2.3.5 – YES]
		• OBSERVE alternate level control channel 1-LI-519A indication NORMAL. [Step 2.3.5.a – YES]
		• DETERMINE automatic level control desired by Unit Supervisor. [Step 2.3.5.b – YES]
	BOP	PLACE 1-LS-519C, Steam Generator 1 Level Channel Select to LY-519 position. [Step 2.3.6 – YES]
	BOP	VERIFY affected SG conditions for auto level control: [Step 2.3.7 - YES]
		• OBSERVE Feedwater and Steam Flows – MATCHED.
		• OBSERVE Steam Generator Level – STABLE AT PROGRAM.

Time	Position	Applicant's Actions or Behavior
		NOTE: There is a 15-20 sec lag for input from the alternate channel to be seen by the level control circuit. The level deviation alarm should clear or the operator should wait 15-20 seconds before placing the control valves in automatic after selecting the alternate channel.
	BOP	PLACE 1-LK-550, SG 1 BYP CTRL in AUTO and MONITOR operation. [Step 2.3.8 - YES]
Examiner Note: The next two (2) steps are performed after I&C troubleshooting is completed.		
		WITHIN 72 hours, CONTACT I&C to PLACE bistable test switches for Level Channel I in CLOSE per Attachments 2 and 3. [Step 2.3.9 - YES]
		VERIFY appropriate alarms and Trip Status Lights LIT per Attachment 3 and NOTE in the Unit Log. [Step 2.3.10 - YES]
		• OBSERVE TSLB-5, Window 1.4 – SG 1 LVL LO-LO LB-551B is LIT.
+10 min	US	EVALUATE Technical Specifications. [Step 2.3.11 – YES]
		• LCO 3.3.1.E, Reactor Trip System Instrumentation. (Function 14, Steam Generator Water Level Low-Low)
		• CONDITION E - One channel inoperable (Channel 1 LO-LO). • ACTION E.1 - Place channel in trip within 72 hours, OR • ACTION E.2 - Be in MODE 3 within 78 hours.
		• LCO 3.3.2.D, ESFAS Instrumentation. (Function 6.c, Steam Generator Water Level Low-Low)
		• CONDITION D - One channel inoperable. • ACTION D.1 - Place channel in trip within 72 hours, OR • ACTION D.2.1 - Be in MODE 3 within 78 hours, AND • ACTION D.2.2 - Be in MODE 4 within 84 hours.

Operating Test :	NRC	Scenario #	4	Event #	4	Page	15	of	33
Event Description:	Steam Generator Level Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
		• LCO 3.3.2.I, ESFAS Instrumentation. (Function 5.b, SG Water Level High-High P-14)
		• CONDITION I - One channel inoperable (Channel 1 HI-HI). • ACTION I.1 - Place channel in trip within 72 hours, OR • ACTION I.2 - Be in MODE 3 within 78 hours.
	US	INITIATE a work request per STA-606. [Step 2.3.12 - YES]
+10 min	US	INITIATE a Condition Report per STA-421. [Step 2.3.13 - YES]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 5.		

Operating Test :	NRC	Scenario #	4	Event #	5	Page	16	of	33
Event Description:	Containment Spray Pump Trip								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Event 5 (Key 5). - CS02A, Containment Spray Pump 1-01 trip.		
Indications Available: 2B-1.3 – ANY CSP OVRLOAD / TRIP Containment Spray Pump 1-01 amber MISMATCH and white TRIP lights lit		
+30 sec	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE 1-HS-4764, CSP 1, Containment Spray Pump 1-01 amber MISMATCH and white TRIP lights LIT.
	US	DIRECT performance of ALM-0022A, 1-ALB-2B, Window 1.3 – ANY CSP OVRLD TRIP.
CAUTION: Do not place pump handswitch in STOP if pump has tripped (white TRIP light). This will reset 86M relay (white TRIP light) and may result in an automatic restart.		
	BOP	DETERMINE Containment Spray Pump 1-01 affected pump. [Step 1 - YES]
Booth Operator: When asked about status of Containment Spray Pump, REPORT that the motor casing is hot.		
	BOP	DISPATCH a PEO to check for signs of damage. [Step 2 - YES]
Booth Operator: When asked about status of Containment Spray (CS) Pump breaker, REPORT that the 50/51 overcurrent relays on Phases B & C are tripped. CSP 1-01 Breaker (1EA1/8/BKR) indicates an overload condition exists.		
	BOP	DISPATCH a PEO to 1APCS1, CONTAINMENT SPRAY PUMP 1-01 MOTOR BREAKER (1EA1/8/BKR). [Step 3 - YES]
	BOP	VERIFY 1-HS-4776/4777, CS HX 1/2 OUT VLV is CLOSED. [Step 4 - YES]
	US	EVALUATE Technical Specifications. [Step 5 - YES]

Operating Test :	NRC	Scenario #	4	Event #	5	Page	17	of	33
Event Description:	Containment Spray Pump Trip								

Time	Position	Applicant's Actions or Behavior
		• LCO 3.6.6.A, Containment Spray System.
		• CONDITION A - One containment spray inoperable. • ACTION A.1 - Restore containment spray training to OPERABLE status within 72 hours. • CONDITION B - Required Action and associated Completion Time of Condition A not met. • ACTION B.1 - Be in MODE 3 within 6 hours, AND • ACTION B.2 - Be in MODE 5 within 84 hours.
Examiner Note: Both Train A Containment Spray (CS) Pumps may be taken to PULLOUT to avoid having the OPERABLE Train A CS Pump 1-03 experience a runout condition in the event a Containment H-3 signal is received.		
	US	SUBMIT a Condition Report per STA-421. [Step 2.3.6 - YES]
+10 min	US	INITIATE a work request per STA-606. [Step 2.3.6 - YES]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Events 6, 7, 8, and 9.		

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	18	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed, EXECUTE Events 6, 7, 8, and 9 (Key 6). **- RP14B, Spurious Train B Safety Injection Actuation Signal.** **- RP01, Automatic Reactor Trip failure.** **- RP09B, Train B Containment Isolation Phase A automatic actuation failure.** **- RC08C1, Small Break Loss of Coolant Accident inside Containment when Safety Injection Pump 1-02 is secured in EOS-1.1A, SI Termination.**		
Indications Available: **Multiple Spurious Train B Safety Injection System Alarms**		
+30 sec	RO/BOP	RECOGNIZE Train B Safety Injection Actuation.
	RO/BOP	DETERMINE Reactor Trip required but NOT tripped.
CRITICAL TASK STATEMENT		**Manually Trip Reactor Due to Reactor Protection System Failure Prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection.**
CRITICAL TASK	RO	Manually INITIATE a Reactor Trip.
	RO	• PLACE 1/1-RTC, RX TRIP Switch in TRIP at CB-07.
	BOP	• PLACE 1/1-RT, RX TRIP Switch in TRIP at CB-10.
Examiner Note: The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.		
	RO	VERIFY Reactor Trip: [Step 1 - YES]
		• VERIFY Reactor Trip Breakers – OPEN. [Step 1.a - YES]
		• VERIFY Neutron flux – DECREASING. [Step 1.a - YES]
		• VERIFY all Control Rod Position Rod Bottom Lights – ON. [Step 1.b - YES]
	BOP	VERIFY Turbine Trip: [Step 2 - YES]
		• VERIFY all HP Turbine Stop Valves – CLOSED. [Step 2 - YES]
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3 - YES]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	19	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a - YES]
		• VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b - YES]
	RO	CHECK SI status: [Step 4 - YES]
		• CHECK if SI is actuated. [Step 4.a - YES]
		• VERIFY Both Trains SI Actuated: [Step 4.b - NO]
		• SI Actuated blue status light – ON and FLASHING. [Step 4.b - YES]
		• PLACE 1/1-SIA2, SI MAN ACT Switch to ACT position at CB-07 and DETERMINE SI has actuated on both Trains. [Step 4.b RNO - YES]
Examiner Note:		**EOP-0.0A, Attachment 2 steps performed by the BOP are at the end of the scenario.**
		CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.
		NOTE: Attachment 2 is required to be completed before FRGs are implemented.
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5 - YES]
	RO	VERIFY AFW Alignment: [Step 6 - YES]
		• VERIFY both MDAFW Pumps – RUNNING. [Step 6.a - YES]
		• PLACE TDAFW Pump in PULLOUT per Foldout Page. [Step 6.b - YES]
		• VERIFY AFW total flow – GREATER THAN 460 GPM. [Step 6.c - YES]
		• VERIFY AFW valve alignment - PROPER ALIGNMENT. [Step 6.d - YES]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	20	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY Containment Spray NOT Required: [Step 7 - YES]
		• VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED. [Step 7.a - YES]
		• VERIFY Containment pressure – LESS THAN 18.0 PSIG. [Step 7.a - YES]
		• VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED. [Step 7.b - YES]
		• VERIFY Train B Containment Spray Pumps – RUNNING. [Step 7.c - YES]
	RO	CHECK if Main Steam lines should be ISOLATED: [Step 8 - YES]
		• VERIFY Containment pressure – GREATER THAN 6.0 PSIG OR Main Steam Line pressure less than 610 PSIG. [Step 8.a - NO]
		• GO to Step 9. [Step 8.a RNO - YES]
	RO	CHECK RCS Temperature: [Step 9 - YES]
		• VERIFY RCS Average Temperature – STABLE AT OR TRENDING TO 557°F. [Step 9 - YES]
	RO	CHECK PRZR Valve Status: [Step 10 - YES]
		• VERIFY PRZR Safeties – CLOSED. [Step 10.a - YES]
		• VERIFY Normal PRZR Spray Valves – CLOSED. [Step 10.b - YES]
		• VERIFY PORVs – CLOSED. [Step 10.c - YES]
		• VERIFY Power to at least 1 Block Valve – AVAILABLE. [Step 10.d - YES]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 10.e - YES]
	RO	CHECK If RCPs Should Be Stopped: [Step 11 - DONE]
		• VERIFY RCS subcooling – LESS THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 11.a - NO]
		• GO to Step 12. [Step 11.a RNO - YES]
	US/RO	CHECK if any SG is Faulted: [Step 12 - YES]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	21	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 12.a - NO]
		• VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 12.a - NO]
		• GO to Step 12. [Step 12.a RNO - YES]
	RO/BOP	CHECK if Steam Generator Tubes Are NOT Ruptured: [Step 13 - YES]
		• VERIFY Condenser Off Gas radiation – NORMAL.
		• VERIFY Main Steam Line radiation – NORMAL.
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL.
		• VERIFY levels in all Steam Generators – NORMAL.
	RO/BOP	CHECK if RCS is Intact: [Step 14 - YES]
		• VERIFY Containment pressure – LESS THAN 1.3 PSIG. [Step 14 - YES]
		• VERIFY Containment recirculation sump levels – NORMAL. [Step 14 - YES]
		• VERIFY Containment radiation levels – NORMAL. [Step 14 - YES]
	US/RO	CHECK if ECCS Flow to Should Be Reduced: [Step 15 - YES]
		• VERIFY Secondary heat sink: [Step 15.a - YES]
		• DETERMINE Total AFW Flow to intact SGs > 460 GPM.
		• DETERMINE Narrow Range Level in all SGs > 50%.
		• DETERMINE RCS subcooling – GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 15.b - YES]
		• VERIFY RCS pressure – STABLE OR INCREASING. [Step 15.c - YES]
		• VERIFY PRZR level - GREATER THAN 13% (34% FOR ADVERSE CONTAINMENT). [Step 15.d - YES]
		• GO to EOS-1.1A, Safety Injection Termination, Step 1. [Step 15.e - YES]
Examiner Note: EOS-1.1A, Safety Injection Termination steps begin here.		
Examiner Note: The following six (6) steps are performed per EOS-1.1A, Attachment 1.D.		

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	22	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
	BOP	[1.D] PLACE both Diesel EMER START/STOP handswitches in START. [Step 1 - YES]
		Examiner Note: When Safety Injection is properly RESET, Annunciator 1-ALB-2B, Window 2.8, SFGD SEQR TRN A/B AUTO TEST TRBL, will RESET.
	BOP	[1.D] RESET SI. [Step 2 - YES]
		• DEPRESS 1/1-SIRA, TRAIN A SI RESET pushbutton.
		• DEPRESS 1/1-SIRB, TRAIN A SI RESET pushbutton.
	BOP	[1.D] RESET SI Sequencers. [Step 3 - YES]
		• At SI Sequencer Train A Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
		• At SI Sequencer Train B Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
	BOP	[1.D] RESET Containment Isolation Phase A and B. [Step 4 - YES]
		• DEPRESS 1/1-C1PARA, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PARB, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PBRA, CNTMT ISOL – PHASE B RESET pushbutton.
		• DEPRESS 1/1-C1PBRB, CNTMT ISOL – PHASE B RESET pushbutton.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	23	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
	BOP	[1.D] RESET Containment Spray Signal. [Step 5 - YES]
		• DEPRESS 1/1-CSRA, TRAIN A CS RESET pushbutton.
		• DEPRESS 1/1-CSRB, TRAIN B CS RESET pushbutton.
	RO/BOP	[1.D] ESTABLISH Instrument Air and Nitrogen to Containment. [Step 6 - YES]
		• ESTABLISH instrument air. [Step 6.a - YES]
		• VERIFY air compressor running. [Step 6.a.1) - YES]
		• OPEN 1-HS-3487, Containment Instrument Air Isolation Valve. [Step 6.a.2) - YES]
		• ESTABLISH Nitrogen: [Step 6.b - YES]
		• VERIFY 1-HC-3943, ACCUM 1●4 VENT CTRL Valve – CLOSED. [Step 6.b.1) - YES]
		• OPEN 1/1-8880, SI/PORV ACCUM N_2 ISOL VLV. [Step 6.b.2) - YES]
	RO	STOP all but one CCP and PLACE in Standby. [Step 7 - DONE]
	US/RO	CHECK RCS Pressure – STABLE OR INCREASING. [Step 8 - YES]
<u>Examiner Note</u>: The following two (2) steps are performed per EOS-1.1A, Attachment 1.J.		
	RO	[1.J] ISOLATE CCP Injection Line Flow Path: [Step 9 - YES]
		• VERIFY CCP – SUCTION ALIGNED TO RWST. [Step 9.a - YES]
		• ALIGN CCP Miniflow Valves: [Step 9.b - YES]
		• OPEN 1/1-8110 and 1/1-8111, CCP Miniflow Valves. [Step 9.b.1) - YES]
		• CLOSE 1/1-8511A and 1/1-8511B, CCP Alternate Miniflow Isolation Valves. [Step 9.b.2) - YES]
		• PLACE Charging Flow Control Valve in MANUAL and 35% demand. [Step 9.c - YES]
		• CLOSE 1/1-8801A and 1/1-8801B, CCP Injection Line Isolation Valves. [Step 9.d - YES]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	24	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
+20 min	RO	[1.J] ESTABLISH Charging Flow Path: [Step 10 - YES]
		• OPEN 1/1-8105 and 1/1-8106, Charging Line Isolation Valves. [Step 10.a - YES]
		• ADJUST Charging Flow Control Valve to establish Charging flow. [Step 10.b - YES]
		• ADJUST RCP seal flow to maintain between 6 GPM and 13 GPM. [Step 10.c - YES]
	RO	CONTROL Charging Flow to maintain PRZR Level. [Step 11 - YES]
Examiner Note:		**When Safety Injection Pump 1-02 is stopped, a Small Break Loss of Coolant Accident will occur. EOS-1.1A, Foldout Page criteria requires entry into EOP-1.0A, Loss of Reactor or Secondary Coolant, if RCS subcooling or Pressurizer level cannot be maintained.**
	RO	CHECK IF SI Pumps Should Be Stopped: [Step 12 - YES]
		• CHECK RCS pressure: [Step 12.a - YES]
		• Pressure – STABLE OR INCREASING. [Step 12.a - YES]
		• Pressure – GREATER THAN 1700 PSIG. [Step 12.a - YES]
		• STOP SI pumps and PLACE in standby. [Step 12.b - YES]
Examiner Note:		**EOP-1.0A, Loss of Reactor or Secondary Coolant, steps begin here.**
		CAUTION: Following a high energy line rupture inside containment, the operator should not rely upon steam generator water level indications in any depressurized steam generators.
		NOTE: As PRZR Temperature decreases the error on indicated PRZR level will increase. Attachment 2 may be used to determine actual PRZR level.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	25	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
		Examiner Note: When EOP-1.0A is entered, RCS subcooling has not lowered to the point where the RCPs must be tripped, however, this is a Continuous Action Step and must eventually be performed.
CRITICAL TASK STATEMENT		**Trip Reactor Coolant Pumps within 10 minutes upon a Loss of Subcooling per EOP-1.0A, Loss of Reactor or Secondary Coolant, Foldout Page.**
CRITICAL TASK	RO	CHECK If RCPs Should Be Stopped: [Step 1 - YES].
		• VERIFY RCS subcooling – LESS THAN 25°F. [Step 11.a - YES]
		• VERIFY ECCS Pumps (CCP or SI) – AT LEAST ONE RUNNING. [Step 1.b - YES]
		• STOP all RCPs. [Step 1.c - YES]
	RO/BOP	CHECK if Any Steam Generator Is Faulted: [Step 2 - YES]
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 2.a - NO]
		• VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 2.a - NO]
		• GO to Step 3. [Step 2.a RNO - YES]
	US	CHECK Intact Steam Generator Levels: [Step 3 - YES]
		• VERIFY Narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT). [Step 3.a - YES]
		• CONTROL AFW flow to maintain Narrow range level – BETWEEN 43% (50% FOR ADVERSE CONTAINMENT) and 60%. [Step 3.b - YES]
	US	CHECK Secondary Radiation NORMAL: [Step 4 - YES]
		• VERIFY Condenser off gas radiation – NORMAL. [Step 4 - YES]
		• VERIFY Main Steam Line radiation – NORMAL. [Step 4 - YES]
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL. [Step 4 - YES]
		• VERIFY levels in all Steam Generators – NORMAL. [Step 4 - YES]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	26	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
		CAUTION: If any PRZR PORV opens because of high PRZR pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint.
	US	CHECK PRZR PORVs and Block Valves: [Step 5 - YES]
		• VERIFY power Block Valves – AVAILABLE. [Step 5.a - YES]
		• VERIFY PORVs – CLOSED. [Step 5.b - YES]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 5.c - YES]
	US/RO	CHECK if ECCS Flow Should Be Reduced: [Step 6 - NO]
		• VERIFY Secondary heat sink conditions – SATISFIED. [Step 6.a - YES]
		• VERIFY RCS subcooling – GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 6.b - NO]
		• GO to Step 7 and OBSERVE CAUTIONS Prior to Step 7. [Step 6.b RNO - YES]
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
		CAUTION: When time permits, Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset.
	RO/BOP	RESET ESF Actuation Signals. [Step 7 - DONE]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	27	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
		CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) the RHR pumps must be manually restarted to supply water to the RCS.
	US	CHECK If RHR Pumps Should Be Stopped: [Step 8 - YES]
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.a - YES]
		• VERIFY RCS pressure – STABLE OR INCREASING
		• VERIFY RHR Pumps – RUNNING AND ALIGNED TO RWST. [Step 8.b - YES]
		• STOP RHR Pumps and PLACE in Standby. [Step 8.c - YES]
		• RESET RHR Auto Switchover. [Step 8.d - YES]
	US	CHECK RCS and SG Pressures: [Step 9 - YES]
	RO/BOP	• VERIFY RCS pressure – STABLE OR DECREASING. [Step 9 – NO]
	RO/BOP	• VERIFY SG pressures in all SGs – STABLE OR INCREASING. [Step 9 - YES]
	US	CHECK If Diesel Generators Should Be Stopped: [Step 10 - YES]
	RO/BOP	• VERIFY AC Safeguards Buses – ENERGIZED BY OFFSITE POWER. [Step 10.a - NO]
	RO/BOP	• PLACE DG EMER STOP/START handswitch in STOP. [Step 10.b - YES]
		NOTE: Verification of at least one flowpath from a RHR pump to the RCS via a SI pump or CCP is sufficient to verify cold leg recirculation capability.
	US	INITIATE Evaluation of Plant Status. [Step 11 - YES]
	RO	• VERIFY Cold Leg Recirculation capability: [Step 11.a - YES]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	28	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
		• VERIFY Train A RHR Pump – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY CCW to Train A RHR Pump – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY 1/1-8811A, CNTMT SMP TO RHRP 1 SUCT ISOL VLV AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY Train B RHR Pump – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY CCW to Train B RHR Pump – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV – AVAILABLE. [Step 11.a.1) - YES]
		• VERIFY 1/1-8804A, RHRP 1 TO CCP SUCT VLV – AVAILABLE. [Step 11.a.2) - YES]
		• VERIFY 1/1-8804B, RHRP 2 TO SIP SUCT VLV – AVAILABLE. [Step 11.a.2) - YES]
	RO/BOP	• CHECK Auxiliary Building and Safeguards Building radiation – NORMAL: [Step 11.b - YES]
		• CHECK PC-11 monitors – NORMAL (Grid 4). [Step 11.b - YES]
	US	• NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident. [Step 11.c - YES]
	US	• CONTACT Plant Staff to EVALUATE plant equipment. [Step 11.d - YES]
	US	CHECK if RCS Cooldown and Depressurization Is Required: [Step 12 - YES]
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 12.a - YES]
	RO/BOP	• GO to EOS-1.2 A, Post LOCA Cooldown and Depressurization, Step 1. [Step 12.b - YES]
When transition to EOS-1.2 A, Post LOCA Cooldown and Depressurization is reached, terminate the scenario.		

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	29	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.		
		CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment.
	BOP	VERIFY SSW Alignment: [Step 1 - YES]
		• VERIFY SSW Pumps – RUNNING. [Step 1.a - YES]
		• VERIFY EDG Cooler SSW return flow. [Step 1.b - YES]
	BOP	VERIFY Safety Injection Pumps – RUNNING. [Step 2 - YES]
	BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3 - NO]
		• PLACE 1/1-CIPAA1 CNTMT ISOL – PHASE A / CNTMT VENT ISOL Switch in ACT position. [Step 3 RNO - YES]
	BOP	VERIFY Containment Ventilation Isolation (Train A) – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4 - YES]
	BOP	VERIFY CCW Pumps – RUNNING. [Step 5 - YES]
	BOP	VERIFY RHR Pumps – RUNNING. [Step 6 - YES]
	BOP	VERIFY Proper CVCS Alignment: [Step 7 - YES]
		• VERIFY Centrifugal Charging Pumps – RUNNING. [Step 7.a - YES]
		• VERIFY Letdown Relief Valve Isolation: [Step 7.b - YES]
		• Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1) - YES]
		• Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2) - YES]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	30	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY ECCS flow: [Step 8 - YES]
		• CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a - NO]
		• RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b - NO]
		• GO to Step 9. [Step 8.b RNO - YES]
	BOP	VERIFY Feedwater Isolation Complete: [Step 9 - YES]
		• Feedwater Isolation Valves – CLOSED.
		• Feedwater Isolation Bypass Valves – CLOSED.
		• Feedwater Bypass Control Valves – CLOSED.
		• Feedwater Control Valves – CLOSED.
	BOP	VERIFY both Diesel Generators – RUNNING. [Step 10 - YES]
	BOP	VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB-10 – LIT. [Step 11 - YES]
		NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.
	BOP	VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12 - YES]
	BOP	INITIATE periodic monitoring of Spent Fuel Cooling. [Step 13 - YES]
		• Spent Fuel Pool temperature (T2900A, T2901A).
		• Spent Fuel Pool level (L4800A, L4801A, L4802A, L4803A).

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	31	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

BOP — VERIFY Components on Table 1 are Properly Aligned. [Step 14 - YES]

Location	Equipment	Description	Condition
CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED
CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED
CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED
CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED
CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	32	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior

	CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
<u>Examiner Note</u>: X-HS-3632 on CV-01 will NOT start due to loss of power.				
	CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
	CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
	CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
	CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
	CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
	CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
	CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
	CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
	CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
	CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
	CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED
<u>Examiner Note</u>: The next four (4) steps would be performed on Unit 2.				
	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8, & 9	Page	33	of	33
Event Description:	Spurious Train B Safety Injection Actuation Signal / Automatic Reactor Trip Failure / Train B Containment Isolation Phase A Automatic Actuation Failure / Small Break Loss of Coolant Accident								

Time	Position	Applicant's Actions or Behavior

		CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
		CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED
		CB-03	2-HS-5536	AIR PRG SPLY ISOL DMPR	CLOSED
	BOP	NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. [Step 14 - YES]			
EOP-0.0A, Attachment 2 steps are now complete.					

Facility: CPNPP	Date of Examination: 04/01/13	Operating Test No. NRC 1, 2, 3

Competencies	Applicants											
	SROU-1				SROU-2				SROU-3			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3		1	2	3		1	2	3	
Interpret/Diag-nose Events and Conditions	1,2,3,4,5	2,3,4,5,6	-		1,2,3,4,5	2,3,4,5,6	-		1,2,3,4,5	-	-	
Comply With and Use Procedures (1)	1,2,3,4,5	2,3,4,5,6	-		1,2,3,4,5	2,3,4,5,6	-		1,2,3,4,5	-	-	
Operate Control Boards (2)	N/A	N/A	-		N/A	N/A	-		N/A	-	-	
Communicate and Interact	ALL	ALL	-		ALL	ALL	-		ALL	-	-	
Demonstrate Supervisory Ability (3)	ALL	ALL	-		ALL	ALL	-		ALL	-	-	
Comply With and Use Tech. Specs. (3)	1,3,4	3,4	-		1,3,4	3,4	-		1,3,4	-	-	

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

Facility: CPNPP	Date of Examination: 04/01/13	Operating Test No. NRC 1, 2, 3

Competencies	Applicants											
	SROU-4				SROU-5				SROI-1			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3		1	2	3		1	2	3	
Interpret/Diag-nose Events and Conditions	2,3,4,5,6	-	-		1,2,3,4,5	-	1,2,3,4,5		1,2,4,5,6	2,3,4,5,6	-	
Comply With and Use Procedures (1)	2,3,4,5,6	-	-		1,2,3,4,5	-	1,2,3,4,5		1,2,4,5,6	2,3,4,5,6	-	
Operate Control Boards (2)	N/A	-	-		N/A	-	N/A		1,2,4,5,6	N/A	-	
Communicate and Interact	ALL	-	-		ALL	-	ALL		1,2,3,4,5,6	ALL	-	
Demonstrate Supervisory Ability (3)	ALL	-	-		ALL	-	ALL		N/A	ALL	-	
Comply With and Use Tech. Specs. (3)	3,4	-	-		1,3,4	-	1,2		N/A	3,4	-	

Notes:

(4) Includes Technical Specification compliance for an RO.

(5) Optional for an SRO-U.

(6) Only applicable to SROs.

Facility: CPNPP	Date of Examination: 04/01/13	Operating Test No. NRC 1, 2, 3

Competencies	Applicants											
	RO-1				RO-2				RO-3			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3		1	2	3		1	2	3	
Interpret/Diag-nose Events and Conditions	1,2,4,5,6	2,4,5,6,8	-		2,4,5,7	3,4,5,6,7	-		1,2,4,5,6	2,4,5,6,8	-	
Comply With and Use Procedures (1)	1,2,4,5,6	2,4,5,6,8	-		2,4,5,7	1,3,4,5,6,7	-		1,2,4,5,6	2,4,5,6,8	-	
Operate Control Boards (2)	1,2,4,5,6	2,4,5,6,8	-		2,4,5,7	1,3,4,5,6,7	-		1,2,4,5,6	2,4,5,6,8	-	
Communicate and Interact	1,3,4,5,6	2,4,5,6,8	-		2,4,5,7	1,3,4,5,6,7	-		1,2,3,4,5,6	2,4,5,6,8	-	
Demonstrate Supervisory Ability (3)	N/A	N/A	-		N/A	N/A	-		N/A	N/A	-	
Comply With and Use Tech. Specs. (3)	N/A	N/A	-		N/A	N/A	-		N/A	N/A	-	

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

Facility: CPNPP	Date of Examination: 04/01/13	Operating Test No. NRC 1, 2, 3

Competencies	Applicants											
	RO-4				RO-5				RO-6			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3		1	2	3		1	2	3	
Interpret/Diag-nose Events and Conditions	2,4,5,7	3,4,5,6,7	-		1,2,4,5,6	2,4,5,6,8	-		2,4,5,7	3,4,5,6,7	-	
Comply With and Use Procedures (1)	2,4,5,7	1,3,4,5,6,7	-		1,2,4,5,6	2,4,5,6,8	-		2,4,5,7	1,3,4,5,6,7	-	
Operate Control Boards (2)	2,4,5,7	1,3,4,5,6,7	-		1,2,4,5,6	2,4,5,6,8	-		2,4,5,7	1,3,4,5,6,7	-	
Communicate and Interact	2,4,5,7	1,3,4,5,6,7	-		1,2,3,4,5,6	2,4,5,6,8	-		2,4,5,7	1,3,4,5,6,7	-	
Demonstrate Supervisory Ability (3)	N/A	N/A	-		N/A	N/A	-		N/A	N/A	-	
Comply With and Use Tech. Specs. (3)	N/A	N/A	-		N/A	N/A	-		N/A	N/A	-	

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

Facility: CPNPP	Date of Examination: 04/01/13	Operating Test No. NRC 1, 2, 3

Competencies	Applicants											
	RO-7				RO-8							
	SCENARIO				SCENARIO							
	1	2	3		1	2	3					
Interpret/Diag-nose Events and Conditions	2,4,5,7	3,4,5,6,7	1,2,5,6,7		-	2,4,5,6,8	1,3,4,5					
Comply With and Use Procedures (1)	2,4,5,7	1,3,4,5,6,7	1,2,5,6,7		-	2,4,5,6,8	1,3,4,5					
Operate Control Boards (2)	2,4,5,7	1,3,4,5,6,7	1,2,5,6,7		-	2,4,5,6,8	1,2,3,4,5					
Communicate and Interact	2,4,5,7	1,3,4,5,6,7	1,2,4,5,6,7		-	2,4,5,6,8	1,2,3,4,5					
Demonstrate Supervisory Ability (3)	N/A	N/A	N/A		-	N/A	N/A					
Comply With and Use Tech. Specs. (3)	N/A	N/A	N/A		-	N/A	N/A					

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

Facility: CPNPP 1 and 2 Date of Exam: 04/01/13 Operating Test No.: NRC

APPLICANT	EVENT TYPE	SCENARIOS												TOTAL	MINIMUM(*)		
		CPNPP #1			CPNPP #2			CPNPP #3			CPNPP #4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
SRO-U1	RX	-			-									**0**	**1**	**1**	**0**
	NOR	4			4									**2**	**1**	**1**	**1**
	I/C	1,2,3			2,3									**5**	**4**	**4**	**2**
	MAJ	5			5,6									**3**	**2**	**2**	**1**
	TS	1,3,4			3,4									**5**	**0**	**2**	**2**
SRO-U2	RX	-			-									**0**	**1**	**1**	**0**
	NOR	4			4									**2**	**1**	**1**	**1**
	I/C	1,2,3			2,3									**5**	**4**	**4**	**2**
	MAJ	5			5,6									**3**	**2**	**2**	**1**
	TS	1,3,4			3,4									**5**	**0**	**2**	**2**
SRO-U3	RX	-												**0**	**1**	**1**	**0**
	NOR	4												**1**	**1**	**1**	**1**
	I/C	1,2,3												**3**	**4**	**4**	**2**
	MAJ	5												**1**	**2**	**2**	**1**
	TS	1,3,4												**3**	**0**	**2**	**2**
SRO-U4	RX				-									**0**	**1**	**1**	**0**
	NOR				4									**1**	**1**	**1**	**1**
	I/C				2,3									**2**	**4**	**4**	**2**
	MAJ				5,6									**2**	**2**	**2**	**1**
	TS				3,4									**2**	**0**	**2**	**2**
SRO-U5	RX	-						-						**0**	**1**	**1**	**0**
	NOR	4						-						**1**	**1**	**1**	**1**
	I/C	1,2,3						1,2,3,4						**7**	**4**	**4**	**2**
	MAJ	5						5						**2**	**2**	**2**	**1**
	TS	1,3,4						1,2						**5**	**0**	**2**	**2**
SRO-I1	RX		4		-									**1**	**1**	**1**	**0**
	NOR		-		4									**1**	**1**	**1**	**1**
	I/C		1,3,6		2,3									**5**	**4**	**4**	**2**
	MAJ		5		5,6									**3**	**2**	**2**	**1**
	TS		-		3,4									**2**	**0**	**2**	**2**

Facility: CPNPP 1 and 2														Date of Exam: 04/01/13			Operating Test No.: NRC			
APPLICANT	EVENT TYPE	SCENARIOS												TOTAL	MINIMUM(*)		
		CPNPP #1			CPNPP #2			CPNPP #3			CPNPP #4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO-1	RX		4				-							**1**	**1**	**1**	**0**
	NOR		-				4							**1**	**1**	**1**	**1**
	I/C		1,3,6				2,8							**5**	**4**	**4**	**2**
	MAJ		5				5,6							**3**	**2**	**2**	**1**
	TS		-				-							**0**	**0**	**2**	**2**
RO-2	RX			-		4								**1**	**1**	**1**	**0**
	NOR			4		1								**2**	**1**	**1**	**1**
	I/C			2,7		3,7								**4**	**4**	**4**	**2**
	MAJ			5		5,6								**3**	**2**	**2**	**1**
	TS			-		-								**0**	**0**	**2**	**2**
RO-3	RX		4				-							**1**	**1**	**1**	**0**
	NOR		-				4							**1**	**1**	**1**	**1**
	I/C		1,3,6				2,8							**5**	**4**	**4**	**2**
	MAJ		5				5,6							**3**	**2**	**2**	**1**
	TS		-				-							**0**	**0**	**2**	**2**
RO-4	RX			-		4								**1**	**1**	**1**	**0**
	NOR			4		1								**2**	**1**	**1**	**1**
	I/C			2,7		3,7								**4**	**4**	**4**	**2**
	MAJ			5		5,6								**3**	**2**	**2**	**1**
	TS			-		-								**0**	**0**	**2**	**2**
RO-5	RX		4				-							**1**	**1**	**1**	**0**
	NOR		-				4							**1**	**1**	**1**	**1**
	I/C		1,3,6				2,8							**5**	**4**	**4**	**2**
	MAJ		5				5,6							**3**	**2**	**2**	**1**
	TS		-				-							**0**	**0**	**2**	**2**
RO-6	RX			-		4								**1**	**1**	**1**	**0**
	NOR			4		1								**2**	**1**	**1**	**1**
	I/C			2,7		3,7								**4**	**4**	**4**	**2**
	MAJ			5		5,6								**3**	**2**	**2**	**1**
	TS			-		-								**0**	**0**	**2**	**2**
RO-7	RX			-		4				-				**1**	**1**	**1**	**0**
	NOR			4		1				-				**2**	**1**	**1**	**1**
	I/C			2,7		3,7				1,2,6, 7				**8**	**4**	**4**	**2**
	MAJ			5		5,6				5				**4**	**2**	**2**	**1**
	TS			-		-				-				**0**	**0**	**2**	**2**
RO-8	RX						-		-					**0**	**1**	**1**	**0**
	NOR						4		-					**1**	**1**	**1**	**1**
	I/C						2,8		1,3,4					**5**	**4**	**4**	**2**
	MAJ						5,6		5					**3**	**2**	**2**	**1**
	TS						-		-					**0**	**0**	**2**	**2**

Instructions:	
1.	Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2.	Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3.	Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.