OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Calculating a Shutdown Margin Following a Stuck Rod

TRAINING MATERIAL NUMBER: 1AD-001

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-001

REVISION NUMBER: 4

TECHNICAL REFERENCES:

1OST-49.1, Shutdown Margin Calculation (Plant Critical), Rev. 23
Unit 1 Curve Book Cycle 24
Unit 1 LRM and Technical Specifications

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 25 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-001
New Revision: 4
Description of Change(s): 1. Updated for current JPM format. 2. Updated for procedure and Curve book revisions. 3. Removed reference to curve book CB-13 in JPM step 9. 4. Updated values used for calculations throughout the JPM. 5. Changed task number to 0011-006-06-013 from 0011-006-01-013.
Reason for Change (s): 1. Changed format to the new JPM procedure (BVPS-TR-0026). 2. 1OST-49.1 and U1 Curve book have been updated for Fuel Cycle 24. 3. CB-13 is not required. Core burnup is given in the initial conditions. 4. Values used for SDM calculations change with fuel cycles. 5. Task list update.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-001 JPM REVISION: 4	JPM TITLE: Calculating a Shutdown Margin Following a Stuck Rod

K/A REFERENCE: 2.1.25 3.9/4.2
001 A4.11 3.5/4.1

TASK ID: 0011-006-06-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform	☐ Plant Site	☐ Annual Requal Exam	☐ BVT
☐ Simulate	☐ Simulator	☐ Initial Exam	☐ NRC
	☒ Classroom	☐ Training	☐ Other:
		☐ Other:	

EVALUATION RESULTS

Performer Name:	Performer SAP:

Time Critical: ☐ Yes ☒ No	Allotted Time: 25 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	The Shutdown Margin calculation is determined to be 2.5272 (+/- 0.100).
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	• The Unit is in Mode 1, 100% power • All rods are at 228 steps on the group demand counters • Annunciator [A4-46], TAVG DEVIATION FROM TREF is "Off" • A single Bank "D" Control Rod is stuck and indicates 228 steps • Current RCS boron concentration is 1620 ppm • Current core burnup is 100 MWD/MTU
INITIATING CUE:	Your Supervisor directs you to perform a shutdown margin calculation for the present plant conditions using 1OST-49.1, Shutdown Margin Calculation (Plant Critical), and report your results in the COMMENT section of the OST cover sheet.
REFERENCES:	1OST-49.1, Shutdown Margin Calculation (Plant Critical), Rev. 23 Unit 1 Curve Book Cycle 24
TOOLS:	Calculator
HANDOUT:	1OST-49.1, Shutdown Margin Calculation (Plant Critical), Rev. 23 with SM authorization signature. Unit 1 Curve Book Cycle 24 Unit 1 LRM and Technical Specifications (as available reference)

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-001 JPM REVISION: 4	JPM TITLE: Calculating a Shutdown Margin Following a Stuck Rod

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR NOTE: Provide the Candidate with a copy of the attached 1OST-49.1, Cycle 24 Curves, LRM, Tech Specs and a calculator.	
	START TIME: _____	
1. If the plant is in Mode 1, Verify that Tavg is less than 5°F above Tref (Annunciator A4-46, TAVG DEVIATION FROM TREF is OFF) (Otherwise N/A). (Step VII.A.1)	1.1 Initials Step VII.A.1, (Plant in Mode 1, Tavg < 5°F above Tref (Annunciator A4-46 OFF) from Initial Conditions. COMMENTS:	
2. If the plant is in Mode 2, Verify that Tavg is less than 8°F above Program Tavg as follows: (Otherwise N/A) (Step VII.A.2)	2.1 Places N/A in Step VII.A.2, (Plant not in Mode 2). COMMENTS:	
3. Request Chemistry to determine current RCS Boron concentration in ppm. (Step VII.A.3)	3.1 Determines current boron concentration is 1620 ppm from initial conditions. COMMENTS:	
4. Record the number of steps withdrawn for Control Bank D from the group demand counters, (BB-B) on Data Sheet 1. (Step VII.A.4)	4.1 Records Control Bank D as 228 steps withdrawn on Data Sheet 1 from initial conditions. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-001 JPM REVISION: 4	JPM TITLE: Calculating a Shutdown Margin Following a Stuck Rod

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
5. Record the current reactor power level in percent of full power from initial conditions, on Data Sheet 1. (Step VII.A.5)	5.1 Records reactor power as 100% on Data Sheet 1. COMMENTS:	
6.**C** Record the number of inoperable (untrippable) OR dropped control rods on Data Sheet 1. (Step VII.A.6)	6.1**C** Records number of inoperable (untrippable) OR dropped control rods as "1" on Data sheet 1 (given in Initial Conditions). COMMENTS:	
7. If the number of inoperable (untrippable) OR dropped control Rods is greater than 1, Use Attachment 1 to determine the required boron concentration with greater than one struck rod and Record below. (Otherwise N/A) (Step VII.A.7)	7.1 Places N/A in Step VII.A.7. COMMENTS:	
8. With the number of inoperable (untrippable) OR dropped rods greater than one, the shutdown margin is < 1.77% k/k. Perform Step VII.C.2 UNTIL the required boron concentration of Attachment 1 is reached. (Step VII.A.8)	8.1 Places N/A in Step VII.A.8. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-001 JPM REVISION: 4	JPM TITLE: Calculating a Shutdown Margin Following a Stuck Rod

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
9.**C** Determine control bank reactivity worth per the following: Using the ARO Total Bank Worth table on Data Sheet 1, Enter the total bank worth for the current core burnup range, in the space provided on Data Sheet 1. (Step VII.B.1.a)	9.1 Recognizes initial plant core burnup is 100 MWD/MTU, based on initial plant conditions. 9.2 Refers to ARO Total Bank Worth table on Data Sheet 1 AND determines ARO Total Bank Worth to be 7.218. 9.3**C** Records 7.218 on Data Sheet 1 (Block B.1.a). COMMENTS:	
10.**C** Using Curve Book Figures CB24A, 24B OR 24C, Determine integral rod worth for the current bank position AND Enter this value on Data Sheet 1. Divide value from curve (in pcm) by 1000 to convert to %Δk/k AND Record on Data Sheet 1. (Step VII.B.1.b)	10.1**C** Using Curve Book Figure CB-24A, determines integral rod worth to be ZERO and records on Data Sheet 1 (Blocks B.1.b.1) and (B.1.b). COMMENTS:	
11. Subtract the integral rod worth from the Total Bank Worth **AND** Enter the result on Data Sheet 1. (Step VII.B.1.c)	11.1 Determines TBW-IRW is 7.218 %Δk/k and records on Data Sheet 1 (Block B.1.c). COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-001 JPM REVISION: 4	JPM TITLE: Calculating a Shutdown Margin Following a Stuck Rod

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
12. Multiply this result by 0.9 to apply a 10% uncertainty **AND** Enter the result on Data Sheet 1. (Step VII.B.1.d)	12.1 Determines 90% of TBW to be 6.4962 %Δk/k and records on Data Sheet 1 (Block B.1.d). COMMENTS:	
13.**C** If ONE rod is inoperable (untrippable) OR dropped, Record "Worst Case Rod with Inoperable Rod" worth on Data Sheet 1. Value is determined from Column "B" on Attachment 2 for the appropriate Cycle Burnup. (Step VII.B.2.b)	13.1**C** Determines stuck rod worth to be 1.999 %Δk/k and records on Data Sheet 1 (Block B.2). COMMENTS:	
14. Subtract Stuck Rod Worth from the 90% Total Bank Worth value AND Enter the result on Data Sheet 1. (Step VII.B.3)	14.1 Determines 90% Total Bank Worth minus Stuck Rod(s) Worth to be 4.4972 %Δk/k and records on Data Sheet 1 (Block B.3). COMMENTS:	
15. Determine Power Defect as follows: Record RCS Boron Concentration results from Chemistry on Data Sheet 1. (Step VII.B.4.a)	15.1 Record RCS Boron Concentration of 1620 ppm on Data Sheet 1 (Block B.4.a). COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-001 JPM REVISION: 4	JPM TITLE: Calculating a Shutdown Margin Following a Stuck Rod

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
16. Using Curve Book Figure 29, Determine the B–10 Correction Factor for the present Burnup (If between two Burnup values, Use the B-10 Correction Factor for the greater MWD/MTU Burnup entry) AND Record on Data Sheet 1. (Step VII.B.4.b)	16.1 Determines B-10 Correction Factor to be 0.989 and records on Data Sheet 1 (Block B.4.b). COMMENTS:	
17. Determine Corrected Boron Concentration by multiplying the RCS Boron Concentration and the B-10 Correction Factor AND Record on Data Sheet 1. (Step VII.B.4.c)	17.1 Determines Corrected Boron Concentration to be 1602 ppm and records on Data Sheet 1 (Block B.4.c). COMMENTS:	
18. Using Curve Book Figure 21, Determine the ABSOLUTE VALUE of the Power Defect for the current power level and the Corrected Boron Concentration AND Enter this value on Data Sheet 1. (Step VII.B.4.d)	18.1 Determines ABSOLUTE VALUE of the Power Defect to be 1720 pcm and records on Data Sheet 1 (Block B.4.d). COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-001 JPM REVISION: 4	JPM TITLE: Calculating a Shutdown Margin Following a Stuck Rod

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
19.**C** Divide value from curve (in pcm) by 1000 to convert to %Δk/k AND Record on Data Sheet 1. (Step VII.B.4.e)	19.1**C** Converts ABSOLUTE VALUE of the Power Defect of 1720 pcm to 1.72 %Δk/k and records on Data Sheet 1 (Block B.4.e). COMMENTS:	
20. Add 0.250% Δk/k for operating temperature band margin to the Power Defect recorded in Step VII.B.4.e AND Record on Data Sheet 1. (Step VII.B.4.f)	20.1 Determines Power Defect plus operating temperature band margin to be 1.97 % Δk/k and records on Data Sheet 1 (Block B.4.f). COMMENTS:	
21.**C** Determine SHUTDOWN MARGIN by subtracting Power Defect (Step (Step VII.B.4.f) from the value determined in Step B.3 AND Record on Data Sheet 1. (Step VII.B.5)	21.1**C** Determines SDM to be 2.5272 % (+/- 0.100) Δk/k, and records on Data Sheet 1 (Block B.4.f) AND space provided on candidate direction sheet. 21.2**C** Compares calculated SDM to Tech Spec and Core Operating Limits Report requirement of 1.77% Δ K/K and determines that it is acceptable. 21.3 Records on OST cover sheet. COMMENTS:	
	EVALUATOR CUE: When the candidate hands in the OST cover sheet, the evaluation for this JPM is complete.	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- The Unit is in Mode 1, 100% power
- All rods are at 228 steps on the group demand counters
- Annunciator [A4-46], TAVG DEVIATION FROM TREF is "Off"
- A single Bank "D" Control Rod is stuck and indicates 228 steps
- Current RCS boron concentration is 1620 ppm
- Current core burnup is 100 MWD/MTU

INITIATING CUE:

Your Supervisor directs you to perform a shutdown margin calculation for the present plant conditions using 1OST-49.1, Shutdown Margin Calculation (Plant Critical), and report your results in the COMMENT section of the OST cover sheet.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Perform a Quadrant Power Tilt Ratio Calculation

TRAINING MATERIAL NUMBER: 1AD-003

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-003

REVISION NUMBER: 3

TECHNICAL REFERENCES:

1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 6

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 25 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-003
New Revision: 3
Description of Change(s): 1. Updated JPM to new format. 2. Updated expected performance time to 25 minutes. 3. Added K/A 2.1.7
Reason for Change (s): 1. Format Change 2. Completion time update 3. K/A review and update.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-003 JPM REVISION: 3	JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

K/A REFERENCE: 015A1.04 3.5/3.7
2.2.12 3.7/4.1
2.1.7 4.4/4.7

TASK ID: 0021-005-06-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☐ Simulator ☒ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SAP:

Time Critical: ☐ Yes ☒ No	Allotted Time: 25 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	The QPTR calculation is completed and compared to Technical Specification limits, as specified in the OST Acceptance Criteria. Reports UNSAT performance of OST.
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	Mode 1, The plant computers are unavailable.
INITIATING CUE:	The Unit Supervisor directs you to perform a QPTR manual calculation in accordance with 1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation" beginning at step VII.B.3. Report your results on the OST Cover Sheet. Normalization factors have been verified by Reactor Engineering.
REFERENCES:	1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 6.
TOOLS:	Calculator
HANDOUT:	1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 6, place kept up to Step VII.B.3, including normalization values and uncorrected currents provided on Data Sheet 1.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-003 JPM REVISION: 3	JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR NOTE: This JPM is designed to use an accompanying Data Sheet Set and is to be performed in a classroom setting. For any of the following data cues, refer to the accompanying Data Sheet Set.	
	START TIME: _____	
	EVALUATOR CUE: Provide a copy of 1OST-2.4A completed up to step VII.B.3. This includes normalization factors and uncorrected current filled out on Data Sheet 1.	
1. Review procedure.	1.1 Candidate reviews procedure provided. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-003 JPM REVISION: 3	JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
2.**C** Determine QPTR for each upper detector by performing the following on Data Sheet 1: a. Multiply each upper detector current value by its associated normalization factor **AND** Record result in "Current (Cor.)" column. b. Add values in "Current (Cor.)" column **AND** Record result in "SUM". c. **IF** all power range high neutron flux channel inputs to QPTR are OPERABLE Divide value in "SUM" by 4 **AND** Record result in "AVG". (Otherwise N/A) d. **IF** one power range high neutron flux channel input to QPTR is inoperable Divide value in "SUM" by 3 **AND** Record result in "AVG". (Otherwise N/A) e. Determine QPTR for each upper detector by dividing each value in the "Current (Cor.)" column by the "AVG" **AND** Record results in "Tilt Ratio" column.	2.1**C** Determines corrected current by multiplying each detectors Current (Uncor.) value by the associated normalization factor and records the result in the appropriate Data Sheet 1 Current (Cor.) column. 2.2**C** Add values in "Current (Cor.)" column **AND** records result in "SUM". 2.3**C** All power range high neutron flux channel inputs to QPTR are OPERABLE, therefore divide value in "SUM" by 4 **AND** Record result in "AVG". 2.4**C** Determines QPTR for each upper detector by dividing each value in the "Current (Cor.)" column by the "AVG" **AND** Record results in "Tilt Ratio" column. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-003 JPM REVISION: 3	JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
3.**C** Determine QPTR for each lower detector by performing the following on Data Sheet 1: a. Multiply each lower detector current value by its associated normalization factor **AND** Record result in "Current (Cor.)" column. b. Add values in "Current (Cor.)" column **AND** Record result in "SUM". c. **IF** all power range high neutron flux channel inputs to QPTR are OPERABLE Divide value in "SUM" by 4 **AND** Record result in "AVG". (Otherwise N/A) d. **IF** one power range high neutron flux channel input to QPTR is inoperable Divide value in "SUM" by 3 **AND** Record result in "AVG". (Otherwise N/A) e. Determine QPTR for each lower detector by dividing each value in the "Current (Cor.)" column by the "AVG" **AND** Record results in "Tilt Ratio" column.	3.1**C** Determines corrected current by multiplying each detectors Current (Uncor.) value by the associated normalization factor and records the result in the appropriate Data Sheet 1 Current (Cor.) column. 3.2**C** Add values in "Current (Cor.)" column **AND** records result in "SUM". 3.3**C** All power range high neutron flux channel inputs to QPTR are OPERABLE, therefore divide value in "SUM" by 4 **AND** Record result in "AVG". 3.4**C** Determines QPTR for each lower detector by dividing each value in the "Current (Cor.)" column by the "AVG" **AND** Record results in "Tilt Ratio" column. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-003 JPM REVISION: 3	JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
4. **IF** uncertain of the calculated tilt values, Compare the results with the following computer points: (Otherwise N/A)	**EVALUATOR NOTE:** Initial conditions stated plant computer was NOT available. 4.1 This step is N/A based on initial conditions provided. COMMENTS:	
5.**C** Consult the Acceptance Criteria for acceptable performance.Verify Steamline Isolation.	5.1 Compares test data with Acceptance Criteria to determine if QPTR exceeds 1.02. 5.2**C** Determines N43 is > 1.02 and is therefore UNSAT. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-003 JPM REVISION: 3	JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
6.**C** Inform the SM/US of the completion of this test	6.1**C** Informs the SM/US that QPTR performance is UNSAT or documents UNSAT completion on front cover sheet of OST. **EVALUATOR CUE:** When the candidate completes the QPTR calculation and reports or records completion, This JPM is COMPLETE. **EVALUATOR NOTE:** After candidate determines tilt is either within OR out of specification, compare candidates data sheet with the Answer Key to ensure calculation method is correct. Grader Discretion Required. COMMENTS:	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS: Mode 1, The plant computers are unavailable.

INITIATING CUE: The Unit Supervisor directs you to perform a QPTR manual calculation in accordance with 1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation" beginning at step VII.B.3.
Report your results on the OST Cover Sheet. Normalization factors have been verified by Reactor Engineering.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Identify Isolation Boundary Points on Plant VOND

TRAINING MATERIAL NUMBER: 1AD-040

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-040

REVISION NUMBER: 0

TECHNICAL REFERENCES:

1OM-36, 4KV Station Service System
Unit 1 EDG Air Start System Vond, RM-0436-001 Rev. 11
Unit 1 Vond Graphics Symbology Sheets 1 and 2, RM-0400-001 Rev. 1 and RM-0400-002 Rev. 2

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 10 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-040
New Revision: 0
Description of Change(s): 1. Developed new JPM for exam bank.
Reason for Change (s): 1. Exam bank development

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-040 JPM REVISION: 0	JPM TITLE: Identify Isolation Boundary Points on Plant VOND

K/A REFERENCE: 2.2.41 3.5 TASK ID: 0481-007-03-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform	☐ Plant Site	☐ Annual Requal Exam	☐ BVT
☐ Simulate	☐ Simulator	☐ Initial Exam	☐ NRC
	☒ Classroom	☐ Training	☐ Other:
		☐ Other:	

EVALUATION RESULTS		
Performer Name:	Performer SSN:	
Time Critical: ☐ Yes ☒ No	Allotted Time: 10 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Identifies boundary isolations for ruptured Diesel Air System Expansion Joint MFH-1EE-3, and correctly marks up the VOND.
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	• The plant is currently at 75% power • The Outside Tour Operator reports that there is an air rupture on Expansion Joint MFH-1EE-3, on the DG1 Air Start System • Air compressor 1EE-C-1A is running • The operator recommends that the rupture be isolated
INITIATING CUE:	You are to identify the isolation points to stop the air release and isolate the rupture, mark them on the VOND, and inform your supervisor of the actions taken.
REFERENCES:	1OM-36, 4KV Station Service System Unit 1 EDG Air Start System Vond, RM-0436-001 Rev. 11 Unit 1 Vond Graphics Symbology Sheets 1 and 2, RM-0400-001 Rev. 1 and RM-0400-002 Rev. 2
TOOLS:	None
HANDOUT:	Unit 1 EDG Air Start System Vond, RM-0436-001 Rev. 11 VONDs RM-0436-002, 003 and 004, other EDG system piping Unit 1 Vond Graphics Symbology Sheets 1 and 2, RM-0400-001 Rev. 1 and RM-0400-002 Rev. 2

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-040 JPM REVISION: 0	JPM TITLE: Identify Isolation Boundary Points on Plant VOND

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR CUE: Provide the Candidate with a copy of Unit 1 DG Air Start System Vond RM-0436-001, VONDs RM-0436-002, 003, 004 and Vond Symbology sheets 001 and 002. **EVALUATOR NOTE:** The sequence of identifying the isolation points is not critical for this JPM, steps may be done in any order.	
	START TIME: _____	
1. Reviews VOND 36-1 to locate the ruptured expansion joint, MFH-1EE-3 at grid location D-2.	1.1 Locates the ruptured expansion joint, MFH-1EE-3 on the VOND at grid location D-2. **EVALUATOR NOTE:** If the candidate decides to only secure the compressor and allow the air tanks to bleed off, Cue them as their Supervisor to stop the air leak by determining the isolation valves necessary to stop the air release. COMMENTS:	
2.**C** Determines that 1A Air Comp Disch Isol valve must be closed.	2.1**C** Identifies that valve 1DA-102, 1A Air Comp Disch Isol valve must be CLOSED. 2.2 Marks the valve on the VOND with an "X". COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-040 JPM REVISION: 0	JPM TITLE: Identify Isolation Boundary Points on Plant VOND

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
3. Determines NO. 1 DG Air Supply Hdr Cross Connect valve must remain closed.	**EVALUATOR NOTE:** The valve is normally closed. 3.1 Identifies that valve 1DA-104, NO. 1 DG Air Supply Hdr Cross Connect valve must remain closed. 3.2 May mark the valve on the VOND with an "X" to identify that it must remain closed. COMMENTS:	
4.**C** Determines that 3A Air Tank Isol valve must be closed.	4.1**C** Identifies that 1DA-105, 3A Air Tank Isol valve must be CLOSED. 4.2 Marks the valve on the VOND with an "X". COMMENTS:	
5.**C** Determines that 3B Air Tank Isol valve must be closed.	5.1**C** Identifies that 1DA-106, 3B Air Tank Isol valve must be CLOSED. 5.2 Marks the valve on the VOND with an "X". COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-040 JPM REVISION: 0	JPM TITLE: Identify Isolation Boundary Points on Plant VOND

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
6.**C** Determines that 3C Air Tank Isol valve must be closed.	6.1**C** Identifies that 1DA-107, 3C Air Tank Isol valve must be CLOSED. 6.2 Marks the valve on the VOND with an "X". COMMENTS:	
7. Determines that Motor Driven Air Compressor, 1EE-C-1A must be secured.	7.1 Identifies that the control switch for 1EE-C-1A, Diesel Generator Start Air Compressor, is taken to OFF **EVALUATOR NOTE:** This action is not required since closing 1DA-102 isolates the compressor pressure switch, the compressor would stop automatically. COMMENTS:	
8. Checks Vond is marked up, and reports to the supervisor.	8.1 Checks Vond is marked up with the isolation boundaries, and reports actions taken to the supervisor. COMMENTS:	
	EVALUATOR CUE: Once the Air Start System Vond is marked up with the isolation boundaries, and the actions taken have been reported, state "This JPM is complete".	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- The plant is currently at 75% power
- The Outside Tour Operator reports that there is an air rupture on Expansion Joint MFH-1EE-3, on the DG1 Air Start System
- Air compressor 1EE-C-1A is running
- The operator recommends that the rupture be isolated

INITIATING CUE: You are to identify the isolation points to stop the air release and isolate the rupture, mark them on the VOND, and inform your supervisor of the actions taken.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Select RWP and Determine Maximum Allowable Stay Time

TRAINING MATERIAL NUMBER: 1AD-012

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-012

REVISION NUMBER: 1

TECHNICAL REFERENCES:

NOP-OP-4107, "Radiation Work Permit (RWP)" , Rev 15

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ _____
Date

PEER REVIEW BY: _____ _____
Date

APPROVED FOR USE: _____ _____
Training Supervisor or Designee Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-012
New Revision: 1
Description of Change(s): 1. Updated for current JPM format. 2. Updated for NOP-OP-4107 revision. 3. Updated RWPs and survey maps (current year) required to perform the JPM. 4. Added step to calculate BVPS administrative limit.
Reason for Change (s): 1. Changed format to the new JPM procedure (BVPS-TR-0026). 2. NOP-OP-4107 was revised. 3. JPM realism and accuracy. 4. Validator feedback

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-012 JPM REVISION: 1	JPM TITLE: Select RWP and Determine Maximum Allowable Stay Time

K/A REFERENCE: 2.3.7 3.5/3.6 TASK ID: 0481-005-03-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☐ Simulator ☒ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SAP:

Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

_____

_____

_____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Select the correct RWP and associated Task Number AND determine the maximum stay time according to survey map dose rates. (cannot complete task due to RWP limit of 25 mrem dose)
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	• A clearance is being prepared to work on RCP seal injection isolation valve MOV-1CH-308C located in "A" Penetrations • You are assigned to connect a drain hose to RCP 1C Seal Supply Drain, 1CH-324, located directly below MOV-1CH-308C, to support the clearance • The task will take 1.5 hours to perform
INITIATING CUE:	You are to SELECT the correct RWP and associated task number to perform the task from the RWPs provided, AND calculate your MAXIMUM stay time using the appropriate survey map and RWP. Also calculate the Beaver Valley ADMINISTRATIVE limit for this job. Report your results in the "Candidate Answer" Box, including whether job can be completed based on calculated stay time.
REFERENCES:	NOP-OP-4107, "Radiation Work Permit (RWP)" , Rev 15
TOOLS:	Calculator
HANDOUT:	Set of 3 RWPs (216-2001, 116-1001, 116-1023) Radiation Survey Maps (Multiple maps, ensure dose near MOV-1CH-308C is reflective of calculated numbers used for JPM)

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-012 JPM REVISION: 1	JPM TITLE: Select RWP and Determine Maximum Allowable Stay Time

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	EVALUATOR NOTE: This JPM is designed to be performed in a classroom setting. Provide candidate with the set of RWPs, calculator, and Survey Map.	
	START TIME: _____	
1.**C** Review set of three (3) RWPs provided and select correct RWP and task number.	1.1**C** Selects RWP 116-1001 based on Operations clearance activities and records RWP # in candidate answer box. 1.2**C** Selects Task # 3 (clearance activities). **EVALAUTOR NOTE:** If asked, inform the candidate that connecting the drain hose is considered a clearance activity. Continue the task. COMMENTS:	
2.**C** Calculate the maximum stay time and administrative limit.	2.1**C** Determines maximum stay time is 1.25 hours (1 hour and 15 minutes) and records this time in the candidate answer box. 25 mr ÷ 20 mr/hr = 1.25 hrs (EAD dose limit) (highest dose rate) (Stay Time) 2.2**C** Determines Administrative time is 80% of the maximum [(1.25 hours * 0.80) =1 hour] and records this time in the candidate answer box. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-012 JPM REVISION: 1	JPM TITLE: Select RWP and Determine Maximum Allowable Stay Time

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Determines allowable stay time does NOT allow completion of the work.	3.1C Determines that the maximum stay time is 1.25 hours, (adminsitrative limits is 1.0 hour) and estimated completion for the job is 1.5 hours, then records that the job CANNOT be completed in the candidate answer box by circling NO. COMMENTS:	
	EVALUATOR CUE: When the Candidate reports the results in the candidate answer box, the evaluation for this JPM is complete. Grader Discretion is required.	
	STOP TIME: _____	

NAME: **ANSWER KEY**

RWP# **116-1001**

TASK # **#3 (Clearance Activities)**

MAXIMUM STAY TIME **1 Hour 15 Minutes (75 minutes)**

BV ADMINISTRATIVE LIMIT **1 Hour (60 Minutes)**

Can the Job be completed within limits? (circle one) **YES** **(NO)**

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- A clearance is being prepared to work on RCP seal injection isolation valve MOV-1CH-308C located in "A" Penetrations
- You are assigned to connect a drain hose to RCP 1C Seal Supply Drain, 1CH-324, located directly below MOV-1CH-308C, to support the clearance
- The task will take 1.5 hours to perform

INITIATING CUE:

You are to SELECT the correct RWP and associated task number to perform the task from the RWPs provided, AND calculate your MAXIMUM stay time using the appropriate survey map and RWP. Also calculate the Beaver Valley ADMINISTRATIVE limit for this job. Report your results in the "Candidate Answer" Box, including whether job can be completed based on calculated stay time.

NAME: _____

RWP# _____

TASK # _____

MAXIMUM STAY TIME _____

BV ADMINISTRATIVE LIMIT _____

Can the Job be completed within limits? (circle one) **YES** **NO**

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Prepare Partial OST [1OST-1.1] for Performance (SRO ONLY)

TRAINING MATERIAL NUMBER: 1AD-029

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-029

REVISION NUMBER: 1

TECHNICAL REFERENCES:

NOP-LP-2601, "Procedure Use And Adherence" (Rev. 5)
1OST-1.1, "Control Rod Assembly Partial Movement Test" (Rev. 20)

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 30 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-029
New Revision: 1
Description of Change(s): 1. Updated to latest format. 2. Updated for latest procedure revisions 3. Updated allotted time. 4. Added evaluator note that it is acceptable to use a line to designate a series of steps that are "N/A" or remove the pages from the procedure.
Reason for Change (s): 1. JPM format update 2. Both referenced procedures were revised 3. Validation time was 30 minutes. 4. Validation comments.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-029 JPM REVISION: 1	JPM TITLE: Prepare Partial OST [1OST-1.1] for Performance (SRO ONLY)

K/A REFERENCE: 2.1.20 4.6 TASK ID: 1320-006-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☐ Simulator ☒ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:		Performer SAP:
Time Critical: ☐ Yes ☒ No	Allotted Time: 30 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	All steps of 1OST-1.1 that are related specifically to movement of Shutdown Banks and Control Banks A, B & D are omitted or marked N/A. (Answer Key provided to assist in this evaluation)
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	Unit 1 is at 100% power with ARO at 228 steps. Control Rod D12 had a blown moveable gripper coil fuse. The fuse has been replaced, and it is **REQUIRED** to perform 1OST-1.1, "Control Rod Assembly Partial Movement Test" to verify the rod is still operable. Senior management has directed that a "Partial" performance of 1OST-1.1, "Control Rod Assembly Partial Movement Test" be performed for Control Bank C **ONLY**.
INITIATING CUE:	As the Unit Supervisor, IAW the guidance provided in NOP-LP-2601, "Procedure Use And Adherence" Step 4.1.11, Prepare 1OST-1.1, "Control Rod Assembly Partial Movement Test" for a Partial OST Performance. The Partial performance shall be for control Bank C **ONLY**. (Assume the evaluator will perform the second licensed SRO concurrence of your mark-ups).
REFERENCES:	NOP-LP-2601, "Procedure Use And Adherence" (Rev. 5) 1OST-1.1, "Control Rod Assembly Partial Movement Test" (Rev. 20)
TOOLS:	None
HANDOUT:	NOP-LP-2601, "Procedure Use And Adherence" (Rev. 5) 1OST-1.1, "Control Rod Assembly Partial Movement Test" (Rev. 20)

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-029 JPM REVISION: 1	JPM TITLE: Prepare Partial OST [1OST-1.1] for Performance (SRO ONLY)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	START TIME: _____	
1. The Unit Supervisor or designated SRO shall determine if the section or step will be designated as N/A or whether the section or step shall be performed. The Unit Supervisor or designated SRO shall document the decision in the official record copy of the procedure	1.1 Determines based on initial conditions, All steps related specifically to movement of Shutdown Banks and Control Banks A, B & D shall be omitted or marked N/A. 1.2 Documents the following on page 3 of the OST under test results: • Circles Partial OST • Writes an explanation documenting why steps related specifically to movement of Shutdown Banks and Control Banks A, B & D are being omitted or marked N/A. **EVALUATOR NOTE:** Completing Test Results section may be deferred until test completion; therefore candidate may NOT perform this step as part of the JPM. This is acceptable. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-029 JPM REVISION: 1	JPM TITLE: Prepare Partial OST [1OST-1.1] for Performance (SRO ONLY)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
2.**C** If the Unit Supervisor or designated SRO has granted approval, the performer or responsible supervisor shall ensure that the procedure section or step is designated as N/A, initialed and dated.	2.1**C** Documents the steps that are to be performed and the steps that are **NOT** to be performed on 1OST-1.1, "Control Rod Assembly Partial Movement Test". Refer to the Answer Key. COMMENTS: **EVALUATOR NOTE:** Per section 4.1.11 of NOP-LP-2601, it is acceptable to mark a series of Steps N/A by drawing a vertical line from the first and last step not performed or by removing the pages that are not to be performed **EVALUATOR NOTE:** Grader discretion will be required. The "critical" portions of this JPM are to clearly document the steps that are to be performed and the steps that are NOT to be performed. An answer key is provided to assist in evaluating this JPM. Each step that MUST be performed and each step that MUST be marked N/A are identified in this key and are "CRITICAL" steps for the JPM. All other steps are optional.	
	EVALUATOR CUE: That completes this JPM.	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS: Unit 1 is at 100% power with ARO at 228 steps. Control Rod D12 had a blown moveable gripper coil fuse. The fuse has been replaced, and it is **REQUIRED** to perform 1OST-1.1, "Control Rod Assembly Partial Movement Test" to verify the rod is still operable. Senior management has directed that a "Partial" performance of 1OST-1.1, "Control Rod Assembly Partial Movement Test" be performed for Control Bank C **ONLY**.

INITIATING CUE: As the Unit Supervisor, IAW the guidance provided in NOP-LP-2601, "Procedure Use And Adherence" Step 4.1.11, Prepare 1OST-1.1, "Control Rod Assembly Partial Movement Test" for a Partial OST Performance. The Partial performance shall be for control Bank C **ONLY**. (Assume the evaluator will perform the second licensed SRO concurrence of your mark-ups).

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Review a Quadrant Power Tilt Ratio Calculation (SRO Only)

TRAINING MATERIAL NUMBER: 1AD-009

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-009

REVISION NUMBER: 4

TECHNICAL REFERENCES:

1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 6

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ _____
Date

PEER REVIEW BY: _____ _____
Date

APPROVED FOR USE: _____ _____
Training Supervisor or Designee Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-009
New Revision: 4
Description of Change(s): 1. Added K/A 2.1.7 2. Removed step to identify missed Verifier initial, signed off step.
Reason for Change (s): 1 K/A review and update. 2. Validator comments, signed off as second verifier to not indicate that the OST was not SAT.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-009 JPM REVISION: 4	JPM TITLE: Review a Quadrant Power Tilt Ratio Calculation (SRO Only)

K/A REFERENCE: 015A1.04 3.5/3.7
2.2.40 3.4/4.7
2.1.7 4.4/4.7

TASK ID: 1320-008-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☐ Simulator ☒ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:

Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD: Reviews completed 1OST-2.4A and identifies the following:

- N43A Tilt Ratio inaccurately calculated.
- N44A Tilt Ratio inaccurately calculated.
- OST Acceptance Criteria is NOT met.
- TS 3.2.4 Condition A identified as Applicable TS.

RECOMMENDED STARTING LOCATION: Classroom

INITIAL CONDITIONS:

- Mode 1 at 100% Power.
- The plant computers are unavailable.
- The QPTR Alarm is Out Of Service, this is the 12 hour surveillance.

INITIATING CUE:

- You are to review the completed 1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation" for accuracy **AND** determine if any TS action statements are applicable.
- Any identified discrepancy will be recorded in the Comments section of the OST Cover Sheet.
- If no discrepancy is identified, list NONE and sign the SM approval of the OST Cover Sheet.
- If it is determined that TS action statement(s) apply, list the specific TS condition in the Comments section of the OST Cover Sheet.
- Normalization factors have been verified by Reactor Engineering.

REFERENCES: 1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 6.

TOOLS: Calculator, Technical Specifications for BVPS Units 1 & 2 (Do NOT provide but have available in the room)

HANDOUT: Completed version of 1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 6 containing errors.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-009 JPM REVISION: 4	JPM TITLE: Review a Quadrant Power Tilt Ratio Calculation (SRO Only)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR CUE: Provide the completed copy of 1OST-2.4A which contains errors.	
	START TIME: _____	
1. Review 1OST-2.4A, "QPTR Manual Calculation" procedure provided.	1.1 Reviews 1OST-2.4A, "QPTR Manual Calculation" procedure which is provided by the evaluator. COMMENTS:	
2.**C** Identifies N43A & N44A math errors contained on Data Sheet 1.	2.1**C** Determines N43A Tilt Ratio was miscalculated (should be 1.0247 versus 0.9759). 2.2**C** Determines N44A Tilt Ratio was miscalculated (should be 0.9836 versus 1.0166). 2.3 Identifies the Verified By individual failed to find the errors. 2.4 Records these errors in the comments section of the OST Cover Sheet. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-009 JPM REVISION: 4	JPM TITLE: Review a Quadrant Power Tilt Ratio Calculation (SRO Only)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
3.**C** Identifies QPTR exceeds 1.02 on N43A.	3.1**C** Identifies N43A when properly calculated exceeds 1.02 which does NOT meet the OST Acceptance Criteria. 3.2 Records OST Acceptance Criteria is NOT met in the comments section of the OST Cover Sheet. COMMENTS:	
4.**C** References T.S 3.2.4 is applicable and records the condition in the comments section of the OST Cover Sheet.	4.1**C** Identifies TS 3.2.4 Condition A is applicable (N43A > 1.02). 4.2 Records TS 3.2.4 Condition A is applicable in the comments section of the OST Cover Sheet. COMMENTS:	
	EVALUATOR CUE: When the candidate documents findings in the comments section of OST Cover Sheet, state "This JPM is COMPLETE". **EVALUATOR NOTE:** Grader discretion may be required.	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- Mode 1 at 100% Power.
- The plant computers are unavailable.
- The QPTR Alarm is Out Of Service, this is the 12 hour surveillance.

INITIATING CUE:

- You are to review the completed 1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation" for accuracy **AND** determine if any TS action statements are applicable.
- Any identified discrepancy will be recorded in the Comments section of the OST Cover Sheet.
- If no discrepancy is identified, list NONE and sign the SM approval of the OST Cover Sheet.
- If it is determined that TS action statement(s) apply, list the specific TS condition in the Comments section of the OST Cover Sheet.
- Normalization factors have been verified by Reactor Engineering.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Identify Isolation Boundary Points on Plant VOND, then determine diesel operability. (SRO Only)

TRAINING MATERIAL NUMBER: 1AD-039

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-039

REVISION NUMBER: 0

TECHNICAL REFERENCES:

1OM-36, 4KV Station Service System
BVPS Technical Specifications and Bases
Unit 1 EDG Air Start System Vond, RM-0436-001 Rev. 11
Unit 1 Vond Graphics Symbology Sheets 1 and 2, RM-0400-001 Rev. 1 and RM-0400-002 Rev. 2

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-039
New Revision: 0
Description of Change(s): 1. Developed new JPM for exam bank.
Reason for Change (s): 1. Exam bank development

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-039 JPM REVISION: 0	JPM TITLE: Identify Isolation Boundary Points on Plant VOND, then determine diesel operability. (SRO Only)

K/A REFERENCE: 2.2.41 3.9 TASK ID: 0481-007-03-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☐ Simulator ☒ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:

Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Identifies boundary isolations for ruptured Diesel Air System Expansion Joint MFH-1EE-3, marks up the VOND, and determines that isolating the air rupture will not make DG1 inoperable.
RECOMMENDED STARTING LOCATION:	Classroom

INITIAL CONDITIONS:

- The plant is currently at 75% power
- The Outside Tour Operator reports that there is an air rupture on Expansion Joint MFH-1EE-3, on the DG1 Air Start System
- Air compressor 1EE-C-1A is running
- DG Air Systems are NOT cross connected
- PI-EE-201, Starting Air Right Bank Pressure is 105 psig and lowering
- PI-EE-202, Starting Air Left Bank Pressure is 190 psig and stable
- The operator recommends that the rupture be isolated

INITIATING CUE: You are to identify the isolation points to stop the air release and isolate the rupture, mark them on the VOND, and then determine if DG1 is Operable, and state the reason for your operability determination.

REFERENCES:
1OM-36, 4KV Station Service System
Unit 1 EDG Air Start System Vond, RM-0436-001 Rev. 11
VONDs RM-0436-002, 003 and 004, other EDG system piping
BVPS Technical Specifications and Bases
Unit 1 Vond Graphics Symbology Sheets 1 and 2, RM-0400-001 Rev. 1 and RM-0400-002 Rev. 2

TOOLS: None

HANDOUT:
Unit 1 EDG Air Start System Vond, RM-0436-001 Rev. 11
VONDs RM-0436-002, 003 and 004, other EDG system piping
BVPS Technical Specifications and Bases
Unit 1 Vond Graphics Symbology Sheets 1 and 2, RM-0400-001 Rev. 1 and RM-0400-002 Rev. 2

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-039 JPM REVISION: 0	JPM TITLE:	Identify Isolation Boundary Points on Plant VOND, then determine diesel operability. (SRO Only)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR CUE: Provide the Candidate with a copy of Unit 1 DG Air Start System Vond RM-0436-001, VONDs RM-0436-002, 003, 004 and Vond Symbology sheets 001 and 002 and Tech Specs. **EVALUATOR NOTE:** The sequence of identifying the isolation points is not critical for this JPM, steps may be done in any order.	
	START TIME: _____	
1. Reviews VOND 36-1 to locate the ruptured expansion joint, MFH-1EE-3 at grid location D-2.	1.1 Locates the ruptured expansion joint, MFH-1EE-3 on the VOND at grid location D-2. **EVALUATOR NOTE:** If the candidate decides to only secure the compressor and allow the air tanks to bleed off, Cue them as their Supervisor to stop the air leak by determining the isolation valves necessary to stop the air release. COMMENTS:	
2.**C** Determines that 1A Air Comp Disch Isol valve must be closed.	2.1**C** Identifies that valve 1DA-102, 1A Air Comp Disch Isol valve must be CLOSED. 2.2 Marks the valve on the VOND with an "X". COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-039 JPM REVISION: 0	JPM TITLE:	Identify Isolation Boundary Points on Plant VOND, then determine diesel operability. (SRO Only)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
3. Determines NO. 1 DG Air Supply Hdr Cross Connect valve must remain closed.	**EVALUATOR NOTE:** The valve is normally closed. 3.1 Identifies that valve 1DA-104, NO. 1 DG Air Supply Hdr Cross Connect valve must remain closed. 3.2 May mark the valve on the VOND with an "X" to identify that it must remain closed. COMMENTS:	
4.**C** Determines that 3A Air Tank Isol valve must be closed.	4.1**C** Identifies that 1DA-105, 3A Air Tank Isol valve must be CLOSED. 4.2 Marks the valve on the VOND with an "X". COMMENTS:	
5.**C** Determines that 3B Air Tank Isol valve must be closed.	5.1**C** Identifies that 1DA-106, 3B Air Tank Isol valve must be CLOSED. 5.2 Marks the valve on the VOND with an "X". COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-039 JPM REVISION: 0	JPM TITLE:	Identify Isolation Boundary Points on Plant VOND, then determine diesel operability. (SRO Only)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
6.**C** Determines that 3C Air Tank Isol valve must be closed.	6.1**C** Identifies that 1DA-107, 3C Air Tank Isol valve must be CLOSED. 6.2 Marks the valve on the VOND with an "X". COMMENTS:	
7. Determines that Motor Driven Air Compressor, 1EE-C-1A must be secured.	7.1 Identifies that the control switch for 1EE-C-1A, Diesel Generator Start Air Compressor, is taken to OFF **EVALUATOR NOTE:** This action is not required since closing 1DA-102 isolates the compressor pressure switch, the compressor would stop automatically. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-039 JPM REVISION: 0	JPM TITLE:	Identify Isolation Boundary Points on Plant VOND, then determine diesel operability. (SRO Only)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
8.**C** Refers to Technical Specifications to make Operability determination.	8.1 Refers to TS 3.8.3 Cond. E to determine if starting Air Pressure < 125 psig will make DG1 inoperable. 8.2 Refers to TS 3.8.3 Bases to determine if one starting Air Receiver Bank pressure > 125 psig is sufficient to maintain the DG operable. 8.3**C** Determines that the required air start capacity for DG1 is met with two out of three air tanks in one of the two air banks at the specified air pressure of ≥125 psig. DG1 is Operable. 8.4 Documents the results on the Direction Sheet in the Candidate Answer box. COMMENTS:	
	EVALUATOR CUE: Once the Air Start System Vond and Candidate Answer box is turned in, state "This JPM is complete".	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

*** THIS SHEET TO BE GIVEN TO CANDIDATE ***

☐ Read:

INITIAL CONDITIONS:

- The plant is currently at 75% power
- The Outside Tour Operator reports that there is an air rupture on Expansion Joint MFH-1EE-3, on the DG1 Air Start System
- Air compressor 1EE-C-1A is running
- DG Air Systems are NOT cross connected
- PI-EE-201, Starting Air Right Bank Pressure is 105 psig and lowering
- PI-EE-202, Starting Air Left Bank Pressure is 190 psig and stable
- The operator recommends that the rupture be isolated

INITIATING CUE: You are to identify the isolation points to stop the air release and isolate the rupture, mark them on the VOND, and then determine if DG1 is Operable, and state the reason for your operability determination.

ANSWER: **NAME:**_____

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Determine Emergency Exposure Authorization Limits (SRO ONLY)

TRAINING MATERIAL NUMBER: 1AD-038

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-038

REVISION NUMBER: 1

TECHNICAL REFERENCES:

1/2-EPP-IP 5.3, "Emergency Exposure Criteria and Control", Rev. 11

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-038
New Revision: 1
Description of Change(s): 1. Updated to match new format. 2. Modified the result to be different from 2AD-038.
Reason for Change (s): 1. Format has changed 2. Modified conditions per NRC request.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-038 JPM REVISION: 1	JPM TITLE: Determine Emergency Exposure Authorization Limits (SRO ONLY)

K/A REFERENCE: 2.3.4 3.7 TASK ID: 1350-006-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☐ Simulator ☒ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS		
Performer Name:		Performer SSN:
Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

_____

_____

_____

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Determines Emergency Exposure Authorization Limits for stated conditions are ***75 rem TEDE, 225 rem lens of eye, and 750 rem organ CDE.*** Determines acute radiation probable effects to be ***possible slight transient blood changes, serious delated effects improbable***.
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	• A General Emergency has been declared at Unit 1. • An individual is trapped and bleeding in a High Radiation Area. • An immediate response is necessary to search and rescue this individual. • It has been clearly determined that actions establishing adequate or equivalent protection, with less dose are not readily available. • Mike Defulle, a qualified radiation worker ***has volunteered*** to perform the rescue activity and has been briefed on risks of projected radiation exposure. • ***The Senior Vice President is not available.*** • Mike Defulle has a year to date exposure of 880 mR (TEDE). • The area dose rate ***is 8820 mR/hr*** and there is no airborne radioactivity present. • The rescue activity could take up to 3 hours. • No previous history of accident or emergency exposure.
INITIATING CUE:	As the Emergency Director, you are to evaluate the listed conditions and determine ALL of the Emergency Exposure Authorization Limits. Also determine the Acute Radiation Exposure Probable Effects to this worker based on a 3 hour stay time. The Emergency Exposure Authorization Form will **NOT** be filled out at this time. **Document your determinations in the box below.**
REFERENCES:	1/2-EPP-IP 5.3, "Emergency Exposure Criteria and Control", Rev. 11
TOOLS:	None
HANDOUT:	1/2-EPP-IP 5.3, "Emergency Exposure Criteria and Control", Rev. 11

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-038 JPM REVISION: 1	JPM TITLE: Determine Emergency Exposure Authorization Limits (SRO ONLY)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	START TIME: _____	
	EVALUATOR NOTE: Block 5 ONLY is Critical.	
1.**C** Determines the appropriate Emergency Exposure Authorization Limits using Attachment A. (Step 8.1.2) 1	1.1**C** Using Attachment A and conditions provided, determines the Emergency Exposure Authorization Limits: **Block 1:** Declared Emergency **YES General Emergency** Personnel are qualified **YES** No declared pregnant workers **YES Male** **Block 2:** Exposure necessary to (1) save human life **YES** **Block 3:** Personnel are volunteers and have been briefed on risks of projected radiation exposure **YES –has volunteered** **Block 4:** Senior Vice President authorization for exposure > 75 Rem **NO - VP not available** **Block 5C:** Limit exposure to: 75 rem TEDE; 225 rem lens of eye, 750 rem organ CDE COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-038 JPM REVISION: 1	JPM TITLE:	Determine Emergency Exposure Authorization Limits (SRO ONLY)

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
2.**C** Determines the Acute Radiation Exposure probable effects (biological risk) using Attachment C. (Step 8.1.5)	2.1**C** Determines (3 hours) x ***(8820 mr/hr) = 26.46 Rem*** and based on this determination, references Attachment C and further determines the probable effects to the worker for a dose of ***25-100 Rads*** are: • ***Possible Slight transient blood changes.*** • ***Serious delayed effects improbable.*** COMMENTS:	
	EVALUATOR CUE: Once determinations are documented, inform the candidate that this JPM is COMPLETE.	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- A General Emergency has been declared at Unit 1.
- An individual is trapped and bleeding in a High Radiation Area.
- An immediate response is necessary to search and rescue this individual.
- It has been clearly determined that actions establishing adequate or equivalent protection, with less dose are not readily available.
- Mike Defulle, a qualified radiation worker has volunteered to perform the rescue activity and has been briefed on risks of projected radiation exposure.
- The Senior Vice President is not available.
- Mike Defulle has a year to date exposure of 880 mR (TEDE).
- The area dose rate is 8820 mR/hr and there is no airborne radioactivity present.
- The rescue activity could take up to 3 hours.
- No previous history of accident or emergency exposure.

INITIATING CUE:

As the Emergency Director, you are to evaluate the listed conditions and determine ALL of the Emergency Exposure Authorization Limits. Also determine the Acute Radiation Exposure Probable Effects to this worker based on a 3 hour stay time. The Emergency Exposure Authorization Form will **NOT** be filled out at this time.
Document your determinations in the box below.

ANSWER: **NAME:**_____

1. Limit Exposure to:

2. Probable Effects:

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Determine Protective Action Recommendations (Part 1)

TRAINING MATERIAL NUMBER: 1AD-037

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1AD-037

REVISION NUMBER: 1

TECHNICAL REFERENCES:

1/2-EPP-IP-4.1, "Offsite Protective Actions", Rev. 31
1/2-EPP-IP-1.1.F01 Rev. 8
1/2-EPP-I-5 Rev 42

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1AD-037
New Revision: 1
Description of Change(s): 1. Updated for format changes. 2. Lowered and adjusted dose rates to lower as the distance from the site increased. 3. Modified to select a different PAR than JPM 2AD-037.
Reason for Change (s): 1. New JPM format 2. The 5 mile dose was higher than then EAB and 2 mile dose, lowered dose to reflect background. 3. Per NRC feedback, different PAR than one used on exam at BV2.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-037 JPM REVISION: 1	JPM TITLE: Determine Protective Action Recommendations (Part 1)

K/A REFERENCE: 2.4.44 4.4 TASK ID: 1350-007-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☐ Simulator ☒ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:

Time Critical: ☒ Yes ☐ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

_____

_____

_____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD: Determine Protective Action Recommendations in accordance with 1/2-EPP-IP-4.1.

RECOMMENDED STARTING LOCATION: Classroom

INITIAL CONDITIONS: A General Emergency has been declared at Unit 1 at 1000 hours following a small break LOCA and the loss of all 4KV emergency power on EAL SG1. A Core Cooling Red condition exists.
The General Emergency was declared due to a Prolonged Loss of all OFFSITE and ONSITE AC power to Emergency Busses (SG1) due to a tornado.
Unit 2 is shutdown and in an outage.

The following plant conditions exist:

- 35' wind direction is from 270° at 4 MPH.
- 150' wind direction is from 290° at 11 MPH.
- 500' wind direction is from 110° at 15 MPH.
- Beaver County 911 Call Center reports numerous road closures due to downed trees and the Shippingport Bridge is closed due to structural damage.
- NO radioactive release has occurred or is imminent (within 1 hour).
- There is NO Hostile Action event in progress.
- Health Physics has provided the following dose projections:

At the EAB: .0025 REM TEDE; .0008 REM CDE
At 2 miles: .00015 REM TEDE; .0004 REM CDE
At 5 miles: .00009 REM TEDE; .00025 REM CDE

INITIATING CUE: You are the Emergency Director and the TSC/EOF has **NOT** yet been activated. You are to evaluate the above conditions and determine which, if any, offsite **Protective Action Recommendations** (PAR) are necessary. Provide PAR by completing 1/2-EPP-IP-1.1.F01 Nuclear Power Plant Initial Notification Form. The evaluator will peer check the form. This JPM is **TIME CRITICAL.**

REFERENCES: 1/2-EPP-IP-4.1, "Offsite Protective Actions", Rev. 30
1/2-EPP-IP-1.1.F01 Rev. 6
1/2-EPP-I-5 Rev 40

TOOLS: NONE

HANDOUT: 1/2-EPP-IP-4.1, "Offsite Protective Actions", Rev. 30
1/2-EPP-IP-1.1.F01 Rev. 6
Emergency Plan Wallboard
1/2-EPP-I-5 Rev 40

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-037 JPM REVISION: 1	JPM TITLE: Determine Protective Action Recommendations (Part 1)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	START TIME: _____	
1. Locate Offsite Protective Action Recommendation Flowchart	1.1 Refers to 1/2-EPP-IP-4.1, Attachment A, Part 1 Offsite Protective Action Recommendation Flowchart. COMMENTS:	
2. Determine offsite protective action.	2.1 Navigates PAR flowchart as follows: • General Emergency already declared (↓) • Met data provided in Initial Conditions (↓) • The difference between the 150' and 500' wind directions is 180 degrees; (→) goes to page 2 2.2 Navigates to Page 2: • This is the initial PAR (↓) AND • NO Loss of Containment Fission Product Barrier transitions to the right (→) 2.3 Navigates to second decision box: • NO Hostile Action (↓) OR • There are impediments to evacuation - YES (↓) 2.4 Navigates to the third decision box: • Projected Dose at or Beyond Site Boundary ≥ 5 REM TEDE -NO (↓) 2.5 Navigates to the Protective Action Recommendation. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-037 JPM REVISION: 1	JPM TITLE: Determine Protective Action Recommendations (Part 1)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
3.**C** Determine Offsite Protective Action Recommendations.	3.1.**C** Determines and documents on 1/2-EPP-IP-1.1.F01, the following PARs: • SHELTER in Place 0 to 5 miles, 360 degrees • All others monitor and prepare • KI per the State Plan COMMENTS:	
4. Continues Assessment.	4.1 Indicates that metrological and radiological conditions would be monitored. **EVALUATOR CUE:** If asked cue, "There has been no change in metrological or radiological conditions." COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1AD-037 JPM REVISION: 1	JPM TITLE: Determine Protective Action Recommendations (Part 1)

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
5.**C** Completes the PAR within 15 minutes.	5.1**C** Determines that form is completed within 15 minutes of the start time. 5.2 Confirm the start and stop times are within 15 minutes. COMMENTS:	
	EVALUATOR CUE: When the candidate completes the Protective Action Recommendation, the evaluation for this JPM is complete.	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

A General Emergency has been declared at Unit 1 at 1000 hours following a small break LOCA and the loss of all 4KV emergency power on EAL SG1. A Core Cooling Red condition exists.
The General Emergency was declared due to a Prolonged Loss of all OFFSITE and ONSITE AC power to Emergency Busses (SG1) due to a tornado.
Unit 2 is shutdown and in an outage.

The following plant conditions exist:

- 35' wind direction is from 270° at 4 MPH.
- 150' wind direction is from 290° at 11 MPH.
- 500' wind direction is from 110° at 15 MPH.
- Beaver County 911 Call Center reports numerous road closures due to downed trees and the Shippingport Bridge is closed due to structural damage.
- NO radioactive release has occurred or is imminent (within 1 hour).
- There is NO Hostile Action event in progress.
- Health Physics has provided the following dose projections:

At the EAB: .0025 REM TEDE; .0008 REM CDE
At 2 miles: .00015 REM TEDE; .0004 REM CDE
At 5 miles: .00009 REM TEDE; .00025 REM CDE

INITIATING CUE:

You are the Emergency Director and the TSC/EOF has **NOT** yet been activated. You are to evaluate the above conditions and determine which, if any, offsite **Protective Action Recommendations** (PAR) are necessary. Provide PAR by completing 1/2-EPP-IP-1.1.F01 Nuclear Power Plant Initial Notification Form. The evaluator will peer check the form. This JPM is **TIME CRITICAL.**

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Withdraw Shutdown Bank "A"

TRAINING MATERIAL NUMBER: 1CR-085

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 1CR-085

REVISION NUMBER: 7

TECHNICAL REFERENCES:

1OM-50.4.D2, Reactor Startup From Mode 3 To Mode 2 Rev. 0

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-085
New Revision: 7
Description of Change(s): 1. Updated to new format 2. Modified JPM from OM-1 procedure to OM-50 procedure that now is used for plant startup. Modified critical steps to match the procedure. 3. Updated to match current procedure revision. 4. Correct typo in Task number to 0011 versus 0111. 5. Updated task standard to withdraw rods to the full out position. 6. Added a cue to identify the full out rod position for the current cycle prior to starting the JPM. 7. Modified time to 15 minutes based upon validation.
Reason for Change (s): 1. Standard JPM format has been updated. 2. OM-1 procedure now only starts up Rod drive system, Shutdown Bank withdrawal is now performed as a part of the overall plant startup procedure. 3. Procedure was revised to be inclusive of all startup activities. 4. Task review and update. 5. Revised to match the expected completion of the task. 6. The full out rod position was not identified, made it a blank step so the JPM does not have to be revised each time the rod position changes. 7. Validation times were shorter due to validation.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-085 JPM REVISION: 7	JPM TITLE: Withdraw Shutdown Bank "A"

K/A REFERENCE: 001A3.02 3.7/3.6 TASK ID: 0011-013-01-013
014A4.02 3.4/3.2

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SAP:

Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

_____

_____

_____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Shutdown Bank "A" is withdrawn, source range counts are monitored and SBA rods are at the all rods out position.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	The Unit is in a normal startup evolution. The reactor trip breakers are closed and all initial conditions are met to withdraw the Shutdown banks. The Rod Control System has been started to the point of withdrawing the shutdown banks, 1OM-50.4.D2 has been completed through step IV.B.1.k.
INITIATING CUE:	Your Supervisor directs you to withdraw Shutdown Bank "A" in accordance with 1OM-50.4.D2 "Reactor Startup From Mode 3 To Mode 2", Step IV.C.1.
REFERENCES:	1OM-50.4.D2, "Reactor Startup From Mode 3 To Mode 2", Step IV.C. Rev 0
TOOLS:	None
HANDOUT:	1OM-50.4.D2, "Reactor Startup From Mode 3 To Mode 2", Step IV.C. Rev 0

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-085 JPM REVISION: 7	JPM TITLE: Withdraw Shutdown Bank "A"

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	Simulator Setup: Initialize into a Start-up IC with Shutdown Banks inserted. Ensure all step counters are set to zero. Ensure Audio Count Rate is audible. Identify the full out rod position in the following cue.	
	START TIME: _____	
1. Review procedure.	**Examiner Cue:** The SBA rods full out position for this cycle is _____steps. 1.1 Candidate reviews procedure 1OM-50.4.D2 as provided. COMMENTS:	
2. Record initial SR and IR levels before pulling shutdown banks. SR IR N31 _____cps N35_____amps N32 _____cps N36_____amps	2.1 Records SR and IR levels before pulling rods. COMMENTS:	
3.**C** Place the bank selector switch in the SBA (Shutdown Bank A) position.	3.1.**C** Places bank selector switch to SBA (Shutdown Bank A) position. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-085 JPM REVISION: 7	JPM TITLE: Withdraw Shutdown Bank "A"

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
4.**C** Place the spring return ROD MOTION lever to the OUT position.	4.1**C** Places rod motion lever in the OUT position. 4.2 Verifies the WHITE OUT (↑) direction lamp is lit, while rod motion lever is held in the OUT position. COMMENTS:	
5. Observes that the Shutdown Bank A, group 1 and group 2 step counters indicate the withdrawal steps.	5.1 Monitors Shutdown Bank A group step counters by observing increasing step indication. COMMENTS:	
6. Verify by observing the Rod Position Indicators (VB-B) and respective IPC computer points that the mechanisms in Shutdown Bank A are moving.	6.1 Monitors Shutdown Bank A Rod Position indicators on the vertical board are increasing as rods are withdrawn. 6.2 Monitors IPC computer points for Shutdown Bank A Rods are increasing as rods are withdrawn COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-085 JPM REVISION: 7	JPM TITLE: Withdraw Shutdown Bank "A"

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
7.**C** Withdraw the Shutdown Bank A rods to the all rods out position for the current cycle and monitor the Source Range instrumentation during the rod movement.	7.1 Monitors the Source Range instruments N31 and N32 as Shutdown Bank A rods are withdrawn. 7.2**C** Releases the Rod Motion lever when the Shutdown Bank A Rod step counters are at the full withdrawn position. COMMENTS **EVALUATOR NOTE:** JPM may be terminated any time after the rod are at the full out position and source range indications are verified.	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS: The Unit is in a normal startup evolution. The reactor trip breakers are closed and all initial conditions are met to withdraw the Shutdown banks. The Rod Control System has been started to the point of withdrawing the shutdown banks, 1OM-50.4.D2 has been completed through step IV.B.1.k.

INITIATING CUE: Your Supervisor directs you to withdraw Shutdown Bank "A" in accordance with 1OM-50.4.D2 "Reactor Startup From Mode 3 To Mode 2", Step IV.C.1.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Perform Manual Makeup to the Charging Pump Suction

TRAINING MATERIAL NUMBER: 1CR-581

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1CR-581

REVISION NUMBER: 7

TECHNICAL REFERENCES:

1OM-7.4.P, "Blender Manual Makeup Operation", Revision 11
Unit 1 Plant Curve Book (1CB-29), Rev. 7

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-581
New Revision: 7
Description of Change(s): 1. Updated for Curve Book (1CB-29) revision. 2. Added note to reset the integrators after each Simulator Reset
Reason for Change (s): 1. Curve Book (1CB-029) was revised. 2. Note to remind Simulator operator for subsequent JPM performances.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

K/A REFERENCE: 004 A4.01 3.8/3.9
004 A4.04 3.2/3.6
004 A4.07 3.9/3.7

TASK ID: 0071-025-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:		Performer SSN:
Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

_____

_____

_____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Begins manual makeup at correct settings and terminates makeup upon discovery of no boric acid flow.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	• Core burnup is 1000 MWD/MTU • RCS boron concentration is 1207 ppm from the most recent Chemist's sample • The in service Boric Acid Tank concentration is 7380 ppm • VCT level is currently 24%
INITIATING CUE:	Your supervisor directs you to add 300 gallons of blended makeup to the VCT at the corrected boron concentration and a flow of 100 gpm in accordance with 1OM-7.4.P, "Blender Manual Makeup Operation". All Initial Conditions have been verified met.
REFERENCES:	1OM-7.4.P, "Blender Manual Makeup Operation", Revision 11 Unit 1 Plant Curve Book (1CB-29), Rev. 7
TOOLS:	Calculator
HANDOUT:	1OM-7.4.P, "Blender Manual Makeup Operation", Revision 11 Unit 1 Plant Curve Book (1CB-29), Rev. 7

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	SIMULATOR SETUP: Select a Mode 1 IC. Ensure VCT level at 24% by setting ACVCVCTW = 6975. Select remote functions and insert CHS067 to close 1CH-P-2A discharge valve to boric acid filter by entering 0 in remote value and selecting insert. Ensure blender setpoint is set to 1254 ppm value (4.25) on FCV-1CH-113A. Snap IC to save for future use. **EVALUATOR NOTE:** Ensure in-service **BAST placard** is updated to **7380 ppm** and **RCS Cb placard** is updated to **1207 ppm**, PRIOR to bringing candidate into simulator. **ENSURE LAPTOP IS RESET FOR AUDIBLE BEEPs (Each Simulator Reset)** **RESET both Integrators to ZERO after each Simulator Reset** Provide candidate a copy of 1OM-7.4.P, Blender Manual Makeup Operation. Place simulator in run when candidate is ready to begin JPM.	
	START TIME: _____	
1. Reviews procedure.	1.1 Candidate reviews 1OM-7.4.P. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
2. At the discretion of the RO and SM/US, Take manual control of the VCT Level and Pressure using [LCV-1CH-115A], VCT to Degas Divert and/or [SOV-1CH-258], VCT Vent Isol.	2.1 This step is N/A based on initial conditions of 24% VCT level. **EVALUATOR CUE:** If asked, role play as Unit Supervisor, and state diverting of the VCT is not required. COMMENTS:	
3. If letdown flow to a degasifier will exceed 75 gpm, perform either of the following:	3.1 This step is N/A. COMMENTS:	
4. Obtain the existing RCS boron concentration obtained from the Chemist's sample.	4.1 Candidate should obtain RCS Boron concentration from the Initial Conditions or posted placard. COMMENTS:	
5. If the plant is operating at power, Obtain the B-10 Correction Factor from Curve Book Figure 29, Otherwise Contact Reactor Engineering to obtain a B-10 Correction Factor.	5.1 Locates Curve Book and determines correction factor from 1CB-29 equals 0.981. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
6. Calculate Corrected Boron Concentration AND record in the Narrative Log. Corrected Boron Concentration = Present Boron Concen. X B-10 Correction Factor	6.1 Calculates a corrected boron concentration of 1184 ppm. (1207 x 0.981 = 1184) **EVALUATOR CUE:** If asked, inform the Candidate that another operator will make the Narrative Log entry. COMMENTS:	
7. Obtain the inservice Boric Acid Tank boron concentration obtained from Chemist's sample	7.1 Candidate should obtain the inservice Boric Acid Tank boron concentration from the Initial Conditions or the posted placard. (7380 ppm) COMMENTS:	
8. Place 1MU to STOP for greater than 1 second to allow the blender to unarm.	8.1 Places 1MU control switch to STOP for > 1 second. 8.2 Verifies makeup control GREEN light – LIT and RED light – NOT LIT. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
9. Adjust [FCV-1CH-113A], Boric Acid to Blender FCV, controller to the desired setting as follows: Determine Boric Acid Flow from the following calculation: Boric Acid Flow = Desired blender outlet concentration X Desired blender total flow/ Actual boric acid supply concentration	9.1 Calculates boric acid flow: $\frac{1184 ppm\ X\ 100 gpm}{7380} = 16.0 gpm$ **EVALUATOR CUE:** If desired, inform candidate that another operator will update the Narrative Log. COMMENTS:	
10.**C** Set [FCV-1CH-113A] as follows: Pot Setting = Boric Acid Flow/4 gpm X 100	10.1**C** Sets FCV-1CH-113A for the desired flowrate. (400 units) Pot setting = 16.0 gpm/4gpm x 100 = 400 units **EVALUATOR NOTE:** A pot setting of 395-405 units is acceptable. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
11.**C** Set [YIC-1CH-113], Boric Acid Integrator, to the total volume in gallons of boric acid to be added from the following equation: (BB-A) B.A. Volume = B.A. Flow X Total Makeup Flow/Total Makeup Volume	11.1**C** Adjusts YIC-1CH-113 to 48 (GREEN LED). BA Vol = 16 X 300/100 = 48 11.2 Depresses YIC-1CH-113 reset pushbutton. 11.3 Verifies YIC-1CH-113 is reading ZERO (RED LED). COMMENTS:	
12. Adjust [FCV-1CH-114A] Primary Water to Blender FCV, controller to the desired blender total flow. Pot Setting = (Total Flow Rate/16 gpm) X 100	12.1 Sets FCV-1CH-114A for the desired blender total flow setpoint of 100 gpm. 100/16 X 100 = 625 units (+/-25) COMMENTS:	
13.**C** Set [YIC-1CH-168A], Blender Output Integrator, for desired quantity. a. Reset [YIC-1CH-168A], Blender Output Integrator.	13.1**C** Adjusts YIC-1CH-168A to 300 (GREEN LED). 13.2 Depresses YIC-1CH-168A reset pushbutton. 13.3 Verifies YIC-1CH-168A reading ZERO (RED LED). COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
14. Note the flow totalizer indication and add to it the number of gallons set into the batch integrator for [YIC-1CH-113], Boric Acid Integrator AND [YIC-1CH-168A], Blender Output Integrator.	14.1 Sums the totalizer and integrator values, then records the summed values for both [YIC-1CH-113] and [YIC-1CH-168]. COMMENTS:	
15. If in Mode 4, 5 or 6, align PG water to the blender by unlocking and opening either of the following valves: (Blender Room)	15.1 This step is N/A. Plant is in Mode 1. COMMENTS:	
16. Immediately prior to initiating makeup, perform the following: • Verify a reactor coolant pump is operating in an unisolated loop. • Record the commencement of the makeup and the RCS flow verification in the Narrative log.(LRS 3.1.10.1)	16.1 Verifies all Reactor coolant pumps are operating - RED lights – LIT and WHITE lights – NOT LIT. 16.2 Makes a notation in the Narrative Log. **EVALUATOR CUE:** Another operator will update the narrative log. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
17.C Place [FCV-1CH-113B], Blender Outlet to Chg Pumps FCV, control switch to OPEN. (BB-A)	17.1C Places FCV-1CH-113B control switch to OPEN. 17.2 Verifies RED light – LIT and GREEN light – NOT LIT. COMMENTS:	
18.C Place 43/MU to MAN. (BB-A)	18.1C Places 43/MU control switch to MANUAL. COMMENTS:	
	FAULT STATEMENT: The boric acid flowpath is isolated, no boric acid flow will occur in the next step.	
19.C To initiate makeup, Place 1MU to START. (BB-A)	19.1C Places 1MU control switch to START. 19.2 Verifies makeup control RED light – LIT and GREEN light – NOT LIT. 19.3 Boric Acid Transfer Pump FAST speed RED light – LIT. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-581 JPM REVISION: 7	JPM TITLE: Perform Manual Makeup to the Charging Pump Suction

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
20.**C** Verify boric acid and PG Water to Blender flow on [FR-1CH-113], Boric Acid Flow.	20.1 Determines from FR-1CH-113 that no boric acid flow exists. (FCV-1CH-113A red light – LIT, Boric Acid flow – ZERO, and Total makeup flow indicates upscale). 20.2**C** Places 1MU control switch to STOP to immediately terminate dilution. (Dilution must be stopped prior to 100 gallons of water being added to the RCS). COMMENTS:	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- Core burnup is 1000 MWD/MTU
- RCS boron concentration is 1207 ppm from the most recent Chemist's sample
- The in service Boric Acid Tank concentration is 7380 ppm
- VCT level is currently 24%

INITIATING CUE:

Your supervisor directs you to add 300 gallons of blended makeup to the VCT at the corrected boron concentration and a flow of 100 gpm in accordance with 1OM-7.4.P, "Blender Manual Makeup Operation". All Initial Conditions have been verified met.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Depressurize RCS During SGTR

TRAINING MATERIAL NUMBER: 1CR-638

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 1CR-638

REVISION NUMBER: 4

TECHNICAL REFERENCES:

1OM-53A.1.E-3, Issue 3 Rev. 0
1OM-53A.1.6-A, Issue 1C Rev. 0

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-638
New Revision: 4
Description of Change(s): 1. Updated JPM for new format 2. Updated for procedure revision 3. Added Note to reset the computers to the reactor trip sprays after each Simulator Reset.
Reason for Change (s): 1. JPM format has changed 2. E-3 procedure has been revised to Issue 3 Rev 0. 3. Note to remind Simulator Operator for subsequent JPM peformances.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-638 JPM REVISION: 4	JPM TITLE: Depressurize RCS During SGTR

K/A REFERENCE: 010 A4.03 4.0/3.8 TASK ID: 0531-004-05-013
038 EA1.04 4.3/4.1
038 EA1.05 4.1/4.3

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SAP:

Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	RCS pressure reduced in accordance with the RCS Depressurization step of 1OM-53A.1.E-3. Candidate Stops pressure reduction when conditions are met in accordance with direction given in this step.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	A SGTR has occurred on the 1C steam generator, resulting in a reactor trip and safety injection. Step 14 of 1OM-53A.1.E-3, Steam Generator Tube Rupture, is being performed at this time.
INITIATING CUE:	Your supervisor directs you to depressurize the RCS by continuing with E-3, Steam Generator Tube Rupture, step 14.
REFERENCES:	1OM-53A.1.E-3, Issue 3, Rev. 0 1OM-53A.1.6-A, Issue 1C, Rev. 0
TOOLS:	None
HANDOUT:	1OM-53A.1.E-3, place kept up to Step 14 1OM-53A.1.6-A

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-638 JPM REVISION: 4	JPM TITLE: Depressurize RCS During SGTR

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR NOTE: This is a FAULTED JPM. The failure of the PORV to close will require the candidate to close the appropriate PORV Block valve to stop the RCS depressurization. **EVALUATOR SET-UP:** Initialize Simulator to 100% pwr IC. Insert 1000 gpm SGTR on the 1C S/G. Progress thru E-0 to E-3, stop and freeze at step 14 of E-3, Write JPM snap at this point. Insert following PORV RESEAT failures PRS04A, PCV-1RC-455C PRS04B, PCV-1RC-455D PRS04C, PCV-1RC-456 **RESET the COMPUTER to the REACTOR TRIP SPRAYS after each Simulator Reset.**	
	START TIME: _____	
1. Locate and review 1OM-53A.1.E-3, Steam Generator Tube Rupture.	1.1 Locates and reviews 1OM-53A.1.E-3, Steam Generator Tube Rupture. **EVALUATOR NOTE:** If the procedure is to be provided, N/A this JPM step. COMMENTS:	
2. RCPs 1A and 1C – BOTH RUNNING.	2.1 Verifies 1A and 1C RCPs are both running, RED lights lit, WHITE lights not lit. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-638 JPM REVISION: 4	JPM TITLE: Depressurize RCS During SGTR

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
3.**C** Fully open available PRZR spray valves.	3.1 Locates both Pressurizer Spray Valves, PCV-1RC-455A and PCV-1RC-455B. 3.2**C** Opens Pressurizer Spray Valve, PCV-1RC-455A by putting 100% demand on the controller, in MANUAL. 3.3**C** Opens Pressurizer Spray Valve, PCV-1RC-455B by putting 100% demand on the controller, in MANUAL. COMMENTS:	
4.**C** Open one PRZR PORV.	4.1 Locates PRZR PORV's, PCV-1RC-455C, PCV-1RC-455D, OR PCV-1RC-456. 4.2**C** Places control switch for one PRZR PORV in the open position. 4.3 Verifies one PORV is open by observing the RED light is lit and GREEN light is not lit. COMMENTS:	
5. Check depressurization method – EFFECTIVELY REDUCING RCS PRESSURE.	5.1 Verifies RCS/Pressurizer Pressure is reducing on PI-1RC-402, 403, or IPC. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-638 JPM REVISION: 4	JPM TITLE: Depressurize RCS During SGTR

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
6. Continue depressurization until ANY of the following conditions satisfied.	6.1 Locates instrumentation to determine PRZR Level, RCS Subcooling, RCS Pressure and Ruptured S/G Pressure and monitors for the following conditions. • PRZR level > 76% OR • RCS subcooling based on Core Exit TCs LESS THAN SUBCOOLING ON ATTACHMENT 6-A OR BOTH: • RCS pressure LESS THAN RUPTURED SG PRESSURE AND • PRZR Level GREATER THAN 17% OR BOTH: • RCS pressure WITHIN 300 PSI OF RUPTURED SG PRESSURE AND • PRZR Level GREATER THAN 47% **EVALUATOR NOTE:** They should continue to depressurize until any of the above conditions are satisfied. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-638 JPM REVISION: 4	JPM TITLE: Depressurize RCS During SGTR

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	FAULT STATEMENT PORV fails to Close, the PORV must be isolated by manually closing the associated PORV Block valve.	
7.**C** Close PORV	7.1 Attempts to close PORV previously opened. 7.2 **C** Recognizes that PORV will NOT close and Closes the appropriate PORV Block valve. • GREEN light – LIT and RED light – NOT LIT COMMENTS:	
8.**C** Close spray valves.	8.1**C** Closes both Pressurizer spray valves. • Demand signal - At ZERO COMMENTS: **EVALUATOR NOTE:** Terminate JPM when Pressurizer spray valves are closed, and candidate has checked RCS pressure rising. If the stuck open PORV is not noticed immediately, it is acceptable to close the spray valves before closing the PORV block valve. Do not terminate the JPM until they have addressed the PORV unless they state that the JPM is complete.	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS: A SGTR has occurred on the 1C steam generator, resulting in a reactor trip and safety injection. Step 14 of 1OM-53A.1.E-3, Steam Generator Tube Rupture, is being performed at this time.

INITIATING CUE: Your supervisor directs you to depressurize the RCS by continuing with E-3, Steam Generator Tube Rupture, step 14.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Respond to a Loss of the RHR System

TRAINING MATERIAL NUMBER: 1CR-694

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1CR-694

REVISION NUMBER: 0

TECHNICAL REFERENCES:

1OM-53C.1.10.1, Loss of the Residual Heat Removal Capability, Rev 15
1OM-10.4.B, Residual Heat Removal System Operation, Rev 11
1OM-10.4.AAB, Residual Heat Removal System Disch Flow Low, Rev 4
1OM-10.4.AAC, Residual Heat Removal PP Auto Stop, Rev 2

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-694
New Revision: 0
Description of Change(s): 1. Update to new JPM format. 2. Updated to latest procedure revision. 3. Modified JPM initial conditions to match alternate JPM 1CR-594. 4. JPM is significantly modified from the original version, begins with a normal evolution. 5. JPM is now Alternate Path, revision 0. 6. Renumbered to new JPM 1CR-694, since JPM is Alternate path. Formerly was 1CR-094
Reason for Change (s): 1. JPM format has changed. 2. Procedure has been revised since JPM last used. 3. Maintain consistency between similar versions of the JPMs. 4. JPM steps were changed to align with revised procedure flowpath of the AOP. 5. JPM is now Alternate Path, begins as a normal evolution, then progresses to AOP for recovery.. 6. Added new number to JPM, since it is Alternate Path, aligns with numbering scheme.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-694 JPM REVISION: 0	JPM TITLE: Respond to a Loss of the RHR System

K/A REFERENCE: APE 025 AA1.09 3.2/3.1 TASK ID: 0535-018-04-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SAP:

Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

_____

_____

_____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	The "A" RHR pump is started, the RCS Cooldown rate is less than 100 °F /hr. and RHR flow is restored to between 3000 and 4000 gpm.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	• The plant is in Mode 4, with RCS pressure at ~310 psig and RCS temperature (Tc) at ~230°F. • 1RH-P-1B is in service. • 1RH-P-1A is in standby. • RHR flow and RCS Temperature are stable.
INITIATING CUE:	Your Supervisor directs you to reduce RHR Outlet (Loop Return) temperature by ~10°F by adjusting the RHR system per 1OM-10.4.B Step IV.A.
REFERENCES:	1OM-10.4.B, Residual Heat Removal System Operation, Rev 11 1OM-10.4.AAC, Residual Heat Removal PP Auto Stop, Rev 2 1OM-10.4.AAB, Residual Heat Removal System Disch Flow Low, Rev 4 1OM-53C.1.10.1, Loss of the Residual Heat Removal Capability, Rev 15
TOOLS:	None
HANDOUT:	Place Kept copy of 1OM-10.4.B, Residual Heat Removal System Operation, Rev 11 **DO NOT PROVIDE THESE PROCEDURES UNTIL REFERENCED** 1OM-10.4.AAC, Residual Heat Removal PP Auto Stop, Rev 2 1OM-10.4.AAB, Residual Heat Removal System Disch Flow Low, Rev 4 1OM-53C.1.10.1, Loss of the Residual Heat Removal Capability, Rev 15.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-694 JPM REVISION: 0	JPM TITLE: Respond to a Loss of the RHR System

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U

SIMULATOR SETUP:
Use IC-24
Mode 4, RCS pressure ~240 psig, RCS temperature ~210°F.
RH-P-1B is in service
RH-P-1A in STBY
Trigger RH-P-1B to Trip due to MEPT after MOV-1RH-758 is adjusted. X04A061P
Stop any running RCP's.
Remove Permanent Caution Tag from MOV-1CH-142.
Ensure that RH-P-1A pump flow is LESS than 3200 GPM when the pump is started.
Put up the OPPS Placard.

Open 1CH-67 N2 to VCT when going to RUN command CHS006- 100.
Use the following POT Settings after EACH Simulator RESET:
MOV-1CH-142 138 Units
MOV-1RH-605 150 Units
MOV-1RH-758 24 Units

EVALUATOR NOTE:
It is the intent that the candidate use procedures in the Simulator, replace the copy after JPM.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-694 JPM REVISION: 0	JPM TITLE: Respond to a Loss of the RHR System

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	START TIME: _____	
1. Reviews procedure, 1OM-10.4.B Steps IV.A.1 and 2 to establish RCS temperature control.	1.1 Reviews 1OM-10.4.B Steps IV.A.1 and 2. 1.2 Verifies that MOV-1RH-605 is controlling flow between 3000 and 4000 gpm. 1.3 Adjusts the cooldown rate to lower RCS temperature by throttling open MOV-1RH-758 using the valve controller. COMMENTS: **ALTERNATE PATH:** Once MOV-1RH-758 is throttled, the 1B RHR pump will trip on Motor Electrical Protection.	
2. Acknowledges Annunciators A1-127, Residual Heat Removal PP Auto Stop and A1-126, Residual Heat Removal System Disch Flow Low alarms.	**EVALUATOR NOTE:** Candidate may directly enter the Loss of RHR Abnormal procedure. If the Alarm Response Procedures are referenced, provide a copy. 2.1 Acknowledges the alarms. 2.2 Reviews A1-127 and A1-126 alarm response procedures 2.3 Transitions to Abnormal Procedure AOP 1.10.1, Loss of Residual Heat Removal Capability. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-694 JPM REVISION: 0	JPM TITLE: Respond to a Loss of the RHR System

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
3. Candidate reviews procedure, AOP 1.10.1	**EVALUATOR NOTE:** Candidate may determine the cause of the pump trip by reviewing the computer trends. 3.1 Reviews AOP 1.10.1. 3.2 Investigates the cause of the loss of 1RH-P-1B. **EVALUATOR CUE:** If asked, inform the candidate that an operator at emergency switchgear has reported a motor ground overcurrent relay is tripped for 1RH-P-1B. COMMENTS:	
4. Check If RHR Pumps Should Be Stopped a. Sound standby alarm AND announce "LOSS OF RESIDUAL HEAT REMOVAL CAPABILITY"	4.1 Sounds the Standby Alarm. 4.2 Using Page party system, announces "LOSS OF RESIDUAL HEAT REMOVAL CAPABILITY" COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-694 JPM REVISION: 0	JPM TITLE: Respond to a Loss of the RHR System

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
5. RHR Pumps – ANY RUNNING.	5.1. Determines that no RHR pumps are running. **EVALUATOR NOTE:** Given in initial conditions – 1RH-P-1A is in standby and 1RH-P-1B has just tripped due to Motor Electrical Protection conditions. 5.2. Determines that the reason for the pump trip is electrical in nature. **EVALUATOR CUE:** Inform the candidate that 1RH-P-1B was tripped by a motor electrical protection relay. 5.3 Performs RNO actions to start 1RH-P-1A. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-694 JPM REVISION: 0	JPM TITLE: Respond to a Loss of the RHR System

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
6C. IF RHR pump trip due to loss of power or motor protection, THEN Start standby RHR pump: 1) Verify MOV-1RH-758, throttled open ~ 60%. 2) Verify MOV-1RH-605, throttled open ~ 15% Verify MOV-1CH-142 Closed 3) Start standby RHR pump. IF standby pump fails to start, THEN GO TO Step 5. 4) Verify the following: Pump amps – STABLE Pump flow – > 3200 GPM 5) Position MOV-1CH-142 as directed by SM/US. 6) Return to procedure and step in effect. IF RHR pump trip due to unstable flow or loss of inventory, THEN continue with Step 1.c.	6.1 Throttles MOV-1RH-758 to ~60% open by adjusting dial pot to 60 units. 6.2 Throttles MOV-1RH-605 to ~15% open by depressing "manual" PB then depressing "Down" PB until indicating at ~15%. 6.3 Verifies MOV-1CH-142 closed, GREEN light –LIT and RED light NOT LIT. 6.4C Starts 1RH-P-1A by placing CS to START position and verifies RED light –LIT and WHITE light – NOT LIT, flow and AMPS increasing. 6.5 Verifies that the 1RH-P-1A ammeter is stable. 6.6 Verifies that pump flow is greater than 3200 gpm on FI-1RH-605. **EVALUATOR CUE:** Your Supervisor directs you to position MOV-1CH-142 to 10% Open. 6.7C Positions MOV-1CH-142 dial pot to ~10% Open as directed by the Supervisor. 6.8 Transitions to procedure and step in effect, 1OM-10.4.B. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-694 JPM REVISION: 0	JPM TITLE: Respond to a Loss of the RHR System

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR CUE: Your Supervisor directs you establish RHR system flow and RCS Cooldown Rate to within the limits listed in 1OM-10.4.B.	
7**C**. Adjusts RHR system flows to maintain system operating limits.	7.1**C** Throttles MOV-1RH-758 CLOSED by adjusting the dial pot lower, to reduce RCS Cooldown Rate to less than 100 °F/ hr. 7.2 Verifies RHR flow or adjusts MOV-1RH-605 controller in "manual" or "auto" to establish RHR system flow to between 3000 gpm and 4000 gpm. 7.3 Verifies RCS Cooldown rate lowers to less than 100 °F/ hr. on plant computer or control board indications. COMMENTS: **EVALUATOR NOTE:** Candidate may decide to raise temperature to establish the ~10 °F temperature reduction that was directed in the initiating cue. Once the RCS Cooldown rate is lowered to less than 100 °F/hr and RHR flow is between 3000 and 4000 gpm the JPM may be terminated.	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- The plant is in Mode 4, with RCS pressure at ~310 psig and RCS temperature (Tc) at ~230°F.
- 1RH-P-1B is in service.
- 1RH-P-1A is in standby.
- RHR flow and RCS Temperature are stable.

INITIATING CUE:

Your Supervisor directs you to reduce RHR Outlet (Loop Return) temperature by ~10°F by adjusting the RHR system per 1OM-10.4.B Step IV.A.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Transfer from Bypass to Main Feed Regulating Valve

TRAINING MATERIAL NUMBER: 1CR-520

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1CR-520

REVISION NUMBER: 7

TECHNICAL REFERENCES:

1OM-52.4.B, "Load Following", Attachment 18 Rev. 53

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 20 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-520
New Revision: 7
Description of Change(s): 1. Updated for procedure revision and 1OM-52.4.B, Load Following.
Reason for Change (s): 1. 1OM-52.4.A was revised to refer to 1OM-53.4.B, Load Following. The Attachment actions to transfer from BFRVs to MFRVs are the same in the new procedure.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

K/A REFERENCE: 035 A3.01 4.0/3.9 TASK ID: 0521-001-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:		Performer SSN:
Time Critical: ☐ Yes ☒ No	Allotted Time: 20 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Transfer control of [FCV-1FW-479] in AUTO to [FCV-1FW-478] in AUTO. [FCV-1FW-478] is placed BACK in MANUAL AFTER the automatic controller failure has been identified and 1A S/G NR level is stabilized between 60% and 70%.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	The plant is in Mode 1 during a plant startup. 1OM-52.4.B, "Load Following", is in progress. Step IV.I.16 directs placing the S/G Main Feed Regulating Valves in service.
INITIATING CUE:	Your supervisor directs you to perform Attachment 18 of 1OM-52.4.B, for [FCV-1FW-478], 1A Main Feed Regulating Valve. The valve is to be placed in automatic to control Steam Generator water level. Use "MANUAL" control of [FCV-1FW-479], 1A S/G FW Bypass FCV during step 8 of Attachment 18.
REFERENCES:	1OM-52.4.B, "Load Following", Attachment 18 Rev. 53
TOOLS:	None
HANDOUT:	1OM-52.4.B, "Load Following", Attachment 18 Rev. 53, (Provide Attachment 18, pages 163 & 164 ONLY).

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
	SIMULATOR SETUP: - Start with IC-13 with MFRBVs in auto - Ensure Xenon is at Equilibrium - Insert Malfunction FWM09A with a 20% severity, and a 10 second delay with a 60 period. ([FCV-1FW-478] malfunctions when placed in AUTO). - Select Event Trigger (1) - Enter X09I096E== 1 **TRGSET 1 'X09I096E'** **IMF FWM09A (1 10) 20** **IMF PLP MAL05 (0 0) 60**	
	EVALUATOR NOTE: The above PLP Malfunction MUST be entered EACH time the Simulator is RESET.	
	EVALUATOR NOTE: Provide candidate with a copy of 1OM-52.4.B, Attachment 18. When candidate is ready to begin JPM, PLACE the simulator in RUN.	
	START TIME: _____	
1. Review 1OM-52.4.B Attachment 18.	1.1 Reviews 1OM-52.4.B, Attachment 18. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
2. Verify [FCV-1FW-478] 1A Main Feed Regulating Valve (MFRV) in MANUAL and Closed. (BB-C)	2.1 Verifies FCV-1FW-478 Auto/Manual station MAN light LIT and AUTO light NOT LIT and 0% demand. 2.2 Verifies Loop 1 FD WTR FCV GREEN light (A-1)- LIT and RED light (A-2) - NOT LIT on Status Light Panel 623. COMMENTS:	
3. Verify closed [MOV-1FW-154A], 1A SG Main FW Isol Vlv (BB-C). and Station an operator at the Main Feed Regulating Valve to observe local valve stroke.	3.1 Verifies MOV-1FW-154A GREEN light – LIT and RED light – NOT LIT. 3.2 Dispatches an operator to 1A MFRV to observe local valve stroke. **EVALUATOR CUE:** Role-play part of local operator to report valve operation locally. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
4. Stroke [FCV-1FW-478], 1A Main Feed Reg Valve to the full open position, THEN to full closed AND check position indication on BB-C AND locally.	4.1 Strokes FCV-1FW-478 full OPEN by depressing ▲ output pushbutton. 4.2 Verifies RED light – LIT and GREEN light – NOT LIT on Status Light Panel 623. 4.3 Strokes FCV-1FW-478 full CLOSED by depressing ▼ output pushbutton. 4.4 Verifies GREEN light – LIT and RED light – NOT LIT on Status Light Panel 623. **EVALUATOR CUE:** As the field operator report FCV-1FW-478 traveled smoothly full open with no hesitation and now indicates full closed. COMMENTS:	
5. Trend L0400A (L0401A) (L0402A), SG A NARROW RANGE 1 (2) (3) Level FW-474 (475) (476) on the In-Plant Computer using lowest scan rate.	5.1 Trends L0400A (L0401A) (L0402A) – SG A NARROW RANGE 1 (2) (3) Level FW-474 (475) (476) on the In-Plant Computer using lowest scan rate. 5.2 Monitors recorders and indicators for 1A SG level, feed flow, AND steam flow. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
	EVALUATOR NOTE: If this JPM is paired with another JPM, then **Cue** that the RO will monitor the parameters listed in the following step.	
6. Maintain stable temperature and reactor power.	6.1 Verifies stable Tavg and reactor power by monitoring NI power and Loop DT and Tavg or directs the RO to monitor these parameters. COMMENTS:	
7.**C** Open [MOV-1FW-154A], 1A SG Main FW Isol Vlv.	7.1**C** Places MOV-1FW-154A control switch to OPEN position. 7.2 Verifies RED light – LIT and GREEN light – NOT LIT. COMMENTS:	
8. If feed flow to the Steam Generator rapidly rises or lowers when performing the following steps, THEN Manually Close the main feed valve AND Establish proper feed flow AND level with bypass feed control.	8.1 Continuously monitors steam flow and feed flow recorders and/or indicators for rapidly changing feedwater flow. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
9.**C** Verify controller in MANUAL AND slowly open [FCV-1FW-478], 1A Main Feed Reg Valve.	9.1 Verifies FCV-1FW-478 Auto/Manual station MAN light LIT and AUTO light NOT LIT. 9.2**C** Slowly opens FCV-1FW-478 using ▲ pushbutton. COMMENTS:	
	EVALUATOR NOTE: Initiating Cue stated that [FCV-1FW-479] is to be controlled in MANUAL. The candidate may need to be reminded if AUTO control is used.	
10.**C** As the 1A Main Feed Reg Valve is being OPENED, Close [FCV-1FW-479], 1A SG FW Bypass FCV, in MANUAL or AUTO to maintain 1A S/G NR level between 60% and 70%. Continues to Open [FCV-1FW-478], 1A Main Feed Reg Valve UNTIL the 1A SG FW Bypass FCV is closed.	10.1**C** Places FCV-1FW-479 Bypass Valve controller in MANUAL. 10.2**C** Slowly CLOSES FCV-1FW-479 Bypass Valve using ▼ pushbutton. 10.3**C** Continues to open FCV-1FW-478. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
11. When [FCV-1FW-479], 1A SG FW Bypass Valve is fully closed, Perform the following: • Verify [FCV-1FW-479], 1A SG FW Bypass FCV controller in MAN. • Observe Feedwater flow, steam flow and SG level for evidence of leakage past the 1A SG FW Bypass FCV.	11.1 Verifies FCV-1FW-479 is full CLOSED (0% demand & FCV-479 GREEN Light – LIT and RED Light – NOT LIT. 11.2 Verifies FCV-1FW-479 Auto/Manual station MAN light LIT and AUTO light NOT LIT. 11.3 Verifies no leakage past valve by observing no change in feedwater flow, steam flow, and S/G water level. COMMENTS:	
	FAULT STATEMENT: The faulted portion of the JPM begins with the next step. When the operator places the MFRV controller in AUTO, it will begin to oscillate. This will require the operator to take MANUAL control and stabilize SG water level manually.	
12.**C** Place controller for [FCV-1FW-478], 1A Main Feed Reg Valve in AUTO **AND** monitor SG level **AND** feed flow and steam flow.	12.1**C** Places FCV-1FW-478 controller to AUTO. 12.2 Monitors level, feed flow, and steam flow. 12.3 Recognizes oscillating MFRV and erratic feed flow. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-520 JPM REVISION: 7	JPM TITLE: Transfer from Bypass to Main Feed Regulating Valve

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
13.**C** If level control is NOT stable, Restore [FCV-1FW-478], 1A Main Feed Reg Valve controller to MANUAL **AND** Maintain S/G NR level between 60% and 70%.	13.1**C** Places FCV-1FW-478 controller in MANUAL. 13.2**C** Slowly adjusts FCV-1FW-478 using ▼▲ pushbuttons to stabilize SG level and feed flow. 13.3**C** Re-establishes control of 1A S/G NR level between 60% and 70%. **EVALUATOR CUE:** Once it is demonstrated that the candidate can control 1A S/G NR water level between 60% and 70%, inform the candidate that the JPM is COMPLETE. COMMENTS:	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

*** THIS SHEET TO BE GIVEN TO CANDIDATE ***

☐ Read:

INITIAL CONDITIONS: The plant is in Mode 1 during a plant startup. 1OM-52.4.B, "Load Following", is in progress. Step IV.I.16 directs placing the S/G Main Feed Regulating Valves in service.

INITIATING CUE: Your supervisor directs you to perform Attachment 18 of 1OM-52.4.B, for [FCV-1FW-478], 1A Main Feed Regulating Valve. The valve is to be placed in automatic to control Steam Generator water level. Use "MANUAL" control of [FCV-1FW-479], 1A S/G FW Bypass FCV during step 8 of Attachment 18.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Manually Actuate CIB

TRAINING MATERIAL NUMBER: 1CR-578

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1CR-578

REVISION NUMBER: 2

TECHNICAL REFERENCES:

1OM-53A.1.1-K, "Verification Of Automatic Actions", Rev. 7.
1OM-53A.1.1-E, "Containment Isolation Phase B Checklist", Rev. 6

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 10 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-578
New Revision: 2
Description of Change(s): 1. Updated to latest revision of the procedure. 2. Updated to latest JPM format.
Reason for Change (s): 1. Verification of Automatic Actions attachment has been revised 2. JPM format has been updated.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-578 JPM REVISION: 2	JPM TITLE: Manually Actuate CIB

K/A REFERENCE: 026 A3.01 4.3/4.5 TASK ID: 0533-016-05-013
026 A4.01 4.5/4.3 0131-003-06-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:		Performer SAP:
Time Critical: ☐ Yes ☒ No	Allotted Time: 10 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Manually initiate CIB, start 1QS-P-1A, open MOV-1QS-101A, and stop the RCP's.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	• A large break LOCA has occurred coincident with the Loss of SSST "1B". • The No. 2 Emergency Diesel Generator failed immediately following startup. • The actions of E-0 are being performed.
INITIATING CUE:	The Unit Supervisor directs you to perform Attachment 1-K, "Verification Of Automatic Actions", Step 10 to check CIB and CNMT Spray status.
REFERENCES:	1OM-53A.1.1-K, "Verification Of Automatic Actions", Rev 7. 1OM-53A.1.1-E, "Containment Isolation Phase B Checklist", Rev. 6
TOOLS:	None
HANDOUT:	1OM-53A.1.1-K, "Verification Of Automatic Actions", Rev 7. Place kept up to step 10. 1OM-53A.1.1-E, "Containment Isolation Phase B Checklist", Rev. 6 (DO NOT INITIALLY PROVIDE TO CANDIDATE)

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-578 JPM REVISION: 2	JPM TITLE: Manually Actuate CIB

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	SIMULATOR SETUP: Initialize to any Mode 1 IC. 1. Insert MALF EPS03B (Loss of SSST 1B) 2. Insert MALF INH42 (1QS-P-1A auto start failure) 3. Insert MALF INH50 (Auto CIB failure) 4. Insert MALF INH54 (#2 EDG failure) 5. Event Trigger #1 Enter X02I052C 6. Insert MALF VLV-QSS03 0 Enter Command DMF VLV-QSS03 and accept new event. (MOV-1QS-101A Fails Closed and opens once control switch is taken to Open) Allow Sim to run and then: Insert MALF RCS02D (DBA Hot Leg Loop 1) Allow Sim to run until majority of alarms clear and snap into IC. (at least three minutes) **EVALUATOR CUE:** (Provide a copy of marked up EOP Attachment 1-K.) You are responsible for simulator alarms on the primary side of the plant. The BOP will respond to secondary alarms ONLY.	
	START TIME: _____	
1. Reviews place kept copy of 1OM-53A.1.1-K, "Verification Of Automatic Actions" provided.	1.1 Reviews 1OM-53A.1.1-K, "Verification Of Automatic Actions". COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-578 JPM REVISION: 2	JPM TITLE: Manually Actuate CIB

STEP ("C" Denotes CRITICAL STEP)	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
2. Checks CIB And CNMT Status • Containment pressure - HAS REMAINED LESS THAN 11 PSIG.	2.1 Determines that containment pressure has **NOT** remained less than 11 psig by checking any of the following: • A1-72, "CONTAINMENT ISOLATION PHASE B" annunciated (should be LIT but is NOT). • PR-LM-100A, Containment Pressure Recorder indicates greater than 11 psig. • PI-1LM-100A, 100B, 100C, 100D, Containment Pressure Indicators indicating > 11 psig. • Status Light PNL 62, HHCP Press CH Trip/Defeat CH I – IV Lights – LIT. COMMENTS:	
3. Check BLUE CIB marks - LIT.	**EVALUATOR NOTE:** It is acceptable that the completion of this step may be out of order and they may choose to perform 1OM-53A.1.1-E, "Containment Isolation Phase B Checklist". RCPs may be tripped based on Hi-Hi Vibration Alarms. 3.1 Checks components properly aligned and determines CIB components not positioned as required, and CIB **NOT** actuated. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-578 JPM REVISION: 2	JPM TITLE: Manually Actuate CIB

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	FAULT STATEMENT CIB fails to AUTO actuate and 1QS-P-1A fails to AUTO START, and MOV-1QS-101A fails to auto open upon manual actuation of CIB. CIB must be manually actuated, 1QS-P-1A must be manually started, and MOV-1QS-101A must be opened.	
4.**C** IF NOT, THEN manually initiate CIB (both pushbuttons for both trains).	4.1**C** Simultaneously DEPRESSES **both** Spray Actuation and CIB Actuation Train "A" pushbuttons. 4.2 Simultaneously DEPRESSES **both** Spray Actuation and CIB Actuation Train "B" CIB pushbuttons. **EVALUATOR NOTE:** Either train may be actuated first followed by the opposite train. Train B of Containment Isolation is not critical since there is no power on that train. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-578 JPM REVISION: 2	JPM TITLE: Manually Actuate CIB

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
5. Check BLUE CIB marks - LIT.	5.1 Checks all indicating lights with BLUE CIB marks LIT. 5.2 Determines 1QS-P-1A & 1B, Quench Spray Pumps not running. **EVALUATOR NOTE:** If requested, provide a copy of Attach. 1-E. 1QS-P-1B will NOT start due to no power to DF Bus. COMMENTS:	
6.**C** IF CIB NOT actuated, THEN manually align equipment. If necessary, refer to Attachment 1-E, "Containment Isolation Phase B Checklist".	6.1**C** Places 1QS-P-1A control switch to START. 6.2 Verifies RED light – LIT and WHITE light – NOT LIT. 6.3 Determines MOV-1QS-101A, 1A Quench Spray Pump Disch Vlv did NOT Auto OPEN. 6.4**C** Places MOV-1QS-101A to OPEN position. 6.5 Verified RED Light – LIT and GREEN Light – NOT LIT. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-578 JPM REVISION: 2	JPM TITLE: Manually Actuate CIB

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
7.**C** Stop all RCP's.	7.1**C** Places control switches for 1RC-P-1A and 1B to STOP. (1RC-P-1C already shutdown) 7.2 Verifies 1RC-P-1A, 1B and 1C RED lights – NOT LIT and WHITE lights – LIT. 7.3 Verifies 1RC-FI-414, (415), (416) and 1RC-FI-424, (425), (426) flows dropping. 7.4 Verifies 1RC-P-1A and 1B amps dropping (BB-A kickup). COMMENTS:	
8. Request BV-2 operator verify CREVS equipment actuation.	8.1 Contacts Unit 2 to verify CREVS equipment operations. **EVALUATOR CUE:** Role play Unit 2 operator and inform candidate that all CREVS equipment is functioning properly then state - "This COMPLETES the JPM." COMMENTS:	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- A large break LOCA has occurred coincident with the Loss of SSST "1B".
- The No. 2 Emergency Diesel Generator failed immediately following startup.
- The actions of E-0 are being performed.

INITIATING CUE: The Unit Supervisor directs you to perform Attachment 1-K, "Verification Of Automatic Actions", Step 10 to check CIB and CNMT Spray status.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Transfer Bus 1AE from Emergency to Normal Feed

TRAINING MATERIAL NUMBER: 1CR-097

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1CR-097

REVISION NUMBER: 7

TECHNICAL REFERENCES:

1OM-36.4.Q, Transferring Emergency Busses 1AE and 1DF From Emergency Feed To Normal Feed, Rev. 14

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 20 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-097
New Revision: 7
Description of Change(s): 1. Modified initial conditions to remove normal 4KV bus alignment 2. Modified step 2 to allow JPM to be performed when the normal bus is powered from either the USST or SSST.
Reason for Change (s): 1. Allows for JPM to be paired with shutdown or at power IC sets. 2. Made step an "OR" step depending upon initial conditions.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 6	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

K/A REFERENCE: 064 A4.06 3.9/3.9 TASK ID: 0362-007-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SAP:

Time Critical: ☐ Yes ☒ No	Allotted Time: 20 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/ SAP:	Name/ SAP:
Name/ SAP:	Name/ SAP:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Bus 1AE is energized from Bus 1A. Load has been removed from the #1 EDG, and the #1 EDG output breaker is open.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	• Breaker 1A10 has spuriously tripped open. • #1 EDG is running and carrying loads on the 1AE bus. • 4KV normal to emergency tie breakers, 1A10 and 1E7, are open. • The relay crew has replaced a defective relay on breaker 1A10. • #1 EDG has only been operating for 45 minutes.
INITIATING CUE:	Your supervisor directs you to return 4160 EMER Bus 1AE to Normal Feed in accordance with 1OM-36.4.Q, "Transferring Emergency Busses 1AE and 1DF From Emergency Feed To Normal Feed" part IV.A.
REFERENCES:	1OM-36.4.Q, "Transferring Emergency Busses 1AE and 1DF From Emergency Feed To Normal Feed", Rev. 14.
TOOLS:	None
HANDOUT:	1OM-36.4.Q, "Transferring Emergency Busses 1AE and 1DF From Emergency Feed To Normal Feed", Rev. 14

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 7	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	SIMULATOR SETUP: Insert malfunction (IMF EPS04E) to trip 1A10, and wait for D/G sequencer to complete loading. Then delete malfunction, and allow plant to stabilize. Lower EDG voltage for an ~2 volts difference from 4Kv Bus 1A voltage. **Set Trigger 1 action to adjust "Speed Droop" to 55 when requested, command LOA-EPS288 (1 0) 1, ensure plant is stable then SNAP IC.** **EVALUATOR CUE:** Provide candidate a copy of 1OM-36.4.Q. When candidate is ready to begin the JPM, Place the Simulator in RUN.	
	START TIME: _____	
1. Reviews procedure.	1.1 Reviews 1OM-36.4.Q, "Transferring Emergency Busses 1AE and 1DF from Emergency Feed to Normal Feed". COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 7	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
	EVALUATOR NOTE: JPM is written to be performed when powered from the Unit or Offsite, so candidate will perform either of the following steps.	
2. If Bus 1A is aligned to System Station Service Transformer 1A, Perform Data Sheet 1 (otherwise, N/A).	2.1 This step is N/A if powered from USST 1C. **OR** 2.2 If powered from SSST 1A, then completes Data Sheet 1 readings. **EVALUATOR CUE:** If Data Sheet 1 is performed, Inform the candidate that another operator will perform the independent verifications. COMMENTS:	
3.**C** Place the Emerg Gen 1 Synchronizing Sel SW to the ACB 1E7 position and verifies ANN, A9-8, "ACB 1E7 OR 1E9 IN SYNCHRONIZING MODE", is ON.	3.1**C** Places EMERG GEN 1 SYNCHRONIZING SEL SW to the 1E7 position. 3.2 Verifies Annunciator A9-8 is LIT. COMMENTS:	
4. Verify control switch 4KV Bus 1AE to 1A, ACB 1E7 is in the AFTER-OPEN position. (Green Target)	4.1 Momentarily places 1E7 breaker control switch to the AFTER-OPEN position. (Green Target). COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 7	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
5.**C** Close 4KV Bus 1A to 1AE ACB 1A10.	5.1**C** Momentarily places ACB 1A10 control switch in the CLOSE position. 5.2 Verifies RED light – LIT / WHITE light – NOT LIT. **EVALUATOR CUE:** Provide the second verification if requested. COMMENTS:	
6. Adjust the governor speed droop knob to 55 while maintaining frequency at approximately 60 hz. (EDG #1 Building)	6.1 Requests operator at EDG #1 to adjust SPEED DROOP to 55 with frequency being maintained at 60Hz. **EVALUATOR CUE:** When requested instruct booth instructor to actuate TRG 1 (LOA-EPS288 1), then role-play outside operator and report that local EDG #1 Gov. speed droop is set at 55. 6.2 Intermittently places the EMERG GEN 1 GOVERNOR control switch in the RAISE direction to maintain frequency at ~60 Hz. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 7	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
7.**C** Using the Emerg Gen 1 Governor control switch, adjust the generator speed UNTIL the Synchroscope needle is rotating very slowly in the FAST direction.	7.1**C** Intermittently places the EMERG GEN 1 GOVERNOR control switch in the RAISE direction UNTIL the synchroscope needle is rotating very slowly in the FAST direction. COMMENTS:	
8.**C** Using the Emerg Gen 1 Volt Adjust, match generator voltage (running) with the voltage in Bus 1A (Incoming). **EVALUATOR NOTE:** EDG Voltage is indicated on the Sync Volts Running Norm voltmeter, Bus 1A voltage is on the Sync Volts Incoming Norm voltmeter.	8.1**C** Intermittently adjusts the EMERG GEN 1 VOLT ADJUST control switch as necessary (RAISE on CS will raise VOLTAGE) until generator voltage is matched with Bus 1A voltage without exceeding 130 volts on the generator voltmeter. 8.2 Monitors Bus 1A voltage on the SYNCH VOLTS INCOMING NORM voltmeter and EDG voltage on the SYNCH VOLTS RUNNING NORM voltmeters on the BB-C kickup. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 7	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
9.**C** When both synchronizing lights are completely dark AND the synchroscope needle is at 12 o'clock position, THEN close 4KV Bus 1AE to 1A ACB 1E7.	9.1**C** Places ACB 1E7 control switch in the CLOSE position when the synchroscope needle is at the 12 o'clock position. 9.2 Verifies RED light – LIT / WHITE light – NOT LIT. **EVALUATOR CUE:** Provide the Concurrent Verification if requested. COMMENTS:	
10. Place the Emerg Gen 1 Sychronizing Sel SW to the OFF position and verifies ANN A9-8, "ACB 1E7 or 1E9 IN SYNCHRONIZING MODE" is OFF.	10.1 Places EMERG GEN 1 SYNCHRONIZING SEL SW in the OFF position. 10.2 Verifies annunciator A9-8, "ACB 1E7 or 1E9 IN SYNCHRONIZING MODE" is reset. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 7	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
11. Perform the following to clean out the exhaust system prior to shutting down the diesel generator, as necessary.	11.1 This step is N/A. The EDG has only been running for ~45 minutes. **EVALUATOR CUE:** If needed, remind the candidate that the EDG has only been operating for ~45 minutes. COMMENTS:	
12.**C** Remove 1EE-EG-1, Emergency Diesel Generator No. 1, from service as follows: a. If diesel load as indicated on the Emerg Gen 1 Watts meter (VB-C) is >1200 KW, Reduce 1EE-EG-1, Emergency Diesel Generator No. 1, load over 10 minutes UNTIL < 500 KW is indicated by placing the Emer Gen 1 Governor control switch intermittently to LOWER (otherwise, N/A).	**EVALUATOR CUE:** If needed to accelerate the rate of the EDG shutdown, inform candidate that 5 minutes has elapsed. 12.1**C** Intermittently places EMERG GEN 1 GOVERNOR control switch in the LOWER position over a 10 minute period to lower load to <500KW. 12.2 Monitors/Maintains the following parameters during the load decrease: a. EMERG GEN 1 VOLTS (<130 volts) b. EMERG GEN 1 POWER FACTOR (0.8 – 1.0 lagging) c. EMERG GEN 1 WATTS (Lower to <500 KW) COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-097 JPM REVISION: 7	JPM TITLE: Transfer Bus 1AE from Emergency to Normal Feed

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
13.**C** Reduce load on the No. 1 Diesel Generator to less than 200 KW (as read on the Emerg Gen 1 Watts meter VB-C) by Placing the Emerg Gen 1 Governor control switch intermittently to the LOWER position.	13.1**C** Intermittently places EMERG GEN 1 GOVERNOR control switch in the LOWER position to lower load to <200KW. COMMENTS:	
14.**C** When the load on No. 1 Diesel Generator has been reduced to less than 200 KW (as read on the Emerg Gen 1 Watts meter VB-C), Open Emerg Gen 1 Circuit Breaker ACB 1E9 (spring return to center).	14.1**C** Momentarily places the ACB 1E9 control switch in TRIP when EDG 1 is < 200 KW. 14.2 Verifies WHITE light – LIT and RED light – NOT LIT. COMMENTS:	
15. Verify the Emerg Gen 1 Motor Operated Gnd Sw DS1, is Open.	15.1 Verifies the EMERG GEN 1 Motor Operated GND SW DS1 is OPEN. WHITE light – LIT and RED light – NOT LIT. COMMENTS:	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- Breaker 1A10 has spuriously tripped open.
- #1 EDG is running and carrying loads on the 1AE bus.
- 4KV normal to emergency tie breakers, 1A10 and 1E7, are open.
- The relay crew has replaced a defective relay on breaker 1A10.
- #1 EDG has only been operating for 45 minutes.

INITIATING CUE:

Your supervisor directs you to return 4160 EMER Bus 1AE to Normal Feed in accordance with 1OM-36.4.Q, "Transferring Emergency Busses 1AE and 1DF From Emergency Feed To Normal Feed" part IV.A.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Verify CREVS Actuation

TRAINING MATERIAL NUMBER: 1CR-662

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1CR-662

REVISION NUMBER: 0

TECHNICAL REFERENCES:

1OM-53A.1.E-1, Loss of Reactor Or Secondary Coolant, Iss. 3 Rev. 0
1/2OM-44A.4A.A, Post Control Room Habitability System Actuation/ Recovery, Rev 17

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1CR-662
New Revision: 0
Description of Change(s): 1. New issue.
Reason for Change (s): 1. New JPM for initial exam.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

K/A REFERENCE: 060 AA1.02 2.9/3.1 TASK ID: 0441-003-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☒ Perform ☐ Simulate	☐ Plant Site ☒ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:		Performer SAP:
Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	MANUALLY closes 1VS-D-40-1B which failed to AUTO close. MANUALLY starts 1VS-F-41A due to Unit 2 Fans 2HVC*FN241A and 2HVC*FN241B failing to start.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	• A Large Break LOCA has occurred. • A transition to E-1, "Loss of Reactor or Secondary Coolant" has just been made. • CIB has actuated.
INITIATING CUE:	The Unit Supervisor directs you to perform Step 1 RNO actions of E-1, "Loss of Reactor or Secondary Coolant".
REFERENCES:	1OM-53A.1.E-1, "Loss of Reactor or Secondary Coolant", Iss. 3 Rev. 0 1/2OM-44A.4A.A, Post Control Room Habitability System Actuation/ Recovery, Rev 17
TOOLS:	None
HANDOUT:	1OM-53A.1.E-1, "Loss of Reactor or Secondary Coolant", Iss. 3 Rev. 0, place kept at step 1. DO NOT PROVIDE THIS PROCEDURE UNTIL REFERENCED. 1/2OM-44A.4A.A, Post Control Room Habitability System Actuation/ Recovery, Rev 17

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	SIMULATOR SETUP: Begin with any power IC. Insert a LB LOCA Malfunction (MALF RCS03A(B,C)) on either loop. Perform actions of E-0, up to step 1 of E-1. Fail 1VS-D-40-1B from AUTO closing (can manually close) as follows: • Select VLV-HVA02 100 • Select Event Trigger, Select Event #, Enter Event X19I44C, Enter command DMF VLV-HVA02 Freeze and take a snap. **EVALUATOR NOTE:** When the candidate is ready to begin the JPM, place the simulator in RUN. **EVALUATOR NOTE:** Provide candidate a place kept copy of E-1. Place simulator in RUN when candidate is ready to begin.	
	START TIME: _____	
1. Review procedure.	1.1 Reviews procedure (E-1 Step 1 RNO) provided. COMMENTS:	
2. Actuate both trains using the CONTROL ROOM EMERG AIR SUP ACTUATION pushbuttons.	2.1 Actuates BOTH trains of CREVS using the CONTROL ROOM EMERG AIR SUP ACTUATION pushbuttons located on the Building Service Control Panel COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
	EVALUATOR NOTE: The following steps can be done in any order.	
3.**C** Verify CREVS actuation: Control Room Air Intake and Exhaust Dampers – CLOSED.	3.1 Verifies 1VS-D-40-1A, "Control Room Air Intake Damper" CLOSED.	
	3.2 Verifies GREEN Light – LIT and RED Light – NOT LIT.	
	3.3**C** Verifies 1VS-D-40-1B, "Control Room Air Intake Damper" CLOSED. Recognizes 1VS-D-40-1B did **NOT** AUTO close	
	3.4**C** Manually places 1VS-D-40-1B control switch to close.	
	3.5 Verifies GREEN Light – LIT and RED Light – NOT LIT.	
	3.6 Verifies 1VS-D-40-1C, "Control Room Air Exhaust Damper" CLOSED.	
	3.7 Verifies GREEN Light – LIT and RED Light – NOT LIT.	
	3.8 Verifies 1VS-D-40-1D, "Control Room Air Exhaust Damper" CLOSED.	
	3.9 Verifies GREEN Light – LIT and RED Light – NOT LIT.	
	COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
4. Request Unit 2 Control Room staff to verify CREVS actuation and place intake and exhaust damper control switches to CLOSE.	4.1 Requests Unit 2 Control Room staff verify CREVS actuation. **EVALUATOR CUE:** When requested, role play and acknowledge request for Unit 2 Control Staff verification of CREVS actuation. COMMENTS:	
5. Place Control Room intake and exhaust damper control switches in CLOSE: • [1VS-D-40-1A] • [1VS-D-40-1B] • [1VS-D-40-1C] • [1VS-D-40-1D]	**EVALUATOR NOTE:** The following steps can be done in any order. 5.1 Places 1VS-D-40-1A control switch in CLOSE. 5.2 Places 1VS-D-40-1B control switch in CLOSE, or verifies in close if previously performed. 5.3 Places 1VS-D-40-1C control switch in CLOSE. 5.4 Places 1VS-D-40-1D control switch in CLOSE. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	FAULT STATEMENT: Neither Unit 2 Control Room Pressurization Fan 2HVC*FN241A or FN241B will start. Candidate will to refer to 1/2OM-44A.4A.A and start a Unit 1 Fan.	
	EVALUATOR CUE: Role play as Unit 2 operator and report that NEITHER Unit 2 Control Room Pressurization Fan will start.	
6. Refer to 1/2OM-44.4A.A, "Post Control Room Emergency Habitability System Activation/Recovery, Part A".	6.1 Locates and references 1/2OM-44A.4A.A, "Post Control Room Emergency Habitability System Activation/Recovery, Part A". **EVALUATOR NOTE:** If this JPM is Paired with another JPM, this procedure may be provided once it is identified. Otherwise, once located, provide candidate a copy of 1/2OM-44A.4A.A, "Post Control Room Emergency Habitability System Activation/Recovery, Part A". COMMENTS:	
7. If CREVS was initiated as a result of a toxic gas release, refer to 1/2OM-53C.4A.44A.A, "Toxic Gas Release".	7.1 N/A this step since CREVS was initiated by a Large Break LOCA as opposed to a Toxic Gas Release. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
8. Check 2HVC*FN241A, "Control Room Emer Vent Fan", has auto started AND 2HVC*MOD204A, "Control Room Emer Outside Air Intake Damper has opened.	8.1 Requests status of 2HVC*FN241A. **EVALUATOR CUE**: Role play as Unit 2 operator and report that 2HVC-FN241A Unit 2 Control Room Pressurization Fan failed to start. 8.2 Requests Unit 2 to perform Step 3 of 1/2OM-44A.4.A. **EVALUATOR CUE**: Unit 2 reports that step 3 is complete and that BOTH 2HVC-FN241A and 2HVC-FN241B have failed to start. Per step step 3.e, Unit 2 Annunicator A10-3E is lit. COMMENTS: **EVALUATOR NOTE**: Candidate should proceed to step IV.A.6 based upon report of Unit 2 Annunciator A10-3E. Refer to JPM Step 11 for the next action.	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
9. If Unit 1 Control Room intake and exhaust damper are closed place the control switches in CLOSE: • [1VS-D-40-1A] • [1VS-D-40-1B] • [1VS-D-40-1C] • [1VS-D-40-1D]	**EVALUATOR NOTE:** The following may be omitted if they were previously performed. 9.1 Verifies 1VS-D-40-1A control switch in CLOSE. 9.2 Verifies 1VS-D-40-1B control switch in CLOSE. 9.3 Verifies 1VS-D-40-1C control switch in CLOSE. 9.4 Verifies 1VS-D-40-1D control switch in CLOSE. COMMENTS:	
10. If 2HVC-FN241A or B is in operation, check the total combined differential pressure is < 5.6 in. WG on the indicators: • 2HVC-PDIS21A • 2HVC-PDIS22A • 2HVC-PDIS23A • 2HVC-PDIS21BA • 2HVC-PDIS22B • 2HVC-PDIS23BA Per Step 5 and 6 of 1/2OM-44A.4A.A	10.1 Requests status of Unit 2 Emergency pressurization Fans per steps 5 and 6 of 1/2OM-44A.4A.A. : **EVALUATOR NOTE/CUE:** Unit 2 Control Room pressurization fans are **NOT** in Operation. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1CR-662 JPM REVISION: 0	JPM TITLE: Verify CREVS Actuation

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
	EVALUATOR NOTE: There is a typographical error in the procedure, there are two steps numbered 6, the following is for the second one.	
11. If neither 2HVC-FN241A or B is available, dispatch an operator to OPEN 1VS-257 Control Room Emergency Vent Outside Air Intake Isolation and 1VS-D-98D Control Room Emerg Air Filter Outlet.	11.1 Dispatches an Operator to OPEN 1VS-257 and 1VS-D-98D. **EVALUATOR CUE:** Report as local operator that 1VS-257 and 1VS-D-98D are OPEN. COMMENTS:	
12.**C** Start 1VS-F-41A Control Room Emergency Supply Fan.	12.1**C** Places the Control Switch for 1VS-F-41A to START. 12.2 Verifies the fan RED Light – LIT and GREEN Light – NOT LIT. 12.3 Contacts local Operator to verify OPEN 1VS-D-98A. **EVALUATOR CUE:** Report as local operator that 1VS-D-98A is OPEN. COMMENTS:	
	EVALUATOR CUE: Once one fan is started State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS:

- A Large Break LOCA has occurred.
- A transition to E-1, "Loss of Reactor or Secondary Coolant" has just been made.
- CIB has actuated.

INITIATING CUE: The Unit Supervisor directs you to perform Step 1 RNO actions of E-1, "Loss of Reactor or Secondary Coolant".

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Vent the Charging Pump Suction Header

TRAINING MATERIAL NUMBER: 1PL-057

PROGRAM TITLE: Non-Licensed Operator Training

COMPUTER CODE: 1PL-057

REVISION NUMBER: 8

TECHNICAL REFERENCES:

1OM-7.4.AV, "Charging Pump Suction Header Venting", Rev. 4
VOND 1OM-7.

INSTRUCTIONAL SETTING: In-Plant

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1PL-057
New Revision: 8
Description of Change(s): 1. Updated cues to match what operator would see in the plant. 2. Updated expected time to 15 minutes
Reason for Change (s): 1. Cues modified to match the observable valve positions. 2. Expected completion time extended.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-057 JPM REVISION: 8	JPM TITLE: Vent the Charging Pump Suction Header

K/A REFERENCE: 2.1.30 4.4/4.0 TASK ID: 0071-021-01-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☐ Perform ☒ Simulate	☒ Plant Site ☐ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:

Time Critical: ☐ Yes ☒ No	Allotted Time: 15 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	A solid stream of water is observed through the vent flow indicator and the vent system is isolated.
RECOMMENDED STARTING LOCATION:	In-Plant
INITIAL CONDITIONS:	The unit is at 100% power. The 'A' charging pump is in operation with the 'B' charging pump in standby, and will be started within one hour. NDE has determined that a gas void greater than limits exists in the 6 inch Charging Pump suction header.
INITIATING CUE:	Your supervisor directs you to vent the Charging Pump 6 inch suction header per 1OM-7.4.AV. Steps IV.A.1 and 2 are complete.
REFERENCES:	1OM-7.4.AV, "Charging Pump Suction Header Venting", Rev. 4
TOOLS:	None
HANDOUT:	1OM-7.4.AV, "Charging Pump Suction Header Venting", Rev. 4, place kept up to but not including step IV.A.3. Should also N/A the 8" header portion to identify the performance steps. Have a Copy of VOND 7.1 available as a reference

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-057 JPM REVISION: 8	JPM TITLE: Vent the Charging Pump Suction Header

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR NOTE: Provide candidate with a place kept copy of 1OM-7.4.AV. If asked provide VOND 7-1.	
	START TIME: _____	
1. Review procedure.	1.1 Candidate reviews 1OM-7.4.AV. COMMENTS:	
2.**C** Open [1CH-487], "Charging Pump Vent Common Isolation, located in Aux Bldg 735'.	2.1**C** OPENS [1CH-487] by rotating valve T-Handle in the counterclockwise position. **EVALUATOR CUE:** 1CH-487 T Handle is full counterclockwise. COMMENTS:	
3.**C** Open [1CH-486], Outlet Isolation for [FI-1CH-170], located in Aux Bldg. 735'.	3.1**C** OPENS [1CH-486] by rotating valve T-Handle in the counterclockwise position. **EVALUATOR CUE:** 1CH-486 T Handle is full counterclockwise. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-057 JPM REVISION: 8	JPM TITLE: Vent the Charging Pump Suction Header

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
4.**C** Open [1CH-484], Inlet Isolation for [FI-1CH-170], located in Aux Bldg. 735'.	4.1**C** OPENS [1CH-484] by rotating valve T-Handle in the counterclockwise position. **EVALUATOR CUE:** 1CH-484 T Handle is full counterclockwise. COMMENTS:	
5.**C** Vent the 6 inch charging pump suction header from the safety injection system by performing the following: a. Open [1CH-483], Charging Pump Vent Isolation Valve, located in Aux Bldg. 735'. b. When a solid stream of flow is observed through [FI-1CH-170], Charging Pump Suction Line Vent Sight Flow Indicator, located in Aux Bldg. 735', Close and independently verify closed on daily journal, [1CH-483], Charging Pump Vent Isolation Valve.	5.1**C** OPENS [1CH-483] by rotating valve T-Handle in the counterclockwise position. **EVALUATOR CUE:** 1CH-483 T Handle is full counterclockwise. 5.2**C** Observes the vent flow indicator, [1CH-FI-170]. **EVALUATOR CUE:** You initially observe an air/water mixture and now there is a solid stream of water flowing through the indicator. 5.3**C** CLOSES [1CH-483] by rotating valve T-Handle in the clockwise position. **EVALUATOR CUE:** 1CH-483 T Handle is full clockwise. 5.4 Requests independent verification that [1CH-483] is closed. **EVALUATOR CUE:** When asked, Inform the candidate that another operator has performed an independent verification of [1CH-483]. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-057 JPM REVISION: 8	JPM TITLE: Vent the Charging Pump Suction Header

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
6. Notify NDE to perform an Ultrasound Test (UT) to confirm no gas voids exist in the 6 inch Charging Pump suction header, in accordance with 3BVT01-11.04, "Void Monitoring".	6.1 Notifies NDE to perform a UT on the 6 inch Charging Pump suction header. **EVALUATOR CUE:** NDE has determined **NO** gas voids exist in the 6 inch Charging Pump suction header and the void limit was **NOT** exceeded. **EVALUATOR NOTE:** If the candidate continues onto the next step (Venting the 8 inch header), inform the candidate, that step of the procedure is N/A. They are to continue with the next step. COMMENTS:	
7.**C** Close [1CH-484], Inlet Isolation for [FI-1CH-170].	7.1**C** CLOSES [1CH-484] by rotating valve T-Handle in the clockwise position. **EVALUATOR CUE:** 1CH-484 T Handle is full clockwise. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-057 JPM REVISION: 8	JPM TITLE: Vent the Charging Pump Suction Header

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
8.**C** Close [1CH-486], Outlet Isolation for [FI-1CH-170].	8.1**C** CLOSES [1CH-486] by rotating valve T-Handle in the clockwise position. **EVALUATOR CUE:** 1CH-486 T Handle is full clockwise. COMMENTS:	
9.**C** Close [1CH-487], "Charging Pump Vent Common Isolation.	9.1**C** CLOSES [1CH-487] by rotating valve T-Handle in the clockwise position. **EVALUATOR CUE:** 1CH-487 T Handle is full clockwise. COMMENTS:	
10. Independently verify closed on Daily Journal, the following valves: a. [1CH-484], Inlet Isolation for [FI-1CH-170]. b. [1CH-486], Outlet Isolation for [FI-1CH-170]. • c. [1CH-487], "Charging Pump Vent Common Isolation..	10.1 Indicates that Independent Verification is required. **EVALUATOR CUE:** An independent Verifier will be sent from the Control Room. Venting of the charging pump individual suctions lines is not required. COMMENTS:	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS: The unit is at 100% power. The 'A' charging pump is in operation with the 'B' charging pump in standby, and will be started within one hour.

NDE has determined that a gas void greater than limits exists in the 6 inch Charging Pump suction header.

INITIATING CUE: Your supervisor directs you to vent the Charging Pump 6 inch suction header per 1OM-7.4.AV. Steps IV.A.1 and 2 are complete.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Startup the Dedicated Auxiliary Feedwater Pump [FW-P-4]

TRAINING MATERIAL NUMBER: 1PL-007

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 1PL-007

REVISION NUMBER: 8

TECHNICAL REFERENCES:

1OM-53A.1.2-K, "Dedicated AFW Pump [1FW-P-4] Startup" Rev. 4

INSTRUCTIONAL SETTING: In-Plant

APPROXIMATE DURATION: 20 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1PL-007
New Revision: 8
Description of Change(s): 1. Updated for current procedure revision.
Reason for Change (s): 1. Procedure was revised with minor changes.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-007 JPM REVISION: 8	JPM TITLE: Startup the Dedicated Auxiliary Feedwater Pump [FW-P-4]

K/A REFERENCE: 054 AK3.04 4.4/4.6
E05 EK1.2 3.9/4.5

TASK ID: 0534-005-05-041

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☐ Perform ☒ Simulate	☒ Plant Site ☐ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:

Time Critical: ☐ Yes ☒ No	Allotted Time: 20 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

_____

_____

_____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Startup the Dedicated Auxiliary Feedwater Pump [1FW-P-4] and open the Discharge Isolation Valve [MOV-1FW-160].
RECOMMENDED STARTING LOCATION:	In-Plant
INITIAL CONDITIONS:	• The crew is performing FR-H.1, "Response to Loss of Secondary Heat Sink" • The Auxiliary Feedwater Pumps [1FW-P-2, 3A & 3B] are inoperable due to a fire • [1WT-TK-10] has been depleted and is unavailable for use • The DAFWP [1FW-P-4] is in NSA, and aligned to 1WT-TK-11 • The DAFWP Discharge Isolation Valve [MOV-1FW-160] is closed • ERF substation 4160V Bus H is energized by offsite power • The ERF Diesel is not running • Steps 1 through 3 of Attachment 2-K are complete
INITIATING CUE:	Your supervisor directs you to Startup the Dedicated Auxiliary Feedwater Pump [1FW-P-4] per Steps 4 through 8 of EOP Attachment 2-K, and report when complete.
REFERENCES:	1OM-53A.1.2-K, "Dedicated AFW Pump [1FW-P-4] Startup" Rev. 4
TOOLS:	None
HANDOUT:	1OM-53A.1.2-K, "Dedicated AFW Pump [1FW-P-4] Startup" Rev. 4 with steps 1-3 completed. Have a copy of VOND 24-3 available as a reference

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-007 JPM REVISION: 8	JPM TITLE: Startup the Dedicated Auxiliary Feedwater Pump [FW-P-4]

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
	EVALUATOR NOTE: All steps required should be performed from the Feed Reg. Valve Room. **EVALUATOR CUE:** Provide candidate a copy of 1OM-53A.1.2-K with steps 1-3 completed. Provide VOND 24-3 is asked.	
	START TIME: _____	
1. Reviews procedure.	1.1 Reviews EOP Att. 2-K. COMMENTS:	
2.**C** At the DAFW Panel (PNL-DAFWP1) place the LOCAL-TEST Switch to LOCAL and the ON-OFF Panel Switch to ON to energize the panel.	2.1**C** Places LOCAL-TEST switch to LOCAL. **EVALUATOR CUE:** LOCAL-TEST switch in LOCAL. 2.2**C** Places ON-OFF switch to ON. **EVALUATOR CUE:** ON-OFF switch is ON. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-007 JPM REVISION: 8	JPM TITLE: Startup the Dedicated Auxiliary Feedwater Pump [FW-P-4]

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
3. Check closed [MOV-FW-160], DAFW Discharge Isolation Valve.	3.1 Checks MOV-FW-160 is CLOSED. GREEN light – LIT and RED light – NOT LIT. **EVALUATOR CUE:** GREEN light – LIT and RED light – NOT LIT. **EVALUATOR NOTE:** Candidate may opt to check MOV-1FW-160 local position. Initial Conditions are that the valve is closed. Cue as needed. COMMENTS:	
4. Establish communications with the control room.	4.1 Establishes communication with Control Room. **EVALUATOR CUE:** Communications have been established with the Control Room. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-007 JPM REVISION: 8	JPM TITLE: Startup the Dedicated Auxiliary Feedwater Pump [FW-P-4]

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	S/U
5.**C** Start [1FW-P-4], Dedicated AFW Pump. (Feed Reg Valve Room, PNL-DAFWP1).	5.1**C** Places DAFWP Control switch to the START position. **EVALUATOR CUE:** DAFWP Control Switch is in START. If asked, suction flow is approximately 150 GPM. 5.2 Checks RED light – LIT and WHITE light – NOT LIT. **EVALUATOR CUE:** RED light – LIT and WHITE light – NOT LIT. COMMENTS:	
6.**C** Open [MOV-FW-160]. Dedicated AFW Pump Discharge Isolation Valve.	6.1**C** Places MOV-FW-160 Control Switch to the OPEN position. **EVALUATOR CUE:** MOV-FW-160 Control Switch is in the OPEN position. 6.2 Verifies RED light – LIT and GREEN light – NOT LIT. **EVALUATOR CUE:** RED light – LIT and GREEN light – NOT LIT. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-007 JPM REVISION: 8	JPM TITLE: Startup the Dedicated Auxiliary Feedwater Pump [FW-P-4]

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
7. Report to the control room step 4 through 8 of Attachment 2-K are complete.	7.1 Reports to control room startup of Dedicated Auxiliary Feedwater Pump is complete. COMMENTS:	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

*** THIS SHEET TO BE GIVEN TO CANDIDATE ***

☐ Read:

INITIAL CONDITIONS:

- The crew is performing FR-H.1, "Response to Loss of Secondary Heat Sink"
- The Auxiliary Feedwater Pumps [1FW-P-2, 3A & 3B] are inoperable due to a fire
- [1WT-TK-10] has been depleted and is unavailable for use
- The DAFWP [1FW-P-4] is in NSA, and aligned to 1WT-TK-11
- The DAFWP Discharge Isolation Valve [MOV-1FW-160] is closed
- ERF substation 4160V Bus H is energized by offsite power
- The ERF Diesel is not running
- Steps 1 through 3 of Attachment 2-K are complete

INITIATING CUE:

Your supervisor directs you to Startup the Dedicated Auxiliary Feedwater Pump [1FW-P-4] per Steps 4 through 8 of EOP Attachment 2-K, and report when complete.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Locally Start the No. 1(2) Emergency Diesel Generator

TRAINING MATERIAL NUMBER: 1PL-606

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 1PL-606

REVISION NUMBER: 7

TECHNICAL REFERENCES:

1OM-53.A.1.2-E, Revision 5

INSTRUCTIONAL SETTING: In-Plant

APPROXIMATE DURATION: 20 Minutes

PREPARED BY: M. Klingensmith _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 1PL-606
New Revision: 7
Description of Change(s): 1. Updated for current procedure revision. 2. Updated to latest format. 3. Added step 2 and cue to address new EDG overspeed Caution
Reason for Change (s): 1. Procedure was revised with minor changes. 2. JPM format changed. 3. New step 2 EDG overspeed Caution and figure included in the attachment.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-606 JPM REVISION: 7	JPM TITLE: Locally Start the No. 1(2) Diesel Generator

K/A REFERENCE: 055 EA1.02 4.3 / 4.4 TASK ID: 0532-001-05-013
055 EA2.03 3.9 / 4.7 0532-009-05-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
☐ Perform ☒ Simulate	☒ Plant Site ☐ Simulator ☐ Classroom	☐ Annual Requal Exam ☐ Initial Exam ☐ Training ☐ Other:	☐ BVT ☐ NRC ☐ Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:

Time Critical: ☐ Yes ☒ No	Allotted Time: 20 Minutes	Actual Time: minutes

JPM RESULTS: ☐ SAT ☐ UNSAT (Comments required for UNSAT evaluation)

Comments: _____

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

TASK STANDARD:	Locally start the No. 1 (2) Diesel Generator and energize the 4KV 'AE (DF)' emergency bus.
RECOMMENDED STARTING LOCATION:	In-Plant
INITIAL CONDITIONS:	A station blackout has occurred. 1OM-53A.1.ECA-0.0, "Loss of All AC Power" has been performed to the step where local actions must be taken to restore power.
INITIATING CUE:	Your Supervisor directs you to use EOP Attachment 2-E to start the No. 1(2) Diesel Generator and ensure that the 4KV 'AE(DF)' bus is energized. You are given the key for the No. 1(2) Diesel Generator. The 1A(1B) RPRW pump is in AUTO.
REFERENCES:	1OM-53.A.1.2-E, Revision 5
TOOLS:	None
HANDOUT:	EOP Attachment 2-E, Revision 5. The use of keys will be simulated.

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-606 JPM REVISION: 7	JPM TITLE: Locally Start the No. 1(2) Diesel Generator

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	EVALUATOR CUE: Provide Candidate a copy of EOP Attachment 2-E. If asked, the required RPRW pump control switch is in AUTO. The use of keys will be simulated.	
	START TIME: _____	
1. Establish communications between Diesel Generator Room 1(2) and Control Room.	1.1 Calls the Control Room on PAX or Page Party. **EVALUATOR CUE:** Role play as RO and acknowledge the call. COMMENTS:	
2. References Caution and Figure 1 to determine if the EDG tripped on Overspeed..	2.1 Reads Caution related to EDG Overspeed trip and proper limit switch position. **EVALUATOR CUE:** If candidate evaluates the Overspeed trip, cue that the limit switch is in the position shown on Figure 1 (2 o'clock) COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-606 JPM REVISION: 7	JPM TITLE: Locally Start the No. 1(2) Diesel Generator

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
3. Clear all start failure alarms on [PNL-EE-EG-1A (2A)].	3.1 Depresses the alarm Reset pushbutton, or Alarm Test & Reset & Silence, to clear all alarms. **EVALUATOR CUE:** No alarms are present. COMMENTS:	
4. With Key 48, Place Selector Switch to LOCAL START on [PNL-EE-EG-1A (2A)].	4.1 Simulates inserting Key 48 into selector switch. 4.2 Selects the LOCAL START Position **EVALUATOR CUE:** Key is in LOCAL START. COMMENTS:	
5. Prime diesel fuel system by pressing FUEL PRIME pushbutton on [PNL-EE-EG-1A(2A)].	5.1 Depresses the FUEL PRIME pushbutton. **EVALUATOR CUE:** If asked, fuel oil pressure on [PI-EE-205(206)] is 35 psig and [PI-EE-207(208)] is 0 psig. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-606 JPM REVISION: 7	JPM TITLE: Locally Start the No. 1(2) Diesel Generator

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
6.**C** Depress ENGINE START pushbutton on [PNL-EE-EG-1A(2A)] and maintain pushbutton depressed until the Diesel starts and is self-sustaining, then release pushbutton.	6.1**C** Depresses the ENGINE START pushbutton and holds until the diesel starts and is self-sustaining. **EVALUATOR CUE:** EDG running at 850 rpm. COMMENTS:	
7.**C** Adjust EDG speed using Governor "Speed Setting" knob to an operating speed of 900 RPM.	7.1**C** Adjusts mechanical governor speed setting knob to raise speed and obtain an engine speed of 900 rpm. **EVALUATOR CUE:** EDG speed rises and is stable at 900 rpm. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-606 JPM REVISION: 7	JPM TITLE: Locally Start the No. 1(2) Diesel Generator

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
	FAULT STATEMENT: Note the next step begins the faulted portion of this JPM. The EDG voltage will be low and the field must be flashed manually.	
8. Verify DG output voltage on [PNL-DIGEN-1(2)].	8.1 Locates EDG output voltmeter on [PNL-DIGEN-1(2)] and reads voltage. **EVALUATOR NOTE:** The intention of this step is to have candidate flash the field locally by manual operation of the K2 Field Flash relay. If candidate does not energize the EDG output voltmeter, continue to provide the following cue until the voltmeter is energized and the K2 Field Flash relay plunger has been actuated. **EVALUATOR CUE:** EDG output voltage is zero volts. COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-606 JPM REVISION: 7	JPM TITLE: Locally Start the No. 1(2) Diesel Generator

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
9. If the automatic field flash has failed, then request Control Room Operator to flash the EDG field from BB-C.	9.1 Calls the Control Room and asks the Operator to flash the No. 1(2) EDG field. **EVALUATOR CUE:** Role play RO and report that field flash for the requested EDG has been performed. EDG voltage still reads zero volts. COMMENTS:	
10.**C** If field flash from BB-C unsuccessful, then locally flash EDG field by depressing the K2 field flash relay's white plunger tabs in [PNL-DIGEN-1(2)].	**EVALUATOR NOTE:** Provided picture of the exciter cabinet and internal components to preclude cycling the door. 10.1**C** Opens the exciter cabinet door [PNL-DIGEN-1A (2A)]. and depresses the plunger on the K2 Field Flash relay to flash the No. 1(2) EDG field. **EVALUATOR CUE:** EDG output voltage rises to 4160 volts (if requested, on all three phases). COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 1PL-606 JPM REVISION: 7	JPM TITLE: Locally Start the No. 1(2) Diesel Generator

STEP (**"C"** Denotes CRITICAL STEP)	STANDARD (Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒**	**S/U**
11. Check if the emergency bus is energized.	11.1 Calls the Control Room to verify that the emergency bus is energized or energizes generator ammeter to monitor generator current. **EVALUATOR CUE:** The emergency bus is energized and/or the ammeter indicates amps. COMMENTS:	
12. Notify Control Room that EOP Attachment 2-E is complete.	12.1 Candidate calls the Control Room to notify Supervisor that EOP Attachment 2-E is complete. **EVALUATOR CUE:** Acknowledge report as Supervisor. COMMENTS:	
	EVALUATOR CUE: State "This JPM is complete"	
	STOP TIME: _____	

CANDIDATE DIRECTION SHEET

Use This Sheet When Protected Train "A"

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS: A station blackout has occurred. 1OM-53A.1.ECA-0.0, "Loss of All AC Power" has been performed to the step where local actions must be taken to restore power.

INITIATING CUE: Your Supervisor directs you to use EOP Attachment 2-E to start the No. 2 Diesel Generator and ensure that the 4KV 'DF' bus is energized.

You are given the key for the No. 2 Diesel Generator. The 1B RPRW pump is in AUTO.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

CANDIDATE DIRECTION SHEET

Use This Sheet When Protected Train "B"

* **THIS SHEET TO BE GIVEN TO CANDIDATE** *

☐ Read:

INITIAL CONDITIONS: A station blackout has occurred. 1OM-53A.1.ECA-0.0, "Loss of All AC Power" has been performed to the step where local actions must be taken to restore power.

INITIATING CUE: Your Supervisor directs you to use EOP Attachment 2-E to start the No. 1 Diesel Generator and ensure that the 4KV 'AE' bus is energized.

You are given the key for the No. 1 Diesel Generator. The 1A RPRW pump is in AUTO.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".
Then hand this sheet to the evaluator.

Facility: **BVPS Unit 1** Scenario No. 1 Op Test No.: BV1LOT16 NRC

Examiners: _____ Candidates: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: **IC-62 (17)**: 67% power, MOL, Equ. XE Conditions, CB "D" @ 177 steps, RCS boron - 985 ppm, 1FW-P-3A OOS

Turnover: Maintain 67% power.

Critical Tasks:

1. **CT-2 (E-0.D)** Crew manually actuates at least 1 train of SIS
2. **CT-51 (FR-S.1.B)** Crew starts AFW pumps
3. **CT-52 (FR-S.1.C)** Crew inserts negative reactivity

Event No.	Malf. No.	Event Type	Event Description
1	PRS06A	(I,A) ATC, SRO (TS) SRO	Pressurizer level transmitter, LT-1RC-459 drifts low.
2	XMT-MSS021A	(I,A) BOP, SRO (TS) SRO	PT-1MS-446 fails low.
3	CHS03	(C,A) ATC, SRO	Isolable 25 gpm RCS leak on letdown line. (AOP 1.6.7)
4	FWM01A	(R) ATC (C,A) BOP, SRO	Main feedwater pump trip, requires turbine runback and manual rod insertion.
5	GEN01, CRF12A, 12B	(M) ALL	Spurious Gen Trip with auto & manual Rx trip failures. (ATWS)
6	IOR X06i068C	(C) ATC, SRO	MOV-1CH-350 failed closed.
7	INH20,21,36	(C) BOP, SRO	All AFW pumps fail to auto start.
8	RCS02A	(M) ALL	950 gpm LOCA
9	VLV-MSS03,04	(C) BOP, SRO	Reheat steam failure to auto isolate.
10	SIS10A, SIS10B	(C) ATC, SRO	Automatic SI actuation failure.

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

E-0 → FR-S.1 → E-0 → E-1 → Terminate after evaluating SI termination criteria.

After taking the shift at 67% power with AFW pump, 1FW-P-3A OOS, Pressurizer level transmitter, LT-1RC-459 will drift low. The crew will diagnose the indications and IAW AOP 1.4.1, Process Control Failure, remove the failed channel from service and ensure the plant is stable, the SRO will transition to the instrument failure procedure for further channel actions and will address Tech Specs for the failed channel.

The non-selected Turbine First Stage pressure transmitter, PT-1MS-446 will fail low. IAW the instrument failure procedure, the crew will take action to transfer the condenser steam dump control to "Steam Pressure" mode. The SRO will address Tech Specs for the failed channel.

An isolable 25 gpm leak will then occur on the letdown line, the crew will enter AOP 1.6.7, Excessive Primary Plant Leakage, to evaluate leak rate and leak location. The crew will determine the leak rate is >10 gpm and is isolable.

The "A" Main feed pump will then trip, the crew will enter AOP 1.24.1, Loss of Main Feedwater, and determine that a power reduction to <52% is required. The crew will reduce power IAW AOP 1.24.1.

When reactor power lowers to < 61%, the Main Unit Generator will spuriously trip. The reactor will fail to automatically trip as expected due to the MUG trip. The crew will identify the automatic Rx trip failure. The SRO will direct the crew to manually trip the Rx and perform IOA's of E-0. The ATC will attempt to manually trip the Rx which will also fail. The SRO will direct the crew to perform IOA's for FR-S.1, Response to Nuclear Power Generation – ATWS. The control rods will fail to automatically insert, the ATC will place the Rod Control system in manual and begin inserting rods. When control bank "D" inserts to <150 steps, an "Urgent Failure" will occur in the Rod control system, stopping all rod motion. When the crew attempts to align the Emergency Boration flowpath, the Emergency Boration Valve, MOV-1CH-350, will fail to open. The crew will align an alternate boration flow path by aligning the Charging pump suction to the RWST. At the lead evaluator's discretion, when an emergency boration flowpath is aligned, the reactor will be locally tripped via a field operator if dispatched.

Additionally, all available AFW pumps will fail to automatically start, the BOP will start the Turbine Driven AFW pump and the "B" Motor driven AFW pump. The BOP will recognize that Reheat steam failed to automatically isolate on the Turbine Trip and manually close, MOV-1MS-100A and 100B.

When the Rx is locally tripped and verified, the crew will transition back to E-0, Reactor Trip Response, coincident with the local Rx trip, a 950 gpm LOCA will occur on the "A" Loop cold leg,

While performing the IOA's of E-0, the crew will recognize that RCS pressure and level are reducing and that conditions require a Safety Injection which failed to automatically actuate. The crew will actuate SI and continue in E-0. The crew will progress thru E-0 and transition to E-1 after diagnosing that containment pressure and sump level are not consistent with pre-event values.

The scenario will be terminated after the crew has evaluated SI termination criteria in E-1.

Expected procedure flow path is E-0 → FR-S.1 → E-0 → E-1.

INITIAL CONDITIONS: **IC-62(17)**: 67% power, MOL, Equ. XE Conditions, CB "D" @ 177 steps, RCS boron - 985 ppm.
Use HTML, **1L16N1.HTM**, Initialize into specified IC and insert preloads per the HTML.

ADDITIONAL LINEUP CHANGES	STICKERS	MONITOR SETUP
1FW-P-3A CS in PTL	1FW-P-3A CS tagged	Normal Splash w/ High Power Screen, on VB-B
EQUIPMENT STATUS	**DATE/TIME OOS**	**TECHNICAL SPECIFICATION(S)**
1FW-P-3A OOS, pump bearing replacement	Yesterday / 1800	3.7.5, Condition B

SHIFT TURNOVER INFORMATION

1. 67% power for the past week due to System request, MOL equilibrium conditions, shift goal is to maintain current power.

SCENARIO SUPPORT MATERIAL REQUIRED

1. MOL Reactivity Placard
2. Protected Train "B" Placard
3. Safety Status PNL lights LIT for "A" AFW
3. 1FW-P-2 aligned to A hdr placard

PROCEDURES NEEDED

E-0
E-1
FR-S.1
1OM-46.4.G
6 IF, Attach 1
24 IF, Attach 5
Attachment 1-K
AOP 1.4.1
AOP 1.6.7
AOP 1.24.1

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Assign shift positions SRO:_____ ATC:_____ BOP:_____		
Conduct a shift turnover with oncoming operators.	Simulator frozen until after shift turnover unless it needs to be run momentarily for an alignment change.	
When the shift turnover is completed, place the simulator to RUN and commence the scenario.	Simulator running.	Crew assumes control of the unit.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 1:		
Pressurizer level transmitter LT-1RC-459 drifts low. **IMF PRS06A (0 0) 0 45**	LI-1RC-459A indicates downscale. ALARM: A4-4, PRZR Control Low Level Deviation,	ATC reports unexpected PRZR level deviation alarm. ATC identifies LT-1RC-459 is failing low. IAW AOP 1.41, Part C, ATC removes LT-1RC-459 from service by placing PRZR level control channel selector to POS 3 (461/460). If necessary ATC places FCV-1CH-122 in manual and restores PRZR level.
NOTE: A control band and Rx trip criteria are not applicable if the PRZR level controls remained in AUTO.		SRO enters AOP 1.4.1, Process Control Failure. SRO provides a control band and Rx trip criteria of 5% low/90% high for manual PRZR level control. BOP refers to ARP.
	SRO enters the Reactor Coolant System Instrument failure procedure, 1OM-6.4.IF, attachment 1.	SRO transitions to Reactor Coolant System Instrument failure procedure, 1OM-6.4.IF, attachment 1. ATC places PRZR level control channel selector to POS 3. (previously performed IAW AOP 1.4.1. ATC verifies PRZR level recorder selector is positioned to record the controlling level channel. ATC verifies there is adequate makeup to the VCT. ATC verifies PRZR heaters (Control & Backup) groups have returned to normal operation or manually energizes heaters as necessary.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 1: (continued) Proceed with next event at LE discretion.		SRO references Technical Specifications: 3.3.1 (RTS Instrumentation) Condition A, immediately enter the Condition referenced in Table 3.3.1-1 function 9 (PRZR level high) Condition K; trip channel in 72 hrs. or reduce power to < P-7 in 78 hrs. SRO determines following TS are for tracking only 3.3.3 (PAM instrumentation) Table 3.3.3-1 function 11 is met if LT460 and LT461 are operable. 3.3.4 (Remote Shutdown System) Table B.3.3.4-1 function 4.a requirement is met if LT460 is operable. SRO contacts operations management and notifies I&C of level transmitter failure.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 2:		
1st Stage Pressure Transmitter, PT-1MS- 446 fails low. **IMF XMT-MSS021A (0 0) 0 10**	PT-1MS-446 failed low (Non controlling Ch) ALARM: A3-20, AMSAC Trouble	BOP identifies PT-1MS- 446 has failed low.
	SRO enters 1OM-24.4.IF, "Instrument Failure Procedure" Attachment 5.	SRO enters 1OM-24.4.IF, Attach 5
		BOP verifies Steam Dump Control Mode Selector Switch is in TAVG mode.
		BOP places Steam Dumps in Stm Pressure Mode; • Places AM-1MS-464B, stm press controller, in MAN with 'zero' percent output signal. • Verify or adjust the setpoint for AM-1MS-464B to the equivalent value for 1005 psig. • Places the Train A and Train B Steam Dump Control Bypass Interlock Selector Switches to OFF/RESET/INTLK. • Place the Steam Dump Control Mode Selector Switch in STM PRESS. • Place AM-1MS-464B, In AUTO. • Checks TI-1RC-408, Stm Dump Demand, is indicating 0% (BB-B) • Places the Train A and Train B Steam Dump Control Bypass Interlock Selector SW's to ON. • Check all steam dump valves remain closed.
NOTE: It is not the intent of the scenario to allow the crew to re-arm AMSAC.		
Proceed with next event at LE discretion.	SRO references Tech Specs	3.3.1 Condition P for P-13, Verify interlock in required state for existing conditions within 1 hour.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 3: 25 gpm letdown line leak inside CNMT. (isolable) **IMF CHS03 (0 0) 25**	A4-71 and 72, Rad Monitor High and High-High alarms on Incore Instrument Area Rad monitor, RIS-RM-204. VCT level slowly decreasing. CNMT sump level rising. SRO enters 1.6.7, Excessive Primary Plant Leakage CNMT particulate Rad monitor, RIS-1RM-215A alarms. SRO transitions from AOP 1.6.7, step 2 to step 6	BOP reviews ARPs. BOP verifies valid Rad monitor indication using ARP. Based on RM alarms with VCT level dropping, SRO may directly enter AOP 1.6.7. ATC determines PRZR level is capable of being maintained > 5%. ATC checks if leakage is RCS/CVCS leakage by: • Checking CNMT, PAB and safeguards conditions are consistent with pre-event. Crew determines conditions are NOT consistent with pre-event based upon rising radiation levels on RIS-1RM-204 and RIS-1RM-215A. Crew verifies RCS temperature is stable. ATC verifies FCV-1CH-122 is maintaining constant PRZR level in AUTO or places FCV-1CH-122 in MAN and controls charging flow to maintain a constant PRZR level. Crew checks VCT level trend and determines that VCT level is DROPPING at >0.7%/min. and determines that leakrate is >10 gpm. SRO informs SM that leak rate is > 10 gpm but may be isolable from the RCS.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENT 3: (continued)

ATC quantifies leakage & checks for CVCS leakage:

- Isolates charging/letdown by closing valves:
- TV-1CH-200A & B Letdown orifice isol.
- LCV-1CH-460A & B Regen Ht Ex inlet.
- FCV-1CH-122, charging flow control vlv.

- ATC adjusts RCP seal injection flow to obtain NET RCS input of 10 gpm.
- Crew determines PRZR level is rising.
- Crew determines that with PRZR level rising, the leak has been isolated.
- ATC adjusts RCP seal injection to 6-9 gpm/pump.

ATC determines VCT level can be maintained >5% with normal makeup.

ATC controls FCV-1CH-122 and HCV-1CH-186 as necessary to maintain at approximately programmed PRZR level.

Crew determines it is NOT desirable to restore charging and letdown to service.

NOTE:
It is not the intent of this scenario for the crew to demonstrate placing Excess Letdown in service. At the Lead Evaluators discretion, Event 4 can be inserted.

SRO directs the crew to place EXCESS letdown in service.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 4: Trip of "A" Main Feed Pump Rapid Power reduction, Control rods fail to insert in AUTO. **IMF FWM01B (0 0)** **IMF CRF02A (0 0) TRUE** **NOTE:** Crew may enter AOP 1.51.1, Unplanned Power Reduction. **NOTE:** Crew may elect to begin the load reduction at 2%/min then increase rate to 5%/min.	1FW-P-1A trips. A7-37, SG Feed Pump Auto Stop A7-39, SG Feed Pump Disch Flow Hi Start 2nd Pump A7-40, Steam Generator Feed Pump Disch Equalize Press Low SRO enters AOP 1.24.1, Loss of Main Feedwater.	BOP recognizes feed pump trip and informs crew. ATC performs IOA's of AOP 1.24.1 and verifies Rx power is < 70% BOP performs IOA's of AOP 1.24.1 and verifies 1FW-P-1B remains running. ATC refers to ARPs as time permits. IAW AOP 1.24.1, crew verifies Rx power is >52%. SRO directs load decrease to < 52% at 5%/minute. BOP initiates turbine load reduction; • Depress 1st STG IN pushbutton • Set EHC SETTER to < 50% power equivalent • Set LOAD RATE thumbwheel to 5%/minute • Depresses GO ATC reduces Rx power by manually inserting control rods or initiating either a normal or emergency boration. BOP: • Verifies both condensate pumps and one heater drain pump are running • Verifies A7-6, "Steam Generator Feed Pump Suct Press Low" - NOT IN ALARM • Verifies proper operation of FCV 1FW-150A,B SG Main FW Pump Recirc Vlvs

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 4: (continued) **ROLE PLAY:** 5 minutes after being dispatched to investigate 1FW-P-1A trip, report 1FW-P-1A has a severe oil leak, oil reservoir is extremely low. **NOTE:** Event 5 will automatically insert when Rx power lowers to <61%.		BOP stabilizes SG levels by verifying steam flow is less than available feed flow. BOP verifies SG levels are at or trending to program. BOP: • Verifies MFP < 450 amps on each motor • Verifies A7-40, "Steam Generator Feed Pump Disch Equalize Press Low" - NOT IN ALARM Crew dispatches an operator to investigate 1FW-P-1A trip.
EVENT 5: Spurious Generator Trip **TRGSET 4 'FNISPR(3)<61'** **IMF GEN01 (4 0)** (preloaded)	MUG trips with AUTO and MANUAL Rx trip failures. 1st out, A5-49, Generator Protection Gen trip. Numerous generator related alarms.	Crew reports MUG trip with automatic Rx trip failure. SRO directs ATC to manually trip the reactor. SRO directs the crew to perform IOA's for E-0.
EVENTS 6, 7, 8, 9 & 10: (all malfunctions are preloaded) Emerg Boration valve, MOV-1CH-350 failed closed, Urgent Rod failure. Loss of all AFW due to AUTO start failure of AFW pumps. "A" Loop, 950 gpm LOCA (Occurs when Rx is locally tripped.) Auto isolation failure of Reheat steam. Auto SI actuation failure.	SRO enters E-0, Reactor Trip or Safety Injection SRO enters FR-S.1, Response to Nuclear Power Generation - ATWS.	ATC attempts a manual reactor trip, reports Rx trip failure/ ATWS condition. SRO directs operators to perform IOA's of FR-S.1, and enters FR-S.1 from RNO of E-0, step 1.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6 – 10: (continued)

Critical Task CT-52 (FR-S.1.C):
Crew inserts negative reactivity into the core by inserting RCCAs before completing the immediate action steps of FR-S.1.

SAFETY SIGNIFICANCE -- Failure to insert negative reactivity, under the postulated plant conditions, results in an unnecessary situation in which the reactor remains critical or returns to a critical condition. Performance of the critical task would make the reactor subcritical and provide sufficient shutdown margin to prevent (or at least minimize the power excursion associated with) any subsequent return to criticality.

Failure to insert negative reactivity constitutes "mis-operation or incorrect crew performance which leads to incorrect reactivity control (e.g., failure to initiate emergency boration or manually insert RCCAs)."

When Bank D Rods insert to <150 steps, an Urgent Failure will occur causing the rods to "lockup" and will quit inserting, requiring the crew to initiate Emergency Boration via MOV-1CH-350, which will also fail closed, requiring the crew to establish an Alternate Emergency Boration flowpath via aligning the charging pump suction to the RWST.

Crew performs IOA's of FR-S.1.

BOP verifies an automatic turbine trip occurred or manually trips Turbine.

ATC recognizes control rods are not inserting in AUTO and places rods in Manual and begins inserting rods.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6 – 10: (continued)

Critical Task CT-51 (FR-S.1.B)
Crew starts AFW pumps before WR SG level is less than 10%.

SAFETY SIGNIFICANCE -- Failure to start at least the minimum required number of AFW pumps under the postulated plant conditions can lead to violation of the RCS emergency stress limit.

IMF INH20, IMF INH21
IMF INH36
(preloaded)

NOTE:
After the crew has identified MOV-1CH-350 failure and performed contingency action, the command can be entered to locally trip the Rx if the crew previously dispatched an operator to locally trip the Rx.

BOP verifies AFW status, Notes there are NO AFW pumps running.

BOP manually starts 1FW-P-3B motor-driven AFW pump.

BOP manually opens TV-1MS-105A and 105B to start Turbine-driven AFW pump, 1FW-P-2 and verifies pump running by A7-7 NOT lit.

BOP verifies all AFW throttle valves are open.

BOP verifies AFW flow.

Crew initiates Emergency Boration Flow by:

- Verifying at least 1 charging pump is running.
- Checking Safety Injection is NOT actuated.
- Aligning Boration path by;
- Opening MOV-1CH-350, ATC reports MOV-1CH-350 has failed closed and won't open.
- SRO directs ATC to open MOV-1CH-115B(D) and close MOV-1CH-115C(E).

ATC aligns charging flow path by adjusting FCV-1CH-122 to establish > 75 gpm charging flow.
ATC verifies RCS pressure is < 2335 psig.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6 - 10: (continued) **ROLE PLAY:** When requested to open the reactor trip breakers & trip the rod drive MG set output ACBs, insert: **TRG! 10** Following commands are preloaded, activate Trigger 10 after the crew has established and alternate Emergency Boration flowpath via MOV-1CH-115B(D). 1st Rx trip breaker will open 10 seconds after actuating Trigger 10. **IMF CRF14A (10 10)** **IMF CRF14B (10 15)** **IMF CRF01A (10 30) 1** **IMF CRF01B (10 45) 1** **ROLE PLAY:** When all breakers are open, report actions to the control room. **NOTE:** Event 8, 950 gpm, Loop "A" LOCA will insert when the Rx is locally tripped. **NOTE:** This is a continuous action step, when the Rx is locally tripped, the crew will return to this step and then transition back to E-0, Step 1.	Crew continues in FR-S.1 after dispatching an operator.	Crew alerts plant personnel by; • Sounding the standby alarm • Announcing a Unit 1 Rx trip w/o SCRAM • Dispatching an operator to locally trip the Rx. BOP verifies turbine is tripped. BOP verifies MOV-1MS-100A, B did not automatically close and MANUALLY CLOSES valves, (BB-C). BOP depresses the RESET Pushbutton on the Reheater Controller. ATC checks if SI is actuated and reports SI is not actuated at this time. (**NOTE:** Event 8, 950 gpm LOCA, automatically inserts when the Rx is locally tripped, SI actuation may be required at this point, depending upon the crews timing and progression thru FR-S.1.) ATC checks if Rx is subcritical: • Power range channels < 5%. • IR channels – negative startup rate.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6 – 10; (continued)	When the Rx is locally tripped. SRO returns to E-0, step 1.	ATC verifies Reactor trip: • Rx trip and bypass breakers open. • Power range indication is < 5%. • Neutron flux is dropping. BOP verifies Turbine trip: • Throttle OR Governor valves ALL closed. • Main Generator output breakers – open. • Exciter Circuit breaker – open.
	AE and DF Busses are energized from offsite.	BOP verifies power to AC Emergency Busses: • Using VB-C voltmeters or IPC, verifies AE and DF busses have voltage indicated. BOP identifies that both emergency busses are energized from offsite power.
Critical Task CT-2 (E-0.D) **Crew manually actuates at least one train of SIS-actuated safeguards before transition to any ORP.** SAFETY SIGNIFICANCE -- Failure to manually actuate SI under the postulated conditions constitutes "misoperation or incorrect crew performance that leads to degraded ECCS capacity."	SI will be required due to low RCS pressure.	Check SI Status. ATC checks if SI is required: • ATC verifies CNMT press < 5psig. • ATC verifies PRZR press is not > 1850 psig. • ATC/BOP verifies Steamline press > 500 psig. Crew determines SI is required; ATC manually actuates SI by depressing both trains' pushbuttons. ATC/BOP, sounds standby alarm, announces reactor trip and safety injection.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6 – 10; (continued)		Check if SI flow should be reduced: • Crew verifies CNMT radiation, Pressure and Sump level are not consistent PRE-EVENT. SRO determines SI flow should not be secured. ATC verifies SI system status: • Charging pumps running – 2 running. • LHSI pumps running – 2 running. • BIT Flow indicated – YES. BOP verifies AFW status: • Motor-driven AFW Pumps – ONE RUNNING. • Turbine-driven pump: TV-1MS-105A, B open. A7-7 is NOT LIT, turbine driven pump running. • AFW Throttle Valves all FULL OPEN. • Total AFW Flow is > 370 GPM.
If AFW pump automatic start failure was not previously identified, the crew would identify and start 1FW-P-2 and 1FW-P-3B at this step.		
NOTE: Evaluation of BOP performing Attachment 1-K begins on page 21.	<u>List of Attachment 1-K Discrepancies:</u> • SIS failed to automatically actuate. • AFW pumps failed to automatically start. • Reheat steam failed to automatically isolate.	SRO directs BOP to perform Attachment 1-K.
NOTE: If Reheat steam automatic isolation failure was not previously identified, the crew will identify and isolate Reheat steam at this step by closing MOV-1MS-100A and B.	RCS temperature < 547°F and dropping due to Safety Injection flow.	ATC checks RCS temp. stable at or trending to 547°F: • ATC verifies no steam release is occurring. • ATC verifies Reheat steam is isolated. • ATC reduces total feedflow to minimize C/D.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6 – 10; (continued)

NOTE:
Depending upon crew timing and procedure progression, the RCP trip criteria may have previously been met, and the RCP's previously tripped.

ATC verifies PRZR isolated:

- PORVs – CLOSED (all)
- Spray Valves – CLOSED (both)
- Safety relief valves – CLOSED (all)
- Power to at least one block valve – AVAILABLE (all available)
- Block valves – AT LEAST ONE OPEN (all)

ATC checks if RCPs should be stopped:

- D/P between RCS pressure and highest SG pressure – < 200 PSID (350 PSID ADVERSE CNMT).
- Criteria for stopping is not met – all RCPs left running.

ATC/BOP checks if any SGs are faulted:

- Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER

  OR

- ANY SG COMPLETELY DEPRESSURIZED

Crew determines NO SG's are faulted.

Crew checks if SG tubes are intact:

- Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES

Crew determines all SG tubes are intact.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6 – 10; (continued)	Hi-Hi Radiation alarm is in due to containment radiation levels. Incore room, RM-204 and containment, RM-215A and 215B in Hi-Hi alarm. Containment Pressure is rising. Containment Sump level is rising. SRO transitions to E-1, Loss of Reactor or Secondary Coolant.	Crew checks if RCS is intact by checking CNMT conditions consistent with pre-event values: • CNMT radiation • CNMT pressure • CNMT sump level Crew determines the RCS is not intact based on CNMT conditions and verifies HHSI valves, MOV-1SI-867A,B,C,D all open & transitions to E-1. Crew checks if CREVS should be actuated by checking EITHER of the following: • Control Room Radiation Monitor RM-1RM-218A,B- NOT IN HIGH ALARM. • CIB - HAS NOT OCCURRED. Crew determines CREVS actuation NOT required. ATC checks if RCPs should be stopped: • D/P between RCS pressure and highest SG pressure – < 200 PSID (350 PSID ADVERSE CNMT). • Criteria for stopping is not met – all RCPs left running. ATC checks Recirc Spray Pumps – NONE RUNNING
NOTE: Depending upon crew timing and procedure progression, the RCP trip criteria may have previously been met, and the RCP's previously tripped.		

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6 – 10; (continued)

ATC/BOP checks if any SGs are faulted:

- Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER
  OR
- ANY SG COMPLETELY DEPRESSURIZED

Crew determines NO SG's are faulted.

BOP checks intact SG levels:

- Narrow range levels > 31% (50% Adverse)

BOP controls feed flow to maintain narrow range level between 31% (50% adverse) and 65%.

BOP checks station instr air hdr press > 100 PSIG.

Crew checks if SG tubes are intact:

- Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER.
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES.

Crew determines no SG levels are rising in an uncontrolled manner and Secondary Radiation is consistent with pre-event values, therefore all SG tubes are intact.

ATC checks PORV's and block valves:

- Power to block valves. (all available)
- PORVs – ALL CLOSED.
- Block valves – AT LEAST ONE OPEN. (all)

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6 – 10; (continued) **NOTE:** Depending upon procedure progression, RCS subcooling may be less than Attachment 6-A requirements at this time. **NOTE:** After the crew evaluates SI termination criteria and determines transition to ES-1.1 is appropriate or not, at the LE discretion, the Scenario can be terminated.	SI reduction criteria are not met.	Crew checks if SI flow should be reduced. ATC verifies RCS subcooling is NOT > 46°F (54°F Adverse) based on CETC's. ATC verifies RCS subcooling is > Attachment 6-A requirements. BOP verifies a secondary heat sink exists.(AFW flow > 370 gpm OR NR level > 31% (50% Adverse). ATC verifies RCS pressure is not Stable or Rising. Crew determines that current plant conditions for RCS pressure/level, does NOT support SI reduction.

Classify Event:
SITE AREA EMERGENCY based on EAL **SS3** due to a failure of the reactor protection system.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions'	Both EDG's are running.	BOP performs the verifications/actions of Attachment 1-K 'Verification of Automatic Actions' as follows: Diesel generators – BOTH RUNNING with no Trouble Alarms, RW pumps running supplying cooling water flow. Verifies power to both Emergency 4KV AC busses. Check at least 1 Leak Collection Exhaust fan running, 1VS-F-4A(4B). Station instrument air header pressure > 100 PSIG.
Reheat steam failed to automatically isolate on the trip, if crew failed to identify and close valves in FR-S.1 or E-0, BOP will close them at this step.	Ensure Reheat Steam Isolation.	Ensure Reheat Steam Isolation: • Verify MOV-1MS-100A,B – CLOSED. • Reset reheater controller. • Close MOV-1MS-204, gland stm spillover vlv. Verify CCR Pumps - ONE RUNNING with recirc pressure >100 psig. Align Neutron Flux Monitoring For Shutdown: • When operable IR channels <1E-10 amp, check SR channels energized. • Transfer NR-1NI-45 recorder to operable source and intermediate range displays.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued)		Verify River Water System In Service: • RPRW Pumps - TWO RUNNING. • Check CCR Heat EX RW press is > 20 psig. OR (IF CIB has occurred) • Verify RPRW flow to recirc spray hxs. Check If Main Steamline isolation required: • CNMT pressure - > 7 PSIG -OR- • Steamline pressure - < 500 PSIG -OR- • Steamline pressure high rate of change - ANY ANNUNCIATOR LIT (A7-41, A7-49, A7-57) Determines steamline isolation is NOT required. Check CIB And CNMT Spray Status: • Containment press - REMAINED < 11 PSIG.
<u>Critical Task CT-2 (E-0.D)</u> **Crew manually actuates at least one train of SIS-actuated safeguards before transition to any ORP.**	Both Trains of SIS failed to automatically actuate, manual actuation successful.	Verify ESF Equipment Status: • Verify SI status by checking all RED SIS marks – LIT. • Verify CIA by checking all ORANGE CIA marks – LIT. • Verify FWI by checking all GREEN FWI marks – LIT.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued)		When SR's are energized, verify Audible indication: • Verify operating SR Ch selected on Audio Count Rate Channel Selector Switch. • Audible indication functioning properly. • Adjust Multiplier Sw & Volume as necessary. Start CNMT Hydrogen Analyzers: • Using 1OM-46.4.G, gets keys, opens isolation valves (VB-A) and dispatches an operator to continue putting Hydrogen analyzers in service.
Attachment 1-K– COMPLETE	**Discrepancies:** • SIS failed to automatically actuate • AFW pumps failed to automatically start. • Reheat steam failed to automatically isolate.	Upon completion, reports any discrepancies to SRO.

Facility: **BVPS Unit 1** Scenario No. 2 Op Test No.: BV1LOT16 NRC

Examiners: _____ Candidates: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: **IC-64 (18)**: 100% power, MOL, Equ. XE Conditions, CB "D" @ 228 steps, RCS boron - 870 ppm. 1FW-P-3A OOS

Turnover: Maintain 100% power.

Critical Tasks:

1. **CT-18 (E-3.A)** Crew isolates ruptured SG
2. **CT-19 (E-3.B)** Crew establishes/maintains temperature
3. **CT-20 (E-3.C)** Crew depressurizes RCS to meet SI termination criteria

Event No.	Malf. No.	Event Type	Event Description
1	XMT-MSS039A	(I,A) BOP, SRO	"C" SG, selected Main steam flow transmitter, 1MS-FT-494 fails low, requires manual control of feedwater and placing alternate channel in service.
2	PRS08D	(I,A) ATC, SRO (TS) SRO	PRZR pressure control transmitter, PT-1RC- 444 fails high, requires closing PORV and manual PRZR pressure control.
3	RCS03A	(C,A) ATC, SRO (TS) SRO	22 gpm SG Tube leak on "A" SG. (AOP 1.6.4)
4		(R) ATC (N) BOP, SRO	SG tube leak requires plant S/D IAW AOP 1.51.1.
5	RCS03A	(M) ALL	650 gpm SGTR occurs on "A" SG during S/D.
6	INH40	(C) ATC, SRO	"B" HHSI pump auto start failure on SI.
7	VLV-SGB01,02,03	(C) BOP, SRO	SG BD isolation failure, requires manual valve closure.
8	MSS08C	(C) BOP, SRO	Condenser steam dump fails open following cooldown, requires Main steam line isolation.

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

E-0 → E-3

After taking the shift at 100% power with AFW pump, 1FW-P-3A OOS, the "C" SG selected Steam flow transmitter will fail low requiring the BOP to take manual feedwater control IAW AOP 1.4.1, Process Control Failure. After the plant has been stabilized, the SRO will transition to the instrument failure procedure and direct placing the alternate steam flow channel in service, Feedwater control will then be returned to automatic.

The controlling PRZR pressure channel, PT-1RC-444 will drift high causing RCS pressure to lower due to the pressurizer spray valves and a PORV opening. The crew will initially respond IAW AOP 1.4.1, identify the failure and close the spray valves and PORV, the SRO will then transition to 1OM-6.4.IF, attachment 2 to address the failed channel. The ATC controls PRZR pressure by manually operating the PRZR heaters and spray valves, or manual control of the PRZR pressure master controller. The SRO will address applicable TS entered due to the instrument failure.

Subsequently, a 22 gpm SG tube leak will develop on the "A" SG. AOP 1.6.4 will be entered and the leak will be quantified. Due to the leak rate, AOP 1.6.4 will provide direction to enter Mode 3 IAW AOP 1.51.1. The SRO will address Technical Specifications which also will require Mode 3 entry.

The crew will initiate an emergency shutdown IAW AOP 1.51.1, when Rx power is reduced to <94%, the tube leak will become a 650 gpm tube rupture. The crew will identify degrading plant parameters and the SRO will direct a pre-emptive reactor trip and enter E-0.

An automatic Safety Injection will occur upon the Rx trip, the "B" HHSI pump will fail to automatically start on the SI signal, the ATC will identify the failure and manually start the pump. Additionally, the steam generator blowdown system will fail to automatically isolate requiring the BOP to identify and isolate the SG Blowdown system.

The crew will proceed thru E-0, perform diagnostics and determine that indications of a SGTR exist, the SRO will transition to E-3 to take actions to address the tube rupture.

After the crew identifies the "A" SG as the ruptured SG and isolates it, a target temperature will be determined and a cooldown commenced. A condenser steam dump valve will fail open during the cooldown, when the cooldown to target temperature is reached, the BOP will identify the failed open steam dump and report it to the crew. The SRO will direct the BOP to manually close the Main steam line isolation valves, requiring the BOP to stabilize RCS temperature using the "B" and "C" SG atmospheric steam dump valves.

The scenario will be terminated when the crew terminates SI and establishes a normal charging flow alignment IAW E-3.

Expected procedure flow path is E-0 → E-3

INITIAL CONDITIONS: **IC-64(18)**: 100% power, MOL, Equ. XE Conditions, CB "D" @ 228 steps, RCS boron - 870 ppm.
Use HTML, **1L16N2.HTM**, Initialize into specified IC and insert preloads per the HTML.

ADDITIONAL LINEUP CHANGES	STICKERS	MONITOR SETUP
1FW-P-3A CS in PTL	1FW-P-3A CS tagged	Normal Splash w/ Full Power Screen, on VB-B
EQUIPMENT STATUS	**DATE/TIME OOS**	**TECHNICAL SPECIFICATION(S)**
1FW-P-3A OOS, pump bearing replacement	Yesterday / 1800	3.7.5, Condition B

SHIFT TURNOVER INFORMATION

1. 100% power for the past month, MOL equilibrium conditions, shift goal is to maintain current power.

SCENARIO SUPPORT MATERIAL REQUIRED

1. MOL Reactivity Placard
2. Protected Train "B" Placard
3. Safety Status PNL lights LIT for "A" AFW
3. 1FW-P-2 aligned to A hdr placard

PROCEDURES NEEDED

E-0
E-3
1OM-46.4.G
6 IF, Attach 2
24 IF, Attach 3
Attachment 1-K
AOP 1.4.1
AOP 1.6.4
AOP 1.51.1

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Assign shift positions SRO:_____ ATC:_____ BOP:_____		
Conduct a shift turnover with oncoming operators.	Simulator frozen until after shift turnover unless it needs to be run momentarily for an alignment change.	
When the shift turnover is completed, place the simulator to RUN and commence the scenario.	Simulator running.	Crew assumes control of the unit.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 1:		
CH 3, "C" SG selected feedwater flow transmitter, FT-1MS-494 fails low. **IMF XMT-MSS039A (0 0) 0 45**	FT-1MS-494, Steam Flow Trans fails low. FCV-1FW-498, 1C SG MFRV modulates shut lowering SG level. ALARMS: A7-58, Loop C Feedwater flow > Steam Flow A7-61, 1C SG Level Deviation	BOP reports unexpected SG alarms. BOP identifies "C" SG level is lowering in Automatic. IAW AOP 1.41, BOP takes Manual control of FCV-1FW-498 and establishes control of SG level. SRO enters AOP 1.4.1, Process Control Failure, and directs BOP to place FCV-1FW-498 controller to Manual and establish control of SG level. SRO provides a control band of 65 ±5% and Rx trip criteria of 25% low/85% high for manual feedwater level control. SRO transitions to Feedwater System Instrument failure procedure, 1OM-24.4.IF, attachment 3.
	SRO enters Instrument Failure procedure, 1OM-24.4.IF, Attachment 3.	Crew identifies steam flow channel, FT-1MS-494, has failed low. SRO directs BOP to take manual control of FCV-1FW-498 and restore SG level to normal. SRO directs BOP to transfer C SG control to CH. 4. BOP places FC-1FW-498 (SF) in the FM 495 pos. BOP places FC-1FW-498 (FF) in the FM 496 pos. When SG level is stabilized within normal range, SRO directs BOP to place FCV-1FW-498 in AUTO. SRO contacts I&C to take actions per Attachment 3 of IF procedure and to investigate failed steam flow transmitter.
Proceed with next event at LE discretion.		

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 2:		
PR-1RC-444 fails high **IMF PRS08D (0 0) 2500 15**	PT-1RC-444 fails high.	
	A4-10, Pressurizer Control High Pressure Dev, followed by numerous Pressurizer pressure related alarms. PCV-1RC-445A & 445B PRZR spray valves modulate open. PORV, PCV-1RC-455C opens. All PRZR heaters turn off. RCS pressure decreases.	ATC recognizes pressurizer pressure related alarms and announces to the crew. Crew identifies PT-1RC-444 failure.
NOTE: ATC is required to manually control RCS pressure for remainder of scenario.		IAW AOP 1.4.1; Part B IOA's, ATC responds to PT-1RC-444 failure by: • Closing PCV-1RC-455C. • Placing Master Pressure control in Manual and adjusting demand to < 40%. • Checking pressure trending to 2235 psig. SRO provides a control band of 2235 ±15% and Rx trip criteria of 2100 psig low/2340 psig high for manual press control. After ATC stabilizes PRZR pressure, SRO transitions to 1OM-6.4.IF, Attachment 2
	SRO enters Instrument Failure procedure, 1OM-6.4.IF, Attachment 2.	Crew identifies PRZR Pressure control transmitter, PT-1RC-444 has failed high.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 2: (continued) **NOTE:** PORV 455C remains operable as manual operation is still available. **NOTE:** If DNB Tech Spec entry not identified by the crew at this time, ask as a follow-up question. Proceed with next event at LE discretion		SRO directs ATC to manually control PRZR press. ATC places CS for PCV-1RC-455C to close. ATC places Master Pressure Control in manual and manually operates PRZR Spray valves, PCV-1RC-455A, B and all PRZR heaters as necessary to control RCS pressure. SRO evaluates Technical Specifications: 3.4.1 (RCS DNB Parameters, RCS press < 2218 psia) Condition A: restore RCS pressure within 2 hours. 3.3.4 (Remote Shutdown System) Table B 3.3.4-1 Function 2.a: LCO met if PT-1RC-455 is operable.
EVENT 3: 22 gpm "A" SG Tube Leak. **IMF RCS03A (0 0) 30** **ROLE PLAY:** 2 minutes after being dispatched to the N-16 monitor: report "A" SG tube leakage indicates full scale. .	SG "A" 22 gpm Tube Leak A4-88, Stm Gen N-16 Monitor Alert/High Trbl A4-71; Radiation Monitoring High A4-72; Radiation Monitoring High-High SG Blowdown Sample, RIS-SS-100 High Air Ejector, RIS-SV-100 is High-High BD-101 Alert & Hi alarms on SPING SRO enters AOP 1.6.4, Steam Generator Tube Leakage.	ATC notes Radiation Monitor Alarms. BOP reviews ARPS, N-16 ARP directs entry into AOP 1.6.4. Crew dispatches an operator to the N-16 monitor to determine leakrate and affected SG. SRO estimates initial primary-to-secondary leakrate using radiation monitor alarm setpoints IAW AOP 1.6.4. Based on existing RM alarms, estimates > 75 gpd.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 3: (continued)		ATC controls charging flow as necessary to maintain programmed PRZR level using FCV-1CH-122 and HCV-1CH-186. Crew determines PRZR level can be maintained with normal charging flow. Crew identifies the affected SG via N-16 field report. ATC verifies VCT lvl maintained by normal makeup. Crew verifies RCS temperature is stable. ATC verifies FCV-1CH-122 is maintaining constant PRZR level in AUTO or places FCV-1CH-122 in MAN and controls charging flow to maintain a constant PRZR level. Crew checks VCT level trend, determines that VCT level is DROPPING at <1.8%/min. and >0.7%/min. Crew determines leakrate is >10 gpm & < 25 gpm. SRO informs SM of leak rate. Crew checks Unit Shutdown Requirement to Mode 3. SRO refers to Attachment 1, "SG Tube Leak Monitoring." IAW with AOP 1.6.4, SRO determines plant shutdown is required; Be <= 50% within 1 hour and MODE 3 entry within the next 2 hours.
	SRO evaluates Tech Specs for leakage.	TS 3.4.13 Condition B, Primary to secondary leakage not within limit, be in MODE 3 within 6 hours.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 3: (continued)		Crew verifies Safety Injection is NOT required due to PRZR level at or trending to program level with FCV-1CH-122 in AUTO. Crew checks Condenser Air Ejector Rad Monitor, reports RM-1SV-100 is in HIGH-HIGH alarm. BOP verifies Condenser Air Ejector discharge has aligned to CNMT, TV-1SV-100A – OPEN and TV-1SV-100B is CLOSED. SRO directs the crew to establish Mode 3 conditions using AOP 1.51.1 and continues in AOP 1.6.4.
EVENT 4: Unplanned Power Reduction IAW AOP 1.51.1	SRO enters AOP 1.51.1, Unplanned Power Reduction.	SRO directs ATC and BOP to reduce power to take the plant offline IAW AOP 1.51.1. Crew commences Power Reduction. BOP initiates turbine load reduction: • Depress 1st STG IN pushbutton. • Set EHC SETTER to desired load. • Set LOAD RATE thumbwheel to 2%. • Depresses GO. • Maintains power factor within limits during S/D.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 4: (continued)		Crew commences Power Reduction. ATC initiates Normal boration IAW Attachment 1: (2% per minute power reduction). • Places 1MU CS to STOP for >1 sec. • Places mode selector switch, 43/MU to BORATE. • Sets FCV-1CH-113A to flow rate desired. • Sets YIC-1CH-113, BA integrator, to total volume in gals of BA to be added per reactivity plan. • Resets YIC-1CH-113. • Verifies YIC-1CH-168 is set to "zero", then depresses reset. • Places 1MU CS to START, then verifies inservice BA pump starts, FCV-1CH-113B opens and boric acid flow is indicated on FR-1CH-113. • Adjusts FCV-1CH-113A setpoint as desired to control boration flowrate. Crew sounds the standby alarm and announces a Unit 1 rapid power reduction. ATC places all PRZR heaters to ON. ATC verifies rod control in AUTO and maintaining Tavg within ± 5F of Tref.
NOTE: Event 5 will automatically initiate when reactor power is reduced to <94% (approx. 6% power reduction).		BOP prepares to perform Attachment 3 to transfer busses to the offsite sources.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 5:		
650 gpm SGTR on "A" SG **TRGSET 4 'FNISPR(3)<=94'** **IMF RCS03A (4 0) 650 120'** (preloaded)	PRZR level and pressure decreases. A4-12, PRZR Control Low press deviation. followed by; A4-11, PRZR Control press low. A4-4, PRZR Control low level deviation.	ATC reports degrading primary plant conditions. SRO directs ATC to manually trip the reactor and initiate Safety Injection. SRO directs the crew to perform IOA's for E-0.
EVENTS 6, 7, & 8: (all preloaded to occur on the reactor trip)	"B" HHSI pump auto start failure on SI. SG Blowdown isolation failure. Condenser stm dump fails open following C/D. SRO enters E-0, Reactor Trip or Safety Injection	ATC verifies Reactor trip: • Rx trip and bypass breakers open. • Power range indication is < 5%. • Neutron flux is dropping. BOP verifies Turbine trip: • Throttle OR Governor valves ALL closed. • Main Generator output brks – open. • Exciter Circuit breaker – open.
	AE and DF Busses are energized from offsite.	BOP verifies Power to AC Emergency Busses • Using VB-C voltmeters or IPC, verifies AE and DF busses have voltage indicated. BOP identifies that both emergency busses are energized from offsite power.
	SI automatically actuated.	Check SI status: ATC reports SI automatically actuated and manually actuates SI by depressing both trains' pushbuttons. ATC/BOP, sounds standby alarm, announces reactor trip and safety injection.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6, 7, & 8: (continued)		Check if SI flow should be reduced. • Verifies that the "A" SG level is rising in an uncontrolled manner. SRO determines SI flow should not be secured. ATC verifies SI system status: • Charging pumps running – identifies only 1 HHSI pump is running and manually starts 1CH-P-1B. • LHSI pumps running – 2 running. • BIT Flow indicated – YES.
IMF INH40 (preloaded)	1CH-P-1B auto start failure.	
1FW-P-3A OOS on turnover.		BOP verifies AFW status: • Motor-driven AFW Pumps – ONE RUNNING. • Turbine-driven pump; TV-1MS-105A, B open. A7-7 is NOT LIT, turbine driven pump running. • AFW Throttle Vlvs all FULL OPEN. • Total AFW Flow – > 370 GPM.
NOTE: Evaluation of BOP performing Attachment 1-K begins on page 21.	List of Attachment 1-K Discrepancies: • "B" HHSI pump failed to auto start. • SG Blowdown failed to isolate. RCS temperature (Tavg) < 547°F and dropping due to Safety Injection flow.	SRO directs BOP to perform Attachment 1-K. ATC checks RCS temp. stable at or trending to 547°F: • ATC verifies no steam release is occurring. • ATC verifies Reheat steam is isolated. • ATC reduces total feedflow to minimize C/D.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6, 7, & 8: (continued)

ATC verifies PRZR isolated:

- PORVs – CLOSED. (all)
- Spray Valves – CLOSED. (both)
- Safety relief valves – CLOSED. (all)
- Power to at least one block valve – AVAILABLE. (all available)
- Block valves – AT LEAST ONE OPEN. (all)

ATC checks if RCPs should be stopped:

- D/P between RCS pressure and highest SG pressure – < 200 PSID.
- Criteria for stopping is not met – all RCPs left running.

ATC/BOP checks if any SGs are faulted:

- Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER.

  OR

- ANY SG COMPLETELY DEPRESSURIZED.

Crew determines NO SG's are faulted.

Crew checks if SG tubes are intact:

- Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER.
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES.

Crew determines "A" SG level is rising in an uncontrolled manner and verifies HHSI valves, MOV-1SI-867A,B,C,D all open & transitions to E-3.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6, 7, & 8: (continued)	SRO transitions to E-3, Steam Generator Tube Rupture.	SRO directs STA to commence control room ventilation actions. Refer to Attachment 4-F. ATC checks if RCPs should be stopped: • D/P between RCS pressure and highest SG pressure – <200 PSID. Crew determines criteria for stopping RCPs is not met.
NOTE: AFW flow may have been preemptively isolated after level rose to >31%.	"A" SG ruptured	Crew notes that "A" SG was previously identified as the ruptured SG based upon unexpected NR level rise. • BOP verifies "A" SG NR level >31%. • SRO directs BOP to isolate feed flow to ruptured SG.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6, 7, & 8: (continued)

Critical Task: CT-18 (E-3.A)
Crew isolates feed flow into and steam flow from the ruptured SG and directs operator to close isolation valve(s) operated from outside of the control room before a transition to ECA-3.1 occurs.

SAFETY SIGNIFICANCE -- Failure to isolate the ruptured SG causes a loss of differential pressure between the ruptured SG and the intact SGs. Upon a loss of differential pressure, the crew must transition to a contingency procedure that constitutes an incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy.

ROLE PLAY:
5 minutes after being dispatched to locally isolate 1MS-15 and open 1MS-17, insert
IRF FWM34 (0 0) 0
IRF FWM36 (0 0) 100
then report
1MS-15 is CLOSED
1MS-16 is OPEN
& 1MS-17 was OPENED.

NOTE:
The items underlined in the right column are the components that are required to be verified/manipulated to confirm isolation of a ruptured SG.

ATC/BOP isolates flow from the ruptured SG.

BOP verifies "A" SG atmospheric steam dump, PCV-1MS-101A, in MANUAL and closed.

BOP verifies residual heat removal valve – CLOSED.

Isolate ruptured SG to turbine driven AFW pump.
- Crew identifies that the steam supply from the "A" SG, 1MS-15 is open.
- BOP reports B motor-driven AFW pp running.
- BOP closes MOV-1MS-105, AFW Turbine Steam Isol Vlv.

Crew dispatches an operator to locally isolate steam supply valve from "A" SG, 1MS-15 and to:
- Verify open steam supply valve from "B" SG, 1MS-16.
- Unlock and open steam supply valve from "C" SG, 1MS-17.

If required, reopens MOV-1MS-105 starting 1FW-P-2.

Verify closed, ruptured SG blowdown isolation valve.
- BOP identifies TV-1BD-100A is NOT CLOSED, and valve failed to manually close.
- SRO directs BOP to CLOSE TV-1BD-101A1.
- BOP CLOSES TV-1BD-101A1.

Close ruptured SG Pre-non-return drain isol valve.
- BOP closes TV-1MS-111A.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6, 7, & 8: (continued)

Critical Task: CT-18 (E-3.A)
(continued)

BOP closes ruptured SG main steam trip, bypass, and non-return valves;

- TV-1MS-101A trip
- NRV-1MS-101A non return

BOP checks ruptured SG pressure is > 380 PSIG.

BOP initiates RCS cooldown:

- Determine required core exit temperature as a function of ruptured SG pressure.
- WHEN PRZR pressure < 1950 PSIG, THEN blocks low steamline pressure SI.
- Checks MSIVs - AT LEAST ONE OPEN ("B" & "C" SG MSIVs are open).
- Verifies Condenser is available.
- Places Steam dump controller in MANUAL.
- Selects STM PRESS Mode, stm dump control.
- Defeats TAVG interlock when necessary.
- Gradually raises steam dump demand to obtain a maximum cooldown rate.
- Verifies Core Exit TCs (CETC's) are reducing.

When CETC's (average of five hottest), Less than REQUIRED Core exit temp, BOP stops RCS cooldown and maintains CETC's < REQUIRED TEMPERATURE.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 8: Condenser steam dump fails open following cooldown. **IMF MSS08C (7 0) 50** (preloaded) **Critical Task: CT-19 (E-3.B)** **Crew establishes/maintains an RCS temperature so that transition from E-3 does not occur because the RCS temperature is in either of the following conditions:** **Too high to maintain minimum required subcooling for subsequent RCS depressurization** **OR** **Below the RCS temperature that causes a red or orange path challenge to Sub-criticality or Integrity CSF** SAFETY SIGNIFICANCE -- Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency procedure, which constitutes an incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy.		BOP recognizes RCS cooldown has not stopped and that a condenser steam dump remains with dual indication. SRO directs BOP to isolate Main Steam lines and stabilize RCS temp using Atmospheric stm dumps. BOP closes TV-1MS-101B and TV-1MS-101C. BOP manually controls PCV-1MS-101B and PCV-1MS-101C to stabilize RCS temperature.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6, 7, & 8 (continued)

BOP checks intact SG levels:

- Narrow range level > 31%.

Controls feed flow to maintain narrow range level between 25% and 65%.

ATC checks PRZR PORVs and block valves:

- Power to block valves. (all available)
- PORVs – CLOSED. (all)
- Block valves – AT LEAST ONE OPEN. (all)

ATC resets SI, CIA and CIB.

NOTE
If cooldown not previously completed, Crew will identify failed open Stm dump at this point and take previously scripted contingency actions to isolate the main steam lines.

BOP checks if RCS cooldown should be stopped:

- When CETCs (average of five hottest) - < REQUIRED TEMPERATURE

BOP stops RCS cooldown and maintains CETCs < REQUIRED TEMPERATURE.

BOP checks ruptured "A" SG pressure- STABLE OR RISING.

ATC checks RCS subcooling based on CETCs is greater than 66°F.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 6, 7, & 8 (continued)

ATC depressurizes RCS to minimize break flow and refill PRZR.

- Checks RCPs 1A and 1C - BOTH RUNNING.
- Fully opens both PRZR spray valves.
- Opens one PRZR PORV.
- Checks depressurization method is EFFECTIVELY REDUCING RCS PRESSURE.

Critical Task: CT-20 (E-3.C)
Crew depressurizes the RCS to meet SI termination criteria before water release from the ruptured SG safety or atmospheric relief valve.

SAFETY SIGNIFICANCE -- Failure to stop reactor coolant leakage into a ruptured S/G by depressurizing the RCS needlessly complicates mitigation of the event. It also constitutes a "significant reduction of safety margin beyond that irreparably introduced by the scenario."

ATC continues depressurization until ANY of the following conditions satisfied:

- PRZR level >76%. (61% ADVERSE CNMT)

-OR-

- RCS subcooling based on CETCs is less than SUBCOOLING ON ATTACHMENT 6-A.

-OR-

- BOTH of the following:
  - RCS pressure < RUPTURED SG press
  - PRZR level >17% (38% ADVERSE CNMT)

-OR-

- BOTH of the following:
  - RCS pressure within 300 PSI of RUPTURED SG pressure.
  - PRZR level > 47%. (50% ADVERSE CNMT)

When above criteria met:

- ATC closes open PORV.
- ATC closes both PRZR spray valves.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
		Checks RCS pressure is rising: • ATC verifies RCS pressure is rising. Crew checks if SI flow should be terminated. ATC verifies RCS subcooling based on CETC's, is > 46°F or > Attachment 6-A. BOP confirms secondary heat sink available by >370 gpm of feed flow available OR NR level in at least 1 SG > 31% (50% ADVERSE CNMT). ATC confirms RCS pressure is stable or rising. ATC reports PRZR level is > 17%. Crew determines that current plant conditions support SI termination. ATC stops all but 1 charging pump. Isolate the BIT: • ATC closes MOV-1SI-867A, B, C, & D. • ATC verifies HHSI flow indicates zero gpm. ATC establishes charging flow by; • Confirming Normal charging is isolated. • Closing FCV-1CH-122. • Opening MOV-1CH-310 and MOV-1CH-289. • Adjusting FCV-1CH-122 as necessary to maintain PRZR level between 31% and 50%.
Terminate scenario when the crew has isolated HHSI flow and established a normal charging flowpath.		

Classify Event:
ALERT per **FA1**, due to a LOSS of RCS Barrier because of a RUPTURED SG resulting in an SI Actuation.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions'	Both EDG's are running.	BOP performs the verifications/actions of Attachment 1-K 'Verification of Automatic Actions' as follows: Diesel generators – BOTH RUNNING with no Trouble Alarms, RW pumps running supplying cooling water flow. Verifies power to both Emergency 4KV AC busses. Check at least 1 Leak Collection Exhaust fan running, 1VS-F-4A(4B). Station instrument air header pressure > 100 PSIG. Ensure Reheat Steam Isolation: • Verify MOV-1MS-100A,B – CLOSED. • Reset reheater controller. • Close MOV-1MS-204, gland stm spillover vlv. Verify CCR Pumps - ONE RUNNING with recirc pressure >100 psig. Align Neutron Flux Monitoring For Shutdown: • When operable IR channels <1E-10 amp, check SR channels energized. • Transfer NR-1NI-45 recorder to operable source and intermediate range displays.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued)	"B" HHSI pump failed to automatically start upon the SIS actuation signal, manual start was successful. SG Blowdown failed to isolate on CIA, redundant valves closed.	Verify River Water System In Service: • RPRW Pumps - TWO RUNNING. • Check CCR Heat EX RW press is > 20 psig. OR (IF CIB has occurred) • Verify RPRW flow to recirc spray hxs. Check If Main Steamline isolation required: • CNMT pressure - > 7 PSIG -OR- • Steamline pressure - < 500 PSIG -OR- • Steamline pressure high rate of change - ANY ANNUNCIATOR LIT (A7-41, A7-49, A7-57) Determines steamline isolation is NOT required. Check CIB And CNMT Spray Status: • Containment press - REMAINED < 11 PSIG. Verify ESF Equipment Status: • Verify SI status by checking all RED SIS marks – LIT. • Verify CIA by checking all ORANGE CIA marks – LIT. • Verify FWI by checking all GREEN FWI marks – LIT.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued)		When SR's are energized, verify Audible indication: • Verify operating SR Ch selected on Audio Count Rate Channel Selector Switch. • Audible indication functioning properly. • Adjust Multiplier Sw & Volume as necessary. Start CNMT Hydrogen Analyzers: • Using 1OM-46.4.G, gets keys, opens isolation valves (VB-A) and dispatches an operator to continue putting Hydrogen analyzers in service.
Attachment 1-K– COMPLETE	**Discrepancies:** • "B" HHSI pump failed to auto start. • SG Blowdown failed to isolate.	Upon completion, reports any discrepancies to SRO.

Facility: **BVPS Unit 1** Scenario No. 3 Op Test No.: BV1LOT16 NRC

Examiners: _____ Candidates: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: **IC-66(5)**: ~5% power, BOL, CB "D" @ 109 steps, RCS boron - 1750 ppm.

Turnover: Raise Rx power and place turbine online.

Critical Tasks:

1. **CT-1 (E-0.A)** Crew manually trips the reactor.
2. **CT-24 (E-0.C)** Energize 1 AC emer bus
3. **CT-9 (E-0.L)** Establish flow from RPRW pump

Event No.	Malf. No.	Event Type	Event Description
1		(R) ATC (N) SRO	Power increase to > P-10.
2	FWM08B	(C,A) BOP, SRO	"B" Bypass feed regulating valve fails asis in Auto. Requires manual control
3	CHS22 X06D088M	(C,A) ATC, SRO	Failure of FCV-1CH-122 controller, requires manual control of PRZR lvl.
4		(N) BOP, SRO	Startup standby Turbine plant River water pump
5	NIS08B	(C,A) BOP, SRO (TS) SRO	N-42 Instrument power fuse blown. (>P6 and < P10)
6	XMT-CNM004A	(TS) SRO	CH 2, CNMT Pressure transmitter fails High, PT-1LM-100B
7	SIS10B	(M) All	Inadvertent Train "B" SI with Rx trip failure.
8		(C,A) ATC, SRO	Manual Rx trip
9	EPS04E, 04F INH53, 54	(C) BOP, SRO	Loss of 1AE and 1DF 4kv Busses on Rx trip w/ EDG auto start failures.
10	INH32, 33	(C) BOP, SRO	Reactor plant River water pump auto start failures on Sequencer, requires manually starting WR-P-1A and 1B.
11	CHS21A	(C) ATC, SRO	Letdown isolation on SI unable to be recovered due to failure of LCV-1CH-460A, requires Excess letdown.

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

E-0 → ES-1.1

The crew will assume the shift at approximately 5% (4.8%) power with instructions to raise power to place the turbine online IAW the reactivity plan and 1OM-52.4.***B***. The ATC will initiate a dilution and withdraw control rods.

After the power has raised to >5.5%, "B" SG Bypass Feed regulating valve will fail as is in Auto, failure will become evident as Rx power continues to be raised, the BOP will be required to identify the malfunction and take action to control FCV-1FW-489 in manual IAW AOP 1.4.1 Process Control Failure. Additionally, at >5.5% Rx power, FCV-1CH-122 will fail closed in Auto, the ATC will be required to identify the failure and manually control FCV-1CH-122 IAW AOP 1.4.1, to maintain PRZR level.

A field operator will then report that the "A" Turbine Plant River Water pump, has a significant ***seal*** leak and needs to be shutdown. IAW 1OM-30.4.N, Standby Turbine Plant River Water Pump Startup, the BOP will startup 1WR-P-6B and shutdown 1WR-P-6A.

An instrument power fuse will then blow for Power Range Nuclear instrument, N-42. The crew will identify the N-42 blown fuse failure and the SRO will enter AOP 1.2.1C, Power Range Channel Malfunction, and direct the BOP to remove the failed channel from service. The SRO will address Tech Specs for the failed instrument.

After the crew has removed N42 from service, CH 2 containment pressure transmitter, PT-1LM-100B fails high. The SRO will enter 1OM-1.4.IF and review the Technical Specifications. The SRO will then contact I&C to trip the applicable bistables.

After the SRO has determined the appropriate Technical Specifications for the CNMT pressure channel, a spurious Train "B" Safety Injection signal will occur with an automatic Rx trip failure. The crew will recognize the automatic Rx trip failure and the SRO will direct the ATC to manually trip the Rx and perform the IOA's of E-0.

Upon the Rx trip, both Emergency 4Kv buses will deenergize with auto start failures of both Emergency Diesel Generators. The BOP will start an EDG IAW E-0 IOA's (RNO actions).

Upon EDG start, each respective River water pump will fail to auto start via sequencer, the crew will identify the auto start failure and start each RW pump.

The crew will continue progressing thru E-0 and perform diagnostic steps and determine that no accident has occurred and plant conditions support Termination of Safety Injection and transition to ES-1.1. LCV-1CH-460A fails closed upon the SI signal and will not be able to be reopened requiring the crew to place Excess letdown in service.

The scenario will be terminated when the crew establishes Excess letdown flow.

Expected procedure flow path is E-0 → ES-1.1

INITIAL CONDITIONS: **IC-66(5)**: 4.8% power, BOL, Start up in progress, CB "D" @ 109 steps, RCS boron - 1750 ppm.
Use HTML, **1L16N3.HTM**, Initialize into specified IC and insert preloads per the HTML.

ADDITIONAL LINEUP CHANGES	STICKERS	MONITOR SETUP
		Normal Splash w/ MID Power Screen, on VB-A
EQUIPMENT STATUS	**DATE/TIME OOS**	**TECHNICAL SPECIFICATION(S)**

SHIFT TURNOVER INFORMATION

1. 4.8% power, BOL, plant startup in progress, shift goal is to raise power IAW the reactivity plan and make preparations for turbine roll.
2. SM requests the crew use "Alternate Dilute" method for required dilutions.
3. Procedure package to include, Reactivity plan, 1OM-52.4.B (placekept), 1OM-7.4.BB.

SCENARIO SUPPORT MATERIAL REQUIRED

1. BOL Reactivity Placard
2. 1OM-52.4B, place kept up to step 11.
3. Reactivity plan
4. 1OM-7.4.BB
5. Protected Train "B" Placard
6. Aux steam from Unit 2 placard posted

PROCEDURES NEEDED

E-0
ES-1.1
1OM-7.4.H
1OM-30.4.N
1OM-46.4.G
1 IF, Attach 1
Attachment 1-K
AOP 1.2.1C
AOP 1.4.1
AOP 1.36.2

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Assign shift positions SRO:_____ ATC:_____ BOP:_____		
Conduct a shift turnover with oncoming operators.	Simulator frozen until after shift turnover unless it needs to be run momentarily for an alignment change.	
When the shift turnover is completed, place the simulator to RUN and commence the scenario.	Simulator running.	Crew assumes control of the unit.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 1, 2 & 3: Normal Plant Startup, Rx Power increase to 10-14% to support Turbine Startup.		ATC commences raising reactor power to between 10 and 14%.
NOTE: Reactivity plan requires 300 gallons dilution and 8 rod steps to raise power to 10%. Crew may elect to add total dilution volume in multiple steps. **NOTE:** Events 2 & 3 are triggered to actuate on rising power at 5.5% on N43. Both events will enter at 5.5% but event 3 will be more obvious sooner then event 2. It is expected that operator response to event 3 will be complete prior to event 2 symptoms being observable.		ATC initiates control rod withdrawal and dilution IAW 1OM-7.4.BB and the reactivity plan. • Places 1MU control switch to STOP for greater than 1 second • Place 43/MU Control switch in ALT DIL. • Set AM-1CH-114, Blender Total Flow Set Point to desired flow rate • Set YIC-1CH-168A, Blender Output Integrator, to desired dilution quanity • Reset YIC-1CH-168A • Place 1MU Control Switch to START • Verify FCV-1CH-114B opens, • Verify FCV-1CH-113B opens • Verify PG water to Blender flow rate indicated on FR-1CH-113. • When YIC-1CH-168A reaches setpoint, verify dilution automatically stops.
When Rx Power increases to > 10%.	Status lights on Panel 176 actuate at 10%.	ATC verifies P-10 bistables lit on Panel 176.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
	Status Light PNL 176, D10, - 'INT RNG RX TRIP BLOCKED' – LIT.	ATC blocks the IR High Flux Trip AND IR High Flux Rod Stop by placing the IR BLOCK TRAIN and TRAIN B control switches to the BLOCK position and verifies status pnl 176, D10 is LIT.
	Status Light PNL 176, B12, - 'PW RA LO SET R TRIP BLKD' – LIT.	ATC blocks the Power Range Low Overpower Trip by placing the PR BLOCK TRAIN A and TRAIN B control switches to the BLOCK position and verifies status pnl 176, B12 is LIT.
		ATC selects highest power ranges on NR-45.
EVENT 3: (Automatically occurs at ≥ 5.5% pwr) FCV-1CH-122 fails closed in Auto **IMF CHS22 (4 0) 0 20**	FCV-1CH-122 closes, Valve demand increases A3-58, Charging Pump Discharge Flow Hi-Lo A3-115 Regen Hx L/D temp Hi (dependent on operator response)	ATC notes alarm and notifies crew. ATC notes problem with PRZR level control, IAW AOP 1.4.1, Process Control Failure, takes manual control of FCV-1CH-122 and informs SRO.
	PRZR level decreases.	BOP reviews ARP.
NOTE: ATC is required to manually control PRZR level for remainder of scenario.	SRO may enter 1OM-7.4.IF, attachment 2.	SRO directs ATC to restore PRZR level to program value using FCV-1CH-122 in manual. Due to manual control of PRZR level, SRO establishes a level control band of program level ±5% and Rx trip criteria of 5% low and 90% high. SRO notifies I&C to investigate.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 2: Malfunction for event 3 is triggered to insert at 5.5% power and will become evident when power rises. **ROLE PLAY:** If dispatched to FCV-1FW-498, wait 2 minutes then report nothing obvious wrong at the valve.	"B" SG level decreases due to increased steaming rate at higher power and constant valve position. A7-54 will alarm for SG level dev. if the crew doesn't notice FCV-1FW-489 malfunction.	BOP recognizes "B" SG level decreasing. IAW Process Control Failure procedure, AOP 1.4.1, BOP places controller for FCV-1FW-489 in manual and restores SG level to program. SRO provides a control band of 65 ±5% and Rx trip criteria of 25% low/85% high for manual feedwater level control.
EVENT 4: At LE discretion, call in and give following ROLE PLAY. **ROLE PLAY:** Report in as field operator and state "The inservice Turbine plant River water pump has a significant seal leak and needs to be removed from service. All local prestart checks have been completed and the standby pump is ready for service." Proceed with next event at LE discretion	SRO enters 1OM-30.4.N to startup the standby TPRW pump and shutdown the inservice TPRW pump.	SRO directs BOP to start the standby TPRW pump and secure the inservice TRPW pump. BOP places motor bearings on trend on IPC. BOP starts 1WR-P-6B, verifies starting current drops off to normal running current. BOP verifies discharge valve, MOV-1RW-110B automatically opens. BOP places and holds 1WR-P-6A CS to STOP, verifies Annunciator A6-118 is OFF and releases CS. BOP verifies discharge valve, MOV-1RW-110A closes.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENT 5:

N-42 Instrument Power blown fuse **IMF NIS08B (0 0) 0**	N-42 failure. Alarms; A4-57: NIS PR Low SP Neutron Flux Hi A4-65: NIS PR High SP Flux Hi A4-66: NIS PR High SP overpower Rod stop A4-68: NIS PR Comparator Deviation A4-69: NIS PR Neutron Flux Rate Hi	ATC reports multiple unexpected NIS alarms.
		ATC and BOP verifies plant remains stable.
		ATC reports N-42 indication is not consistent with other power range channels.
		Crew identifies Blown Instrument fuse indications for N-42.
	SRO enters Power Range Channel Malfunction procedure, AOP 1.2.1C to address failed NI channel.	ATC reports only one PR channel (N-42) has failed.
		BOP turns "Rod Stop Bypass Switch" for N42 on NIS Rack N50 to BYPASS. ATC verifies status light for Overpower Rod Stop Bypass for N42 is lit. (status pnl 176, B-14)
		BOP turns "Comparator Channel Defeat Switch" on NIS rack N37/N46 to N42 position.
		Within 1 hr, verifies P-8, P-9, & P-10 interlocks in required state for current power level.
		Within 72 hrs, trips nuclear bistables by removing control power fuses from Drawer A for N42 or directing I&C to remove the failed ch from service.
		Crew recognizes failure is an OTΔT channel and directs I&C to trip the applicable bi-stables from Attachment 1 within 72 hours.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
		ATC ensures VB recorders are selected to operable detectors.
	SRO evaluates Tech Specs for N-42 failure.	SRO addresses TS for N-42 failure: 3.3.1, Function 2.a, PR Neutron flux - HIGH, Condition D, trip ch w/in 72 hrs and QPTR every 12 hours. 3.3.1, Function 2.b, PR Neutron flux - LOW, Condition E, trip ch w/in 72 hrs.- (N/A if > P-10). 3.3.1, Function 3, PR Hi flux rate, Condition E, trip ch w/in 72 hrs. 3.3.1, Function 6, OTΔT, Condition E, trip ch w/in 72 hrs. 3.3.1, Functions 17.c, d, Rx trip interlocks, Condition P, verify in required state w/in 1 hr. 3.3.1, Function 17.e, Rx trip interlocks, Condition O, verify in required state w/in 1 hr. 3.3.3, for PAM instrumentation – for Info Only.
Proceed with next event at LE discretion		
EVENT 6: Containment Pressure Ch 2 transmitter (PT-1LM-100B) fails high **IMF XMT-CNM004A (0 0) 55 40**	Containment Pressure Ch 2 transmitter PT-1LM-100B fails high. A1-58, Containment Press High (1/3) A1-60, Containment Press Intermediate High-High (1/3) A1-66, Containment Press High-High (1/4)	ATC announces multiple unexpected containment pressure related alarms. ATC reports PT-1LM-100B failed high. BOP reviews ARPs and reports entry into IF procedure is required.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 6: (continued) **NOTE:** If SRO did not identify applicable TS prior to next event being entered, ask as a follow up question. Proceed with next event at LE discretion.	SRO enters 1OM-1.4.IF, Attach. 1, Instrument Failure procedure for failed Ch 2 CNMT Pressure. SRO evaluates Tech Specs for failed CNMT pressure channel.	Tech Specs 3.3.2, Condition A requires actions from Table 3.3.2-1, Functions 1.c, & 4.c, Condition D – Place channel in TRIP within 72 hrs or Shutdown. Functions 2.a.3, 2.b.2, & 3.b.3, Condition E – Place channel in BYPASS within 72 hrs or Shutdown. SRO notifies I&C to investigate and trip/bypass bistables within 72 hrs.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7 and 8: Inadvertent Train "B" SI with automatic Reactor Trip failure. **IMF SIS08** **IMF CRF12A** (preloaded)	Train "B" SIS components actuate, including Feedwater isolation and CIA. Main feedwater pump trips due to FWI.	Crew recognizes a loss of feedwater/Safety Injection signal has occurred and the Reactor has failed to automatically trip.
	Manual Rx trip successful.	SRO directs the ATC to manually trip the Rx.
Critical Task CT-1 (E-0.A): **Crew manually trips the reactor from the Control Room before performing the mitigation strategy of FR-S.1.**		SRO directs the crew to perform IOA's for E-0.
SAFETY SIGNIFICANCE -- Failure to manually trip the reactor causes a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated conditions.		
NOTE: For this fast acting event, the crew may trip the Rx due to loss of feed. If this occurs quickly, the crew may not recognize the automatic Rx trip failure.		
	SRO enters E-0	ATC verifies Reactor trip: • Rx trip and bypass breakers open. • Power range indication is < 5%. • Neutron flux is dropping. BOP verifies Turbine was not online and is tripped: • Throttle OR Governor valves ALL closed. • Main Generator output brks – open. • Exciter Circuit breaker – open.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 9 and 10: Loss of 1AE and 1DF 4Kv Emergency Busses on Rx trip with auto start failures of EDG'S and Reactor plant River Water pumps. **IMF SIS08** **IMF CRF12A** (preloaded) **ROLE PLAY:** If directed to investigate EDG status, wait 4 minutes then report as appropriate: If not manually started, report no obvious problems identified at diesel(s). If manually started, diesel(s) running sat with normal cooling flow (if RPRW pump was started.)	AE and DF Busses are both de-energized. Offsite power not available. Both 4Kv emergency busses de-energize when the Reactor is manually tripped. EDG's fail to automatically start. (Both will manually start from BB controls.) When emergency bus is powered from EDG, Reactor plant River water pumps will fail to start from the sequencer.	BOP verifies Power to AC Emergency Busses; • Using VB-C voltmeters, verifies neither AE nor DF 4Kv busses have voltage indicated. BOP identifies that both emergency busses are de-energized with no EDGs running.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 9 and 10: (continued)

Critical Task: CT-24 (E-0.C)
Crew energizes at least one AC emergency bus before transition out of E-0, unless the transition is to ECA-0.0, in which case the critical task must be performed before placing safeguards equipment hand switches in pull-to-lock position.

SAFETY SIGNIFICANCE -- Failure to energize an ac emergency bus constitutes "misoperation or incorrect crew performance which leads to degraded...emergency power capacity." Failure to perform the critical task also results in needless degradation of a barrier to fission product release, specifically of the RCS barrier at the point of the RCP seals.

NOTE:
IAW Transient Response Guidelines, the BOP is expected to start only 1 EDG IAW E-0 RNO, and then start the second EDG following completion of the IOA's using either AOP 1.36.2 or Attachment 1-K.

BOP verifies Power to AC Emergency Busses
- Using VB-C voltmeters, verifies neither AE nor DF has voltage indicated.

BOP identifies that both emergency busses are de-energized with no EDGs running.

BOP performs RNO actions of E-0, step 3.
- Verifies no Orange or Purple bordered alarms for Electrical Protection are lit.
- Depresses both DG STOP pushbuttons.
- Places CS to EXERCISE.
- Depresses START pushbutton.
- Verifies 900 RPM on tachometer.
- Depresses Field Flash pushbutton.
- Closes EDG output breaker.
- Verifies associated RPRW pump is running.
  Identifies RPRW pump is not running.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 9 and 10: (continued)		BOP verifies AFW status: • Motor-driven AFW Pumps – Both RUNNING. • Turbine-driven pump; TV-1MS-105A, B open. A7-7 is NOT LIT, turbine driven pump running. • AFW Throttle Vlvs all FULL OPEN. • Total AFW Flow is > 370 GPM.
NOTE: Evaluation of BOP performing Attachment 1-K begins on page 22.	List of Attachment 1-K Discrepancies: • Train "A" SIS failed to auto actuate. • Both EDG's failed to auto start. • Both RPRW pumps failed to auto start.	SRO directs BOP to perform Attachment 1-K.
NOTE: If the crew has preemptively throttled AFW flow, RCS temperature will be stable at or trending to 547F.	RCS temperature < 547F and dropping due to low decay heat and AFW flow.	ATC checks RCS temp. stable at or trending to 547F; • ATC verifies no steam release is occurring. • ATC verifies Reheat steam is isolated. • ATC reduces total feedflow to minimize C/D. ATC verifies PRZR isolated: • PORVs – CLOSED (all) • Spray Valves – CLOSED (Controlling press) • Safety relief valves – CLOSED (all) • Power to at least one block valve – AVAILABLE (all available) • Block valves – AT LEAST ONE OPEN (all)

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 9 and 10: (continued)

ATC checks if RCPs should be stopped:

- D/P between RCS pressure and highest SG pressure is < 200 PSID (350 PSID ADVERSE CNMT).
- Criteria for stopping is not met – all RCPs left running.

ATC/BOP checks if any SGs are faulted:

- Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER.

  OR
- ANY SG COMPLETELY DEPRESSURIZED.

Crew determines NO SG's are faulted.

Crew checks if SG tubes are intact:

- Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER.
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES.

Crew determines all SG tubes are intact.

Crew checks if RCS is intact by checking CNMT conditions consistent with pre-event values:

- CNMT radiation.
- CNMT pressure.
- CNMT sump level.

Crew determines the RCS is intact based on CNMT conditions consistent with PRE-EVENT VALUES.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
		Crew checks if SI flow should be reduced. ATC verifies RCS subcooling is >46F based on CETC's. BOP confirms secondary heat sink available by >370 gpm of feed flow available OR NR level in at least 1 SG >31%. ATC confirms RCS pressure is stable or rising. ATC confirms PRZR level is >17%. Crew determines that current plant conditions support SI reduction.
	SRO transitions to ES-1.1, SI Termination	
NOTE: SIS signal previously RESET.		ATC/BOP resets SI – both trains. ATC/BOP resets CIA and CIB – both trains.
NOTE: Charging pump is running on sequencer, requires PTL to S/D.		ATC stops 1 charging pump.
	HHSI flow previously isolated in E-0.	SRO directs ATC to isolate the BIT: • ATC verifies MOV-1SI-867A,B,C, D closed. ATC verifies HHSI flow is secured.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

SRO directs ATC to establish normal charging flowpath by:

- Verifying normal charging is isolated.
- Closing FCV-1CH-122.
- Opening MOV-1CH-310.
- Opening MOV-1CH-289.
- Controlling FCV-1CH-122 as necessary to maintain PRZR level.

BOP verifies 4160V and 480V stub busses energized:

- Verifies ACB-1E5 and ACB-1F5 closed.
- BA transfer pumps or CNMT vacuum pump indicating lights are lit.

BOP verifies CNMT Instrument air is available:

- Station Instrument Air > 100 psig.
- TV-1IA-400 open.
- CNMT Instrument Air header > 85 psig.

ATC checks if LHSI pumps should be stopped:

- LHSI pumps are running with RWST suction.

ATC stops LHSI pumps AND places CS's in AUTO.

ATC resets SI Auto Recirc Changeover by depressing both trains RESET PBs.

ATC verifies SI flow is NOT required:

- Verifies RCS subcooling is >46F.
- Verifies PRZR level is >17%.

Crew confirms that SI is NOT required.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

Maintain RCS temp. via condenser steam dumps:

- BOP confirms ALL MSIV's are open.
- Condenser steam dumps previously in steam pressure mode.
- Defeats Tavg interlock as necessary.
- Adjust controller setpoint as necessary to maintain RCS temperature.

ATC verifies RCS Hot Leg temperatures – STABLE.

Crew verifies no Quench or Recirc Spray pps running.

Crew checks if Letdown can be Established, ATC verifies;

- PRZR level >31%.
- CCR Hx RW hdr press > 20 psig.
- At least 1 CCR pump is running.

Crew determines conditions support establishing L/D.

EVENT 11:

SRO directs the crew to monitor L/D rad monitor.

LCV-1CH-460A failed closed.
IMF CHS21A (6 0) 1
(preloaded)

ATC establishes letdown as follows:

- Verifies normal charging is established.
- Places PCV-1CH-145 in MAN & 75% open.
- Opens TV-1CH-204.
- Attempts to opens LCV-1CH-460A.

ATC reports LCV-1CH-460A will NOT open.

SRO enters 1OM-7.4.H, "Excess Letdown Heat Exchanger Operation."

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
ROLE PLAY: 2 minutes after being dispatched to energize a loop drain valve, enter command and report back.		Crew places Excess Letdown Hx in service: • BOP dispatches operator to energize loop drain valve. • ATC opens energized loop drain valve. • ATC places HCV-1CH-389 CS to "PDT TANK" position. • ATC opens MOV-1CH-201. • ATC slowly adjusts MOV-1CH-137 to warm up the Excess L/D Hx, limiting temperature at < 140F (TI-1CH-139) and pressure at <135 psig (PI-1CH-138.)
Terminate scenario when the crew has aligned Excess letdown and initiated a warmup of the Excess letdown system.		

Classify Event:
The highest EPP call would be an **ALERT** based on EAL **SA3** due to a Failure of the reactor protection system.
However, due to initially being a fast moving scenario, the Rx trip failure may not be recognized until the post-trip review.
Therefore, if the manual Rx trip was based upon a loss of main feedwater, the expected EPP call would be **UNUSUAL EVENT** based on EAL **SU1** – due to a loss of offsite power to both 4KV Emergency busses for > 15 minutes.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions'		BOP performs the verifications/actions of Attachment 1-K 'Verification of Automatic Actions' as follows:
NOTE: Neither EDG auto started on loss of power, 1 EDG would have been started IAW E-0 step. 2nd EDG would have been started IAW AOP 1.36.2 or this attachment.	Both EDG's failed to auto start on loss-of power.	Diesel generators – Both NOT running. Verifies no Orange (Purple) Alarms. Depresses both STOP PB's. Selects EXERCISE and depresses START PB. Depresses FIELD FLASH PB and closes output brkr. Identifies RW pump failed to start on sequencer and manually starts RW pump to supply cooling water. Verifies power to both Emergency 4KV AC busses. Check at least 1 Leak Collection Exhaust fan running, 1VS-F-4A(4B). Station instrument air header pressure > 100 PSIG. Ensure Reheat Steam Isolation: • Verify MOV-1MS-100A,B – CLOSED. • Reset reheater controller. • Close MOV-1MS-204, gland stm spillover vlv. Verify CCR Pumps - ONE RUNNING with recirc pressure >100 psig. Align Neutron Flux Monitoring For Shutdown: • When operable IR channels <1E-10 amp, check SR channels energized. • Transfer NR-1NI-45 recorder to operable source and intermediate range displays.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued)	Both RPRW pumps failed to auto start on sequencer.	Verify River Water System In Service: • RPRW Pumps - TWO RUNNING. • Check CCR Heat EX RW press is > 20 psig. OR (IF CIB has occurred) • Verify RPRW flow to recirc spray hxs. Check If Main Steamline isolation required: • CNMT pressure - > 7 PSIG. -OR- • Steamline pressure - < 500 PSIG. -OR- • Steamline pressure high rate of change - ANY ANNUNCIATOR LIT (A7-41, A7-49, A7-57). Determines steamline isolation is NOT required. Check CIB And CNMT Spray Status; • Containment press - REMAINED < 11 PSIG.
	"A" Train of SIS failed to automatically actuate, manual actuation successful.	Verify ESF Equipment Status: • Verify SI status by checking all RED SIS marks – LIT. • Verify CIA by checking all ORANGE CIA marks – LIT. • Verify FWI by checking all GREEN FWI marks – LIT.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued)		When SR's are energized, verify Audible indication: • Verify operating SR Ch selected on Audio Count Rate Channel Selector Switch. • Audible indication functioning properly. • Adjust Multiplier Sw & Volume as necessary. Start CNMT Hydrogen Analyzers: • Using 1OM-46.4.G, gets keys, opens isolation valves (VB-A) and dispatches an operator to continue putting Hydrogen analyzers in service.
Attachment 1-K– COMPLETE	**Discrepancies:** • Train "A" SIS failed to auto actuate. • Both EDG's failed to auto start. • Both RPRW pumps failed to auto start.	Upon completion, reports any discrepancies to SRO.

Facility: **BVPS Unit 1** Scenario No. 5 Op Test No.: BV1LOT16 NRC

Examiners: _____ Candidates: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: **IC- 68 (10)**: 100% power, BOL, Equ. XE Conditions, CB "D" @ 228 steps, RCS boron - 1210 ppm, 1FW-P-3A OOS

Turnover: Maintain 100% power.

Critical Tasks:

1. **CT-10 (E-0.M)** Crew closes ***failed*** PORV valves.
2. **CT-11 (E-0.O)** Crew closes CNMT isolation valves.
3. **CT-43 (FR-H.1.A)** Crew establishes feedwater flow before feed and bleed required.

Event No.	Malf. No.	Event Type	Event Description
1	CHS20B	(I,A) ATC, SRO	VCT Level Transmitter, ***LT-1CH-115*** fails low causing auto makeup to occur.
2	FWM14B	(C,A) BOP, SRO	"A" Feedwater flow transmitter fails high, requires manual control of Feedwater control valve and placing alternate channel in service and return to auto control.
3	NIS03D	(C,A) ATC, SRO (TS) SRO	N44 failed high, control rods automatically insert. (AOP 1.1.3)
4		(N) BOP, SRO (TS) SRO	N44 removal from service. (AOP 1.2.1C)
5	CRF04	(C,A) BOP, SRO (TS) SRO	Dropped Rod, requires turbine load reduction (AOP 1.1.8)
6	CRF04BP	(C,A) ATC, SRO	2nd Dropped Rod, requires manual Rx trip.
7		(M) ALL	Reactor Trip
8	PRS08E	C) ATC, SRO	PT-1RC-445 fails high on Rx trip, PORVs open, requires closing valves.
9	INH49 VLV-SEA09	(C) BOP, SRO	Train "B" CIA Actuation failure with MOV-1CH-378 (Trn A) auto close failure.
10		(M) ALL	Loss of ALL Feedwater – FR-H.1 with main feed pump recovery.

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

E-0 → FR-H.1 → E-0

After taking the shift at 100% power with AFW pump 1FW-P-3A OOS, VCT level transmitter, ***LT-1CH-115*** will fail low causing an automatic Makeup to occur. The ATC will diagnose the indications and IAW AOP 1.4.1, Process Control Failure, turn the blender off to stop the makeup and ensure the plant is stable, the SRO will transition to the instrument failure procedure for further channel actions.

The channel 3, "A" SG feed flow transmitter, FT-1FW-477, will then drift high, the crew will recognize the SG level perturbation and IAW AOP 1.4.1, the BOP will place the controller for 1FW-FCV-478 in manual and restore SG level, the SRO will transition to the instrument failure procedure for additional channel removal actions and place the alternate channel in service, the BOP will then return 1FW-FCV-478 to automatic control.

Power Range Nuclear instrument, N-44 will then fail high causing the control rods to automatically insert. The crew will perform the Immediate Operator Actions for AOP 1.1.3, Unexpected Control Rod Movement. The ATC will identify the N-44 failure and place the rods in manual. The SRO will then transition to AOP 1.2.1C, Power Range Channel Malfunction, and direct the BOP to remove the failed channel from service. The SRO will address Tech Specs for the failed instrument.

A control rod will then drop, the crew will enter AOP 1.1.8 for an Inoperable Rod. Due to the magnitude of the RCS temperature drop, the crew will be required to lower power to restore RCS temperature. The SRO will address Tech Specs for the dropped rod.

After the crew has completed a power reduction and stabilized the plant, a 2nd control rod will drop. The ATC will recognize that 2 control rods are now dropped. Due to 2 dropped rods, IAW AOP 1.1.8 IOA's, the SRO will direct the ATC to manually trip the Rx and enter E-0.

When the Rx is manually tripped, PT-1RC-445 will fail high causing 2 PORV's to open resulting in a Safety Injection signal, the ATC will recognize the open PORV's with lowering RCS and manually close the valves.

The safety injection that occurred as a result of the PORV's opening, will fail to actuate the train "B" CIA signal, and MOV-1CH-378 (a train "A" CIA valve) will fail to automatically close. The crew will be required to isolate the containment penetration via either manually actuating Train "B" CIA or manually closing MOV-1CH-378.

On the trip, the turbine driven AFW pump, 1FW-P-2 will start but not produce any flow, the remaining available motor driven AFW pump, 1FW-P-3B will start but will trip when the SI Manual actuation PB's are depressed. When "Verifying AFW Status" in E-0, the crew will identify that all auxiliary feedwater pumps have failed, the SRO will transition to FR-H.1.
IAW FR-H.1 direction the crew will restore feedwater flow by starting a main feedwater pump. After feed flow is verified, the SRO will return to E-0 at which point the scenario will be terminated.

Expected procedure flow path is E-0 → FR-H.1 → E-0

INITIAL CONDITIONS: **IC-68 (10)**: 100% power, BOL, Equ. XE Conditions, CB "D" @ 228 steps, RCS boron - 1210 ppm.
Use HTML, **1L16N5.HTM**, Initialize into specified IC and insert preloads per the HTML.

ADDITIONAL LINEUP CHANGES	STICKERS	MONITOR SETUP
1FW-P-3A CS in PTL	1FW-P-3A CS tagged	Normal Splash w/ Full Power Screen, on VB-B
EQUIPMENT STATUS	**DATE/TIME OOS**	**TECHNICAL SPECIFICATION(S)**
1FW-P-3A OOS, pump bearing replacement	Yesterday / 1800	3.7.5, Condition B

SHIFT TURNOVER INFORMATION

1. 100% power for the past month, BOL equilibrium conditions, shift goal is to maintain current power.

SCENARIO SUPPORT MATERIAL REQUIRED

1. BOL Reactivity Placard
2. Protected Train "B" Placard
3. Safety Status PNL lights LIT for "A" AFW
3. 1FW-P-2 aligned to A hdr placard

PROCEDURES NEEDED

E-0
FR-H.1
1OM-46.4.G
7 IF, Attach 1
24 IF, Attach 2
Attachment 1-K
AOP 1.1.3
AOP 1.1.8
AOP 1.2.1C
AOP 1.4.1

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Assign shift positions SRO:_____ ATC:_____ BOP:_____		
Conduct a shift turnover with oncoming operators.	Simulator frozen until after shift turnover unless it needs to be run momentarily for an alignment change.	
When the shift turnover is completed, place the simulator to RUN and commence the scenario.	Simulator running.	Crew assumes control of the unit.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 1:		
LT-1CH-115 fails low. **IMF CHS20B (0 0) 0 0 ASIS**	LI-1CH-115 VCT level indication decreases (computer trend for LT-1CH-112 increases) A3-53: VCT level low. Auto makeup initiates.	Crew acknowledges alarm, verifies plant stability and recognizes auto makeup is occurring due to LT-1CH-115 failing low. IAW AOP 1.4.1, ATC stops the Auto makeup by placing the Boric Acid Blender CS to STOP. SRO enters AOP 1.4.1 then transitions to the CVCS Instrument failure procedure, 1OM-7.4.IF, Attachment 1 to address VCT level channel failure. Crew confirms LT-1CH-115 has failed low by comparing LI-1CH-115 and computer point for LT-1CH-112 (IPC point L2704A). SRO verifies ATC previously stopped the makeup by placing the Boric Acid Blender CS to STOP after verifying adequate VCT level as indicated by IPC. For remainder of scenario, ATC manually initiates VCT makeup when necessary.
Proceed with next event at LE discretion.		

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENT 2:		
Feed flow channel FT-1FW-477 drifts high. **IMF FWM14B (0 0) 5E6 120 ASIS**	Controlling feed flow channel for "A" steam generator level control drifts high, main feed regulating valve closes in response. Actual feed flow and level lower.	BOP acknowledges and reports alarms, diagnoses feed flow channel failure, IAW AOP 1.4.1, establishes manual control of "A" MFRV to stabilize "A" SG level.
NOTE: Both ARPs direct manual MFRV control (FCV-1FW-478) and IF procedure implementation.	A7-42, Loop A feed flow > steam flow (due to feed flow failure). A7-45, SG 1A Level Deviation from Setpoint.	ATC reviews ARPs.
	SRO enters AOP 1.4.1.	IAW AOP 1.41, SRO establishes a control band of 65 plus or minus 5% and Rx trip criteria of 25% low and 85% high for manual SG level control.
	SRO transitions to 1OM-24.4.IF Attachment 2.	BOP identifies FT-1FW-477 has failed high and is the controlling channel. SRO directs BOP to take Manual control of FCV-1FW-478 and restore SG level to normal. SRO directs BOP to transfer A SG to CH. 4. BOP places redundant feedflow channel, FC-1FW-478 (FF) in the FM 476 pos. BOP places redundant steamflow channel, FC-1FW-478 (SF) in the FM 475 pos. When SG level is stabilized, SRO directs BOP to place FCV-1FW-478 in AUTO.

Insert next event at LE discretion.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 3,4 & 5: N44 fails high / removal from service Shutdown bank dropped rod Requires turbine load reduction **IMF NIS03D (0 0) 200 0 ASIS**	Rods automatically step inward in response to N44 failure. Shutdown bank Rod J09 drops, causing Tavg drop. Crew enters AOP 1.1.3, Unexpected Control Rod Movement.	ATC reports unexpected alarms and rod motion. ATC verifies Control Rods are in AUTO. ATC verifies no load rejection in progress and places rod control to MANUAL to stop the rod insertion. ATC verifies reactor overpower has not occurred. BOP verifies PT-1MS-446 and 447 are consistent with current power level and Tref. ATC reports N-44 indication is not consistent with other power range channels. Crew recognizes Shutdown bank rod has dropped.
NOTE: The SRO may transition to AOP 1.2.1C to address the N-44 failure before transitioning to AOP 1.1.8.	SRO transitions to Rod Inoperability procedure, AOP 1.1.8 to address the dropped rod.	SRO directs the ATC to perform IOA's for a dropped rod IAW AOP 1.1.8; • ATC verifies only one dropped rod. • ATC verifies Rod Control previously placed in MANUAL due to N-44 failure. (AOP 1.1.3) • ATC verifies Rx is critical and Tavg is > 541F. • Crew verifies TAVG is NOT w/in 4F of Tref. SRO directs BOP to adjust turbine load for Tavg. • BOP depresses 1st STG IN. • Sets turbine load AND reduction rate as directed by SRO. • Initiates load reduction by depressing GO. • Reduces power incrementally until Tavg is within 4F of Tref. • Crew verifies Tavg is STABLE.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
	SRO evaluates Tech Specs for the dropped rod.	SRO addresses TS for dropped rod: 3.1.4, Rod Group Alignment Limits, Condition B, w/in 1 hr, either restore Rod to within alignment limits OR verify SDM. 3.4.1 (RCS DNB Parameters, RCS press < 2218 psia) Condition A: restore RCS pressure within 2 hours.
EVENT 4:	SRO transitions to Power Range Channel Malfunction procedure, AOP 1.2.1C to address failed NI channel.	ATC reports only one PR channel (N44) has failed, and verifies rods previously placed in manual.
		BOP turns "Rod Stop Bypass Switch" for N44 on NIS Rack N50 to BYPASS. ATC verifies status light for Overpower Rod Stop Bypass for N44 is lit. (status pnl 176, D-14)
NOTE: A4-68 will not clear when defeat sw is turned to N44 position due to the dropped rod causing an actual comparator alarm.		BOP turns "Comparator Channel Defeat Switch" on NIS rack N37/N46 to N44 position.
		Within 1 hr, verifies P-8, P-9, & P-10 interlocks in required state for 100% power.
NOTE: Crew may initiate performance of 1OST-2.4A, however next event will occur before completion of OST.		ATC verifies reactor power is > 50%. BOP determines all PR channel upper and lower detector inputs to QPTR are operable.
		BOP determines all detector inputs to AFD monitor alarm are operable or requests I&C assistance in determining AFD alarm operability.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
		Within 72 hrs, trips nuclear bistables by removing control power fuses from Drawer A for N-44 or directing I&C to remove the failed ch from service. ATC ensures VB recorders are selected to operable detectors.
	SRO evaluates Tech Specs for N-44 failure.	SRO addresses TS for N-44 failure: 3.3.1, Function 2.a, PR high flux, Condition D, trip ch w/in 72 hrs and QPTR every 12 hours. 3.3.1, Function 2.b, PR Neutron flux - LOW, Condition E, trip ch w/in 72 hrs.- for Info Only. 3.3.1, Function 3, PR Hi flux rate, Condition E, trip ch w/in 72 hrs. 3.3.1, Functions 17.c, d, Rx trip interlocks, Condition P, verify in required state w/in 1 hr. 3.3.1, Function 17.e, Rx trip interlocks, Condition O, verify in required state w/in 1 hr. 3.3.3, for PAM instrumentation – for Info Only.
Proceed with next event at LE discretion		
EVENT 6: 2nd dropped rod **IMF CRF04BP (0 0)1**	Bank D, rod B08 drops, RCS temperature and pressure drops. A4-12 , Low Pressurizer pressure alarm, followed by; A4-46, Tavg Deviation alarm.	Crew recognizes a 2nd dropped rod. ATC performs IOA's for Rod Drop and per the RNO action, with 2 or more rods dropped, manually trips the reactor.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7, 8, 9, & 10: Multiple malfunctions occur on reactor trip. All commands preloaded	1RC-PT-445 fails high causing 2 PORV's to open. Train "B" CIA fails to actuate along with MOV-1CH-378 (Trn A) auto close failure. Loss of all Feedwater	
	SRO enters E-0.	ATC and BOP commence IOA's of E-0. ATC verifies Reactor trip: • Rx trip and bypass breakers open. • Power range indication is < 5%. • Neutron flux is dropping. BOP verifies Turbine trip: • Throttle OR Governor valves ALL closed. • Main Generator output brks – open. • Exciter Circuit breaker – open.
	AE and DF Busses are energized from offsite.	BOP verifies Power to AC Emergency Busses • Using VB-C voltmeters or IPC, verifies AE and DF busses have voltage indicated. BOP identifies that both emergency busses are energized from offsite power.
EVENT 8: 1RC-PT-445 fails high when electrical busses transfer to Offsite. **IMF PRS08E (4 2) 2500** (preloaded)	PORV's PCV-1RC-455D and 456 fail open upon transmitter failure.	After ATC completes IOA's for E-0, recognizes transmitter failure and 2 PORV's are open, verifies pressure is < 2325 psig and manually places CS's for both valves to CLOSE.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7, 8, 9, & 10:(continued)	SI automatically actuated due to Low PRZR pressure.	Check SI status: ATC reports SI automatically actuated and manually actuates SI by depressing both trains' pushbuttons. ATC/BOP, sounds standby alarm, announces reactor trip and safety injection. Check if SI flow should be reduced. • Crew verifies that an adequate secondary heat sink does not exist. SRO determines SI flow should not be secured. ATC verifies SI system status: • Charging pumps running – 2 running. • LHSI pumps running – 2 running. • BIT Flow indicated – YES. BOP verifies AFW status: • Motor-driven AFW Pumps – NONE RUNNING. • Turbine-driven pump; TV-1MS-105A, B OPEN. A7-7 is NOT LIT, turbine driven pump running • AFW Throttle Vlvs all FULL OPEN. • Total AFW Flow is < 370 GPM. BOP reports no Aux feed water flow exists.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7, 8, 9, & 10:(continued)	SRO recognizes that AFW flow cannot be established and enters FR-H.1, Response to Loss of Secondary Heat Sink.	ATC checks if secondary heat sink is required by: • Verifying RCS press is > any non-faulted SG. • RCS hot leg temperatures >350°F. Crew determines a secondary heat sink is required. Crew checks SG WR levels and determines if RCS bleed and feed should be initiated. • BOP verifies WR lvl in at least 2 SG's is >14%. BOP reports ALL WR levels are > 14%. Crew determines bleed and feed is not required at this time and continues to monitor WR level. BOP checks Primary Plant Demineralized Water storage tank level is > 27.5 feet.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7, 8, 9, & 10:(continued) **ROLE PLAY:** When directed to investigate AFW pump status: If dispatched to Emergency Switchgear, wait 2 minutes then report 1FW-P-3B; ACB 1F16 ground OC relay 50-VF116G is flagged. If dispatched to AFW room, wait 3 minutes then report as appropriate. FW-P-3B, not running, nothing obvious wrong at the pump. FW-P-2, appears to be running, recirc valve is open. Local Suction Pressure is normal. **ROLE PLAY:** If dispatched with attachment 2-K, as operator do not report in unless called, then report that you are having trouble getting the local panel to energize.		Crew tries to establish AFW flow to at least 1 SG. ATC/BOP verifies SG Blowdown and blowdown sample lines are isolated. Crew confirms: • "A" motor-driven pump previously OOS. • "B" motor-driven pump initially started but tripped and will not restart. • Turbine-driven pump running but no flow. BOP reports that ALL AFW throttle valves are open. Crew continues to try to restore AFW flow while SRO continues in FR-H.1. BOP confirms AFW flow is not > 370 gpm. SRO dispatches operator with attachment 2-K to establish alternate AFW flow using the Dedicated AFW pump.
NOTE: It is expected that the crew will not wait for 1FW-P-4 field actions before continuing with procedure and restore a main feed pump.	Restoration of feed using a main feed pump.	Crew reports that feed flow is NOT verified. SRO directs ATC to stop ALL RCP's. Crew takes actions to restore a main feedwater pump. • Verifies a condensate pump is in service. • Resets SI/FWI and opens feedwater CNMT isolation valves, HYV-1FW-100A, B, C. • Starts and holds CS for main feedpump.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7, 8, 9, & 10:(continued) **Critical Task: CT-43 (FR-H.1.A)** **Crew establishes feedwater flow into at least one SG before RCS feed and bleed is required.** **Basis for Selection:** SAFETY SIGNIFICANCE -- Failure to establish feedwater flow to any SG results in the crew's having to rely upon the lower-priority action of establishing RCS bleed and feed to minimize core uncovery. This constitutes incorrect performance that "leads to degradation of any barrier to fission product release."	Feedwater flow established SG levels begin rising. SRO returns to E-0, Step 9 IAW FR-H-1, step 8.	With a main feed pump running as a source, BOP throttles the Bypass feed regulating valves to establish flow to intact SGs. Crew checks at least 1 SG NR level > 31% (50%) If NR not >31%, crew verifies either CETC's are dropping OR SG WR levels are rising.

NOTE:
At the LE discretion, the scenario can be terminated after the crew has established feedwater flow if the crew has previously identified and performed corrective actions for CT-10 (Close PORV valves) and CT-11 (Close CNMT Isol valves). Otherwise, allow the crew to return to E-O and perform E-0 up through the diagnostic steps and terminate after SI termination criteria is evaluated.

NOTE: Evaluation of BOP performing Attachment 1-K begins on page 18. **Critical Task CT-11 (E-0.O):** Crew closes CNMT isolation valves….	List of Attachment 1-K Discrepancies: Train "B" CIA failed to automatically actuate, and Train "A" CNMT Isolation valve, MOV-1CH-378 failed to automatically close.	SRO directs BOP to perform Attachment 1-K.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7, 8, 9, & 10:(continued)	RCS temperature may be decreasing due to feedwater flow to SG's.	ATC checks RCS temp. stable at or trending to 547F: • ATC verifies no steam release is occurring. • ATC verifies Reheat steam is isolated. • ATC reduces total feedflow to minimize C/D.
Critical Task: CT-10 (E-0.M) **Crew closes the failed open PRZR PORVS prior to completion of the "PRZR PORV check" step of E-0.** SAFETY SIGNIFICANCE -- Failure to close the PORV or block MOV under the postulated plant conditions constitutes "misoperation or incorrect crew performance which leads to degradation of any barrier to fission product release." In this case, the RCS fission-product barrier can be restored to full integrity simply by closing the PORV or block MOV. Therefore, failure to close the PORV/MOV also represents a "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plant safety."		ATC verifies PRZR isolated: • PORVs – CLOSED, ATC reports PORVs, PCV-1RC-455D and 456, were both open due to failure of 1RC-PT-445. • ATC reports both valves successfully closed manually. ATC continues verifying PRZR isolated: • Spray Valves – CLOSED (controlling press). • Safety relief valves – CLOSED. • PRT conditions – CONSISTENT WITH EXPECTED VALUES. • Power to at least one block valve – AVAILABLE. (all). • Block valves – AT LEAST ONE OPEN. (all)
NOTE: RCP's were previously S/D in FR-H.1 due to loss of heat sink.		ATC checks if RCPs should be stopped: • D/P between RCS pressure and highest SG pressure – LESS THAN 200 PSID [350 PSID] ATC reports all RCPs previously stopped.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE

EVENTS 7, 8, 9, & 10:(continued)

ATC/BOP checks if any SGs are faulted:

- Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER.

OR

- ANY SG COMPLETELY DEPRESSURIZED.

Crew determines NO SG's are faulted.

Crew checks if SG tubes are intact:

- Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER.
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES.

Crew determines no SG levels are rising in an uncontrolled manner and Secondary Radiation is consistent with pre-event values, therefore all SG tubes are intact.

Crew checks if RCS is intact by checking CNMT conditions consistent with pre-event values:

- CNMT radiation.
- CNMT pressure.
- CNMT sump level.

Crew determines the RCS is intact based on CNMT conditions consistent with PRE-EVENT VALUES.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 7, 8, 9, & 10:(continued)		Crew checks if SI flow should be reduced. ATC verifies RCS subcooling is >46F based on CETC's. BOP confirms secondary heat sink available by >370 gpm of feed flow available OR NR level in at least 1 SG >31%. ATC confirms RCS pressure is stable or rising. ATC confirms PRZR level is >17%. Crew determines that current plant conditions support SI reduction.
Terminate scenario when the crew determines transition to ES-1.1 is appropriate or not. Classify Event: **SITE AREA EMERGENCY** based on EAL **FS1** due to entry into FR-H.1 which indicates a "Potential loss of the RCS barrier" and a "Potential loss of the Fuel Clad barrier" due to a loss of heat sink when a Heat Sink is required.		

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions'		BOP performs the verifications/actions of Attachment 1-K 'Verification of Automatic Actions' as follows:
	Both EDG's are running.	Diesel generators – BOTH RUNNING with no Trouble Alarms, RW pumps running supplying cooling water flow. Verifies power to both Emergency 4KV AC busses. Check at least 1 Leak Collection Exhaust fan running, 1VS-F-4A(4B). Station instrument air header pressure > 100 PSIG.
	Ensure Reheat Steam Isolation.	Ensure Reheat Steam Isolation: • Verify MOV-1MS-100A,B – CLOSED. • Reset reheater controller. • Close MOV-1MS-204, gland stm spillover vlv. Verify CCR Pumps - ONE RUNNING with recirc pressure >100 psig. Align Neutron Flux Monitoring For Shutdown: • When operable IR channels <1E-10 amp, check SR channels energized. • Transfer NR-1NI-45 recorder to operable source and intermediate range displays.

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued)		Verify River Water System In Service: • RPRW Pumps - TWO RUNNING. • Check CCR Heat EX RW press is > 20 psig. OR (IF CIB has occurred) • Verify RPRW flow to recirc spray hxs. Check If Main Steamline isolation required: • CNMT pressure - > 7 PSIG -OR- • Steamline pressure - < 500 PSIG -OR- • Steamline pressure high rate of change - ANY ANNUNCIATOR LIT (A7-41, A7-49, A7-57) Determines steamline isolation is NOT required. Check CIB And CNMT Spray Status: • Containment press - REMAINED < 11 PSIG

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Attachment 1-K 'Verification of Automatic Actions' (continued) **<u>Critical Task CT-11 (E-0.O):</u>** **Crew closes CNMT isolation valves such that at least one valve is closed on each critical phase A penetration before the end of the scenario.** SAFETY SIGNIFICANCE -- Closing at least one containment isolation valve on each critical Phase A penetration, under these conditions and when it is possible to do so, constitutes a task that "is essential to safety," because "its improper performance or omission by an operator will result in direct adverse consequences or significant degradation in the mitigative capability of the plant."	Train "B" CIA failed to actuate with Train "A" CIA valve, MOV-1CH-378 failing to automatically close.	Verify ESF Equipment Status; • Verify SI status by checking all RED SIS marks – LIT • Verify CIA by checking all ORANGE CIA marks - LIT • Verify FWI by checking all GREEN FWI marks – LIT When SR's are energized, verify Audible indication: • Verify operating SR Ch selected on Audio. Count Rate Channel Selector Switch. • Audible indication functioning properly. • Adjust Multiplier Sw & Volume as necessary. Start CNMT Hydrogen Analyzers: • Using 1OM-46.4.G, gets keys, opens isolation valves (VB-A) and dispatches an operator to continue putting Hydrogen analyzers in service.
Attachment 1-K– COMPLETE	**Discrepancies:** Train "B" CIA failed to automatically actuate, and Train "A" CNMT Isolation valve, MOV-1CH-378 failed to automatically close.	Upon completion, reports any discrepancies to SRO.