SALEM

17-01 NRC EXAM

RO ADMINISTRATIVE

JPMs

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine Maximum Vent Time in EOP-FRCI-3

TASK NUMBER: N1150880502

JPM NUMBER: 17-01 NRC RO-A1

ALTERNATE PATH: [ ] **K/A NUMBER:** 2.1.25

IMPORTANCE FACTOR: 3.9 (RO) ____ (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [ ]

EVALUATION SETTING/METHOD: Classroom

REFERENCES: 2-EOP-FRCI-3, Rev 30 (checked 9-14-18)

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 8 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Rudolph Chan **Date: 9-14-18**
Instructor

Validated By: Don Raymond **Date:** 9-14-18
SME or Instructor
David Bell

Approved By: **Date:** 10/30/18
Training Department Tom McHugh

Approved By: **Date:** 10.23.18
Operations Department Myers

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 17-01 NRC RO-A1

Rev #	Date	Description	Validation Required
00	5-21-18	NEW JPM for LOR Annual Exam. Added revision history and simulator setup pages.	Yes
01	9-14-18	Incorporated comments from 2018 LOR Annual Exams to provide acceptable bands for critical steps. Used for 17-01 NRC ILOT Exam.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine Maximum Vent Time in EOP-FRCI-3

TASK NUMBER: N1150880502

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS: None

NAME: _____

DATE: _____

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine Maximum Vent Time in EOP-FRCI-3

TASK NUMBER: N1150880502

INITIAL CONDITIONS:

- Unit 2 has experienced a small break LOCA.
- The crew has performed an RCS cooldown and depressurization in EOP-LOCA-2.
- During the depressurization the crew experienced some complications and indications of upper head voiding are now present.
- STA reports a valid CFST **YELLOW** path exists on Coolant Inventory.
- The TSC recommends initiating EOP-FRCI-3, Response to Void in Reactor Vessel.

INITIATING CUE:

- You are the extra NCO.
- The crew has completed actions in EOP-FRCI-3 up to step 19.1 and has directed you to **PERFORM** Attachment 1 of EOP-FRCI-3 to determine the maximum venting time.
- The following conditions exist in Unit 2 containment:
  - Containment temperature is 140 F
  - Containment hydrogen concentration is 1.8%
  - RCS pressure is 1200 psig
- Round off to the **nearest tenths** when performing your calculations

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **Correctly performs calculations IAW EOP-FRCI-3, Attachment 1**
2. **Calculates Maximum Venting Time of 10.2 mins (9.2 – 11.2 mins acceptable band).**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**
TASK: **Determine Maximum Vent Time**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	Provide the following: ▪ 2-EOP-FRCI-3 Attachment 1, and ▪ 2-EOP-FRCI-3 Figure 1, Hydrogen Flow Rate ▪ Calculator			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	1	Record the following data	Operator records the provided data in steps 1.1 through 1.3 **Evaluator's CUE:** See attached Answer Key for completed Attachment 1		
*	2.1	Calculate containment absolute temperature, Tabs Tabs = Containment temperature (°F) + 460 = _____ °R	**Calculates (Tabs) = 140 + 460 = 600 R**		
*	2.2	Calculate containment air volume (V) at STP: V = 1.28E09/Tabs = _____ ft3	**Calculates (V) = 1.28E09 / 600 R = 2.13E06 ft3 or 2133333.33 ft3 is acceptable** **Evaluator's Note:** This value will have rounding errors depending on how the candidate writes out the value.		
	3	Determine maximum hydrogen vent volume			
	3.1	Record containment hydrogen concentration • (from Step 1.2) H = _____ %	Records hydrogen value from step 1.2		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**
TASK: **Determine Maximum Vent Time**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.2	Record containment air volume at STP (from Step 2.2) V = _____ ft3	Records air volume from step 2.2		
*	3.3	Calculate maximum vent volume (M) M = (3.0% - H) x V / 100% M = _____ ft3	**Calculates (M) as:** **M = (3% - 1.8%) x 2.13E06 / 100%** **M = 25,560 ft3 (25,500 to 25,600 ft3 acceptable band)**		
	4	Determine maximum vent time			
	4.1	Record RCS pressure (from Step 1.3) _____ psig	Records RCS pressure from step 1.3 as 1200 psig.		
	4.2	Record calculated maximum vent volume (from Step 3.3) M = _____ ft3	Records (M) from step 3.3		
*	4.3	Record hydrogen vent flow rate (from Figure 1) F = _____ cfm	**Using Figure 1, determines Hydrogen Flow Rate of 2500 cfm** **Evaluator's Note:** determining hydrogen flow rate will have some readability errors. A +/- 100 cfm allowance was factored into the max vent time.		
*	4.4	Calculate maximum vent time (Tv) Tv = M / F Tv = _____ minutes	**Calculates maximum vent time as:** **(Tv) = 25,560 ft3 / 2500 cfm = 10.2 mins (+/- 1.0 mins)** Due to rounding and readability errors, a maximum vent time of **9.2 – 11.2 mins** is acceptable.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**
TASK: **Determine Maximum Vent Time**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM when operator determines maximum vent time.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: **17-01 NRC RO-A1**

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 30 Date 9-14-18

R 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Rudolph Chan Date: 9-14-18

SME/Instructor: DAVID BELL Date: 9/14/18

SME/Instructor: D. Raymond Date: 9/14/18

INITIAL CONDITIONS:

- Unit 2 has experienced a small break LOCA.
- The crew has performed an RCS cooldown and depressurization in EOP-LOCA-2.
- During the depressurization the crew experienced some complications and indications of upper head voiding are now present.
- STA reports a valid CFST **YELLOW** path exists on Coolant Inventory.
- The TSC recommends initiating EOP-FRCI-3, Response to Void in Reactor Vessel.

INITIATING CUE:

- You are the extra NCO.
- The crew has completed actions in EOP-FRCI-3 up to step 19.1 and has directed you to **PERFORM** Attachment 1 of EOP-FRCI-3 to determine the maximum venting time.
- The following conditions exist in Unit 2 containment:
  - Containment temperature is 140 F
  - Containment hydrogen concentration is 1.8%
  - RCS pressure is 1200 psig
- Round off to the **nearest tenths** when performing your calculations

MAXIMUM VENT TIME DETERMINATION

1. Record the following data:

   1.1 Containment temperature **140 °F**

   1.2 Containment hydrogen concentration (H) **1.8 %**

   1.3 RCS pressure **1200 psig**

2. Determine containment air volume at standard temperature and pressure (STP):

   2.1 Calculate containment absolute temperature, Tabs

   Tabs = Containment temperature (°F) + 460 = **600 °R**

   2.2 Calculate containment air volume (V) at STP:

   V = 1.28E09/Tabs = **2.1E+6 ft3 (or 2133333.33 ft3)**

3. Determine maximum hydrogen vent volume

   3.1 Record containment hydrogen concentration

   (from Step 1.2) H = **1.8 %**

   3.2 Record containment air volume at STP

   (from Step 2.2) V = **2.1E+6 ft3** (rounding errors)

   3.3 Calculate maximum vent volume (M)

   M = (3.0% - H) x V M = **25,200 ft3 (25,500 to 25,600 ft3)**

4. Determine maximum vent time

   4.1 Record RCS pressure

   (from Step 1.3) **1200 psig**

   4.2 Record calculated maximum vent volume

   (from Step 3.3) M = **25,200 ft3**

   4.3 Record hydrogen vent flow rate

   (from Figure 1) F = **2500 cfm** (readability errors)

   4.4 Calculate maximum vent time (Tv)

   Tv = M / F Tv = **10.2 minutes** (+/- 1.0 mins)
   (acceptable range 9.2 – 11.2 mins)

[Note: the acceptable range takes into account rounding errors and readability errors using Figure 1]

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM 1 & 2

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Perform Borated Water Source surveillance IAW S2.OP-ST.CVC-0010

TASK NUMBER: N0040420201

JPM NUMBER: 17-01 NRC RO-A2

ALTERNATE PATH: ☐ **K/A NUMBER:** 2.2.37

IMPORTANCE FACTOR: 3.6

APPLICABILITY: **RO** **SRO**

EO ☐ **RO** ☒ **STA** ☐ **SRO** ☐

EVALUATION SETTING/METHOD: Classroom / Perform

REFERENCES: S2.OP-ST.CVC-0010, Rev. 10 (checked 9-14-18)
Salem Tech Specs 3.1.2.6 & Figure 3.1-2

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 10 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan **Instructor** **Date:** 9-14-18

Validated By: **SME or Instructor** **Date:** 9-14-18

Approved By: **Training Department** **Date:** 10/30/18

Approved By: **Operations Department** **Date:** 10-23-18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: ☐ **SAT** ☐ **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Perform Borated Water Source surveillance IAW S2.OP-ST.CVC-0010

TASK NUMBER: N0040420201

SIMULATOR SETUP: N/A

INITIAL CONDITIONS:

- Salem Unit 2 is at 100% power.
- 21 BAT pump developed a leak that went unnoticed until the cross-connected BAST's reached their low level alarm setpoint.
- 21 BAT pump and the leak are isolated. BAST levels are stable.
- 21 BAST level – 48.0%
- 22 BAST level – 48.0%
- 21 BAST temp – 100 °F
- 22 BAST temp – 98.1°F
- RWST temperature – 70°F
- RWST levels are:

CH I	CH II	CH III	CH IV
41.4	41.4	41.4	41.4

- Chemistry reports current RWST and BAST boron concentrations are:
- 21 BAST – 6650 ppm
- 22 BAST – 6650 ppm
- RWST – 2350 ppm

INITIATING CUE:

- You are the Reactor Operator.
- Perform S2.OP-ST.CVC-0010, Borated Water Sources.
- All Prerequisites are completed SAT.
- Based on the Test Results is the surveillance SAT or UNSAT? (circle one)

Successful Completion Criteria:
1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:
1. **Correctly completes Attachment 2 of S2.OP-ST.CVC-0010 <u>and</u> determines Test Results for combined BAST Volume is UNSAT**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Generic Administrative – Conduct of Operations
TASK: Perform Borated Water Source surveillance IAW S2.OP-ST.CVC-0010

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	Provide the following: ▪ marked up copy of S2.OP-ST.CVC-0010, Borated Water Sources, and ▪ Tech Spec 3.1.2.6 (2 pages)			
	3.0	Precautions and Limitations	Operator reads and initials steps.		
*	5.1.1	**COMPLETE** Attachment 2 per the following: • **RECORD** Data. • **RECORD** Test Results by initialing SAT or UNSAT column using the stated Acceptance Criteria.	Completes Attachment 2 with the below data. **Operator determines Test Results are UNSAT for BAST levels and boron concentration.**		
		ATTACHMENT 2 **BORATED WATER SOURCE DATA** **MODES 1-4**	**Evaluator's Note**: The following steps are from Attachment 2 of S2.OP-ST.CVC-0010. **Also see attached Answer Key**.		
*	Att. 2	RWST Level	**Operator records the RWST level from the initial cue sheet and determines that the Test Results is SAT.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Generic Administrative – Conduct of Operations
TASK: Perform Borated Water Source surveillance IAW S2.OP-ST.CVC-0010

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att. 2	RWST Temp	**Operator records the RWST temperature from the initial cue sheet and determines that the Test Results is SAT.**		
*	Att. 2	RWST Conc	**Operator records the RWST concentration from the initial cue sheet and determines that the Test Results is SAT.**		
*	Att. 2	21 BAST Vol AND/OR 22 BAST Vol	**Operator records the BAST levels from the initial cue sheet and determines that the Test Results is UNSAT.** **Evaluator's Note: The Operator calculates the combined BAST level of 96% and using Figure 3.1-2 determines that the required BAST level is > 96.5%.**		
*	Att. 2	21 BAST Temp AND/OR 22 BAST Temp	**Operator records the BAST temperature from the initial cue sheet and determines that the Test Results is SAT.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Generic Administrative – Conduct of Operations
TASK: Perform Borated Water Source surveillance IAW S2.OP-ST.CVC-0010

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att. 2	21 BAST Conc AND/OR 22 BAST Conc	**Operator records the BAST concentration from the initial cue sheet and determines that the Test Results is UNSAT.** **Evaluator's Note: The Operator uses current BAST level of 96% and determines using Figure 3.1-2 that the required BAST concentration is > 6650 ppm (≈6675 ppm)**		
	5.3	**ACCEPTANCE CRITERIA**			
	5.3.1 $	This surveillance is considered satisfactory when Attachments 2 and 3 (as applicable) are complete with components listed meeting Acceptance Criteria stated in each Attachment.	Operator marks as N/A		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Generic Administrative – Conduct of Operations
TASK: Perform Borated Water Source surveillance IAW S2.OP-ST.CVC-0010

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.3.2	This surveillance is unsatisfactory. ___ A. IF the cause of the UNSAT surveillance is due to BAST level being out of specification for expected conditions (e.g. outage preparations) AND this condition is being tracked in the Tech Spec Tracking Log THEN a notification is not required AND **GO TO** Section 5.4. ___ B. **INITIATE** Notification(s) to correct the unsatisfactory condition(s). ___ C. **RECORD** Notification number(s) and reason for unsatisfactory completion on Attachment 4 in the Comments Section.	**Operator determines this surveillance is UNSAT.** **JPM is complete** **Evaluator's Note:** The operator does not have to complete the actions in these steps, just required to make a determination if the surveillance is UNSAT or SAT based on the results from completing Attachment 2.		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM after the operator determines that Step 5.3.2 for UNSAT surveillance is met.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 10 Date 9-14-18

R 9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chain Rudolf Clu Date: 9-14-18

SME/Instructor: DAVID BEIL Date: 9/14/18

SME/Instructor: David Raymond Date: 9/14/18

INITIAL CONDITIONS:

- Salem Unit 2 is at 100% power.
- 21 BAT pump developed a leak that went unnoticed until the cross-connected BAST's reached their low level alarm setpoint.
- 21 BAT pump and the leak are isolated. BAST levels are stable.
- 21 BAST level – 48.0%
- 22 BAST level – 48.0%
- 21 BAST temp – 100 °F
- 22 BAST temp – 98.1°F
- RWST temperature – 70°F
- RWST levels are:

CH I	CH II	CH III	CH IV
41.4	41.4	41.4	41.4

- Chemistry reports current RWST and BAST boron concentrations are:
- 21 BAST – 6650 ppm
- 22 BAST – 6650 ppm
- RWST – 2350 ppm

INITIATING CUE:

- You are the Reactor Operator.
- Perform S2.OP-ST.CVC-0010, Borated Water Sources.
- All Prerequisites are completed SAT.
- Based on the Test Results is the surveillance SAT or UNSAT (circle one)?

ATTACHMENT 2
(Page 1 of 1)

BORATED WATER SOURCES DATA MODES 1-4

Parameter	Data	Acceptance Criteria	Test Results		Date
			SAT	UNSAT	
RWST Level 2LT960 ___ 2LT961 ___ 2LT962 ___ 2LT963 ___	41.4 ft	364,500 to 400,000 gals (≥40.5 ft ≤41.9 ft) (Note 2)	✓		Today
RWST Temp	70 °F T0650A	≥35°F	✓		Today
RWST Conc	2350 ppm	≥2,300 and ≤2,500 ppm	✓		Today
21 BAST Vol AND/OR 22 BAST Vol	48.0 % (2LI106) 48.0 % (2LI102)	IAW Tech Spec 3.1.2.6.a and 3.1.2.6.b Figure 3.1-2 (Note 1)		✓	Today
21 BAST Temp AND/OR 22 BAST Temp	100 °F (2TI107) 98.1 °F (2TI103)	≥63°F	✓		Today
21 BAST Conc AND/OR 22 BAST Conc	6650 ppm (21 BAST) 6650 ppm (22 BAST)	Tech Spec 3.1.2.6.a and 3.1.2.6.b Figure 3.1-2 (Note 1)		✓	Today

(1) If one BAST is the borated water source, then level and concentration requirements must be maintained in acceptable operation region of figure 3.1-2.
If two BASTs are the borated water source, then combine volumes are used to satisfy Tech Spec 3.1.2.6.a.

(2) Refer to S2.OP-TM.ZZ-0002(Q), Tank Capacity Data.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Administrative – Radiation Control

TASK: Determine Personnel Exposure and Special Requirements into A Radiologically Controlled Area

TASK NUMBER: 1200100104

JPM NUMBER: 17-01 NRC RO-A3

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.3.4

IMPORTANCE FACTOR: 3.2 (RO) / (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [ ]

EVALUATION SETTING/METHOD: Classroom / Simulate

REFERENCES: Radiological Survey Map #1108410 dated 5-18-18 (checked 9-14-18)
RP-AA-460, Rev. 19, RP-AA-463, Rev. 5, RP-AA-300, Rev. 6

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Rudolph Chan

Developed By: R. Chan, Instructor **Date:** 12-4-18

Validated By: Raymond / Bell (Rev. 0), SME or Instructor **Date:** 9-14-18

Approved By: Training Department **Date:** 12/11/18

Approved By: MYERS, Operations Department **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC RO-A3

Rev #	Date	Description	Validation Required
00	9-14-18	**This is a NEW JPM**. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-4-18	Incorporated NRC Prep week comments. Modified HRA briefing sheet to increase dose rate alarm setpoint to 250 mrem/hr to avoid conflict with survey map dose rate of 205 mrem/hr. This change is an enhancement and re-validation is not required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Administrative – Radiation Control

TASK: Determine Personnel Exposure and Special Requirements into A Radiologically Controlled Area

TASK NUMBER: 1200100104

SIMULATOR IC: **N/A**

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

PROVIDE copies of the following documents:

- Radiological Survey Map #1108410, S1 AUX 084' PIPE ALLEY (dated 5-18-18)
- HRA Briefing Sheet
- RP-AA-300, Radiological Survey Program
- RP-AA-460, Controls for High and Very High Radiation Areas

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Administrative – Radiation Control

TASK: Determine Personnel Exposure and Special Requirements into A Radiologically Controlled Area

TASK NUMBER: 1200100104

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- A Locked Valve surveillance IAW S1.OP-ST.CAN-0001, Primary Containment Valves Monthly, is scheduled to be performed on your shift.
- One of the valves to be verified is located in the Unit 1 Pipe Alley, Elevation 84 ft. Auxiliary Building.
- An entry into the Pipe Alley has been made since the last performance of this surveillance requiring this valve position to be verified.

INITIATING CUE:

- You are the WCC RO and have been assigned to perform the valve verification in the Unit 1 Pipe Alley.
- Using the provided Radiological Survey Map and procedures, determine the following:

1. What is the Radiological Posting for the area that the task will be performed?
2. What is the highest On Contact radiation dose rate?
3. What is the highest General Area dose rate?
4. What protective clothing is required to enter this area?
5. Calculate your personnel dose exposure. Assume the following:
   - it will take 1 minute to complete the task
   - use the highest On Contact radiation dose rate as the General Area dose rate for the room

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **High Radiation Area (HRA), Contaminated Area (CA)**
2. **205 mrem/hr**
3. **10 mrem/hr**
4. **Protective Clothing: lab coat, booties and rubber gloves**
5. **3.42 mrem (if rounded up 3.5 is acceptable)**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Administrative – Radiation Control
TASK: Determine Personnel Exposure and Special Requirements into A Radiologically Controlled Area

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		PROVIDE copies of the following documents: 1. Radiological Survey Map #1108410, S1 AUX 084' PIPE ALLEY (dated 5-18-18) 2. HRA Briefing Sheet 3. RP-AA-300, Radiological Survey Program 4. RP-AA-460, Controls for High and Very High Radiation Areas			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:**_____			

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Administrative – Radiation Control
TASK: Determine Personnel Exposure and Special Requirements into A Radiologically Controlled Area

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		What is the Radiological Posting for the area that the task will be performed?	**Operator refers to Radiological Survey Map and determines that the work area is in a <u>High Radiation Area (HRA) and Contaminated Area (CA)</u>**		
*		What is the highest On Contact radiation dose rate?	**Operator refers to Radiological Survey Map and determines that the highest On Contact radiation dose rate is <u>205 mrem/hr</u>.** **Evaluator's Note:** RP-AA-300, Attachment 2 provides definitions of survey map symbols and abbreviations.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Administrative – Radiation Control
TASK: Determine Personnel Exposure and Special Requirements into A Radiologically Controlled Area

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		What is the highest General Area dose rate?	**Operator refers to Radiological Survey Map and determines that the highest General Area (GA) radiation dose rate is <u>10 mrem/hr</u>.** **Evaluator's Note:** RP-AA-300, Attachment 2 provides definitions of survey map symbols and abbreviations.		
*		What special requirement is needed to enter this area?	**Operator reviews the HRA briefing sheet and determines that Protective Clothing (lab coat, booties and rubber gloves) are required for entry into CA.**		
*		Calculate your personnel dose exposure. Assume the following: ▪ it will take 1 minute to complete the task ▪ use the highest On Contact radiation dose rate as the General Area dose rate for the room	**Operator calculates the following:** **[205 mrem/hr x 1 hr/60 mins] x 1 min** **= <u>3.42 mrem</u> (round up to 3.5 mrem acceptable)**		
	CUE:	<u>WHEN</u> operator informs you the task is complete, OR the JPM has been terminated for other reasons, <u>THEN</u> **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM after RO submits the response to you.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 17-01 NRC RO-A3

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-4-18

NA 1. Task description and number, JPM description and number are identified.

____ 2. Knowledge and Abilities (K/A) references are included.

____ 3. Performance location specified. (in-plant, control room, or simulator)

____ 4. Initial setup conditions are identified.

____ 5. Initiating and terminating Cues are properly identified.

____ 6. Task standards identified and verified by SME review.

____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

____ 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

R 12-4-18

SME/Instructor: NA Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- A Locked Valve surveillance IAW S1.OP-ST.CAN-0001, Primary Containment Valves Monthly, is scheduled to be performed on your shift.
- One of the valves to be verified is located in the Unit 1 Pipe Alley, Elevation 84 ft. Auxiliary Building.
- An entry into the Pipe Alley has been made since the last performance of this surveillance requiring this valve position to be verified.

INITIATING CUE:

- You are the Unit 1 CRS.
- Using the provided Radiological Survey Map and procedures, determine the following:

1. What is the Radiological Posting for the area that the task will be performed?

2. What is the highest On Contact radiation dose rate?

3. What is the highest General Area dose rate?

4. What protective clothing is required to enter this area?

5. Calculate your personnel dose exposure. Assume the following:
   - it will take 1 minute to complete the task
   - use the highest On Contact radiation dose rate as the General Area dose rate for the room

[Provide your answers on this Cue Sheet]

RP-AA-460

Attachment 2, HRA and Above Briefing Form

Work Area: Salem U1 Pipe Alley, 84 ' Aux Building
RWP #: 1 Task #: 010 Date: Today

Briefing Content

- ☐ This is a High Radiation Area (HRA) brief
- ☐ Review Radiological Survey Map # 1108410, S1 AUX 084' PIPE ALLEY to identify work area.
  - o Work area inside Unit 1 Pipe Tunnel area to perform valve lineup verification IAW S1.OP-ST.CAN-0001
- ☐ Identify permitted activities for the area
  - o Operator inspection of valves only
  - o No climbing
- ☐ Discuss required dosimetry, high noise (if applicable), area dose rates, and low dose areas
- ☐ Discuss dosimeter accumulated dose alarm **10** mrem and response
  - o Leave the area, close and lock the door and notify RP
- ☐ Discuss dosimeter dose rate alarms **250** mrem/hr and response
  - o Leave the area, close and lock the door and notify RP
- ☐ Check SRD every 15 minutes while in the area
- ☐ Conduct self-check of SRD alarm setpoints against setpoints noted in the briefing
- ☐ Discuss proper control of barricades and postings entering and exiting the area
  - o Ensure the door is closed and locked
- ☐ Protective Clothing:
  - o Lab coat, booties and rubber gloves are required to be worn in this area
  - o Extra sets of gloves and booties are located near the step off pad area
- ☐ This concludes the HRA briefing

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative - Emergency Plan

TASK: Perform Duties as Primary Communicator IAW EP-SA-111-F6

TASK NUMBER: N1240110501

JPM NUMBER: 17-01 NRC RO-A4

ALTERNATE PATH: [X] **K/A NUMBER:** G 2.4.43

IMPORTANCE FACTOR: RO 3.2 SRO

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [ ]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: EP-SA-111-F6, Rev 22 (checked 9-14-18)

TOOLS AND EQUIPMENT: Simulator ERO Phones

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Rudolph Chan

Developed By: R. Chan, Instructor **Date:** 12-4-18

Validated By: Bell / Raymond (Rev. 0), SME or Instructor **Date:** 9-14-18

Approved By: Training Department **Date:** 12/10/18

Approved By: Operations Department MYERS JT **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM NUMBER: 17-01 NRC RO-A4

Rev #	Date	Description	Validation Required
00	9-14-18	**New JPM**. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	10-9-18	EP-SA-111-F6 revised to Rev. 23. Revision does not impact the JPM and no re-validation is required.	No
02	12-4-18	Incorporated comments from NRC Prep week. Clarified task standard that the caller needs to read sections I thru V of the ICMF form correctly to the person contacted. Due to minor change no re-validation is required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative - Emergency Plan

TASK: Perform Duties as Primary Communicator IAW EP-SA-111-F6

TASK NUMBER: N1240110501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **ENSURE** the ERO phones (NETS, NAWAS) call directly to the back booth area prior to starting JPM.
- **ENSURE** extra instructor is available on head set to monitor phone calls from the back to cue booth operator when to answer the phone.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Administrative - Emergency Plan

TASK: Perform Duties as Primary Communicator IAW EP-SA-111-F6

TASK NUMBER: N1240110501

INITIAL CONDITIONS:

- Salem Unit 2 was manually tripped from 100% power due to an RCS leak.
- Safety Injection was manually initiated and all ECCS pumps are running
- The Shift Manager has declared an **ALERT.**

INITIATING CUE:

- You are the Primary Communicator.
- Make the required notifications to the State of New Jersey and Delaware within the required **15 minutes** IAW EP-SA-111-F6, Primary Communicator Log.
- Notify the Shift Manager when your 15 minute notifications are complete.
- Prior to making each phone call, **SIMULATE** to the evaluator the actions would take to make the phone call, THEN **WAIT** for the evaluator to prompt you to pick up the phone.
- **THIS IS A TIME CRITICAL TASK**

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **Makes the required notifications to the state of NJ and DE IAW EP-SA-111-F6 within 15 minutes.**
2. **Reads sections I thru V of the ICMF form correctly to the contacted organization.**

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Simulator Operator: ❖ **ENSURE** the ERO phones call directly to the back booth area prior to starting JPM. ❖ **ENSURE** extra instructor to monitor phone calls in back and when to cue booth operator to respond. **Use of headsets is highly recommended.** ❖ **Pay Attention** to the caller's message and Repeat back the information exactly as the caller reads it you. ❖ **Record** any information not identified on the ICMF Answer Key and the person contacted. ❖ **Notify** the Lead Evaluator of any discrepancies noted from the call.	**Evaluator's Note: ENSURE** copy of ICMF is provided to the Primary Communicator and the booth operator.		
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	A.1	**ENSURE** the Secondary Communicator has a copy of the ICMF, AND **REQUEST** assistance with 15 minute notifications, if necessary.	**CUE: Secondary Communicator is not available to assist.**		
	A.2	**CALL** each organization or Individual identified on the Communicator Log and **READ** the ICMF.	Operator calls each organization / individual on Communicator Log. See the following steps.		
	CUE		**Evaluator's Note:** Provide the following cue to be used before picking up phones (except NAWAS which is direct dial). **CUE**: Prior to picking up the phone to perform your calls, **SIMULATE** the actions you would take to make the call, THEN **WAIT** until the Evaluator prompts you to pick up the phone. **Actual dialing of number is not required.**		

NAME:_____

DATE:_____

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	15.a	**NEW JERSEY STATE POLICE/OEM** Primary: NETS 5400 Secondary: 609-963-6900, **PRESS 1** BACKUP: EMRAD (not in TSC)	**Operator SIMULATES the following:** **1. Selects the phone labeled "NETS"** **2. Depresses pushbuttons to dial 5400** **CUE: You may pick the phone up.** 3. Waits for individual to answer CUE: ***This is SGT Smith NJ State Police*** **4. Correctly reads sections I thru V of the ICMF form to individual** **CUE: SGT Smith repeats back the ICMF and states he has no questions.** 5. Records the Notification information 6. Waits for repeat back from individual 7. Hangs up 8. IF Primary does not answer move on to Secondary then Backup		

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	15.b 15.c 15.d	**SALEM COUNTY** **CUMBERLAND COUNTY** **U.S. COAST GUARD**	Operator determines that Step 15.a was successful and **PROCEEDS** on to **Step 15.e** - Delaware.		

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	15.e	**DELAWARE STATE POLICE / DEMA** Initial contact: (DE STATE POLICE) Primary: NETS 5406 Secondary: 302-659-2341 Backup: NAWAS	**Operator SIMULATES the following:** 1. Selects the phone labeled "NETS" 2. Depresses pushbuttons to dial 5406 **CUE: You may pick the phone up.** 3. Waits for individual to answer 4. Primary doesn't respond 5. Operator simulates calling Secondary number by using ANY phone available. **CUE: You may pick the phone up.** 6. Secondary doesn't respond 7. Operator simulates using "NAWAS" phone (no dialing required) **CUE: You may pick the phone up.** 8. NAWAS doesn't respond **9. Operator determines Step 15.e is NOT SUCCESSFULLY COMPLETED and PERFORMS Steps 15.f-g**		
		ALTERNATE PATH STARTS HERE	**No Response from Delaware State Police**		

OPERATOR TRAINING PROGRAM NAME:_____

JOB PERFORMANCE MEASURE DATE:_____

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	15.f	**NEW CASTLE COUNTY** Primary: NETS 5408 Secondary: 302-571-7331	**Operator <u>SIMULATES</u> the following:** **1. Selects the phone labeled "NETS"** **2. Depresses pushbuttons to dial 5408** **<u>CUE</u>: You may pick the phone up.** 3. Waits for individual to answer <u>CUE</u>: ***This is New Castle County Tom Grey speaking*** **4. <u>Correctly</u> reads sections I thru V of the ICMF form to individual** **<u>CUE</u>: Tom Grey repeats back the ICMF and states he has no questions** 5. Records the Notification information 6. Waits for repeat back from individual 7. Hangs up		

OPERATOR TRAINING PROGRAM NAME:_____

JOB PERFORMANCE MEASURE DATE:_____

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	15.G	**KENT COUNTY** Primary: NETS 5409 Secondary: 302-678-9111	**Operator <u>SIMULATES</u> the following:** **1. Selects the phone labeled "NETS"** **2. Depresses pushbuttons to dial 5409** **<u>CUE</u>: You may pick the phone up.** 3. Waits for individual to answer <u>CUE</u>: ***This is Kent County Joe Black speaking*** **4. <u>Correctly</u> reads sections I thru V of the ICMF form to individual** **<u>CUE</u>: Joe Black repeats back the ICMF and states he has no questions.** 5. Records the Notification information 6. Waits for repeat back from individual 7. Hangs up **JPM is complete**		

System: Generic Administrative – Emergency Plan

Task: Perform Duties as Primary Communicator IAW EP-SA-111-F6

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**JPM is Complete.** **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM when operator completes notification to KENT COUNTY.** **Evaluator's Note: IAW EP-SA-111-F6 Attachment 6, the fifteen minute clock ends when the contacted organization is provided the Emergency Classification Level or PAR upgrade.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM #: 17-01 NRC RO-A4

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-4-18

NA 1. Task description and number, JPM description and number are identified.

2. Knowledge and Abilities (K/A) references are included.

3. Performance location specified. (in-plant, control room, or simulator)

4. Initial setup conditions are identified.

5. Initiating and terminating Cues are properly identified.

6. Task standards identified and verified by SME review.

7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

NA R 12-4-18

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Salem Unit 2 was manually tripped from 100% power due to an RCS leak.
- Safety Injection was manually initiated and all ECCS pumps are running
- The Shift Manager has declared an **ALERT.**

INITIATING CUE:

- You are the Primary Communicator.
- Make the required notifications to the State of New Jersey and Delaware within the required **15 minutes** IAW EP-SA-111-F6, Primary Communicator Log.
- Notify the Shift Manager when your 15 minute notifications are complete.
- Prior to making each phone call, **SIMULATE** to the evaluator the actions would take to make the phone call, THEN **WAIT** for the evaluator to prompt you to pick up the phone.
- **THIS IS A TIME CRITICAL TASK**

SALEM

17-01 NRC EXAM

SRO ADMINISTRATIVE

JPMs

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Administrative – Conduct of Operations

TASK: Determine which ECCS pumps can be stopped to maintain minimum injection flow IAW 2-EOP-LOCA-5, Figure A

TASK NUMBER: 1150680502

JPM NUMBER: 17-01 NRC SRO-A1

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.1.7

IMPORTANCE FACTOR: RO ____ SRO 4.7

APPLICABILITY:
EO [ ] RO [ ] STA [X] SRO [X]

EVALUATION SETTING/METHOD: Classroom / Simulate

REFERENCES: 2-EOP-LOCA-5, Rev. 31 (checked 9-4-18)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 5 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Rudolf Chan **Date:** 9-4-18
Instructor

Validated By: R. Lawrence RLawrence **Date:** 9/6/18
SME or Instructor

Approved By: McHugh **Date:** 10/30/18
Training Department

Approved By: **Date:** 10.23.18
Operations Department

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC SRO-A1

Rev #	Date	Description	Validation Required
00	9-4-18	**This is a NEW JPM**. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Administrative – Conduct of Operations

TASK: Determine which ECCS pumps can be stopped to maintain minimum injection flow IAW 2-EOP-LOCA-5, Figure A

TASK NUMBER: 1150680502

INITIAL CONDITIONS:

- At 0500 Salem 2 reactor was manually tripped and Safety Injection automatically actuated as a result of a small break LOCA
- 21 RHR pump was C/T for maintenance and 22 RHR pump tripped while in 2-EOP-LOCA-1
- The crew has transitioned to 2-EOP-LOCA-5 due to no recirculation capability.
- The crew is performing the major action steps (minimum SI flow for decay heat removal) of 2-EOP-LOCA-5
- The following ECCS pumps are running:
  - 21 SI pump with indicated flow of 420 gpm
  - 22 Charging pump with indicated flow of 360 gpm

INITIATING CUE:

- You are the Unit 2 CRS at Step 19.2 of 2-EOP-LOCA-5.
- **DETERMINE** the following:
  1. At time 0550 hours, what is the minimum SI flow required from Figure A (attached)?
  2. Which ECCS pumps can be stopped (if any) to reduce injection flow as close as possible to minimum flow from Figure A (assume that ECCS pump flows remains stable)?

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **Min flow injection of 390 gpm (+/- 10 gpm)**
2. **Stops 22 Charging pump**

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Determine which ECCS pumps can be stopped to maintain minimum injection flow IAW 2-EOP-LOCA-5, Figure A

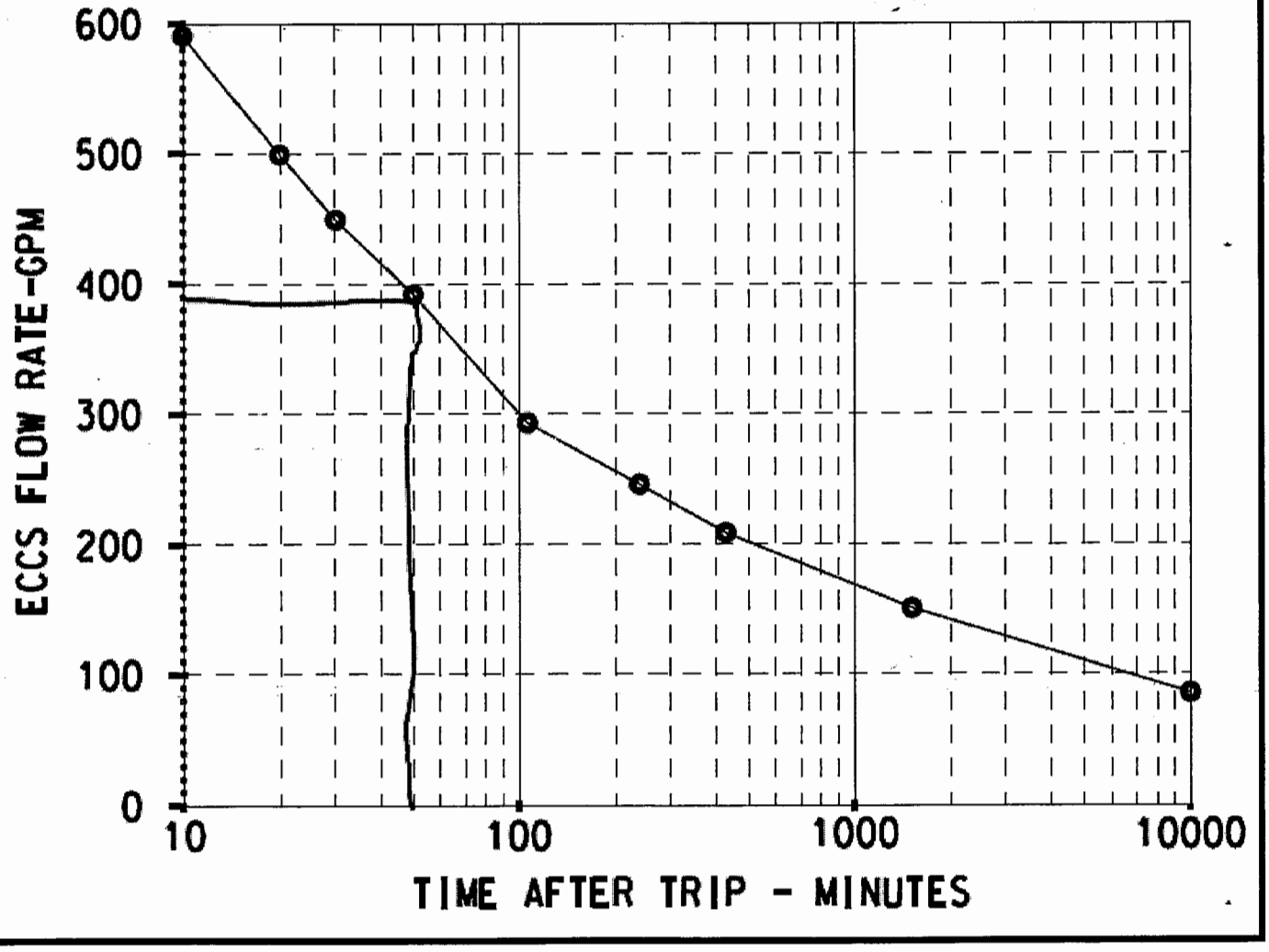
* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	**PROVIDE** the operator a copy of 2-EOP-LOCA-5 Sheet 2. Figure A is also attached with CUE SHEET.			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:**_____			
*	19.1	Determine the minimum SI flow required from Figure A	**Using Figure A and a time after reactor trip of 50 minutes, SRO determines a minimum SI flow of 390 gpm (+/- 10 gpm)**		
*	19.2	Start or stop RHR, SI and Charging pumps to obtain injection flow as close as possible, but not less than the value determined from Figure A.	**Using the given ECCS flow rates, the SRO determines the following:** ▪ **21 SI pump (420 gpm) must remain in service, and** ▪ **22 Charging pump (360 gpm) can be stopped** **JPM is complete**		

SYSTEM: Generic Administrative – Conduct of Operations
TASK: Determine which ECCS pumps can be stopped to maintain minimum injection flow IAW 2-EOP-LOCA-5, Figure A

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM after SRO reports which ECCS pumps can be stopped.**		

FIGURE A

MINIMUM ECCS FLOW VERSUS TIME AFTER TRIP



JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 17-01 NRC SRO-A1

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 31 Date 9-6-18
2-EOP-LOCA-5

C 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Rudolph Chan Date: 9-6-18

SME/Instructor: R Lawrence J Bates Date: 9/6/18

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- At 0500 Salem 2 reactor was manually tripped and Safety Injection automatically actuated as a result of a small break LOCA
- 21 RHR pump was C/T for maintenance and 22 RHR pump tripped while in 2-EOP-LOCA-1
- The crew has transitioned to 2-EOP-LOCA-5 due to no recirculation capability.
- The crew is performing the major action steps (minimum SI flow for decay heat removal) of 2-EOP-LOCA-5
- The following ECCS pumps are running:
  - 21 SI pump with indicated flow of 420 gpm
  - 22 Charging pump with indicated flow of 360 gpm

INITIATING CUE:

- You are the Unit 2 CRS at Step 19.2 of EOP-LOCA-5.
- **DETERMINE** the following:
  1. At time 0550 hours, what is the minimum SI flow required from Figure A (attached)?
  2. Which ECCS pumps can be stopped (if any) to reduce injection flow as close as possible to minimum flow from Figure A (assume that ECCS pump flows remains stable)?

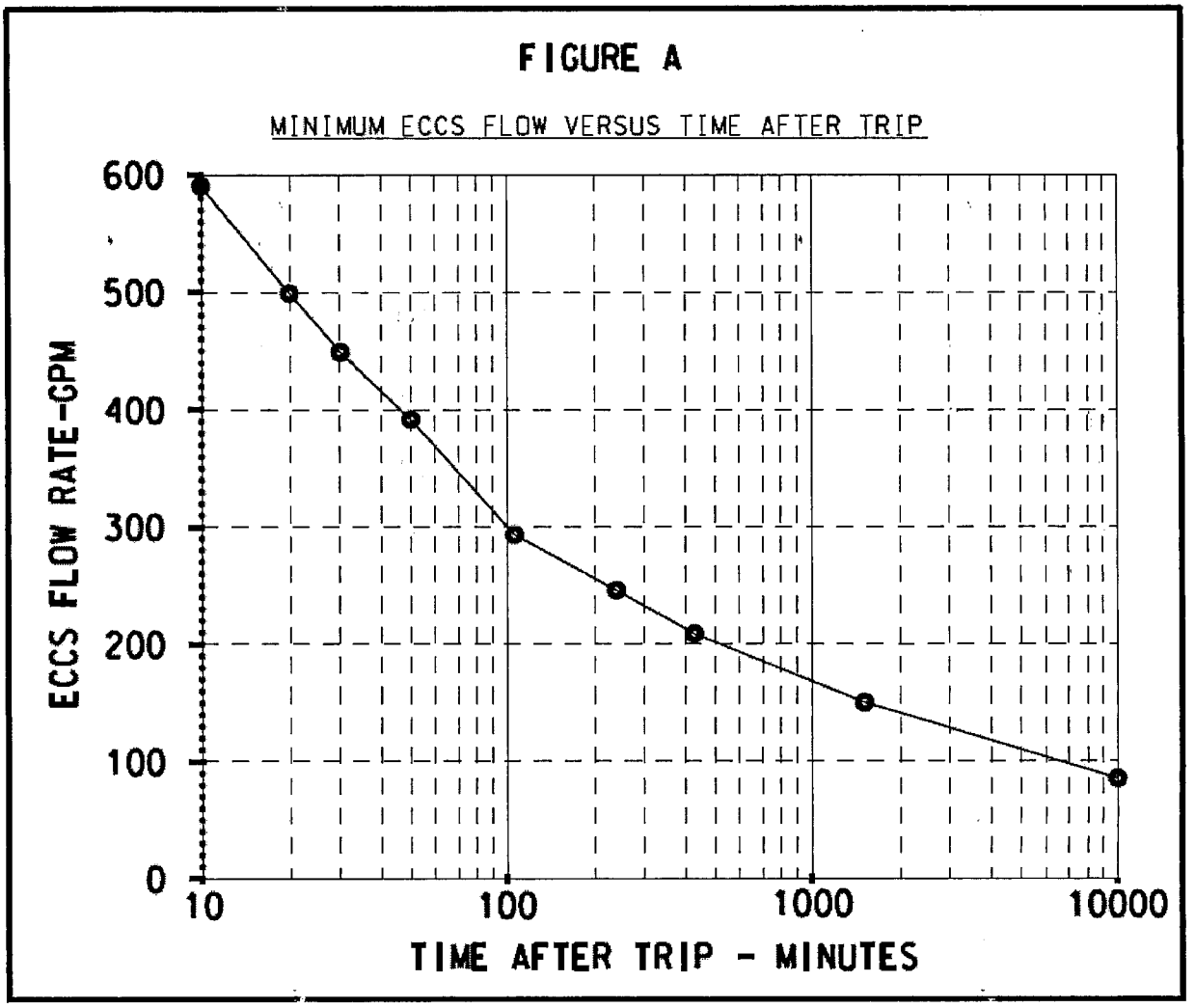


FIGURE A
MINIMUM ECCS FLOW VERSUS TIME AFTER TRIP
ECCS FLOW RATE-GPM
600
500
400
300
200
100
0
10
100
1000
10000
TIME AFTER TRIP - MINUTES

JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative - Conduct of Operations

TASK: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111

TASK NUMBER: N1220400302

JPM NUMBER: 17-01 NRC SRO-A2

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.1.26

IMPORTANCE FACTOR: RO: ____ SRO: 3.6

APPLICABILITY:

EO [ ] RO [ ] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: Classroom

REFERENCES: SA-AA-111 Rev. 12 (checked 9-5-18)

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Rudolph Chan **Date:** 9-6-18
Instructor

Validated By: R. LAWTON R. Lawton J. BATES **Date:** 9/6/18
SME or Instructor

Approved By: M. HUGH **Date:** 10/30/18
Training Department

Approved By: MYERS **Date:** 10-23-18
Operations Representative

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 17-01 NRC SRO-A2

Rev #	Date	Description	Validation Required
00	10-3-17	New JPM. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-11-17	Incorporated NRC Prep week comments. Added information in Initial Conditions to better describe task as a High Work rate.	No

JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative - Conduct of Operations

TASK: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111

TASK NUMBER: N1220400302

SIMULATOR IC: **N/A**

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS: None

JOB PERFORMANCE MEASURE

SYSTEM: Generic Administrative - Conduct of Operations

TASK: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111

TASK NUMBER: N1220400302

INITIAL CONDITIONS:

- Unit 2 is at 100% power.
- 2PS3, PZR Spray Valve, is operating erratically and a decision has been made to enter containment to isolate the 2PS3 by closing the manual isolation valve (2PS28).
- The 2PS28 is located inside the PZR housing (dog house), upper elevation, and is known to be very physically demanding on the operators to operate. Two operators will be required to simultaneously operate the valve using a valve wrench during the entire valve operation. Operators will also have to climb ladders to access the 2PS28 in the dog house.
- The Shift Manager needs to determine the amount of resources needed to close this valve given the Heat Stress conditions.
- Rad Pro has provided a Wet Bulb Globe Thermometer (WBGT) temperature of 89 F for the work area.
- Rad Pro has determined that operators will need to wear double PCs.

INITIATING CUE:

- You are the Unit 2 Control Room Supervisor.
- **DETERMINE** the following using SA-AA-111, Heat Stress Control for the two workers:
  - What is the **Stay Time**?
  - Assume the task will need more time. What is the **Maximum Extended Stay Time**?
  - Assume the task will **NOT** use the Maximum Extended Stay Time. What is the **Recovery Time**?

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **Determines; Stay Time = 20 mins, Maximum Extended Stay Time = 30 mins, and Recovery Time = 60 mins.**

System: Generic Administrative - Conduct of Operations
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111

Name:
Date:

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide blank copy of SA-AA-111, Heat Stress Control procedure.			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:**_____			

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	4.1.1	**OBTAIN** the Dry Bulb **or** Wet Bulb Globe Temperatures in the location where employees will be physically performing work activities. Heat Stress surveys may be conducted in conjunction with radiation surveys. Remote temperature monitors may be used to obtain dry bulb temperatures. **RECORD** the temperatures in lines 1 **and** 2 of Attachment 4. 1. For locations such as the drywell, areas with multiple elevations, areas with changing ventilation or areas where work is being performed in various physical locations, temperatures should be obtained, at a minimum, at the location where most work activities will be performed (>50% of work time). 2. In areas where varied environmental conditions exist or if the worker may be exposed to varied environmental conditions, due to the type of activity performed, the worst case area WBGT must be used for determining Stay Times. This method represents the only practical solution to this set of circumstances.	CRS records Wet Bulb Globe Temperature given from Initiating Cue as 89 F on Attachment 4.		

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	4.1.2	**CLASSIFY** the work environment as High Temperature (HT), Very High Temperature (VHT) or Extremely High Temperature (EHT). **RECORD** in line 3 of Attachment 4. 1. High Temperature: Environmental **and** work conditions that result in a calculated Stay Time. 2. Very High Temperatures: Work areas with dry bulb temperatures between 145°F and 160°F **or** WBGT between 110°F and 115°F. 3. Extremely High Temperature: Dry bulb temperatures great than 160°F **or** WBGT greater than 115°F refer to Attachment 7.	**CRS classifies the work environment as High Temperature based on work area temperature of 89 F.**		
	4.2	Evaluation of Work Rate as Low, Moderate or High			
	4.2.1	**DETERMINE** Work Rate through the use of Attachment 2, Work Rate Metabolism Guideline. **RECORD** results in line 4 of Attachment 4.			
		1. When determining the work rate, the clothing ensemble for the exposed employees should **not** be considered. Determination should be limited to the physical effort of activities.			

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		2. Low Work Rate activities involving the use of negative pressure, air-purifying respirators should, at minimum, be classified as Moderate Work Rate activities. Moderate Work Rate activities should be classified as High Work Rate if they involve the use of negative pressure, air-purifying respirators.			
		3. When determining the work rate using Attachment 2, Work Rate Metabolism Guideline, the evaluator should use the most frequent workload activity (>50% of work time) to characterize the overall activity as being Low, Moderate or High exertion. Higher exertion levels result in higher metabolic body heat generation. A. Low Work Rate is defined as sedentary activities involving sitting, standing still, and low physical effort. These include inspections **and** operation of instruments **and** powered equipment. B. Moderate Work Rate is defined as activities that are easily accomplished in a thermally comfortable environment. These types of tasks include pump **and** valve rebuilds **and** the sorting of materials. Additionally, heavy exertion activities that are broken up by periods of light activity or rest **and** do **not** involve the use of negative pressure, air-purifying respirators should be classified as Moderate Work Rate.			

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		C. High Work Rate is defined as demanding physical work for greater than 50% of work time. Activities characterized as High Work Rate include lifting **and** movement of heavy objects **and** manual decontamination of internal plant locations. Additionally, all Moderate Work Rate activities involving the use of negative pressure, air-purifying respirators should be classified as High Work Rate activities.	**CRS determines that this task is a HIGH work rate.** This can be based on the initial condition provided that the 2PS28 is historically very hard to operate and physically demanding on them giving the high temperatures inside the PZR dog house.		
*	4.3	Identification of Clothing Ensemble	**Determines the clothing ensemble to be Double Cloth Coveralls (also known as double PCs) and the adjustment factor to add 9 F to the WBGT.**		
	4.4	Determination of Stay Times			

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	4.4.1	**DETERMINE** the Stay Time by using the WBGT/Dry Bulb values obtained in 4.1, the work rate determined in 4.2, **and** the clothing ensemble identified in 4.3 by the following step-by-step process: 1. **LOCATE** the table in Attachment 3, Heat Stress Stay Time Limits. 2. **LOCATE** the clothing ensemble most applicable to the work activity as described in 4.3. 3. The left side of the table has WBGT/Dry Bulb value. **FIND** the WBGT/Dry Bulb value. 4. **DETERMINE** the Stay Time by adding the WBGT/Dry Bulb plus the Clothing Adjustment Factor **and** determining the work demand. Record this value in line 6 of Attachment 4.	**CRS uses the following information and Attachment 3 to determine Stay Time:** **4.1 – WBGT = 89 F** **4.2 – Work Rate = High** **4.3 – Clothing = Double PCs** **CRS adds adjustment factor to WBGT (89 F + 9 F = 98 F)** **Using Attachment 3; CRS uses the WBGT value of 98 F and a High work demand to determine a Stay Time = 20 min.**		
	4.6	Extending the Stay Time through the use of Check Times			

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	4.6.1	The following limitations apply to the use of Check Times. 1. **USE** Check Times **only** for work activities involving Stay Times contained in Attachment 3, Heat Stress Stay Time Limits. 2. Check Times **cannot** be used to extend beyond 1.5 times the established Stay Time for a given work activity. (1.5 X ST) 3. The Check Time process is designed to supplement self-determination by employees. Essentially, the process allows Stay Times to be extended if a set method of determining the physical condition of employees has been established. 4.....	CRS reads step and continues on.		
*	4.6.3	**RECORD** the Maximum Extended Stay Time in line 8 of Attachment 4, Job Evaluation Worksheet. 1. The maximum extended Stay Time when using the Check Time Process is 1.5 times the Stay Time determined in 4.4.1. (1.5 X ST)	**CRS calculates Maximum Extended Stay Time (1.5 x ST) of:** **1.5 x 20 mins = <u>30 mins</u>**		
	4.8	Determination and Application of Recovery Times			

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	4.8.1	**DETERMINE** the Recovery Time. **RECORD** the Recovery Time in line 12 of Attachment 4, Job Evaluation Worksheet.			
*	4.8.1.1	The Recovery Time calculation is used to determine the amount of time necessary for employees to recover from a high temperature job exposure. **A. CALCULATE** the Recovery Time (RT) as follows: 1. (Actual Work Time / Stay Time) x 60 minutes 2. When using liquid cooling garments under high metabolic rate conditions or when using ice vests, use four times the Attachment 3 Stay Time for computing recovery time. 3. **If** the Attachment 3 Stay Time is less than 15 minutes and cooling garments are worn, **then** use a Stay Time of 60 minutes for calculating Recovery Time.	Stay Time (ST) = 20 mins Actual Work Time = Stay Time **Recovery Time = 20/20 x 60** **Recovery Time = 60 mins**		

System: Generic Administrative - Conduct of Operations **Name:**
Task: Determine Heat Stress Requirements for Containment Entry IAW SA-AA-111 **Date:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **REPEAT BACK** any message from the operator on the status of the JPM and then state **"This JPM is complete"** **STOP TIME:**_____	**JPM is complete when the candidate submits the CUE SHEET.**		

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R 9-6-18

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 17-01 NRC SRO-A2

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 12 Date 9-6-18
SA-AA-111

R 9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Rudolph Chan Date: 9-6-18

SME/Instructor: [signature] Date: 9/6/18

SME/Instructor: [signature] BARES Date: 9/24/18

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 2 is at 100% power.
- 2PS3, PZR Spray Valve, is operating erratically and a decision has been made to enter containment to isolate the 2PS3 by closing the manual isolation valve (2PS28).
- The 2PS28 is located inside the PZR housing (dog house), upper elevation, and is known to be very physically demanding on the operators to operate. Two operators will be required to simultaneously operate the valve using a valve wrench during the entire valve operation. Operators will also have to climb ladders to access the 2PS28 in the dog house.
- The Shift Manager needs to determine the amount of resources needed to close this valve given the Heat Stress conditions.
- Rad Pro has provided a Wet Bulb Globe Thermometer (WBGT) temperature of 89 F for the work area.
- Rad Pro has determined that operators will need to wear double PCs.
- Cooling Garments will not be used.

INITIATING CUE:

1. You are the Unit 2 Control Room Supervisor.
2. **DETERMINE** the following using SA-AA-111, Heat Stress Control for the two workers:
    1. What is the **Stay Time**?
    2. Assume the task will need more time. What is the **Maximum Extended Stay Time**?
    3. Assume the task will **NOT** use the Maximum Extended Stay Time. What is the **Recovery Time**?

[Provide your answers on this sheet]

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Equipment Control

TASK: Determine Technical Specification action for inoperable components

TASK NUMBER: 112670302

JPM NUMBER: 17-01 NRC SRO-A3

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.2.40

IMPORTANCE FACTOR: RO: ____ SRO: 4.7

APPLICABILITY:
EO [ ] RO [ ] STA [X] SRO [X]

EVALUATION SETTING/METHOD: Classroom / Simulate

REFERENCES: S1.OP-SO.DG-0005, Rev. 9 (checked 9-6-18)
Salem Unit 1 Tech Specs

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 10 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan (Rudolph Chan) — Instructor — **Date:** 12-4-18

Validated By: Lantigua / Bates (Rev. 0) — SME or Instructor — **Date:** 9-6-18

Approved By: Training Department — **Date:** 12/11/18

Approved By: Operations Department — **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC SRO-A3

Rev #	Date	Description	Validation Required
00	9-4-18	**This is a NEW JPM**. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-4-18	Incorporated NRC Prep week comments. Comment is enhancements to clarify a question and re-validation is not required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin – Equipment Control

TASK: Determine Technical Specification action for inoperable components

TASK NUMBER: 112670302

SIMULATOR IC: **N/A**

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **ENSURE** copy of S1.OP-SO.DG-0005 and Unit 1 Technical Specifications are available per candidate.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Equipment Control

TASK: Determine Technical Specification action for inoperable components

TASK NUMBER: 112670302

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- 12 Charging pump is in service
- 1B EDG is C/T for scheduled maintenance. TS 3.8.1.1 action b was entered with 60 hours remaining of the LCO.
- S1.OP-SO.DG-0005, Preparation for Removing a Diesel Generator from Service, was reviewed by the CRS prior to C/T the 1B EDG.

At 0700 hours:

- 12 Charging pump trips.
- Crew responds to the event and enters S1.OP-AB.CVC-0001 and starts 13 Charging pump and restores letdown and PZR level.

INITIATING CUE:

- You are the Unit 1 CRS.
- Evaluate the impact to Technical Specifications and **DETERMINE** the following:

1. What LCO action(s) are applicable at 0700 hours?

2. At 1100 hours you're notified that 12 Charging pump troubleshooting is still ongoing and 1B EDG will need 6 hours to restore from maintenance. What action(s) are required **and** by what times?

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **Determines TS 3.8.1.1 action b.2 (4 hours) and 3.5.2.a action a (72 hours) are applicable**
2. **At 1100 hours, be in Mode 3 at 1700 hours and Mode 5 at 2300 hours the next day.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Generic Admin - Emergency Plan
TASK: Classify the Emergency and complete the ICMF

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**PROVIDE** copy of S1.OP-SO.DG-0005 to CRS	**Evaluator's Note**: This procedure would already be in progress and in the control room prior to removing the 1B EDG from service.		
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:**_____			
*		What LCO action(s) are required at 0700 hours?	**Operator determines the following Tech Spec LCOs are applicable:** **1. 3.5.2.a Action a (72 hours) for 12 Charging pump being inoperable, and** **2. 3.8.1.1 Action b.2 (4 hours) for 1B EDG and redundant component (12 Charging pump) inoperable.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Generic Admin - Emergency Plan
TASK: Classify the Emergency and complete the ICMF

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		At 1100 hours, you're notified that 12 Charging pump repairs are still ongoing. List ALL action(s) are required and at what times?	**SRO determines that at 1100 hours the Unit must be in Mode 3 at 1700 hours and Mode 5 at 2300 hours the next day** **(Mode 3 in next 6 hours and Mode 5 in within the following 30 hours)** **Evaluator's Note:** Use of TS 3.0.3 is not appropriate. **JPM is complete**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM after SRO submits the response to you.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 17-01 NRC SRO-A3

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-4-18

NA 1. Task description and number, JPM description and number are identified.

____ 2. Knowledge and Abilities (K/A) references are included.

____ 3. Performance location specified. (in-plant, control room, or simulator)

____ 4. Initial setup conditions are identified.

____ 5. Initiating and terminating Cues are properly identified.

____ 6. Task standards identified and verified by SME review.

____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

____ 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

R 12-4-18

SME/Instructor: NA Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- 12 Charging pump is in service
- 1B EDG is C/T for scheduled maintenance. TS 3.8.1.1 action b was entered with 60 hours remaining of the LCO.
- S1.OP-SO.DG-0005, Preparation for Removing a Diesel Generator from Service, was reviewed by the CRS prior to C/T the 1B EDG

At 0700 hours:

- 12 Charging pump trips.
- Crew responds to the event and enters S1.OP-AB.CVC-0001 and starts 13 Charging pump and restores letdown and PZR level.

INITIATING CUE:

- You are the Unit 1 CRS.
- Evaluate the impact to Technical Specifications and **DETERMINE** the following:

1. What LCO action(s) are applicable at 0700 hours?

2. At 1100 hours you're notified that 12 Charging pump troubleshooting is still ongoing and 1B EDG will need 6 hours to restore from maintenance. What action(s) are required **and** by what times?

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Radiation Control

TASK: Determine Personnel Exposure and Authorization for Entry into A High Radiation Area (HRA)

TASK NUMBER: 1200100104

JPM NUMBER: 17-01 NRC SRO-A4

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.3.4

IMPORTANCE FACTOR: RO ____ SRO 3.7

APPLICABILITY:
EO [ ] RO [ ] STA [X] SRO [X]

EVALUATION SETTING/METHOD: Classroom / Simulate

REFERENCES: Radiological Survey Map #1108410 dated 5-18-18 (checked 9-6-18)
RP-AA-460, Rev. 19, RP-AA-463, Rev. 5, RP-AA-300, Rev. 6

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 20 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Instructor Date: 9-6-18

Validated By: SME or Instructor Date: 9/6/18

Approved By: Training Department Date: 10/30/18

Approved By: Operations Department Date: 10/23/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC SRO-A4

Rev #	Date	Description	Validation Required
00	9-6-18	**This is a NEW JPM**. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative – Radiation Control

TASK: Determine Personnel Exposure and Authorization for Entry into A High Radiation Area (HRA)

TASK NUMBER: 1200100104

SIMULATOR IC: **N/A**

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

PROVIDE copies of the following documents:

- Radiological Survey Map #1108410, S1 AUX 084' PIPE ALLEY (dated 5-18-18)
- RP-AA-300, Radiological Survey Program
- RP-AA-463, High Radiation Area Key Controls
- RP-AA-460, Controls for High and Very High Radiation Areas

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Administrative – Radiation Control

TASK: Determine Personnel Exposure and Authorization for Entry into A High Radiation Area (HRA)

TASK NUMBER: 1200100104

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- A Locked Valve surveillance IAW S1.OP-ST.CAN-0001, Primary Containment Valves Monthly, is scheduled to be performed on your shift.
- One of the valves to be verified is located in the Unit 1 Pipe Alley, Elevation 84 ft. Auxiliary Building.
- An entry into the Pipe Alley has been made since the last performance of this surveillance requiring this valve position to be verified.

INITIATING CUE:

- You are the Unit 1 CRS.
- Using the provided Radiological Survey Map and procedures, determine the following:
    1. What is the Radiological Posting for the area that the task will be performed?
    2. What is the highest On Contact radiation dose rate?
    3. What is the highest General Area dose rate?
    4. What authorization is needed to enter this room?
    5. Calculate the <u>total</u> personnel dose exposure. Assume the following:
        - two (2) operators are need to complete the task
        - it will take 1 minute <u>per</u> operator to complete the task
        - use the highest On Contact radiation dose rate as the General Area dose rate for the room

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **High Radiation Area (HRA), Contaminated Area (CA)**
2. **205 mrem/hr**
3. **10 mrem/hr**
4. **SRPT (may also specify signing onto RWP-1 and HRA brief)**
5. **6.8 mrem (6-7 mrem is acceptable)**

SYSTEM: Generic Administrative – Radiation Control
TASK: Determine Personnel Exposure and Special Requirements for Entry into A High Radiation Area (HRA)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		PROVIDE copies of the following documents: ♦ Radiological Survey Map #1108410, S1 AUX 084' PIPE ALLEY (dated 5-18-18) ♦ RP-AA-300, Radiological Survey Program ♦ RP-AA-463, High Radiation Area Key Controls ♦ RP-AA-460, Controls for High and Very High Radiation Areas			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:**_____			

NAME: _____

DATE: _____

SYSTEM: Generic Administrative – Radiation Control

TASK: Determine Personnel Exposure and Special Requirements for Entry into A High Radiation Area (HRA)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		What is the Radiological Posting for the area that the task will be performed?	**Operator refers to Radiological Survey Map and determines that the work area is in a <u>High Radiation Area (HRA) and Contaminated Area (CA)</u>**		
*		What is the highest On Contact radiation dose rate?	**Operator refers to Radiological Survey Map and determines that the highest On Contact radiation dose rate is <u>205 mrem/hr</u>.** **Evaluator's Note:** RP-AA-300, Attachment 2 provides definitions of survey map symbols and abbreviations.		

NAME: _____

DATE: _____

SYSTEM: Generic Administrative – Radiation Control

TASK: Determine Personnel Exposure and Special Requirements for Entry into A High Radiation Area (HRA)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		What is the highest General Area dose rate?	**Operator refers to Radiological Survey Map and determines that the highest General Area (GA) radiation dose rate is <u>10 mrem/hr</u>.** <u>Evaluator's Note</u>: RP-AA-300, Attachment 2 provides definitions of survey map symbols and abbreviations.		
*		What authorization is needed to enter this room?	**Operator determines that the SRPT needs to authorize the key release for entry into HRA IAW RP-AA-463, Attachment 1.** <u>Evaluator's Note</u>: The operator may also identify (but not required) to sign onto RWP-1 and receive a HRA brief from Rad Pro. Refer to RP-AA-460 P&Ls; 2.1.1 and 2.1.3		
*		Calculate the total personnel dose exposure. Assume the following: ▪ two (2) operators are need to complete the task ▪ it will take 1 minute per operator to complete the task use the highest On Contact radiation dose rate as the General Area dose rate for the room	**Operator calculates the following:** **[205 mrem/hr x 1 hr/60 mins] x 2 mins** **= <u>6.8 mrem</u> (6-7 mrem acceptable)**		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: Generic Administrative – Radiation Control

TASK: Determine Personnel Exposure and Special Requirements for Entry into A High Radiation Area (HRA)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM after SRO submits the response to you.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 17-01 NRC SRO-A4

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date 9-6-18
RP-AA-300 Rev 6 Survey Map 5-15-18 RP-AA-460 Rev 19 RP-AA-463 Rev 5

R 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 9-6-18

SME/Instructor: R. Lawtins Date: 9/6/18

SME/Instructor: J. Bates Date: 9/24/18

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- A Locked Valve surveillance IAW S1.OP-ST.CAN-0001, Primary Containment Valves Monthly, is scheduled to be performed on your shift.
- One of the valves to be verified is located in the Unit 1 Pipe Alley, Elevation 84 ft. Auxiliary Building.
- An entry into the Pipe Alley has been made since the last performance of this surveillance requiring this valve position to be verified.

INITIATING CUE:

- You are the Unit 1 CRS.
- Using the provided Radiological Survey Map and procedures, determine the following:

1. What is the Radiological Posting for the area that the task will be performed?

2. What is the highest On Contact radiation dose rate?

3. What is the highest General Area dose rate?

4. What authorization is needed to enter this room?

5. Calculate the <u>total</u> personnel dose exposure. Assume the following:
   - two (2) operators are need to complete the task
   - it will take 1 minute <u>per</u> operator to complete the task
   - use the highest On Contact radiation dose rate as the General Area dose rate for the room

[Provide your answers on this Cue Sheet]

Salem GENERATING STATION — Radiological Survey

MAP # 1108410

Location: S1 AUX 084' PIPE ALLEY | Date: 05/17/18 | Time: 2250 | RWP: 1

Radiation Survey		
γ	Instrument: TPOLE	Serial#: 6609-010
γ	Instrument: N/A	Serial#: N/A

Contamination Survey		
β,γ	Instrument: RM14	Serial#: 7145
α	Instrument: N/A	Serial#: N/A

Contamination β,γ

LOC	dpm/100cm²	LOC	dpm/100cm²
1	<1k		
2	<1k		
3	<1k		
4	<1k		N
5	<1k		A
6	<1k		
7	<1k		
8	<1k		
9	<1k		
10	<1k		

Survey Type		Contamination α		
		LOC	ccpm	dpm/100cm²
N	Clean Area			
	Routine		N	
A	Monthly			A
X	S.O.J.			
N/A	Other			

Surveyed By:

Print

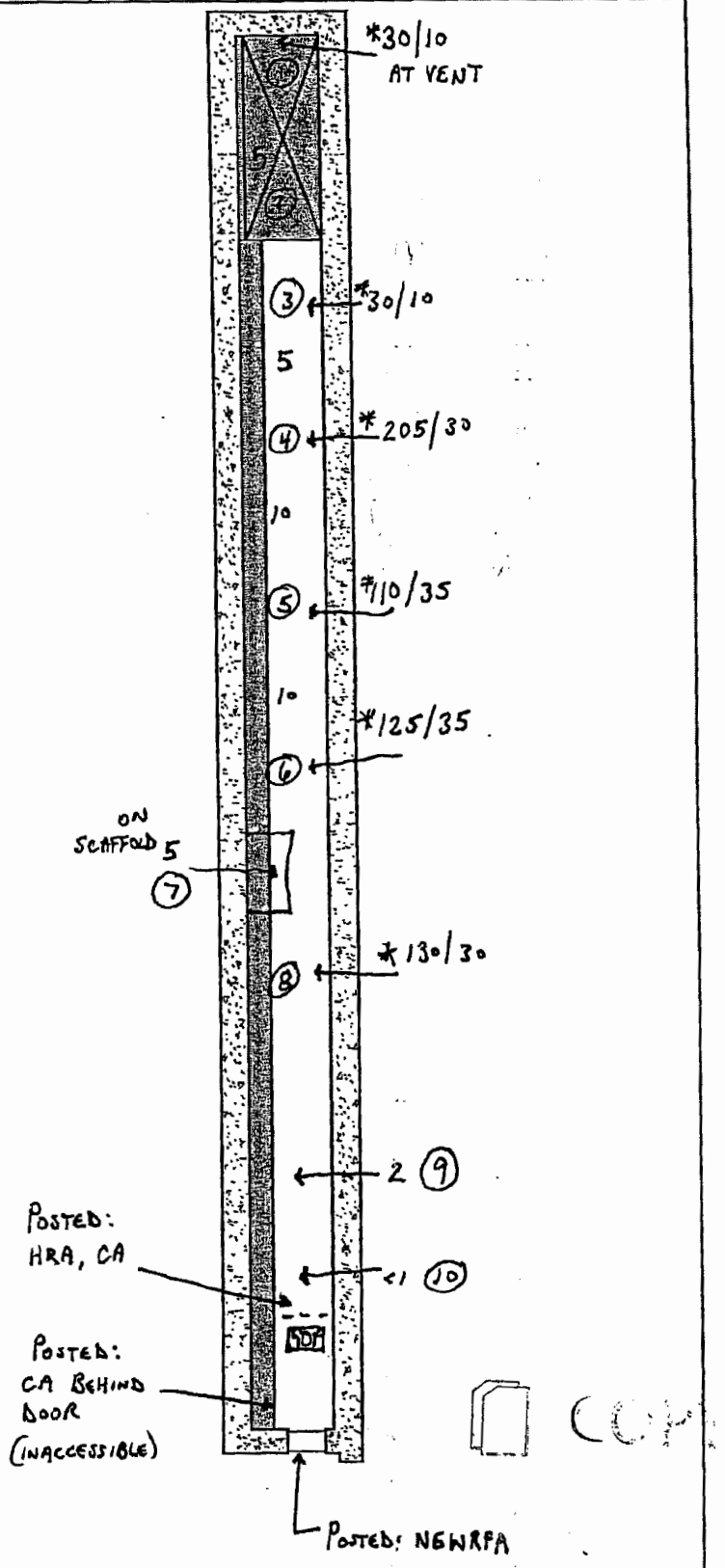
Sign

COMMENTS: ELEVATION POSTED: RA SURVEY FOR OPS ESCORT FOR 509

N/A Dose Rates along masslinn path <1 mRem/hr unless otherwise noted

N/A Masslinn results <1000 dpm/LAS on floors, walls & equipment

[X] Verified Radiological postings, labels, marking, and barriers



Technician Review		Supervisor Review	
Print / Sign: N/A	DATE: N/A	Print / Sign: Alex Johns /	DATE: 5/18/18

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative - Emergency Plan

TASK: Classify an Event and Complete ICMF IAW EP-SA-111-101

TASK NUMBER: 1240020502

JPM NUMBER: 17-01 NRC SRO-A5

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.4.41

IMPORTANCE FACTOR: RO: ____ SRO: 4.6

APPLICABILITY:
EO [ ] RO [ ] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: Classroom

REFERENCES:
EP-SA-111-101, Rev. 01 (checked 9-6-18)
EP-SA-111-121, Rev 00
EP-SA-111-F3, Rev 03

TOOLS AND EQUIPMENT: Salem ECG Books

VALIDATED JPM COMPLETION TIME: 8 mins

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: 15 mins

Developed By: R. Chan, Instructor — **Date:** 12-4-18

Validated By: Lantigua / Bates (Rev. 0), SME or Instructor — **Date:** 9-6-18

Approved By: Training Department — **Date:** 12/11/18

Approved By: Operations Department — **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM NUMBER: 17-01 NRC SRO-A5

Rev #	Date	Description	Validation Required
00	3-29-18	**NEW JPM for 2018 Annual.**	Yes
01	12-4-18	Incorporated NRC Prep week comments. Modified standard for what sections needs to be completed accurately on the ICMF form. This change is minor in nature and re-validation is not required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative - Emergency Plan

TASK: Classify an Event and Complete ICMF IAW EP-SA-111-101

TASK NUMBER: 1240020502

SIMULATOR IC: **N/A**

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **ENSURE** sufficient copies of EP-SA-111 Attachments 1 thru 4.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Administrative - Emergency Plan

TASK: Classify an Event and Complete ICMF IAW EP-SA-111-101

TASK NUMBER: 1240020502

INITIAL CONDITIONS:

- Salem 2 is at 100% power.
- The control room is responding to valid indications of a Steam Generator tube leak in 23 Steam Generator IAW S2.OP-AB.SG-0001.
- The RO reports that PZR level and RCS pressure are lowering rapidly.
- The CRS implemented the CAS of AB.SG-0001 to trip the Reactor and initiate Safety Injection.
- The crew is currently implementing 2-EOP-SGTR-1.
- 23 MS167 failed to close from the control room and the crew has initiated close on 21, 22, and 24 MS167's.
- Following the closing of the 21, 22, & 24MS167's, the control room suddenly hears a loud roaring noise.
- The PO reports that 23 SG pressure is 850 psig and lowering rapidly and steam flows are approx. 12% and rising. All other SG pressures are stable around 995 psig with 0-1% steam flow.
- Met Tower data indicates wind from 105 degrees at 5 mph.

INITIATING CUE:

- You are the Unit 2 Control Room Supervisor (CRS).
- **CLASSIFY** the event AND **COMPLETE** the ICMF IAW the applicable attachment.
- The JPM will stop when you have submitted the ICMF to your evaluator.
- **THIS IS A TIME CRITICAL JPM.**

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. **Classifies the event as a Site Area Emergency (SAE) 8 points based on RB3.L (5 pts) and CB3.L (3 pts) or CB4.L (3 pts).**
2. **Properly completes sections I thru IV of the ICMF for the classified event.**

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System: Generic Administrative - Emergency Plan

Task: Classify an Event and Complete ICMF IAW EP-SA-111-101

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		PROVIDE the following materials: ▪ Salem ECG books ▪ Attachments 1 thru 4 (EP-SA-111-F1/F2/F3/F4)			
	CUE:	**State to the Operator:** **THIS IS A TIME CRITICAL JPM.** **You will be giving time to REVIEW the Initial Conditions. The JPM will START once you have completed your review and acknowledge the Initiating Cue. The time will stop when you have classified the event and submitted the ICMF to the Lead Evaluator.** Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____	Operator reviews initial conditions.		
*		**CLASSIFY** the event.	**Operator classifies the event as a <u>Site Area Emergency (SAE)</u> based on Fission Product Barrier Section F – EAL#: RB3.L (5 pts), and CB3.L (3 pts) <u>or</u> CB4.L (3 pts).**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative - Emergency Plan

Task: Classify an Event and Complete ICMF IAW EP-SA-111-101

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		**COMPLETES** ICMF	**Evaluator's Note**: Attachments 1 thru 4 will be made available. The operator will have to select the correct Attachment based on the classification. **CUE:** Evaluator provides the requested attachment. **Operator accurately and completely fills out Sections I thru IV of the ICMF for Site Area Emergency (SAE) IAW EP-SA-111-F3, Attachment 3.** **Note: A release is in progress due to the event.** **Note:** See attached **ANSWER KEY** for complete and accurate ICMF.		
	CUE:	**JPM is Complete.** **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM when operator submits the ICMF form.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM #: 17-01 NRC SRO-A5

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-4-18

NA 1. Task description and number, JPM description and number are identified.

2. Knowledge and Abilities (K/A) references are included.

3. Performance location specified. (in-plant, control room, or simulator)

4. Initial setup conditions are identified.

5. Initiating and terminating Cues are properly identified.

6. Task standards identified and verified by SME review.

7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

R 12-4-18

SME/Instructor: NA Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Salem 2 is at 100% power.
- The control room is responding to valid indications of a Steam Generator tube leak in 23 Steam Generator IAW S2.OP-AB.SG-0001.
- The RO reports that PZR level and RCS pressure are lowering rapidly.
- The CRS implemented the CAS of AB.SG-0001 to trip the Reactor and initiate Safety Injection.
- The crew is currently implementing 2-EOP-SGTR-1.
- 23 MS167 failed to close from the control room and the crew has initiated close on 21, 22, and 24 MS167's.
- Following the closing of the 21, 22, & 24MS167's, the control room suddenly hears a loud roaring noise.
- The PO reports that 23 SG pressure is 850 psig and lowering rapidly and steam flows are approx. 12% and rising. All other SG pressures are stable around 995 psig with 0-1% steam flow.
- Met Tower data indicates wind from 105 degrees at 5 mph.

INITIATING CUE:

- You are the Unit 2 Control Room Supervisor (CRS).
- **CLASSIFY** the event AND **COMPLETE** the ICMF IAW the applicable attachment.
- The JPM will stop when you have submitted the ICMF to your evaluator.
- **THIS IS A TIME CRITICAL JPM.**

SALEM

17-01 NRC EXAM

SIMULATOR

JPMs

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Reactivity Control (SF1) - Control Rod Drive System (CRDS)
TASK:	Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011
TASK NUMBER:	0220040101
JPM NUMBER:	17-01 NRC Sim-a
ALTERNATE PATH:	[X]
K/A NUMBER:	001 A2.01
IMPORTANCE FACTOR:	3.1 (RO) / 3.7 (SRO)
APPLICABILITY:	EO [ ] RO [X] STA [ ] SRO [X]
EVALUATION SETTING/METHOD:	Simulator / Perform
REFERENCES:	S2.OP-AR.ZZ-0011, Rev 60 (checked 6-22-18) S2.OP-SO.CBV-0001, Rev 34
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	5 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A

Developed By: R. Chan Instructor — **Date: 6-22-18**

Validated By: Michael Spencer / Michael Spencer — **Date:** 6/22/18
SME or Instructor

Approved By: Training Department — **Date:** 10/30/18

Approved By: Operations Department — **Date:** 10/23/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: **17-01 NRC Sim-a**

Rev #	Date	Description	Validation Required
00	9-15-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	3-12-18	**New for 2018 LOR Annual Exam**. This task aligns with Safety Function #1 K/A.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Reactivity Control (SF1) - Control Rod Drive System (CRDS)

TASK: Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011

TASK NUMBER: 0220040101

SIMULATOR IC: **IC-230 [6-22-18, 13:09:31]**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Ensure 21 and 22 CRD Vent Fans are running; 23 in standby.
3. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	RD0316A, 21 CRD Vent Fan damper fails close	N/A	N/A	N/A	RT-1	TRUE
02	VC0316C, 23 CRD Fan Trip	00:00:40	N/A	N/A	ET-1	TRUE
03	VC0316B, 22 CRD Fan Trip	00:00:50	N/A	N/A	ET-1	TRUE

4. These malfunctions will simulate the running CRDM Vent Fan dampers closing resulting in air flow lo console alarm. IAW ARP, the standby fan will be started. **ALTERNATE PATH**: Seconds later the standby fan trips followed by the last remaining running fan (no CRDM Fans running). IAW ARP, the operator is required to TRIP the Reactor.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

EVENT TRIGGERS:

ET#	Description	Command
1	KAB05PBR, 23 CRD Vent Fan Start PB	

SPECIAL INSTRUCTIONS: None

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF1) - Control Rod Drive System (CRDS)

TASK: Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011.

TASK NUMBER: 0220040101

INITIAL CONDITIONS:

- Unit 2 at 100% power, BOL.
- No equipment is out of service and no active Tech Specs are in effect.

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all alarms and indications.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **STARTs Standby CRDM Vent Fan IAW ARP based on abnormal console indications.**
2. **TRIPs the Reactor IAW ARP based on no CRDM Vent Fans running.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Reactivity Control (SF1) - Control Rod Drive System (CRDS)

TASK: Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	CUE	**Simulator Operator**: **INSERT** RT-1 when the operator assumes the watch. **MALF: RD0361A 21 CRD Vent Fan Damper Failure**			
		The following alarm and indication will come in following RT-1 for 21 CRDM Vent Fan: ▪ AIR FLOW LO ▪ SEQUENCE COMPLETE bezel extinguished (NOT Illuminated)	Operator reports receipt of unexpected console alarm on 21 CRD Vent Fan for AIR FLOW LO and the SEQUENCE COMPLETE bezel extinguished. Operator refers to 2CC1 ARP. **CUE**: IF operator reports to you as CRS the following alarms AND is waiting for direction; **THEN state**: CRS directs you to respond to alarms and indications IAW applicable Alarm Response Procedures.		
	CUE	The following steps are from Alarm Response Procedure (ARP) **S2.OP-AR.ZZ-0011, CONTROL CONSOLE 2CC1**	**Evaluator's Note**: The operator may also refer to S2.OP-SO.CBV-0001, Containment Ventilation Operation, section 5.4 for starting/stopping CRDM Vent Fans. However, this procedure provides NO direction for a loss of all CRDM Vent Fans.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Reactivity Control (SF1) - Control Rod Drive System (CRDS)

TASK: Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	2CC1 ARP pg 13	CONTAINMENT VENTILATION SYSTEM Rod Drive Vent Fans **AIR FLOW LO**	Operator responds to console alarm for AIR FLOW LO and refers to 2CC1 ARP S2.OP-AR.ZZ-0011 page 13.		
	1.0	**CAUSE(S):** Fan discharge pressure < 2.0 INWC.	Operator reads the step and continues on.		
	2.0	**AUTOMATIC ACTIONS**: None	Operator reads the step and continues on.		
	3.0	**OPERATOR ACTIONS:**			
	NOTE	Low flow alarm may result from erratic flow during fan start. Illumination of control console SEQUENCE COMPLETE light indicates flow through fan outlet damper. Alarm should clear when fan is up to speed.	Operator reads the Note and continues on.		
	CAUTION	Operating with less than two Rod Drive Vent Fans in service could degrade the Rod Drive Coils. An Operability Determination should be performed when operating with one Rod Drive Vent Fan. Operating with more than two Rod Drive Vent Fans in service could damage the fan blades.	Operator reads the Caution and determines this is not applicable at this time, unless the standby fan does not start. Operator continues on. **CUE:** IF operator informs CRS of Caution, **THEN state**: the CRS will review this Caution for potential Operability Determination requirements.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Reactivity Control (SF1) - Control Rod Drive System (CRDS)**

TASK: **Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.1	IF Rod Drive Vent Fan has just been started, AND SEQUENCE COMPLETE indication is illuminated, THEN **MONITOR** both running Rod Drive Hdr Outlet temperatures. Fan Comp Pt / Alrm Description 21 T2602A / 160°F 21 Rod Drive Hdr Outlet Temp 22 T2603A / 160°F 22 Rod Drive Hdr Outlet Temp 23 T2604A / 160°F 23 Rod Drive Hdr Outlet Temp	Operator reads the step and determines that a Vent Fan has NOT been started. Marks step N/A and continues on.		
*	3.2	IF SEQUENCE COMPLETE indication for affected fan is extinguished THEN immediately **SWAP** to the standby Rod Drive Vent Fan, (**Evaluator's Note**: Steps A-E are below)	**Operator determines these steps are applicable based on the SEQUENCE COMPLETE indication bezel is extinguished.** Operator continues on and PERFORMs the applicable steps. **Evaluator's Note**: It is acceptable for the operator to Stop and Start CRD Vent Fans using S2.OP-SO.CBV-0001.		
*	3.2.A	**PRESS** STOP for affected Rod Drive Vent Fan	**Operator depresses STOP PB for 21 Fan and verifies STOP bezel illuminates Green.**		
*	3.2.B	**PRESS** START for standby Rod Drive Vent Fan	**Operator depresses START PB for standby vent fan and verifies START bezel illuminates RED. Operator reports SEQUENCE COMPLETE bezel is illuminated and AIR FLOW LO is extinguished as expected.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Reactivity Control (SF1) - Control Rod Drive System (CRDS)**

TASK: **Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	**Simulator Operator**: ENSURE **ET-1 is TRUE** when the standby fan is started. This will INSERT **VC0316C and VC0316B** to Trip the two (2) running Vent Fans after a time delay. **MALF VC0316C 23 CRD Fan Trip** **Delay = 00:40 seconds** **MALF VC0316B 22 CRD Fan Trip** **Delay = 00:50 seconds.**			
	3.2.C	IF the standby fan can NOT be started, AND at least one Rod Drive Vent Fan is in operation, THEN **PERFORM** an Operability Determination to determine continued plant operation [80083830].	Operator marks step as N/A based on standby fan starting.		
		ALTERNATE PATH STARTS HERE:	**Loss of ALL CRDM Vent Fans**		
*	3.2.D	IF there are NO Rod Drive Vent Fans in operation, THEN:	Operator initially marks this step as N/A based on standby fan starting. This step will become applicable when the two (2) running vent fans trip shortly after.		
*		1. **TRIP** the Reactor	**Operator TRIPs the Reactor when NO Vent Fans are in operation.**		
		2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection	**Terminate the JPM when Rx is Tripped** **Evaluator's Note:** Performing EOP-TRIP-1 immediate actions is not required to complete this JPM.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Reactivity Control (SF1) - Control Rod Drive System (CRDS)

TASK: Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.2.E	IF at least one Rod Drive Vent Fan is in operation, THEN **INITIATE** a NOTF to determine and correct the cause of the low flow.	Operator determines this step is N/A and continues on.		
	3.3	**SEND** an operator to check the main and backup breakers closed for the affected fan.	**CUE:** CRS will dispatch an operator to check the breaker positions for the main and backup breakers for 21 CRD Vent Fan.		
	NOTE	Main breakers are on 84', 460/230V Switchgear Room	Operator reads the Note and continues on.		
	3.3.A	IF a breaker is found tripped, THEN **INFORM** the Unit 2 Control Room. 21 Fan Main Bkr 2EX1AX5X Backup Bkr 2EX1AX5X-1	Operator awaits report from field operator and continues on.		
	3.3.B	**INITIATE** a NOTF to determine and correct cause of the breaker trip.	Operator awaits report from field operator and continues on.		
	3.4	**MONITOR** running Rod Drive Hdr Outlet temperature(s). Fan Comp Pt / Alrm Description 21 T2602A / 160°F 21 Rod Drive Hdr Outlet Temp 22 T2603A / 160°F 22 Rod Drive Hdr Outlet Temp 23 T2604A / 160°F 23 Rod Drive Hdr Outlet Temp	Operator monitors running Vent Fan Outlet temperatures on the P250 computer.		
	3.5	**INITIATE** a NOTF to determine and correct cause of the of the low flow alarm	Operator informs CRS to initiate NOTF. **CUE:** CRS will initiate the notification.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Reactivity Control (SF1) - Control Rod Drive System (CRDS)**

TASK: **Respond to Loss of All Control Rod Drive Vent Fans IAW S2.OP-AR.ZZ-0011**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	JPM is complete when the task is complete OR at the direction from the Lead Evaluator. **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate the JPM when the operator TRIPs the Reactor.** **Evaluator's Note:** Operator performing immediate actions of EOP-TRIP-1 is not required for this task.		

OPERATIONS DEPARTMENT
JOB PERFORMANCE MEASURE

TQ-AA-106-0303

JPM: 17-01 NRC Sim-a

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

JL 1. Task description and number, JPM description and number are identified.

JL 2. Knowledge and Abilities (K/A) references are included.

JL 3. Performance location specified. (in-plant, control room, or simulator)

JL 4. Initial setup conditions are identified.

JL 5. Initiating and terminating Cues are properly identified.

JL 6. Task standards identified and verified by SME review.

JL 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

JL 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 60 / 34 Date 6/22/18 / 6/22/18 S2.OP-AR.ZZ-0011 S2.OP-SO.CBV-0001

JL 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

NA R 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA R 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: Michael Spencer | Michael Spencer Date: 6/22/18

SME/Instructor: JL / Thomas Wathey Date: 6/22/18

SME/Instructor: _____ Date: _____

OPERATIONS DEPARTMENT
JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 2 at 100% power, BOL.
- No equipment is out of service and no active Tech Specs are in effect.

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all alarms and indications.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	Salem Generating Station
SYSTEM:	Reactor Coolant System (SF 2) - ECCS
TASK:	Transfer To Hot Leg Recirculation IAW EOP-LOCA-4
TASK NUMBER:	N1150110501
JPM NUMBER:	17-01 NRC Sim-b
ALTERNATE PATH:	[X]
K/A NUMBER:	006 A4.05
IMPORTANCE FACTOR:	3.9 (RO) / 3.8 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: 2-EOP-LOCA-4, Rev. 30 (checked 6-22-18)
2-EOP-LOCA-1, Rev. 31

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 5 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Rudolf Chan **Date:** 6-22-18
Instructor

Validated By: J. Brennan / Thomas Wathey **Date:** 6/22/18, 6-22-18
SME or Instructor

Approved By: Matthew McHugh M. McHugh **Date:** 10/30/18
Training Department

Approved By: MGRS **Date:** 10/23/18
Operations Representative

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:
GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Reactor Coolant System (SF 2) - ECCS

TASK: Transfer To Hot Leg Recirculation IAW EOP-LOCA-4

TASK NUMBER: 1150360501

SIMULATOR IC: **IC-231 [6-4-18, 08:39:53]**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	RC0001B, RCS rupture of RC loop 22	N/A	N/A	N/A	N/A	TRUE
02	SJ0062B, 22 SI pump trip					TRUE

3. These malfunctions will simulate plant conditions to support transferring to Hot Leg Recirc IAW LOCA-4. The operator will commence the task in LOCA-1 Step 27 to remove lockouts for 21/22SJ49's, then on cue transfer to LOCA-4. While in LOCA-4, the operator will recognize that only 22 RHR pump is running and 21SJ45 is C/T as part of maintenance on 21 RHR pump. The operator will recognize that 22 SI pump tripped during LOCA-3 and take the Alternate Path to use 21 SI pump for Hot Leg injection.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	RH26D, 21 RHR pump breaker control power					OFF
02	RH27D, 21 RHR pump rack out					TAGGED

EVENT TRIGGERS:

ET#	Description	Command

SPECIAL INSTRUCTIONS:

- Provide mark up of EOP-LOCA-1, sheet 3, steps completed up to Step 27.
- ENSURE bezel covers for 21 RHR pump and 21SJ45 C/T

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Reactor Coolant System (SF 2) - ECCS

TASK: Transfer To Hot Leg Recirculation IAW EOP-LOCA-4

TASK NUMBER: N1150110501

INITIAL CONDITIONS:

- Unit 2 experienced a Large Break LOCA.
- The crews have completed actions to transfer to Cold Leg Recirculation IAW EOP-LOCA-3 and have transitioned back to EOP-LOCA-1.
- 22 SI pump tripped during LOCA-3 and is being investigated.
- 21 RHR pump and 21SJ45 were C/T for scheduled maintenance prior to the event.
- The crew has just reached the 4.5 hour wait time at Step 26 of EOP-LOCA-1.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to continue with EOP-LOCA-1 starting at **Step 27**.
- Your evaluator will respond to all alarms not related to your task.

Successful Completion Criteria

1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made**

Task Standard for Successful Completion:

Align RCS for Hot Leg Recirculation IAW 2-EOP-LOCA-4 Steps 3 thru 4.

NAME: _____

DATE: _____

SYSTEM: Reactor Coolant System (SF 2) - ECCS

TASK: Transfer To Hot Leg Recirculation IAW EOP-LOCA-4

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
		The following steps are from 2-EOP-LOCA-1, Step 27 and 2-EOP-LOCA-4. **Evaluator's Note: Figures 1 and 2 are snapshots that shows the exact EOP steps to follow along.**			
		EOP-LOCA-1, sheet 3			
*,#	27	DEPRESS "CLOSE" PUSHBUTTON FOR 21 AND 22 SJ40 (HOT LEG DISCHARGE VALVES)	**Operator depresses the CLOSE PB for 21 and 22 SJ40 on 2CC1.**		
*,#	27.1	REMOVE LOCKOUTS FOR 21 AND 22 SJ40 (HOT LEG DISCHARGE VALVES)	**Operator places 21 and 22 SJ40 Lockout CMC switches to "Valve Operable" and verifies Valve Operable backlight illuminates.**		
		ARE "VALVE OPERABLE" BACKLIGHTS LIT FOR 21SJ40 AND 22SJ40	**YES**, Operator verifies that Valve Operable backlights are lit on 2RP4 for both 21 and 22		

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
			SJ40.		
	28	WAIT UNTIL 6.5 HOURS HAVE ELAPSED SINCE SI ACTUATION	**CUE:** 6.5 hours has elapsed since SI actuation. The CRS directs you to "Transfer to Hot Leg Recirculation" by performing EOP-LOCA-4.		
		EOP-LOCA-4, sheet 1			
	1	ARE **BOTH** RHR PUMPS RUNNING?	Determines that ONLY 22 RHR Pump is running. (21 RHR pump is C/T) **GOES TO Step 3.**		
	3	IS 22 RHR Pump Running	YES, determines that 22 RHR Pump is running.		
*,#	4	CLOSE 22CS36 (RHR SUPPLY TO CS VALVE)	**Operator depresses CLOSE PB for 22CS36 (RHR SUPPLY TO CS VALVE) and verifies CLOSE PB illuminates.**		
		ALTERNATE PATH #1 STARTS HERE:	21SJ45 is tagged CLOSED for maintenance		
		IS 21SJ45 (RHR DISCHARGE TO SI PUMPS VALVE) OPEN	**NO**, Operator determines 21SJ45 (RHR DISCHARGE TO SI PUMPS VALVE) is CLOSED due to 21 RHR pump maintenance.		
*,#		OPEN 22SJ49 (COLD LEG ISOLATION VALVE)	**Operator depresses OPEN PB for 22SJ49 (COLD LEG ISOLATION VALVE) and verifies OPEN PB illuminates.**		
		ALTERNATE PATH #2 STARTS HERE:	22 SI pump tripped during EOP-LOCA-3		

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	4.1	IS 22 SI Pump Running	**NO**, Operator determines 22 SI Pump is NOT running based on initial conditions that 22 SI pump tripped during LOCA-3. **GOES TO step 6.1**		
*,#		STOP 21 SI Pump	**Operator depresses 21 SI Pump STOP PB on 2CC1 and verifies STOP PB illuminates.**		
*,#		CLOSE 21SJ134 (Cold Leg Discharge Valve)	**Operator depresses CLOSE PB for 21SJ134 (Cold Leg Discharge Valve) on 2CC1 and verifies CLOSE PB illuminates.**		
*,#		OPEN 21SJ40 (Hot Leg Discharge Valve)	**Operator Opens 21SJ40 (Hot Leg Discharge Valve) by inserting key and rotating; verifies OPEN PB illuminates.**		
*,#		START 21 SI Pump	**Operator depresses START PB for 21 SI Pump and verifies START PB illuminates.**		
		Return to Procedure in Effect	**CUE: JPM is complete**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM when operator RETURNS TO PROCEDURE IN EFFECT.**		

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Figure 1 (2-EOP-LOCA-1, Sheet 3):

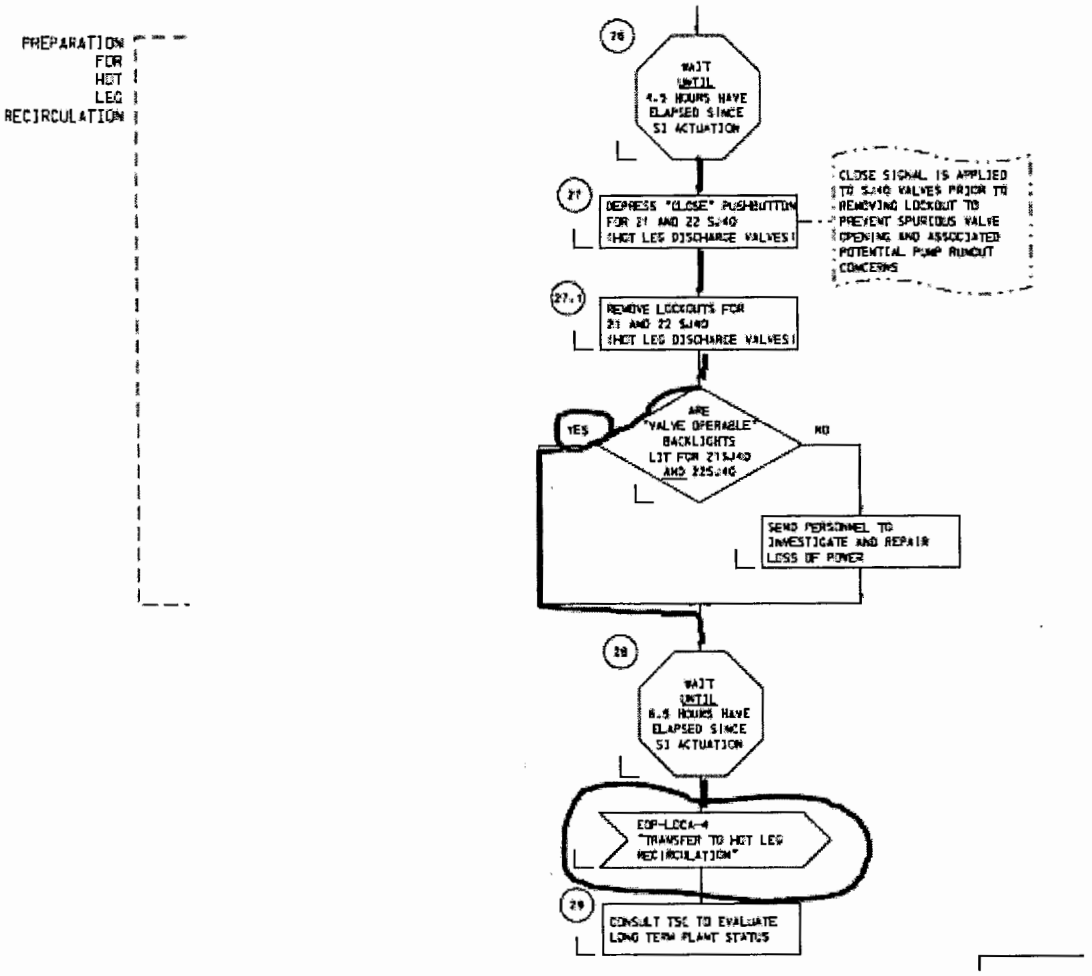
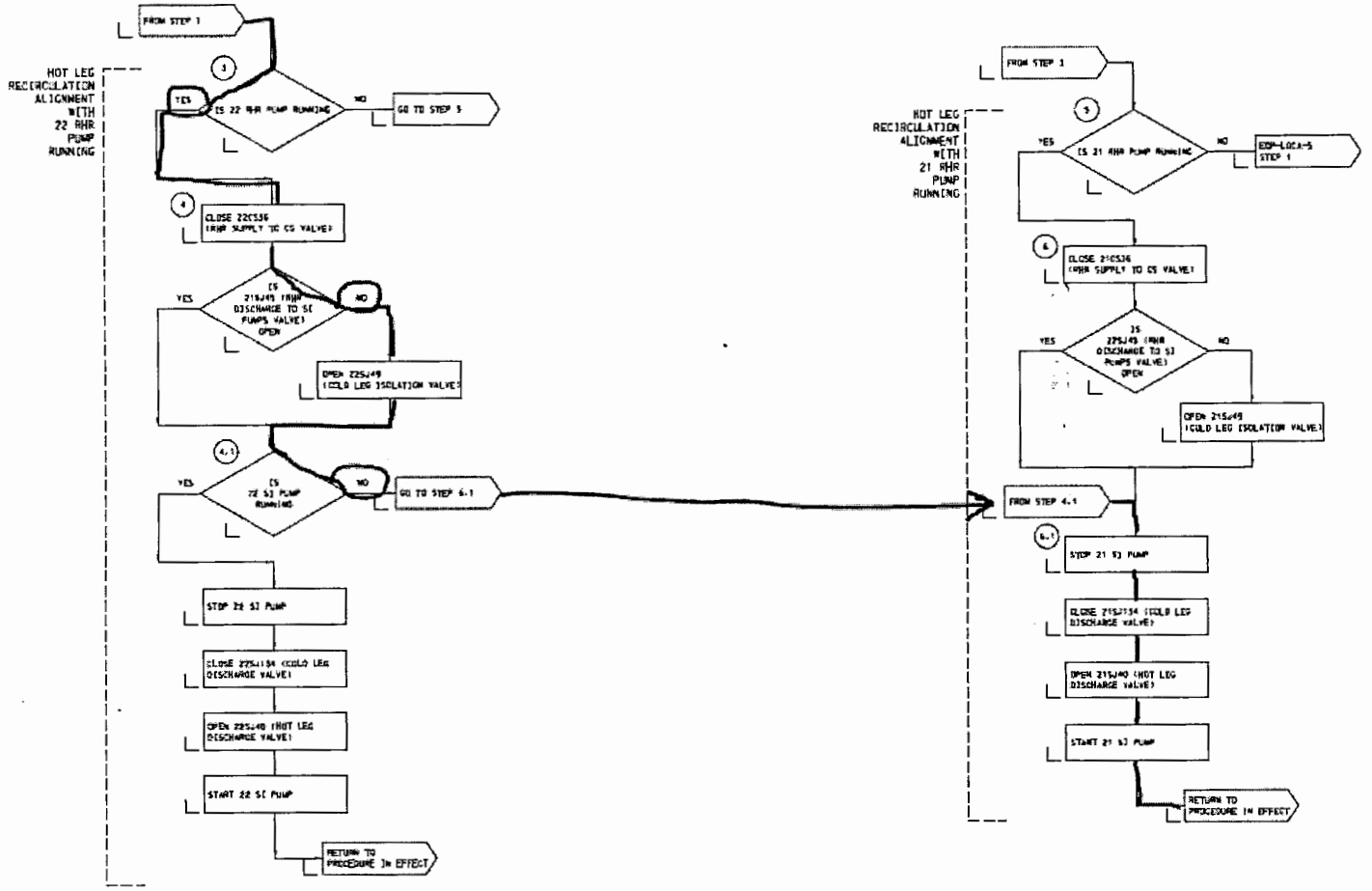


Figure 2 (2-EOP-LOCA-4, Sheet 1):



TQ-AA-106-0303

JPM#: 17-01 NRC Sim-b

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

JL 1. Task description and number, JPM description and number are identified.

JL 2. Knowledge and Abilities (K/A) references are included.

JL 3. Performance location specified. (in-plant, control room, or simulator)

JL 4. Initial setup conditions are identified.

JL 5. Initiating and terminating Cues are properly identified.

JL 6. Task standards identified and verified by SME review.

JL 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

JL 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 30 / 31 Date 6/22/18 / 6/22/18 2-EOP-LOCA-4 / 2-EOP-LOCA-1

JL 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

(SME)/Instructor: JL Brennan Date: 6-22-18

SME/Instructor: JL Thomas Wathey Date: 6/22/18

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Unit 2 experienced a Large Break LOCA.
- The crews have completed actions to transfer to Cold Leg Recirculation IAW EOP-LOCA-3 and have transitioned back to EOP-LOCA-1.
- 22 SI pump tripped during LOCA-3 and is being investigated.
- 21 RHR pump and 21SJ45 were C/T for scheduled maintenance prior to the event.
- The crew has just reached the 4.5 hour wait time at Step 26 of EOP-LOCA-1.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to continue with EOP-LOCA-1 starting at **Step 27**.
- Your evaluator will respond to all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Reactor Pressure Control (SF 3) – Pressurizer Pressure Control System
TASK:	Respond to Spray Valve Failing to Close during RCS Depressurization in EOP-SGTR-1
TASK NUMBER:	N1150190501
JPM NUMBER:	'17-01 NRC Sim-c
ALTERNATE PATH:	[X]
K/A NUMBER:	010 A2.02
IMPORTANCE FACTOR:	3.9 (RO) / 3.9 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: 2-EOP-SGTR-1, Rev 32 (checked 6-22-18)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Rudolph Chan — Instructor — **Date: 12-4-18**

Validated By: Spencer / Wathey (Rev. 0) — SME or Instructor — **Date: 6-22-18**

Approved By: Training Department — **Date:** 12/11/18

Approved By: Operations Department — **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:
GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC Sim-c

Rev #	Date	Description	Validation Required
00	6-22-18	**This is a NEW JPM.**	Yes
01	12-4-18	Incorporated NRC Prep week comments. Changed cue on page 6 to PZR level is now 79% and slowly rising. This is a minor change and re-validation is not required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Reactor Pressure Control (SF 3) – Pressurizer Pressure Control System

TASK: Respond to Spray Valve Failing to Close during RCS Depressurization in EOP-SGTR-1

TASK NUMBER: N1150190501

SIMULATOR IC: **IC-232 [6-11-18, 12:00:52]**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	PR0019B, PZR Spray valve 2PS3 fails open	N/A	N/A	N/A	ET-1	N/A
02	SG0078B, 22 SG Tube Rupture	N/A	N/A	N/A	N/A	1200

3. These malfunctions will simulate a SGTR in 22 SG and the operator is directed to perform RCS depressurization at Step 19 of EOP-SGTR-1. **ALTERNATE PATH**: 2PS3 will fail to close following reaching RCS depressurization criteria in Table D. The operator will be required to stop both 21 and 23 RCPs.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

EVENT TRIGGERS:

ET#	Description	Command
01	KB216TWI, 2PS3 Decrease (Close) PB	
02	MPC Pressure Increase PB	IMF PR0019B

SPECIAL INSTRUCTIONS:

- **Make sure EOP-SGTR-1 is marked up to Step 19.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Reactor Pressure Control (SF 3) – Pressurizer Pressure Control System

TASK: Respond to Spray Valve Failing to Close during RCS Depressurization in EOP-SGTR-1

TASK NUMBER: N1150190501

INITIAL CONDITIONS:

- Unit 2 was manually tripped at 100% power due to Steam Generator Tube Rupture (SGTR) on 22 SG.
- Safety Injection (SI) was initiated successfully on both trains.
- The crew is implementing 2-EOP-SGTR-1.
- The crew has just completed the RCS cooldown to the target temperature and the steam dumps are in Auto in MS Mode.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to **PERFORM** RCS depressurization using normal spray starting at Step 19 of 2-EOP-SGTR-1
- Your evaluator will respond to all alarms not related to your task.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **Performs RCS depressurization IAW EOP-SGTR-1 Step 19.**
2. **Identifies one PZR Spray Valve failed to close and Stops 21 and 23 RCPs.**

SYSTEM: Reactor Pressure Control (SF 3) – Pressurizer Pressure Control System

TASK: Respond to Spray Valve Failing to Close during RCS Depressurization in EOP-SGTR-1

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	CUE	The following are Steps from 2-EOP-SGTR-1, Steam Generator Tube Rupture.			
	19	IS NORMAL SPRAY AVAILABLE	YES, Operator determines from Initial Cue that CRS directed use of Normal Spray.		
	19.1	WHEN ANY CONDITION IN TABLE D OCCURS, THEN CLOSE THE PZR SPRAY VALVES	Operator reads Continuous Action Step and continues on.		
*	19.1 Contd.	FULLY OPEN BOTH PZR SPRAY VALVES	**Operator depresses the open PB for 2PS1 and 2PS3 and verifies open bezel illuminates.**		
	19.2	IS PZR SPRAY REDUCING RCS PRESSURE	YES. Operator checks RCS pressure is lowering.		
	19.2 Contd.	HAS ANY CONDITION IN TABLE D OCCURRED	NO. Operator checks parameters listed in Table D and determines that conditions are not met yet.		

SYSTEM: Reactor Pressure Control (SF 3) – Pressurizer Pressure Control System

TASK: Respond to Spray Valve Failing to Close during RCS Depressurization in EOP-SGTR-1

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	19.3	CONTINUE DEPRESSURIZATION	Operator continues the depressurization. **Evaluator's Note**: During validation it took approx.. **5-7 minutes** until conditions in Table D were met. RCS pressure less than ruptured SG pressure AND PZR level > 11% (19% ADVERSE) was the first condition met during validation.		
	19.3 Contd.	RETURN TO STEP 19.2	**Evaluator's Note**: At the discretion of the Lead Evaluator to save time use the following: **CUE**: *PZR Level is now 79% and rising slowly*		
	19.2 Contd.	HAS ANY CONDITION IN TABLE D OCCURRED	YES. Operator determines that a condition of Table D has occurred. **Evaluator's Note:** Operator may also use Step 19.1 to stop the depressurization. **Evaluator's Note**: Condition in Table D is met for RCS pressure < ruptured SG pressure WHEN both RCS pressure and ruptured SG pressure are lowering together.		

SYSTEM: Reactor Pressure Control (SF 3) – Pressurizer Pressure Control System

TASK: Respond to Spray Valve Failing to Close during RCS Depressurization in EOP-SGTR-1

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	19.2 Contd.	CLOSE BOTH PZR SPRAY VALVES	**Operator depresses CLOSE PB for 2PS1 and 2PS3 and verifies CLOSE PB illuminates.** **Operator identifies that 2PS3 will not close.**		
		[ALTERNATE PATH STARTS HERE:]	**2PS3 Fails to Close**		
	19.4	ARE <u>BOTH</u> PZR SPRAY VALVES CLOSED	NO, Operator reports that 2PS3 will NOT CLOSE.		
*	19.4 Contd.	STOP 21 AND 23 RCPS	**Operator depresses STOP PBs for 21 and 23 RCPs and verifies STOP bezel illuminates.**		
	19.4 Contd.	IS RCS PRESSURE DROPPING UNCONTROLLED	NO. Operator reports that RCS pressure is rising.		
	19.4 Contd.	GO TO STEP 27	Operator goes to Step 27. **CUE: JPM is Complete.**		
	CUE:	**JPM is Complete** **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate the JPM when the operator goes to Step 27.**		

JPM: 17-01 NRC Sim-c

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R

NA 1. Task description and number, JPM description and number are identified.

2. Knowledge and Abilities (K/A) references are included.

3. Performance location specified. (in-plant, control room, or simulator)

4. Initial setup conditions are identified.

5. Initiating and terminating Cues are properly identified.

6. Task standards identified and verified by SME review.

7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

R 12-4-18

SME/Instructor: NA Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

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INITIAL CONDITIONS:

- Unit 2 was manually tripped at 100% power due to Steam Generator Tube Rupture (SGTR) on 22 SG.
- Safety Injection (SI) was initiated successfully on both trains.
- The crew is implementing 2-EOP-SGTR-1.
- The crew has just completed the RCS cooldown to the target temperature and the steam dumps are in Auto in MS Mode.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to **PERFORM** RCS depressurization using normal spray starting at Step 19 of 2-EOP-SGTR-1
- Your evaluator will respond to all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Heat Removal From Reactor Core (SF 4) – Reactor Coolant System
TASK:	Initiate Feed and Bleed using Reactor Head Vents IAW EOP-FRHS-1
TASK NUMBER:	N1150290501
JPM NUMBER:	17-01 NRC Sim-d
ALTERNATE PATH:	[X]
K/A NUMBER:	002 A2.04
IMPORTANCE FACTOR:	4.3 (RO) / 4.6 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: 2-EOP-FRHS-1, Rev 36 (checked 7-5-18)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 8 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Instructor — **Date:** 12-5-18

Validated By: J. Klein (validated during 2018 Annual) SME or Instructor — **Date:** 7-5-18

Approved By: ~~Training Department~~ — **Date:** 12/11/18

Approved By: ~~Operations Department~~ — **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:
GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 17-01 NRC Sim-d

Rev #	Date	Description	Validation Required
00	9-29-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	11-13-17	Deleted malfunction for 2PR1 not opening in manual and changed initial conditions that three (3) SG WR levels are less than 32% for Bleed and Feed criteria IAW new revision to 2-EOP-FRHS-1 (Rev. 34).	Yes
02	3-12-18	Aligned task to appropriate Safety Function #10 K/A.	Yes
03	7-5-18	Updated JPM for Bleed and Feed criteria with 3 steam generator wide range levels < 20% IAW EOP-FRHS-1, Rev 36. Partially revalidated. Full validation performed during LOR exam development (see S-2).	Yes
04	12-5-18	Incorporated NRC Prep week comments. Identified step 24 as a Critical Step to open both PZR PORVs. Basis requires at least one PORV and Head Vents open for adequate bleed path. Revised Task Standard to include the requirement for; initiating SI and opening one PZR PORV for successful completion of the JPM. These changes are clarifications to the task standard and re-validation is not required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Heat Removal From Reactor Core (SF 4) – Reactor Coolant System

TASK: Initiate Feed and Bleed using Reactor Head Vents IAW EOP-FRHS-1

TASK NUMBER: N1150290501

SIMULATOR IC: **IC-233 (6-4-18)**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	AF0181A, 21 AFW pump trip	N/A	N/A	N/A	N/A	TRUE
02	AF0181B, 22 AFW pump trip	N/A	N/A	N/A	N/A	TRUE
03	AF0183, 23 AFW pump trip	N/A	N/A	N/A	N/A	TRUE
04	RP0247, False FW Isolation	N/A	N/A	N/A	N/A	TRUE

3. These malfunctions will simulate a total loss of all feed water and reaching the Bleed and Feed criteria of 3 SGs < 20% WR levels IAW FRHS-1. **ALTERNATE PATH**: 2PR2 will fail to open requiring the use of Rx Head Vent valves.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	AF20D, 21 AFW control power	N/A	N/A	N/A	N/A	OFF
02	AF25D, 22 AFW control power	N/A	N/A	N/A	N/A	OFF
03	B202 E DI, 2PR2 Open PB	N/A	N/A	N/A	N/A	OFF

EVENT TRIGGERS:

ET#	Description	Command

SPECIAL INSTRUCTIONS:

- **ENSURE** four (4) Reactor Head Vent keys are available for the evaluator.
- Extra Instructor to respond to alarms.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Heat Removal From Reactor Core (SF 4) – Reactor Coolant System

TASK: Initiate Feed and Bleed using Reactor Head Vents IAW EOP-FRHS-1

TASK NUMBER: N1150290501

INITIAL CONDITIONS:

- Unit 2 was manually tripped at 90% power due to elevated main turbine vibrations IAW S2.OP-AB.TL-0001.
- An inadvertent feedwater isolation actuation occurred resulting in the loss of all main feedwater.
- Loss of all AFW flow occurred when all AFW pumps tripped.
- The crew has entered 2-EOP-FRHS-1 due to valid RED Path on Heat Sink CFST based on all SG NR levels < 9% and AFW flow < 22E4 lbm/hr.
- Plant conditions have continued to deteriorate and three (3) steam generator Wide Range levels are now less than 20%.
- MSPI AFW pump failed to start.
- The CRS is implementing the CAS action to Initiate Bleed and Feed.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to Initiate Bleed and Feed starting at **Step 21** IAW 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink.
- Your evaluator will respond to all alarms not related to your task.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **Initiates Safety Injection (SI)**
2. **Opens one PZR PORV**
3. **Opens 2RC40 thru 2RC43 Reactor Head Vents IAW 2-EOP-FRHS-1.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Heat Removal From Reactor Core (SF 4) – Reactor Coolant System**

TASK: **Initiate Feed and Bleed using Reactor Head Vents IAW EOP-FRHS-1**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	CUE	The following are Steps from 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink.			
	Step 21	CAUTION To establish RCS Het Sink Removal by RCS Bleed and Feed , Steps 24 thru 29 Must Be Performed Quickly and Without Interruption.	Operator reads the Caution and continues on.		
	Step 21 Contd.	STOP ALL RCPs	Operator verifies that all RCPs are already Stopped. (Step 7 of FRHS-1 stopped RCPs)		
*	Step 22	Initiate SI	**Operator initiates SI on both Trains by inserting key and turning switch clockwise until the SI Operate bezel illuminates and the SI Reset bezel extinguishes.** Note: Operator only needs to initiate SI on one Train.		
	Step 23	Are SI Valves in Safeguards Position	YES. Operator checks that all SI valve bezels on 2RP4 are illuminated.		
	Step 23.1	Is 21 or 22 Charging Pump Running	YES. Operator reports that both Charging pumps are running as indicated by START bezels illuminated Red.		
	Step 23.1 Contd.	Is BIT Flow Established	YES. Operator reports BIT flow is established by indication of flow on Charging flowmeter. (During validations flow was about 235 gpm)		

SYSTEM: Heat Removal From Reactor Core (SF 4) – Reactor Coolant System

TASK: Initiate Feed and Bleed using Reactor Head Vents IAW EOP-FRHS-1

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	Step 23.2	Is any SI Running	YES. Operator reports that both SI pumps are running by START PBs illuminated Red.		
	Step 23.2 Contd.	Are Valves in Table C Open for At Least One Running SI Pump	YES. Operator verifies that all valves are OPEN in Table C for both running SI pumps as indicated by valve OPEN bezels illuminated.		
	Step 23.2 Contd.	Are All Charging and SI Pumps Running And Aligned to Deliver Flow	YES. Operator identifies that all Charging and SI Pumps are running and the valves are in the safeguards positions.		
	Step 24	Open Both PZR PORV Stop Valves	Operator reports that both PZR PORV Stop Valves are OPEN as indicated by 2PR6 and 2PR7 OPEN bezels illuminated.		
		[ALTERNATE PATH STARTS HERE:]	**2PR2 Fails to Open**		
*	Step 24 Contd.	Open Both PZR PORVs	**Operator places both PZR PORVs in Manual and depresses OPEN PBs for 2PR1 and 2PR2.** Operator reports that 2PR2 will NOT OPEN. Note: The PZR PORVS may be cycling during this time. The operator should determine that both PORVs are required to be fully open in Manual and maintained open and not credit auto operation.		
	Step 24.1	Are Both PZR PORV Stop Valves Open	YES. Operator reports both 2PR6 and 2PR7 are open as indicated by OPEN bezels illuminated.		

SYSTEM: Heat Removal From Reactor Core (SF 4) – Reactor Coolant System

TASK: Initiate Feed and Bleed using Reactor Head Vents IAW EOP-FRHS-1

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	Step 24.1 Contd.	Are Both PZR PORVs Open	NO. Operator reports that 2PR2 will NOT OPEN.		
*	Step 24.1 Contd.	Open 2RC40 Thru 2RC43 (Reactor Head Vents)	**CUE:** Lead Evaluator needs to provide the four (4) keys to the Operator. **At the 2RP2 backpanel, Operator obtains keys and inserts key into each keyswitch one at a time and turns clockwise until the OPEN bezel illuminates.** **Terminate JPM when 2RC40 Thru 2RC43 are open.**		
	CUE:	**JPM is Complete** **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate the JPM when the operator Opens 2RC40 Thru 2RC43.**		

JPM: 17-01 NRC Sim-d

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-5-18

NA 1. Task description and number, JPM description and number are identified.

2. Knowledge and Abilities (K/A) references are included.

3. Performance location specified. (in-plant, control room, or simulator)

4. Initial setup conditions are identified.

5. Initiating and terminating Cues are properly identified.

6. Task standards identified and verified by SME review.

7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

NA R 12-5-18

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

INITIAL CONDITIONS:

- Unit 2 was manually tripped at 90% power due to elevated main turbine vibrations IAW S2.OP-AB.TL-0001.
- An inadvertent feedwater isolation actuation occurred resulting in the loss of all main feedwater.
- Loss of all AFW flow occurred when all AFW pumps tripped.
- The crew has entered 2-EOP-FRHS-1 due to valid RED Path on Heat Sink CFST based on all SG NR levels < 9% and AFW flow < 22E4 lbm/hr.
- Plant conditions have continued to deteriorate and three (3) steam generator Wide Range levels are now less than 20%.
- MSPI AFW pump failed to start.
- The CRS is implementing the CAS action to Initiate Bleed and Feed.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to Initiate Bleed and Feed starting at **Step 21** IAW 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink.
- Your evaluator will respond to all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System
TASK:	Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003
TASK NUMBER:	N0450130201
JPM NUMBER:	17-01 NRC Sim-e
ALTERNATE PATH:	[X] **K/A NUMBER:** 045 A4.01
	IMPORTANCE FACTOR: 3.1 (RO) ____ (SRO)
APPLICABILITY:	EO [ ] RO [X] STA [ ] SRO [ ]
EVALUATION SETTING/METHOD:	Simulator / Perform
REFERENCES:	S2.OP-PT.TRB-0003, Rev 20 (checked 9-14-18)
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	8 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A
Developed By:	R. Chan, Instructor — **Date: 9-14-18**
Validated By:	D. Raymond, SME or Instructor — **Date:** 9-14-18
Approved By:	McHugh, Training Department — **Date:** 10/30/18
Approved By:	Operations Department — **Date:** 10/23/18

ACTUAL JPM COMPLETION TIME:	
ACTUAL TIME CRITICAL COMPLETION TIME:	
PERFORMED BY:	
GRADE:	[ ] SAT [ ] UNSAT
REASON, IF UNSATISFACTORY:	
EVALUATOR'S SIGNATURE:	**DATE:**

REVISION HISTORY

JPM NUMBER: 17-01 NRC Sim-e

Rev #	Date	Description	Validation Required
00	9-14-18	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System

TASK: Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003

TASK NUMBER: N0450130201

SIMULATOR IC: **IC-234**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	N/A					
02						
03						
04						

3. This JPM requires no malfunctions. The initial conditions support the required power level to perform Main Turbine Valve testing procedure. The alternate path for this JPM is when the field operator misses monitoring the valve for stroke and control room needs to restroke the valve using the restroke steps.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	N/A					
02						
03						

EVENT TRIGGERS:

ET#	Description	Command

SPECIAL INSTRUCTIONS:

- **ENSURE** copy of S2.OP-PT.TRB-0003 is available for candidate.
- Extra Instructor to respond to alarms.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System

TASK: Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003

TASK NUMBER: N0450130201

INITIAL CONDITIONS:

- Unit 2 is at 89% power.
- Power ascension is on hold to complete Main Turbine Valve testing IAW S2.OP-PT.TRB-0003, Main Turbine Valve Stroke Testing.
- A Retest on 22MS28 Main Turbine Stop Valve is required due to the valve failing to stroke during valve testing.
- Maintenance repairs are complete and the valve is turned over to the operating shift for testing.
- Control Rods are in Manual with rods at D-200.

INITIATING CUE:

- You are the Plant Operator.
- The CRS has directed you to PERFORM retest on **22MS28 Main Turbine Stop Valve** (TSV) IAW S2.OP-PT.TRB-0003, Main Turbine Valve Stroke Testing, section 5.4.3.
- All Prerequisites and P&L's are satisfied.
- Test Preparation section 5.2 is complete.
- An operator is in the field standing by the 22MS28 valve to monitor the valve stroke.
- Notify the CRS the results of the valve stroke test.
- Your evaluator will respond to all alarms not related to your task.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **Performs valve stroke steps in the correct order on Turbine Stop Valve IAW approved procedure.**

SYSTEM: Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System
TASK: Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	**Simulator Operator: ENSURE** the HMI screen is selected to Operations screen	**Evaluator Note**: Ensure HMI screen is selected to operations screen.		
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
		The following are Steps from S2.OP-PT.TRB-0003, Main Turbine Valve Stroke Testing.	**Evaluator's Note: The Operator will use the DEHC HMI panel on 2CC2 for performing this test.** **In the event that this monitor unexpectantly fails to operate, the Operate can use the panel on 2RP7.**		
	5.4.3	IF performing 22MS28/22MS29 testing, THEN:	Operator reads step, confirms correct valve (22MS28) and continues on.		
			Evaluator's Note: The operator will need to navigate from the main screen (Operating Screen) to the Test Screen by performing the following: ♦ Selects **TEST** (top left) ♦ Selects **STOP/GOV TEST**		
	5.4.3.A	At the TURBINE E-H CONTROL & STATUS monitor, STOP/GOVERNOR VALVE TESTS screen, **ENSURE** the following TEST PERMISSIVES are green: ♦ TURBINE INLET PRESSURE OK ♦ NO OTHER TESTS IN PROGRESS	Operator verifies that the TEST PERMISSIVES stated in the step are GREEN		

SYSTEM: **Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System**

TASK: **Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CAUTION	Failure of any Main Turbine Stop Valve or Governor Valve to reopen while the Main Turbine is operating, requires compliance with the actions in the Precautions and Limitations Step 3.4.3. Failure of ALL Turbine Inlet Pressure signals results in automatic switching to VLV POS CTRL and may require REFERENCE adjustments by the Operator until the test completes.	Operator reads Caution and continues on. Operator may refer to P&L 3.4.3. 3.4.3 Except for short periods during TSV (MS28) and GV (MS29) testing, **[VTD 326163]** ___ A. The Main Turbine should be operated at ≤75% of turbine load with any one HP Turbine inlet valve (MS28/MS29) CLOSED. ___ B. The Main Turbine should be operated at ≤30% of turbine load with any two HP Turbine inlet valves (MS28/MS29) CLOSED. ___ C. Engineering concurrence is required prior to exceeding any 8-hour period for either case		
	5.4.3.B	**DIRECT** Operator to monitor 22MS28 AND 22MS29 for full stroke	**CUE**: ***Field Operator will monitor the 22MS28 and 22MS29 for stroke.***		
	5.4.3.C	**RECORD** 22MS28 AND 22MS29 positions on Attachment 1, Section 3.0, by initialing TEST POSITION 1.	Operator records 22MS28 and 22MS29 are both **OPEN**. **Evaluator's Note**: Attachment 1 NOTE states that 22MS29 (Governor Valve) is considered OPEN when local position is ≥ 17.9% (≥ 2.5 inches) **CUE**: IF asked, ***field operator reports 22MS28 and 22MS29 are OPEN.***		

SYSTEM: Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System

TASK: Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	NOTE	The MicroNet System will perform the following functions during testing: ▪ Modulate the 21, 23, and 24MS29 (GV) to maintain load during testing ▪ Ramp 22MS29 (GV) until 0% is achieved ▪ Issue an alarm should the GV indicate 0% without closed indication ▪ Hold the GV closed during 22MS28 (TSV) testing ▪ CLOSE the TSV and hold in the closed position for 5 seconds ▪ OPEN the TSV after 5 seconds elapses (Total Test Sequence .120 seconds) ▪ Ramp the GV OPEN upon selecting END TEST	Operator reads NOTE and continues on. **Evaluator's Note**: This note describes what occurs when test is in progress.		
*	5.4.3.D	At the TURBINE E-H CONTROL & STATUS monitor, STOP/GOVERNOR VALVE TESTS screen, ___ 1. **SELECT** 22MS28/22MS29 - START TEST. ___ 2. **ENSURE** 22MS28/22MS29 changes from NORMAL OPERATION to TEST IN PROGRESS	**Operator SELECTS 22MS28/22MS29 START TEST on HMI screen** **Operator verifies 22MS28/22MS29 changes from NORMAL OPERATION to TEST IN PROGRESS on HMI screen.** **CUE:** IF field operator is contacted, ***report that you are standing by to monitor.*** **Evaluator's Note**: P&L 3.6 requires local observation of valve movement.		

SYSTEM: Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System
TASK: Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Evaluator's Note: When the valves strokes from CLOSED to OPEN, expect to see Tavg to rise when valve CLOSED and Tavg to lower when valve reopens. Time to CLOSE 22MS29 Governor Valve takes ≈ 2 minutes from start of test. Time to full stroke 22MS28 Stop Valve (closed to open) takes ≈ 25 seconds. 22MS28 will stay CLOSED for ≈ 10 seconds then reopens. Time to OPEN 22MS29 Governor Valve to previous position takes ≈ 2 minutes.		
	5.4.3.E	WHEN TSV (22MS28) CLOSED indication is received, THEN: ___ 1. **RECORD** 22MS28 AND 22MS29 positions on Attachment 1, Section 3.0, by initialing TEST POSITION 2. ___ 2. **RECORD** 22MS901 position on Attachment 1, Section 3.0, by initialing TEST POSITION 1.	**Evaluator's Note:** Expect **OHA G-12 TURB STM STOP VLV CLSD**, when 22MS28 is closed and clears when strokes open. **CUE**: ***Field operator reports that the 22MS29 is CLOSED and 22MS901 is OPEN, but missed monitoring the 22MS28 stroke.*** Operator records 22MS29 position as CLOSED and records on Attachment 1 Test Position 2 Operator records 22MS901 positon as OPEN and records on Attachment 1 Test Position 1		

SYSTEM: Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System
TASK: Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.4.3.F	IF 22MS28 position was NOT captured locally, THEN: ___ 1. **SELECT** 22MS28/22MS29 - RESTROKE TSV. ___ 2. WHEN TSV (22MS28) OPEN/MOVING indication is cleared, THEN: ___ a. **RECORD** 22MS28 position on Attachment 1, Section 3.0, by initialing TEST POSITION 2. ___ b. **RECORD** 22MS901 position on Attachment 1, Section 3.0, by initialing TEST POSITION 1.	**Operator selects RESTROKE on HMI Test screen.** Operator records position of 22MS28 and 22MS901 CUE: ***Field operator reports 22MS28 valve stroke fully closed and open with no issues noted.*** ***IF asked, report that 22MS901 is OPEN and 22MS29 remains CLOSED***		
*	5.4.3.G	WHEN Stop Valve is OPEN, **SELECT** 22MS28/22MS29 - END TEST	**Operator SELECTS 22MS28/22MS29 END TEST on HMI screen**		

SYSTEM: Heat Removal From Reactor Core (SF 4) – Main Turbine Generator System

TASK: Perform Retest on a Main Turbine Stop Valve IAW S2.OP-PT.TRB-0003

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.4.3.H	WHEN 22MS28/22MS29 changes from TEST IN PROGRESS to NORMAL OPERATION, THEN: ___ 1. **RECORD** 22MS28 position on Attachment 1, Section 3.0, by initialing TEST POSITION 3. ___ 2. **RECORD** 22MS29 position on Attachment 1, Section 3.0, by initialing TEST POSITION 4. ___ 3. **RECORD** 22MS901 position on Attachment 1, Section 3.0, by initialing TEST POSITION 2.	**CUE:** ***Field operator reports that 22MS28 & 22MS29 are OPENED and 22MS901 is CLOSED.*** Operator records 22MS28 OPEN position on Attachment 1 Test Position 3 Operator records 22MS29 OPEN position on Attachment 1 Test Position 4 Operator records 22MS901 CLOSED position on Attachment 1 Test Position 2		
	5.4.3.I	IF all STOP/GOVERNOR VALVE TESTS are completed, THEN **SELECT** CLOSE WINDOW at the TURBINE E-H CONTROL & STATUS monitor.	**CUE: JPM is Complete**		
	CUE:	**JPM is Complete** **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate the JPM when the operator reaches step 5.4.3.I .**		

JPM: 17-01 NRC Sim-e

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 20 Date 9-14-18

R 9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 9-14-18

SME/Instructor: D. Raymond Date: 9/14/18

SME/Instructor: DAVID BELL Date: 9/14/18

J. BATES 9/14/18

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INITIAL CONDITIONS:

- Unit 2 is at 89% power.
- Power ascension is on hold to complete Main Turbine Valve testing IAW S2.OP-PT.TRB-0003, Main Turbine Valve Stroke Testing.
- A Retest on 22MS28 Main Turbine Stop Valve is required due to the valve failing to stroke during valve testing.
- Maintenance repairs are complete and the valve is turned over to the operating shift for testing.
- Control Rods are in Manual with rods at D-200.

INITIATING CUE:

- You are the Plant Operator.
- The CRS has directed you to PERFORM retest on **22MS28 Main Turbine Stop Valve** (TSV) IAW S2.OP-PT.TRB-0003, Main Turbine Valve Stroke Testing, section 5.4.3.
- All Prerequisites and P&L's are satisfied.
- Test Preparation section 5.2 is complete.
- An operator is in the field standing by the 22MS28 valve to monitor the valve stroke.
- Notify the CRS the results of the valve stroke test.
- Your evaluator will respond to all alarms not related to your task

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Containment Integrity (SF 5) - Containment Cooling System
TASK:	Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003
TASK NUMBER:	N0220130201
JPM NUMBER:	17-01 NRC Sim-f
ALTERNATE PATH:	[ ]
K/A NUMBER:	022 A1.04
IMPORTANCE FACTOR:	3.2 (RO) / 3.3 (SRO)
APPLICABILITY:	EO [ ] RO [X] STA [ ] SRO [X]
EVALUATION SETTING/METHOD:	Simulator / Perform
REFERENCES:	S2.OP-ST.CBV-0003, Rev 20 (checked 6-6-18)
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	8 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A
Developed By:	R. Chan Rudolph Chan Instructor — **Date: 6-6-18**
Validated By:	Pierce / Bates See Rev History SME or Instructor — **Date: 4-10-18**
Approved By:	Mc Hugh Training Department — **Date: ~~8-8-18~~ 10/30/18** D.10/30/18
Approved By:	MYERS Operations Department — **Date: 10·23·18**

ACTUAL JPM COMPLETION TIME:	
ACTUAL TIME CRITICAL COMPLETION TIME:	
PERFORMED BY:	
GRADE:	[ ] SAT [ ] UNSAT
REASON, IF UNSATISFACTORY:	
EVALUATOR'S SIGNATURE:	**DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC Sim-f

Rev #	Date	Description	Validation Required
00	9-18-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
NA	6-6-18	JPM previously validated during LOR annual exam development (see 2018 Annual S-5 for signatures).	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Containment Integrity (SF 5) - Containment Cooling System

TASK: Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003

TASK NUMBER: N0220130201

SIMULATOR IC: **IC-235 [6-4-18, 08:49:25]**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	VL0570, 22SW223 fails to position	00:00:15	N/A	N/A	ET-1	89

3. These malfunctions will simulate malfunction of 22SW223 valve when the CFCU is placed in LOW SPEED. The malfunction attempts to have SW flow below 1811 gpm (110 psid) for Unsat test. This was chosen in case the operator chooses the incorrect Min Flow Rate of 1769 gpm for a SW DP at 105 psid..

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

EVENT TRIGGERS:

ET#	Description	Command
1	KAD06PBR, 22 CFCU low speed PB	

SPECIAL INSTRUCTIONS:

- Provide operator marked up copy of S2.OP-ST.CBV-0003 for 22 CFCU.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Containment Integrity (SF 5) - Containment Cooling System

TASK: Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003

TASK NUMBER: N0220130201

INITIAL CONDITIONS:

- Unit 2 is at 100% power.
- No major equipment out of service and no active Tech Specs are in effect.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to **PERFORM** a scheduled surveillance test on 22 CFCU IAW S2.OP-ST.CBV-0003, Containment Systems – Cooling Systems.
- All Prerequisites are completed SAT and all required M&TE are installed in the field.
- A field NEO is standing by to provide SW header differential pressure when directed.
- Notify CRS of test results.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **PERFORMS surveillance test IAW S2.OP-ST.CBV-0003 and determines 22 CFCU Test Results is UNSAT.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Containment Integrity (SF 5) - Containment Cooling System

TASK: **Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	3.0	**PRECAUTIONS AND LIMITATIONS** 3.4 After recording Differential Pressure (DP) reading, select corresponding minimum flow value specified in Exhibit 1. • IF measured DP value is between DP values specified in Exhibit 1, THEN select minimum flow value for next higher DP value listed (e.g., if measured DP is 101 psid, use minimum flow required at 105 psid).	Operator reads and initials all P&Ls. **Evaluator's Note:** Understanding P&L 3.4 is important to properly determining which DP value to choose from Exhibit 1.		
	4.0	**EQUIPMENT/MATERIAL REQUIRED**	**CUE**: Completed SAT by I&C Technicians.		
	5.1	CFCU Operability and Service Water Flow Verification			
	5.1.1	PERFORM test on each Containment Fan Coil Unit required to be tested IAW the following instructions:			
*	5.1.1.A	**ENSURE** CFCU being tested is in LOW SPEED IAW S2.OP-SO.CBV-0001(Q), Containment Ventilation Operation.	**Operator places CFCU in LOW SPEED IAW S2.OP-SO.CBV-0001.** Operator **GOES TO** S2.OP-SO.CBV-0001		
		These next steps are from S2.OP-SO.CBV-0001, Containment Ventilation Operation.			

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Containment Integrity (SF 5) - Containment Cooling System

TASK: **Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.2	IF shifting CFCU(s) from High Speed to Low Speed, THEN for each CFCU to be shifted:			
*	5.1.2.A	**PRESS** FAN HIGH SPEED STOP bezel.	**Operator depresses HIGH SPEED STOP bezel for 22 CFCU and verifies STOP bezel illuminates.**		
	NOTE	Steps 5.1.2B and 5.1.2C should be coordinated for 25 second delay prior to energizing slow speed windings.	Operator reads the Note and continues on.		
	5.1.2.B	**ENSURE** FAN STOP bezel is illuminated.	Operator verifies HIGH SPEED STOP bezel is illuminated.		
*	5.1.2.C	When 25 seconds have elapsed from pressing HIGH SPEED STOP bezel, **PRESS** FAN LOW SPEED START bezel.	**Operator waits 25 seconds from when HIGH SPEED STOP bezel was depressed.** **Operator depresses LOW SPEED START bezel for 22 CFCU and verifies START bezel illuminates.**		
	5.1.2.D	**ENSURE** following dampers are in indicated positions: ▪ ROUGH FLTR DAMPER CLOSED ▪ HEPA INLET DAMPER OPEN ▪ HEPA OUTLET DAMPER OPEN	Operator verifies the following for 22 CFCU: ▪ ROUGH FLT DAMPER CLOSED bezel extinguished. ▪ HEPA INLET DAMPER OPEN bezel illuminated. ▪ HEPA OUTLET DAMPER OPEN bezel illuminated.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Containment Integrity (SF 5) - Containment Cooling System

TASK: **Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.2.E	IF Service Water flow is less than 1465 gm, THEN: 1. STOP the CFCU 2. REFER to S2.OP-SO.SW-0005, SW System Operability Guidelines	Operator determines that SW flow is > 1465 gpm and marks step **N/A** and continues on.		
	5.1.2.F	**ENSURE** Service Water flow greater than or equal to 1465 gpm.	Operator verifies that SW flow is > 1465 gpm.		
		Operator returns to S2.OP-ST.CBV-0003:	Operator **GOES TO** S2.OP-ST.CBV-0003		
	5.1.1.B	**RECORD** Start Time in applicable Attachment(s), Section 3.0, for CFCU being tested.	Operator records START time.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Containment Integrity (SF 5) - Containment Cooling System

TASK: **Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.1.C	WHEN at least 15 minutes has elapsed, THEN **RECORD** the following in applicable Attachment, Section 3.0, for CFCU being tested:	**CUE**: Inform operator that 15 minutes have elapsed.		
		• Stop Time	Operator records STOP time.		
*		• Cooling Water Flow Rate (gpm)	**Operator records SW flow on 22 CFCU (1787 +/- 5 gpm)**		
*		• IF testing 21 OR 22 CFCU, THEN **RECORD** 21 SW HDR DP.	**Operator contacts field NEO and Records SW header DP of 106 psi**		
		• IF testing 23 CFCU, THEN **RECORD** both 21 SW HDR DP AND 22 SW HDR DP (Refer to Step 3.5).	**CUE:** When field operator is contacted; report 21 SW Header DP is reading 106 psi.		
		• IF testing 24 OR 25 CFCU, THEN **RECORD** 22 SW HDR DP.	Operator determines that 23, 24, and 25 CFCUs are not being tested.		
*		• **RECORD** Test Results by initialing the SAT OR UNSAT column IAW Acceptance Criteria stated in the attachment.	**Operator records Test Results as UNSAT.** 22 CFCU is Inoperable based on Cooling Water Flow Rate is less than the Minimum Flow Rate (1811 gpm) required in Exhibit 1 selecting a SW DP of 110 psi (refer to P&L 3.4).		
			P&L 3.3 requires CFCU SW flow rate ≥ 1465 gpm AND ≥ Min Flow Rate specified in Exhibit 1 to be Operable.		
			See Answer Key for completed Attachment 2, Section 3.0		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Containment Integrity (SF 5) - Containment Cooling System

TASK: **Perform 22 CFCU Surveillance Test IAW S2.OP-ST.CBV-0003**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**JPM is Complete.** **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate the JPM when the operator Records Test Results as SAT or UNSAT.**		

OPERATIONS DEPARTMENT
JOB PERFORMANCE MEASURE

TQ-AA-106-0303

JPM: 17-01 NRC Sim-f

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 20 Date 6-6-18

NA 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Rudolph Chan Date: 6-6-18

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

OPERATIONS DEPARTMENT
JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 2 is at 100% power.
- No major equipment out of service and no active Tech Specs are in effect.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to **PERFORM** a scheduled surveillance test on 22 CFCU IAW S2.OP-ST.CBV-0003, Containment Systems – Cooling Systems.
- All Prerequisites are completed SAT and all required M&TE are installed in the field.
- A field NEO is standing by to provide SW header differential pressure when directed.
- Notify CRS of test results.

ATTACHMENT 2

22 CFCU DATA SHEET

1.0 Reason For Test

Date: Today	Post-Maintenance Operability Retest?	Yes	No X
	SAP Order Number(s): 50206325		

2.0 Calibration Data

Instrument/Test Equipment Description	Calibration Due Date	ID Number	Initials
2FA5495 22 CFCU Outlet Water Flow Indicator	4-15-19	205216	R
Model HQS-2 Sensor Module 0-250 psi	5-7-19	205152	R
Model HQS-2 Sensor Module 0-250 psi	5-21-19	206116	R
Model PTE-1 Hand Held Heise Pressure Calibrator Gauge	9-2-19	206025	R

3.0 22 CFCU Performance Data

Component	Test Data		Acceptance Criteria	Test Results SAT	Test Results UNSAT
22 CFCU	Start Time		22 CFCU operated for at least 15 minutes in LOW SPEED at ≥1465 gpm. (+/- 5 spm)	✓	
	Stop Time	> 15 mins			
22SW58	Cooling Water Flow Rate	1787			
22SW72					
22SW223					
21 SW HDR ΔP (78' IPA - 21 SW Piping Room)		106	Cooling Water Flow Rate is ≥ the Minimum Flow Rate obtained in Exhibit 1 for ΔP specified.		✓
Minimum Flow Rate (Exhibit 1)		1811			

ANSWER KEY

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Electrical Systems (SF 6) - AC Distribution
TASK:	Start and load a EDG during Loss of All Off-Site Power IAW EOP-LOPA-1
TASK NUMBER:	N0640010101
JPM NUMBER:	17-01 NRC Sim-g
ALTERNATE PATH:	[ ]
K/A NUMBER:	064 A4.06
IMPORTANCE FACTOR:	RO: 3.9 / SRO: 3.9
APPLICABILITY:	EO [ ] RO [X] STA [ ] SRO [X]
EVALUATION SETTING/METHOD:	Simulator / Perform
REFERENCES:	2-EOP-LOPA-1, Rev 31 (checked 9-14-18)
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	8 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A
Developed By:	**R. Chan** Rudolf Chan **Instructor** — **Date: 12-5-18**
Validated By:	**Bell / Raymond / Bates (Rev. 0)** **SME or Instructor** — **Date: 9-14-18**
Approved By:	McHugh **Training Department** — **Date:** 12/11/18
Approved By:	MYERS **Operations Department** — **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC Sim-g

Rev #	Date	Description	Validation Required
00	9-14-18	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-5-18	Incorporated NRC Prep week comments. Corrected System description on various pages. This is an editorial change and no re-validation is required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Electrical Systems (SF 6) - AC Distribution

TASK: Start and load a EDG during Loss of All Off-Site Power IAW EOP-LOPA-1

TASK NUMBER: N0640010101

SIMULATOR IC: **IC-237 [9-14-18]**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	EL0161, 2A EMERG DIESEL GEN TRIP	N/A	N/A	N/A	N/A	TRUE
02	EL0134, LOSS OF ALL 500KV OFF-SITE POWER	N/A	N/A	N/A	N/A	TRUE
03	EL0145, LOSS OF 2B 4160V VITAL BUS	N/A	N/A	N/A	N/A	TRUE

3. These malfunctions will simulate a loss of all off-site power (LOPA) with 2A EDG tripping following Rx Trip and 2B 4 KV bus locked out on Bus Differential. 2C EDG was C/T for scheduled maintenance prior to the event. The crew entered EOP-LOPA-1 and has performed all actions thru step 12. CRS reports that 2C EDG is restored from maintenance and is ready for start. The CRS will direct the operator to perform Step 14 to start 2C EDG, then continue on with the procedure. The JPM will terminate when loads are started in Step 17.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
1	DG01D, DEENERGIZE A SEC CABINET	N/A	N/A	N/A	N/A	YES
2	DG02D, DEENERGIZE B SEC CABINET	N/A	N/A	N/A	N/A	YES
3	DG03D, DEENERGIZE C SEC CABINET	N/A	N/A	N/A	N/A	YES
4	AF25D, 22 AFW pump Control Power	N/A	N/A	N/A	N/A	OFF
5	AJ04 L AO, 21 RCP Seal Inlet Temp	N/A	N/A	N/A	N/A	200
6	AJ04 R AO, 21 RCP Seal Outlet Temp	N/A	N/A	N/A	N/A	200
7	AK04 L AO, 22 RCP Seal Inlet Temp	N/A	N/A	N/A	N/A	200
8	AK04 R AO, 22 RCP Seal Outlet Temp	N/A	N/A	N/A	N/A	200
9	AL04 L AO, 23 RCP Seal Inlet Temp	N/A	N/A	N/A	N/A	200
10	AL04 R AO, 23 RCP Seal Outlet Temp	N/A	N/A	N/A	N/A	200
11	AM04 L AO, 24 RCP Seal Inlet Temp	N/A	N/A	N/A	N/A	200
12	AM04 R AO, 24 Seal Outlet Temp	N/A	N/A	N/A	N/A	200

EVENT TRIGGERS:

ET#	Description	Command
	None	

SPECIAL INSTRUCTIONS: None

NAME: _____

DATE: _____

SYSTEM: Electrical Systems (SF 6) - AC Distribution

TASK: Start and load a EDG during Loss of All Off-Site Power IAW EOP-LOPA-1

TASK NUMBER: N0640010101

INITIAL CONDITIONS:

- Unit 2 experienced a Reactor Trip following a total loss of off-site power.
- The crew is implementing 2-EOP-LOPA-1 with all actions completed through Step 12.
- The following is a status of AC Power:
  - ❖ 2A EDG tripped shortly after the reactor was tripped and is being investigated by Maintenance.
  - ❖ 2B EDG was secured (stopped) by the crew due to the bus being locked out on Bus Differential.
  - ❖ 2C EDG was C/T for scheduled maintenance prior to this event.

INITIATING CUE:

- You are the Plant Operator.
- WCC Supervisor reports that 2C EDG has been restored from maintenance and tags are fully released.
- The CRS directs you to start and load 2C EDG starting at Step 13 of EOP-LOPA-1.
- Your evaluator will respond to all other alarms not related to your task.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **Starts 2C EDG and one SW pump for that bus, and closes 23SW20 valve.**
2. **Starts all directed C bus loads IAW Table C of EOP-LOPA-1.**

SYSTEM: **Electrical Systems (SF 6) - AC Distribution**

TASK: **Start and load a EDG during Loss of All Off-Site Power IAW EOP-LOPA-1**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Simulator Operator: Ensure **2-EOP-LOPA-1** is marked up to Step 12.			
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
		2-EOP-LOPA-1			
	13	CAUTION 4 KV VITAL BUS LOADING SHOULD NOT EXCEED POWER SUPPLY CAPACITY AS FOLLOWS: • GAS TURBINE – INSTALLED POWER TRUM CURVE • DG – 2000-HR LIMIT – 2750 KW • DG – 2-HR LIMIT – 2860 KW • DG – HALF-HR LIMIT – 3100 KW	Operator reviews CAUTION and continues on.		

SYSTEM: Electrical Systems (SF 6) - AC Distribution

TASK: Start and load a EDG during Loss of All Off-Site Power IAW EOP-LOPA-1

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
* #	14	RESTORE POWER TO DE-ENERGIZED 4 KV VITAL BUSES AS FOLLOWS: • START DGs • CLOSE DG OUTPUT BKRS	**Operator starts 2C EDG by depressing the DIESEL GEN START PB and verifying FREQUENCY is ≈ 60 Hz and VOLTS is ≈ 4.15 KV.** **In order to close the Output Breaker, the operator depresses the MIMIC PB for 2C DG 4KV BKR 2CDD and verifies both the MIMIC PB illuminates Yellow and the BUS INTLK CLOSE SELECTION Bezel is illuminated Yellow.** **Operator closes the 2C EDG output breaker by depressing the 2C BREAKER CLOSE PB.**		
			Evaluator's Note: 2C TROUBLE console alarm will be illuminated due to loss of bus voltage. **CUE**: If asked why the console alarm is illuminated THEN state: ***local alarm panel shows no alarms up, it may be from the loss of power.***		

SYSTEM: Electrical Systems (SF 6) - AC Distribution

TASK: Start and load a EDG during Loss of All Off-Site Power IAW EOP-LOPA-1

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	14.1	WHEN ANY 4 KV VITAL BUS IS ENERGIZED, THEN: 1. START ONLY ONE SW PUMP ON THAT BUS 2. CLOSE ASSOCIATED TURBINE AREA SW STOP VALVE	**Operator depresses START PB for either 25 or 26 SW pump on 2CC1 and verifies associated amps are increasing.** Operator checks loading on 2C EDG by observing KW meter on bezel. **Operator depresses CLOSED PB for 23SW20 on 2CC1 and verifies PB illuminates.**		
	15	SEND OPERATORS TO START NON-OPERATING DGs AND TO MONITOR OPERATING DGs.	CUE: ***CRS will dispatch operator to monitor 2C DG, CRS directs you to continue on with the procedure***		
	16	IS ANY 4 KV VITAL BUS ENERGIZED	YES: Operator determines that 2C 4 KV Vital bus is energized.		
	17	IS SI ACTUATED	NO: Operator determines SI has not actuated.		
	17 Contd.	IS SI REQUIRED	NO: Operator determines SI is not required.		

SYSTEM: **Electrical Systems (SF 6) - AC Distribution**

TASK: **Start and load a EDG during Loss of All Off-Site Power IAW EOP-LOPA-1**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	17 Contd.	START LOADS IN TABLE C AS REQUIRED	**CUE**: When operator reaches this step, THEN state: ***CRS directs the following loads to be started***: • 22 Charging Pump • 23 CCW Pump • #2 ECAC **Operator starts the required loads by depressing the START PBs and verifying PB illuminates followed by amps increasing.** Operator should also be monitoring EDG loading during starting loads.		
	CUE:	Operator notifies CRS Step 17 is complete	**CUE: JPM is complete**		
	CUE:	JPM is complete when the task is complete OR at the direction from the Lead Evaluator. **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate the JPM when the operator completes loading in Step 17.**		

JPM: 17-01 NRC Sim-g

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-5-18

NA 1. Task description and number, JPM description and number are identified.

2. Knowledge and Abilities (K/A) references are included.

3. Performance location specified. (in-plant, control room, or simulator)

4. Initial setup conditions are identified.

5. Initiating and terminating Cues are properly identified.

6. Task standards identified and verified by SME review.

7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: NA R 12-5-18 Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Unit 2 experienced a Reactor Trip following a total loss of off-site power.
- The crew is implementing 2-EOP-LOPA-1 with all actions completed through Step 12.
- The following is a status of AC Power:
  - ❖ 2A EDG tripped shortly after the reactor was tripped and is being investigated by Maintenance.
  - ❖ 2B EDG was secured (stopped) by the crew due to the bus being locked out on Bus Differential.
  - ❖ 2C EDG was C/T for scheduled maintenance prior to this event.

INITIATING CUE:

- You are the Plant Operator.
- WCC Supervisor reports that 2C EDG has been restored from maintenance and tags are fully released.
- The CRS directs you to start and load 2C EDG starting at Step 13 of EOP-LOPA-1.
- Your evaluator will respond to all other alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Plant Service Systems (SF8) – Component Cooling Water System
TASK:	Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001
TASK NUMBER:	N1140080401
JPM NUMBER:	17-01 NRC Sim-h
ALTERNATE PATH:	[X]
K/A NUMBER:	008 A2.02
IMPORTANCE FACTOR:	3.2 (RO) / 3.5 (SRO)
APPLICABILITY:	EO [ ] RO [X] STA [ ] SRO [X]
EVALUATION SETTING/METHOD:	Simulator / Perform
REFERENCES:	S2.OP-AB.CC-0001, Rev 16 (checked 9-14-18)
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	8 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A
Developed By:	**R. Chan** Rudold Chan **Instructor** — **Date: 12-5-18**
Validated By:	**Raymond / Bell / Bates (Rev. 0) SME or Instructor** — **Date: 9-14-18**
Approved By:	**Training Department** — **Date:** 12/11/18
Approved By:	**Operations Department** MYERS — **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:
GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 17-01 NRC Sim-h

Rev #	Date	Description	Validation Required
00	8-30-18	**This JPM was modified from the bank by altering the course of action to isolate CCW to CNTMT**. This task aligns with Safety Function #8 K/A.	Yes
01	12-5-18	Incorporated NRC Prep week comments. Attachment 2 of S2.OP-AB.CC-0001 has a place keeping issue that may result in the candidate from performing the intended step to isolate CCW flow to containment and stop the leak. Due to exam security concerns formal procedure revision was not performed, notification to follow after exam. Attachment 2 was revised by the exam team and will be provided to the candidate during the exam. Change provides proper procedure place keeping method and no re-validation is considered necessary.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Plant Service Systems (SF8) – Component Cooling Water System

TASK: Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001

TASK NUMBER: N1140080401

SIMULATOR IC: **IC-238 [6-6-18]**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity (Final)
01	CC0303, CC Leak Inside CNTMT	00:00:15	50	N/A	RT-1	10

3. This malfunction will simulate a CCW leak inside containment and cause CCW Surge Tank level to lower, resulting in console alarm for low level. The operator will initiate makeup by opening 2DR107 and CCW tank level will rise. **ALTERNATE PATH**: After operator restores CCW level, the leak will worsen and leak will exceed make up capability requiring operator to stop RCPs IAW Attachment 2. The operator will also be required to close various CCW valves to isolate CCW to containment.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

EVENT TRIGGERS:

ET#	Description	Command

SPECIAL INSTRUCTIONS:

- Additional instructor to silence OHA alarms should be used.
- **ENSURE that copies of revised S2.OP-AB.CC-0001 are available and that Attachment 2 has the proper place keeping initial step added to second bullet under step 1.D.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Plant Service Systems (SF8) – Component Cooling Water System

TASK: Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001

TASK NUMBER: N1140080401

INITIAL CONDITIONS:

- Unit 2 at 100% power, MOL.
- No equipment is out of service and no active Tech Specs are in effect.

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all alarms and indications.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **Open's 2DR107 to makeup to CCW surge tank.**
2. **TRIPs the Reactor, Stops RCPs, and Closes CNTMT CCW valves IAW Attachment 2.**

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	CUE	**Simulator Operator**: **INSERT** RT-1 when the operator assumes the watch. **MALF: CC0303 CCW Leak Inside CNTMT** **Initial Value = 50** **Final Value = 10** **Ramp = 15 seconds**	**Evaluator's Note:** Both CCW Surge Tank levels are normally at 46%. It can take 9-10 minutes for the CCW surge tanks to reach 0% level with the modified leak rate and makeup in progress.		
		The following alarm and indication will come in after ≈ 25 seconds: 1. **OHA C-2 CNTMT SUMP PMP START** 2. Followed shortly by CCW Console Alarm for **SURGE TANK LEVEL HI-LO**	Operator reports receipt of unexpected OHA C-2 and shortly thereafter console alarm for CCW Surge Tank Level Hi-Lo. Operator refers to OHA ARP for C Window and/or 2CC1 ARP. **CUE**: IF operator reports to you as CRS the following alarms AND is waiting for direction; **THEN state**: CRS directs you to respond to alarms and indications IAW applicable Alarm Response Procedures.		
	CUE:	**Evaluator's Note:** The operator may at any time initiate makeup by opening 2DR107 without waiting for procedure direction.			

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		The following steps are from Alarm Response Procedure (ARP) **S2.OP-AR.ZZ-0011, CONTROL CONSOLE 2CC1**	**Evaluator's Note**: The operator may also refer to ARP for OHA C-2 Window, but the console ARP will provide the appropriate action to address lowering CCW Surge Tank Level.		
	2CC1 ARP pg 93	COMPONENT COOLING WATER SYSTEM Surge Tank **SURGE TANK LEVEL HI-LO**	Operator responds to console alarm for SURGE TANK LEVEL HI-LO and refers to 2CC1 ARP S2.OP-AR.ZZ-0011 page 93.		
	1.0	**CAUSE(S):** High or low level in the CC Surge Tank.	Operator reads the step and continues on.		
	2.0	**AUTOMATIC ACTIONS**: None	Operator reads the step and continues on.		
	3.0	**OPERATOR ACTIONS:**			
	3.1	**MONITOR** CC Surge Tank Level on 2LI-628A and C on Bezel	Operator monitors Surge Tank Level and observes lowering Surge Tank Level.		
	3.2	IF the cause of the alarm is high level, THEN:	N/A: Operator determines alarm is due to low level AND GOES to next step.		
	3.3	IF the cause is low level, **THEN**:	Operator determines alarm is due to low level.		

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	3.3.A	**OPERATE** 2DR107, MAKEUP TO CC SURGE TANK, to restore CC Surge Tank level.	**Operator opens 2DR107.** **Operator reports CCW Surge Tank Level is rising.** **CUE:** IF operator requests an operating band THEN state: *CRS directs you to maintain CCW surge tank level between 45 and 55%.*		
	3.3.B	IF a leak exists or is suspected, THEN **GO TO** S2.OP-AB.CC-0001, Component Cooling Abnormality	Operator **GOES TO** S2.OP-AB.CC-0001. **CUE:** IF operator asks about entering the Abnormal procedure, THEN state: *CRS directs you to implement AB.CC-0001.*		
		S2.OP-AB.CC-0001			
	3.1	**INITIATE** Attachment 1, CAS	Operator reviews Attachment 1 CAS and determines none are applicable at this time.		
		Simulator Operator: IF the operator takes the action to Trip the Rx using the CAS,THEN **MODIFY RT-1 to 35.**	**Evaluator's Note**: The operator may determine that the CCW rate is large enough that warrants implementing the CAS action to trip the Rx upon entering AB.CC-0001.		

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.2	Is CCW Surge Tank Level > 58% and rising?	NO: Operator determines CCW Surge Tank Level is NOT rising and **GOES TO** Step 3.13. **Evaluator's Note**: Surge Tank may be rising at this point due to makeup in progress. The operator should determine that level cannot be maintained without makeup. Operator can stop makeup and monitor level to make this determination.		
	3.13	Is CCW Surge Tank level < 42% and dropping?	YES: Operator determines that CCW Surge Tank level is < 42% and dropping.		
*	3.14	**INITIATE** makeup to the CCW Surge Tank to maintain level > 42%. ❖ **OPEN** 2DR107, Surge Tank Make-up ❖ **OR** ❖ **DIRECT** an NEO to OPEN 2WR114, PW CC SURGE TK VALVE, **AND START** Primary Water Pump.	**IF not already performed, Operator OPENs 2DR107.** Operator may report CCW Surge Tank level is rising.		
	3.15	**SEND** Operators to locate leak.	**CUE:** *CRS will dispatch operators to locate leak. You are directed to continue on with procedure.*		
	3.16	Are any Aux Building Sump, RHR Sump, or WHUT levels rising?	YES: Operator checks recorders on 2RP1 back panel and determines that 22 WHUT level is rising. Operator **GOES TO** step 3.19		
	3.17	**DIRECT** NEO to area of suspected leakage.	**CUE**: CRS will direct an NEO to look for leakage.		

SYSTEM: Plant Service Systems (SF8) – Component Cooling Water System

TASK: Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.18	When the leak is located, ISOLATE the leak using Attachment 3	**CUE**: CRS will direct operators to locate leak using Attachment 3.		
	3.19	Does indication of a CCW leak in Containment exist (e.g., Containment Sump level rise?)	YES: Operator determines CCW leak is in CNTMT due to receiving OHA C-2, CNTMT SUMP PMP START earlier.		
	3.20	**SEND** Operators to walkdown Containment as applicable.	**CUE**: *CRS will assemble a team to walkdown Containment to locate leak. You are directed to continue on with procedure.*		
	CUE	**Simulator Operator:** When the operator commences **step 3.21**, THEN MODIFY RT-1 to the following: **MALF: CC0303 Final Value = 35** **No Ramp**	**Evaluator's Note:** Modifying RT-1 will increase the CCW leak inside Cntmt above the capacity of CCW makeup such that CCW Surge Tank will continue to lower. Following modifying CCW leak, the operator may take the CAS action to Stop RCPs IAW Attachment 2 at any time.		
		ALTERNATE PATH STARTS HERE:	CCW Leak > Makeup Capability		

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.21	**ISOLATE** CCW to the Excess Letdown HX by performing the following: **3.21.1 ENSURE** 2CV132, EXCESS LETDOWN is CLOSED. **3.21.2 ENSURE** 2CC215, EXC LHX INLET, is CLOSED. **3.21.3 ENSURE** 2CC113, EXC LHX OUTLET, is CLOSED.	Operator determines all of these valves are already in the CLOSED position, **EXCEPT for 2CC113 which the operator will need to depress the CLOSED PB.**		
	3.22	IF Excess Letdown is in service, **THEN** ISOLATE Excess Letdown flow through the Excess Letdown HX:	N/A: Operator determines that Excess Letdown is not in service and continues on.		
	3.23	Does indication of a CCW leak in Containment still exist with 2CC113, EXC LHX OUTLET, **AND** 2CC215, EXC LHX INLET, closed?	YES: Operator determines that CCW leak inside Containment still exists since not action has been taken to isolate the leak.		
	3.24	IF CC Surge Tank level indication can NOT be maintained >5%, **THEN STOP** RCPs IAW Attachment 2, Stopping Reactor Coolant Pumps.	Operator determines that with 2DR107 makeup valve open AND lowering CCW Surge Tank level, leak exceeds makeup capability and **GOES TO** Attachment 2 to Stop RCPs. **Evaluator's Note**: IF operator goes to Step 3.25 **THEN** see Evaluator's CUE below.		

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.25	IF CC Surge Tank level indication can be maintained >5%, THEN **EVALUATE** continued operation of Unit 2 and RCPs.	CUE: IF operator reaches this step, THEN state: ***CRS directs you to perform actions IAW Attachment 2.***		
		S2.OP-AB.CC-0001, Attachment 2	**Stopping RCPs and Isolating CCW to CNTMT**		
*	1.0	IF Reactor Trip Breakers are CLOSED, THEN: A. Manually **TRIP** the Reactor B. Is Reactor Trip confirmed? C. **STOP** affected RCPs	**Operator TRIPs the Reactor using either Rx Trip pistol grip switches.** **Operator confirms Reactor is Tripped** **Operator STOPs ALL RCPs** CUE: WHEN all RCPs are Stopped, THEN state: ***CRS directs you to continue performing Attachment 2 actions and the crew will initiate EOP-TRIP-1.***		
	1.0 Contd.	D. Simultaneously **PERFORM** the following:			

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	❖	IF a total loss of Component Cooling Water was the initiating event (including loss of CCW to the CVCS Letdown Heat Exchanger), **THEN ISOLATE** RCS Letdown **AND SWAP** Charging Pump Suction to RWST as follows:	**N/A**: Operator determines that this step is not applicable at this time, unless the CC leak cannot be isolated. **Evaluator's Note**: A total loss of CCW is defined as no CCW flow due to no pumps running. In this case, CCW leak can be isolated by closing the CNTMT isolation valves.		
*	❖	IF a Component Cooling Water LEAK in Containment with 2CC113 AND 2CC215 closed was the initiating event, **THEN CLOSE** the following valves: • 2CC117, RCP COOLING INLET • 2CC118,, RCP COOLING INLET • 2CC131, RCP THERM BAR CC CONT V • 2CC136, RCP COOLIING OUTLET • 2CC187, RCP COOLING OUTLET • 2CC190, RCP THERM BAR CC OUTLET V	**CUE:** IF the operator initiates Attachment 2 prior to closing 2CC113 and 2CC215, THEN state: ***CRS directs you to Perform this step to close the CC valves.*** **Operator closes all of the valves listed by depressing the CLOSED PB for each valve and verifying the CLOSED PB illuminates.** **When 2CC190 is CLOSED, state JPM is Complete.**		
	❖	**GO TO** 2-EOP-TRIP-1,, Reactor Trip or Safety Injection	**CUE: JPM is complete**		

SYSTEM: **Plant Service Systems (SF8) – Component Cooling Water System**

TASK: **Respond to CCW Leak Inside Containment IAW S2.OP-AB.CC-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	JPM is complete when the task is complete OR at the direction from the Lead Evaluator. **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate the JPM when the operator GOES TO 2-EOP-TRIP-1**		

JPM: 17-01 NRC Sim-h

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-5-18

NA 1. Task description and number, JPM description and number are identified.

2. Knowledge and Abilities (K/A) references are included.

3. Performance location specified. (in-plant, control room, or simulator)

4. Initial setup conditions are identified.

5. Initiating and terminating Cues are properly identified.

6. Task standards identified and verified by SME review.

7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

R 12-5-18

SME/Instructor: NA Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Unit 2 at 100% power, MOL.
- No equipment is out of service and no active Tech Specs are in effect.

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all alarms and indications.

SALEM

17-01 NRC EXAM

IN-PLANT

JPMs

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE:

STATION: SALEM

SYSTEM: Reactivity Control (SF-1) – CVCS

TASK: Locally Borate the RCS

TASK NUMBER: N1130140504

JPM NUMBER: 17-01 NRC IP-i

ALTERNATE PATH: [ ]

K/A NUMBER: 004 A4.18

IMPORTANCE FACTOR: 4.3 (RO) 4.1 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: In-Plant / Simulate

REFERENCES: S1.OP-AB.CR-0001, Rev. 18 (checked 8-23-18)

TOOLS AND EQUIPMENT: JAM Key

VALIDATED JPM COMPLETION TIME: 10 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: Rudolph Chan — **R. Chan, Instructor** — **Date: 12-5-18**

Validated By: **Maxey / Thomas (Rev. 0), SME or Instructor** — **Date: 5-22-18**

Approved By: **Training Department** — **Date: 12/11/18**

Approved By: Myers — **Operations Department** — **Date: 12/7/18**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 2018 Annual IP-10

Rev #	Date	Description	Validation Required
00	5-22-18	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
NA	8-23-18	Previously validated during 2018 Annual exam development. See 2018 Annual IP-10 for validation documentation.	No
01	12-5-18	Incorporated NRC Prep week comments. Identified steps 10.2, 10.3, 10.5 and 10.6 as Critical Steps to ensure that 11 and 12 CV160 recirc valves are closed to prevent bypass flow. These changes are minor and re-validation is not required.	No

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Reactivity Control (SF-1) – CVCS

TASK: Locally Borate the RCS

TASK NUMBER: N1130140504

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is in the RCA.**
- **Ensure you have a JAM Key before going into RCA.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE:

NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF-1) – CVCS

TASK: Locally Borate the RCS

TASK NUMBER: N1130140504

INITIAL CONDITIONS:

- Unit 1 control room was evacuated due to a security event.
- The immediate actions of 1-EOP-TRIP-1 were completed.
- 3 control rods remain withdrawn following the Rx trip.
- CRS is performing actions of S1.OP.AB-CR-0001, Control Room Evacuation.
- Attachment 5, Steps 1 thru 9 of S1.OP-AB.CR-0001 are complete with 1CV55 maintaining Charging flow at **90 gpm** and RCP seal injection flows being maintained at **6 gpm to each seal**.

INITIATING CUE:

- You are the Reactor Operator.
- Perform **Emergency Boration** for the stuck control rods IAW Attachment 5, Step 10, of S1.OP-AB.CR-0001.

Successful Completion Criteria:
1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Task Standard for Successful Completion:
1. **Perform steps to close 11 and 12 CV160 recirc valves.**
2. **Simulate locally opening 1CV175 Rapid Boration valve.**
3. **Simulate adjusting charging flow to ≥ 99 gpm.**

NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF-1) – CVCS

TASK: Locally borate the RCS

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	Provide copy of S1.OP-AB.CR-0001, Attachment 5.			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	10.0	WHEN directed by the CRS, THEN:			
	10.1	**PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1A, El 122', near the Boric Acid Storage Tanks.	Locates Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1A		
*	10.2	**CLOSE** the Air Supply Isolation Valve, 11CV160 A/S, AIR SUPPLY FOR 11CV160.	Locates and simulates closing the Supply Isolation Valve, 11CV160 A/S, AIR SUPPLY FOR 11CV160. **CUE**: air supply isolation valve for 11CV160 is closed		
*	10.3	**OPEN** draincock for control air regulator for 11CV160.	Simulates opening draincock for control air regulator for 11CV160. **CUE**: draincock for 11CV160 is open.		

NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF-1) – CVCS

TASK: Locally borate the RCS

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	10.4	**PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1B, El 122", near the Boric Acid Storage Tanks.	Locates Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1B		
*	10.5	**CLOSE** the Air Supply Isolation Valve, 12CV160 A/S, AIR SUPPLY FOR 12CV160.	Locates and simulates closing the Supply Isolation Valve, 12CV160 A/S, AIR SUPPLY FOR 12CV160. **CUE**: air supply isolation valve for 12CV160 is closed.		
*	10.6	**OPEN** draincock for control air regulator for 12CV160.	Simulates opening draincock for control air regulator for 12CV160. **CUE**: draincock for 12CV160 is open.		
*	10.7	**OPEN** 1CV175, Rapid Borate Stop Valve.	**Locates and discusses opening 1CV175, Rapid Borate Stop Valve by disengaging clutch and rotating handwheel (counterclockwise).** **CUE**: 1CV175 is open		

NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF-1) – CVCS

TASK: Locally borate the RCS

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Evaluator's Note: The control room will receive an OHA alarm when the 216-1 Panel door is opened for the operator to adjust the hand sender and read charging flow on 1FI-128A.. Verify that the alarm clears when the operator exits the Panel.	Operator is expected to contact the control before and after the 216-1 Panel door is opened and closed.		
*	10.8	**PROCEED** to 1CV55 and ADJUST the flow for 75 gpm above existing total flow for all RCP seal flows.	Operator refers back to Step 8 of Attachment 5 (provided to Operator) and observes that Charging flow is being controlled locally in MANUAL at 90 gpm. **Determines charging flow must be raised to <u>99 gpm</u> (75 gpm + 24 gpm for seals).** **At the 216-1 Panel, Operator adjusts the MANUAL hand sender in the direction to lower the air signal to open 1CV55 and raise charging to desired flow.** **CUE:** Charging flow is 100 gpm. **JPM is complete.**		

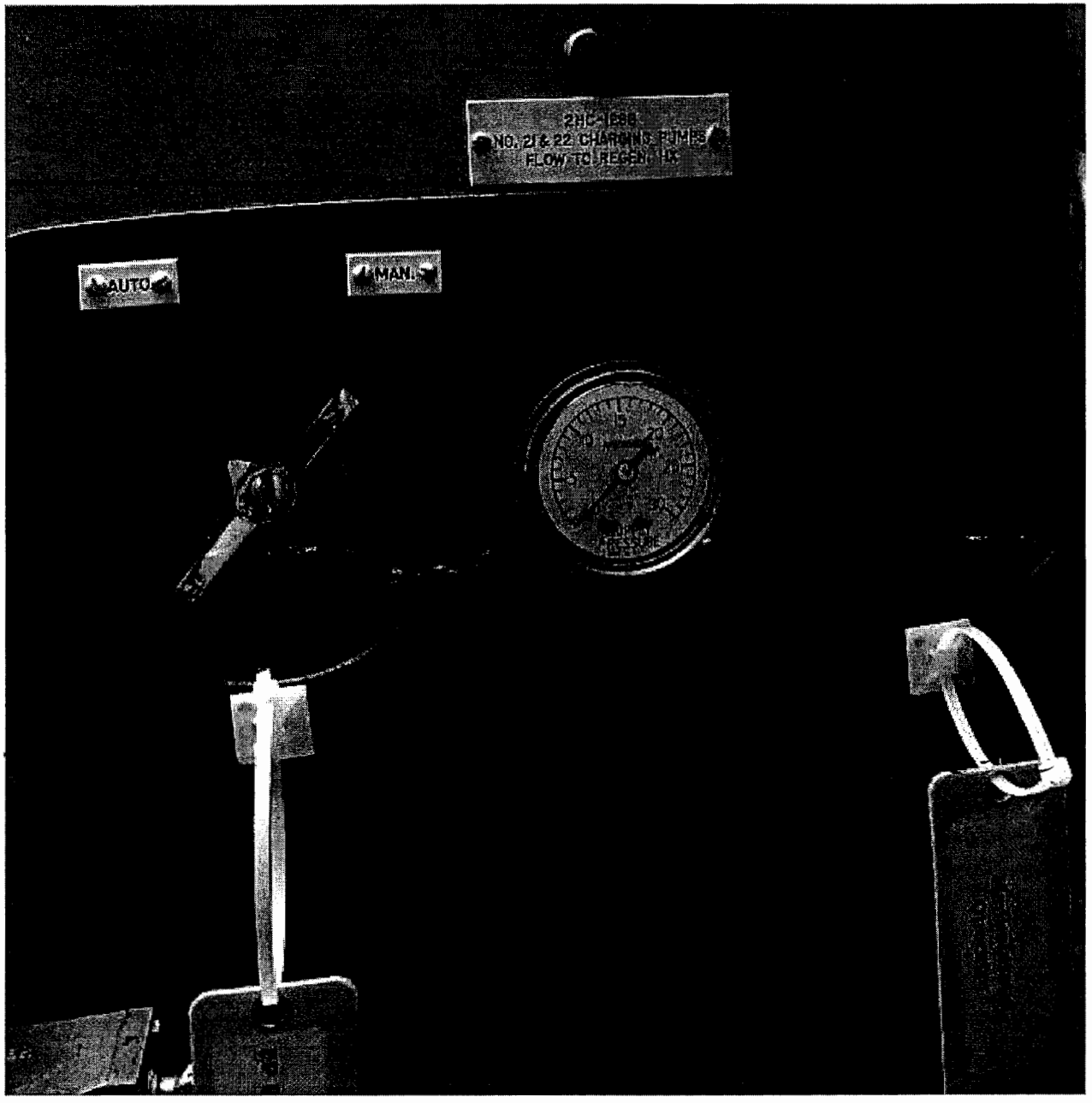
NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF-1) – CVCS

TASK: Locally borate the RCS

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM once charging flow has been adjusted.**		



ATTACHMENT 5
(Page 1 of 4)

REACTOR OPERATOR

✓ 1.0 **OBTAIN** the following:

- One copy of this procedure.
- One radio (located in Appendix "R" Cabinet)
- Key ring set and tools (JA Master, Breaker Keyswitch, screwdriver and adjustable wrench).
- A Security Master Key from the Unit 1 CRS (located on the Unit 1 Security Key Ring) **[C0363]**

✓ 2.0 **PROCEED** to Rod Drive MG Set Control Panel (460V Vital Bus Room-El 84'), AND **OPEN** the following breakers:

✓ 2.1 Reactor Trip Breaker A

✓ 2.2 Reactor Trip Breaker B

NA 2.3 Reactor Trip Bypass Breaker A

NA 2.4 Reactor Trip Bypass Breaker B.

✓ 3.0 **CONFIRM** with the Hot Shutdown Panel Operator (PO) that 11 or 12 Charging Pump is operating.

✓ 4.0 **PROCEED** to 1AX1AX7X, #13 Charging Pump breaker AND **OPEN** the breaker.

✓ 5.0 **PROCEED** to 1C West Valve & Misc 230V Control Center-El 84', AND **OPEN** Breaker 1CY2AX4I, 1CV175-Rapid Borate Stop Valve.

✓ 6.0 **NOTIFY** the CRS of the following:

✓ 6.1 The Reactor Trip and Bypass breakers are OPEN

✓ 6.2 #13 Charging Pump Breaker is OPEN.

✓ 7.0 **CONFIRM** with NEO #1 that 1CV71, Chr Hdr PCV, is isolated (1CV70) and bypassed (1CV73) and that flow is being maintained to RCP seals at flowrate of 6 to 10 gpm to each seal.

ATTACHMENT 5
(Page 2 of 4)

REACTOR OPERATOR

NOTE

The following indications and controls are available for local operation at Unit 1 CVC Chg Pmps FL & PR Inst Pnl, Panel 216-1:

- 1CV55 AUTO/MANUAL Selector Switch (1HC-128G No. 11 & 12 Charging Pumps Flow to Regen HX)
- 1CV55 Manual HAND/AIR Regulator Control
- Charging Pump Flow Indication, 1FI-128A
- 11 and 12 Charging Pump Pressure Indication, 1PI-142B
- VCT Level Indication 1LT-114.

✓ 8.0 **TAKE** control of 1CV55, Cent Chg Pmp Flow Cont Valve, by performing the following:

✓ 8.1 **RECORD** the charging flow as indicated on 1FI-128A.

90 gpm indicated on 1FI-128A

✓ 8.2 **PLACE** local E/P Bypass Line Selector Valve in Manual.

✓ 8.3 Using the MANUAL hand air operator, **ENSURE** that the flow rate as noted in Step 8.1 is being maintained with 1CV55.

✓ 8.4 **OBSERVE** local air pressure indicator to verify local control.

✓ 9.0 **NOTIFY** the STA and CRS that Steps 1 through 8 of Attachment 5 are completed.

ATTACHMENT 5
(Page 3 of 4)

REACTOR OPERATOR

NOTE
Step 10.0 through Step 15.0 will only be performed if an Emergency Boration is required for stuck rod.

___ 10.0 WHEN directed by the CRS,
THEN:

___ 10.1 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1A, El 122', near the Boric Acid Storage Tanks.

___ 10.2 **CLOSE** the Air Supply Isolation Valve, 11CV160 A/S, AIR SUPPLY FOR 11CV160.

___ 10.3 **OPEN** draincock for control air regulator for 11CV160.

___ 10.4 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1B, El 122", near the Boric Acid Storage Tanks.

___ 10.5 **CLOSE** the Air Supply Isolation Valve, 12CV160 A/S, AIR SUPPLY FOR 12CV160.

___ 10.6 **OPEN** draincock for control air regulator for 12CV160.

___ 10.7 **OPEN** 1CV175, Rapid Borate Stop Valve.

___ 10.8 **PROCEED** to 1CV55 and ADJUST the flow for 75 gpm above existing total flow for all RCP seal flows.

___ 11.0 **REQUEST** NEO #1 to adjust 1CV73 to maintain flow to RCP seals between 6 and 10 gpm.

___ 12.0 **NOTIFY** the CRS that Rapid Boration has commenced.

___ 13.0 **REMAIN** in the area of the Charging Pumps.

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-5-18

NA 1. Task description and number, JPM description and number are identified.

2. Knowledge and Abilities (K/A) references are included.

3. Performance location specified. (in-plant, control room, or simulator)

4. Initial setup conditions are identified.

5. Initiating and terminating Cues are properly identified.

6. Task standards identified and verified by SME review.

7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

9. Pilot test the JPM:
   a. verify Cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: NA R 12-5-18 Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 1 control room was evacuated due to a security event.
- The immediate actions of 1-EOP-TRIP-1 were completed.
- 3 control rods remain withdrawn following the Rx trip.
- CRS is performing actions of S1.OP.AB-CR-0001, Control Room Evacuation.
- Attachment 5, Steps 1 thru 9 of S1.OP-AB.CR-0001 are complete with 1CV55 maintaining Charging flow at **90 gpm** and RCP seal injection flows being maintained at **6 gpm to each seal.**

INITIATING CUE:

- You are the Reactor Operator.
- Perform **Emergency Boration** for the stuck control rods IAW Attachment 5, Step 10, of S1.OP-AB.CR-0001.

ATTACHMENT 5
(Page 1 of 4)

REACTOR OPERATOR

✓ 1.0 **OBTAIN** the following:

- One copy of this procedure.
- One radio (located in Appendix "R" Cabinet)
- Key ring set and tools (JA Master, Breaker Keyswitch, screwdriver and adjustable wrench).
- A Security Master Key from the Unit 1 CRS (located on the Unit 1 Security Key Ring) **[C0363]**

✓ 2.0 **PROCEED** to Rod Drive MG Set Control Panel (460V Vital Bus Room-El 84'), AND **OPEN** the following breakers:

✓ 2.1 Reactor Trip Breaker A

✓ 2.2 Reactor Trip Breaker B

NA 2.3 Reactor Trip Bypass Breaker A

NA 2.4 Reactor Trip Bypass Breaker B.

✓ 3.0 **CONFIRM** with the Hot Shutdown Panel Operator (PO) that 11 or 12 Charging Pump is operating.

✓ 4.0 **PROCEED** to 1AX1AX7X, #13 Charging Pump breaker AND **OPEN** the breaker.

✓ 5.0 **PROCEED** to 1C West Valve & Misc 230V Control Center-El 84', AND **OPEN** Breaker 1CY2AX4I, 1CV175-Rapid Borate Stop Valve.

✓ 6.0 **NOTIFY** the CRS of the following:

✓ 6.1 The Reactor Trip and Bypass breakers are OPEN

✓ 6.2 #13 Charging Pump Breaker is OPEN.

✓ 7.0 **CONFIRM** with NEO #1 that 1CV71, Chr Hdr PCV, is isolated (1CV70) and bypassed (1CV73) and that flow is being maintained to RCP seals at flowrate of 6 to 10 gpm to each seal.

ATTACHMENT 5
(Page 2 of 4)

REACTOR OPERATOR

NOTE

The following indications and controls are available for local operation at Unit 1 CVC Chg Pmps FL & PR Inst Pnl, Panel 216-1:

- 1CV55 AUTO/MANUAL Selector Switch (1HC-128G No. 11 & 12 Charging Pumps Flow to Regen HX)
- 1CV55 Manual HAND/AIR Regulator Control
- Charging Pump Flow Indication, 1FI-128A
- 11 and 12 Charging Pump Pressure Indication, 1PI-142B
- VCT Level Indication 1LT-114.

✓ 8.0 **TAKE** control of 1CV55, Cent Chg Pmp Flow Cont Valve, by performing the following:

✓ 8.1 **RECORD** the charging flow as indicated on 1FI-128A.

90 gpm indicated on 1FI-128A

✓ 8.2 **PLACE** local E/P Bypass Line Selector Valve in Manual.

✓ 8.3 Using the MANUAL hand air operator, **ENSURE** that the flow rate as noted in Step 8.1 is being maintained with 1CV55.

✓ 8.4 **OBSERVE** local air pressure indicator to verify local control.

✓ 9.0 **NOTIFY** the STA and CRS that Steps 1 through 8 of Attachment 5 are completed.

ATTACHMENT 5
(Page 3 of 4)

REACTOR OPERATOR

NOTE
Step 10.0 through Step 15.0 will only be performed if an Emergency Boration is required for stuck rod.

___ 10.0 WHEN directed by the CRS,
THEN:

___ 10.1 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1A, El 122', near the Boric Acid Storage Tanks.

___ 10.2 **CLOSE** the Air Supply Isolation Valve, 11CV160 A/S, AIR SUPPLY FOR 11CV160.

___ 10.3 **OPEN** draincock for control air regulator for 11CV160.

___ 10.4 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1B, El 122", near the Boric Acid Storage Tanks.

___ 10.5 **CLOSE** the Air Supply Isolation Valve, 12CV160 A/S, AIR SUPPLY FOR 12CV160.

___ 10.6 **OPEN** draincock for control air regulator for 12CV160.

___ 10.7 **OPEN** 1CV175, Rapid Borate Stop Valve.

___ 10.8 **PROCEED** to 1CV55 and ADJUST the flow for 75 gpm above existing total flow for all RCP seal flows.

___ 11.0 **REQUEST** NEO #1 to adjust 1CV73 to maintain flow to RCP seals between 6 and 10 gpm.

___ 12.0 **NOTIFY** the CRS that Rapid Boration has commenced.

___ 13.0 **REMAIN** in the area of the Charging Pumps.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

TASK NUMBER: N0015010104

JPM NUMBER: 17-01 NRC IP-j

ALTERNATE PATH: [ ]

K/A NUMBER: 012 A4.07

IMPORTANCE FACTOR: 3.9 (RO) 3.9 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: In-Plant / Simulate

REFERENCES: S1.OP-SO.RCS-0001, Rev. 32 (checked 8-23-18)
OTSC No. 32A

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: R. Chan Rudolph Chan **Date:** 8-23-18
Instructor

Validated By: Harris / Bates **Date:** 4-10-18
SME or Instructor

Approved By: ~~Marshall~~ McHugh **Date:** ~~8-16-18~~ 10/30/18
~~10/30/18~~ D 10/30/18
Training Department

Approved By: Myers **Date:** 10/23/18
~~Operations Department~~

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

TASK NUMBER: N0015010104

INITIAL CONDITIONS:

- Unit 1 is operating at 75% power.
- 11 Rod Drive MG (RDMG) set tripped 3 days ago.
- Maintenance has completed repairs and is ready to start.

INITIATING CUE:

- Start up 11 RDMG set and parallel it to 12 RDMG set IAW S1.OP-SO.RCS-0001, section 5.4.
- Maintenance personnel are standing by to take the required voltage readings.

Successful Completion Criteria:

1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).**

Task Standard for Successful Completion:

1. **Simulate starting and paralleling 11 RDMG set with 12 RDMG set IAW approved procedures.**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

*	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		Provide marked up copy of S1.OP-SO.RCS-0001.	Reviews P&Ls and Prequisites. Enters the proper section of the procedure. (5.4)		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	5.4.1	**ENSURE** the following: A. A AND B REACTOR TRIP BREAKERS are CLOSED B. Running Rod Drive Motor Generator Set GENERATOR LINE VOLTS is 260V (247V - 273V) AND GENERATOR LINE AMPS is ~80 DC AMPS.	Locates A AND B REACTOR TRIP BREAKERS and verifies closed. **CUE**: RTB's are closed Locates 12 Rod Drive Motor Generator Set GENERATOR LINE VOLT AND GENERATOR LINE AMPS meters and checks readings. **CUE**: 12 RDMG set volts is reading 260V and Generator Line Amps is ~ 80 DC amps.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

*	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.4.2	**ALIGN** MG Set Controls for MG Set to be started IAW Attachment 1.	Using attachment 1, determines 11 MG Set controls are aligned correctly **CUE the following for each component:** ▪ Voltmeter selector switch is on 'A-B' position ▪ Voltage adjust is in 'Vertical' position ▪ Ammeter selector switch is in 'A' position ▪ Motor Breaker Control Switch target is 'GREEN' ▪ Motor Breaker is 'OPEN'. ▪ Synchronize switch is in 'OFF' position ▪ Generator Breaker Control Switch target is 'GREEN'. ▪ Generator Breaker is 'OPEN'.		
*	5.4.3	**CLOSE** MOTOR Breaker AND **ALLOW** at least 20 seconds for MG Set to reach rated speed.	**Simulates rotating motor breaker control switch and waits at least 20 seconds before proceeding.** **CUE**: You hear 11 MG set motor breaker close.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

*	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.4.4	**PRESS** GEN FIELD FLASH pushbutton until Generator voltage stops rising (GENERATOR LINE VOLTS should indicate ~260V).	**Simulates pressing GEN FIELD FLASH pushbutton until Generator voltage stops rising.** **CUE:** Generator Lines Volts indicates 260 Volts.		
	5.4.5	**CHECK** VOLTAGE ADJUST range of adjustment as follows:			
	5.4.5A	**ADJUST** VOLTAGE ADJUST full counterclockwise to LOW. (GENERATOR LINE VOLTS meter should indicate ~220V.)	Simulates adjusting VOLTAGE ADJUST full counterclockwise to LOW. **CUE**: Generator Line Volts is 220 volts.		
	5.4.5.B	**ADJUST** VOLTAGE ADJUST full clockwise to HIGH. (GENERATOR LINE VOLTS meter should indicate ~300V)	Simulates adjusting VOLTAGE ADJUST full clockwise to HIGH. **CUE**: Generator Line Volts is 295 volts.		
	5.4.5.C	**ADJUST** VOLTAGE ADJUST until GENERATOR LINE VOLTS meter indicates ~260V.	Simulates adjusting VOLTAGE ADJUST (counterclockwise) until GENERATOR LINE VOLTS meter indicates ~260V. **CUE**: Generator Line Volts is 260 volts		
	NOTE	DMM (OR equivalent, set to voltage) voltage readings will be less (by ≈ ½) than installed voltmeter readings.	Operator reads the Note and continues		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

*	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.4.5.D	Direct Maintenance to **OBTAIN** voltage reading on Running MG Set using a DMM OR equivalent, set to voltage, at back of installed voltmeter.	Directs Maintenance to Perform IV and **OBTAIN** voltage reading on Running MG Set using a DMM at back of installed voltmeter. **CUE**: IV is completed SAT AND Maintenance reports voltage reading on Running MG Set is 130 V.		
	5.4.5.E	Direct Maintenance to **MONITOR** voltage reading on In-coming MG Set using a DMM OR equivalent, set to voltage, at back of installed voltmeter.	Directs Maintenance to Perform IV and monitor voltage reading on In-coming MG Set using a DMM at back of installed voltmeter. **CUE**: IV is completed SAT AND Maintenance reports voltage reading on In-coming MG Set is 129 V.		
*	5.4.5.F	**ADJUST** the VOLTAGE ADJUST until indicated voltage on DMM OR equivalent, set to voltage, is 0-2.5 volts higher than the reading obtained in Step 5.4.5.D.	**Simulates adjusting the VOLTAGE ADJUST (clockwise to raise voltage) until indicated voltage on DMM is 0-2.5 volts higher than the reading obtained in Step 5.4.5.D (Running MG Set)** **CUE:** Maintenance reports voltage reading on In-coming MG Set is 130.25 V.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

*	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.4.5.G	Direct Maintenance to **REMOVE** DMM OR equivalent, set to voltage, AND **CLOSE** panel doors.	Directs Maintenance to remove DMM AND close panel doors. **CUE:** Maintenance has removed DMM AND closed panel doors.		
	CAUTION	**Do NOT attempt to manually close generator output breaker. Manually closing generator output breaker could result in both MG Sets tripping. If the MG Sets are not closely synchronized, automatic breaker closure could take as long as 60 seconds**	Operator reads the CAUTION is proceeds on.		
	NOTE	A single handle is shared between both MG set SYNCHRONIZE switches. The handle can only be removed when the switch is in the OFF position. The Generator Pistol Grip indication will remain GREEN when the Generator Breaker auto closes. This indicates a neutral position and is expected since the Pistol Grip has not been physically turned to the CLOSED position.	Operator reads the Note and proceeds on.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Startup and parallel a RDMG set

*	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.4.6	**PLACE** MG Set SYNCHRONIZE Switch to ON, AND **OBSERVE** following: • GENERATOR Breaker automatically closes • Load is divided equally between MG Sets (~40 DC Amps each)	**IF necessary; Simulates moving the Synchronize Switch from 12 MG set and inserting into 11 MG set and places it in ON.** **CUE**: 11 MG set generator breaker is closed and load stabilizes at 40 amps on each generator.		
	5.4.7	**PLACE** MG Set SYNCHRONIZE Switch to OFF.	Simulates placing 11 MG Set SYNCHRONIZE Switch to OFF. **JPM Complete.**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:**_____	**Terminate JPM when operator completes Step 5.4.7.**		

TQ-AA-106-0303
Revision 4

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 1. Task description and number, JPM description and number are identified.

R 2. Knowledge and Abilities (K/A) references are included.

R 3. Performance location specified. (in-plant, control room, or simulator)

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

R 6. Task standards identified and verified by SME review.

R 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

R 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 32A Date 8-23-18

* NA 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

NA 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Rudolf Chan Date: 8-23-18

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

* Previously validated during 2018 Annual exam development. See 2018 Annual IP-12 for validation documentation.

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 1 is operating at 75% power.
- 11 Rod Drive MG (RDMG) set tripped 3 days ago.
- Maintenance has completed repairs and is ready to start.

INITIATING CUE:

- Start up 11 RDMG set and parallel it to 12 RDMG set IAW S1.OP-SO.RCS-0001, section 5.4
- Maintenance personnel are standing by to take the required voltage readings.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Radioactivity Release (SF 9) - Waste Gas Disposal System
TASK:	Conduct an Authorized Waste Gas Release
TASK NUMBER:	N0715070104
JPM NUMBER:	17-01 NRC IP-k
ALTERNATE PATH:	[ ]
K/A NUMBER:	071 A4.26
IMPORTANCE FACTOR:	3.1 (RO) / 3.9 (SRO)
APPLICABILITY:	EO [ ] RO [X] STA [ ] SRO [X]
EVALUATION SETTING/METHOD:	In-Plant / Simulate
REFERENCES:	S2.OP-SO.WG-0009, Rev. 29 (checked 8-23-18)
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	25 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A
Developed By:	R. Chan Rudolph Chan, Instructor — **Date:** 12-5-18
Validated By:	Maxey / Thomas (Rev. 0), SME or Instructor — **Date:** 5-22-18
Approved By:	Training Department — **Date:** 12/11/18
Approved By:	Operations Department — **Date:** 12/7/18

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: **17-01 NRC IP-k**

Rev #	Date	Description	Validation Required
00	4-25-18	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
NA	8-23-18	Previously validated for LOR Annual exam. See 2018 Annual IP-8 for validation documentation.	No
01	12-5-18	Incorporated NRC Prep week comments. Added note to step 5.2.13.A that 10 minutes needs to have elapsed before calculating the first average release rate. This is minor change and re-validation is not required.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Conduct an Authorized Waste Gas Release

TASK NUMBER: N0715070104

SIMULATOR IC: **N/A**

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is in the RCA.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Conduct an Authorized Waste Gas Release

TASK NUMBER: N0715070104

INITIAL CONDITIONS:

- Both Salem Units are operating at 100% power.
- 21 Waste Gas Decay Tank is in Standby at 15 psig
- 22 Waste Gas Decay Tank is in Holdup at 90 psig
- 23 Waste Gas Decay Tank is O/S at 15 psig
- 24 Waste Gas Decay Tank is O/S at 15 psig
- 2R41 Plant Vent radiation monitor is Operable
- Plant vent flow rate and sample flow rate monitors are Operable

INITIATING CUE:

- CRS directs you to PERFORM a release of 22 Waste Gas Decay Tank IAW S2.OP-SO.WG-0009, Discharge of 22 Gas Decay Tank to Plant vent, starting at **Step 5.2.11**.
- Section 5.1 and Steps 5.2.1 through 5.2.10 are complete.
- You have the Tag Release for 22WG31.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. **Performs a Radiological Waste Gas release IAW S2.OP-SO.WG-0009.**
2. **Terminates the Waste Gas release as directed by procedure.**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Place a Waste Gas Tank in Holdup

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Evaluator provide operator with marked up copy of S2.OP-SO.WG-0009.			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME:**_____			
	5.2.11	**PERFORM** the following preparations at Panel 104-2 for the GDT release:			
	5.2.11	A. **ENSURE** 22 GDT is NOT in service. B. **ENSURE** 22 GDT is NOT selected for "Standby". C. **RECORD** 22 GDT "Initial Pressure" (PIS2037) on Attachment 3. D. **LATCH** AND **SET** 2WG41, GDT VENT CONT VALVE, as follows:	Operator verifies that 22 WGDT is NOT in service. **CUE**: 22 WGDT is NOT in service Operator verifies 22 GDT is NOT selected for Standby. **CUE**: 22 GDT is NOT selected for Standby. **CUE**: PIS2037 reads **90 psig**.		
	NOTE	2WG41 Controller (2HIC-14) must be set to <0% or 2WG41 will NOT latch.			

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Place a Waste Gas Tank in Holdup

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.2.11.D	1. **TURN** 2WG41 Waste Gas Vent Valve Flow Bias fully counterclockwise until indicator <0%.	**Operator turns 2WG41 flow bias fully counter-clockwise until indicator reads < 0%.** **CUE**: 2WG41 flow bias < 0%		
		2. **POSITION** Selector Switch to OPEN AND **RELEASE** to AUTO position (spring return to AUTO).	**Operator positions selector switch to OPEN and RELEASE to AUTO position.** **CUE**: Selector switch released back to the AUTO position.		
		3. **TURN** 2WG41 Waste Gas Vent Valve Flow Bias clockwise until indicator ≥100%.	**Operator turns 2WG41 flow bias clockwise until indicator reads ≥ 100%** **CUE**: 2WG41 flow bias reads 100%		
	NOTE	2WG41 will not immediately open.	**Evaluator's Note**: The 2WG41 will not go full open until the flow bias is adjusted to 100%.		

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Place a Waste Gas Tank in Holdup

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.11.D Contd.	4. **ENSURE** with Unit 2 Control Room that 2WG41 valve has lost the CLOSED indication AND audible alarm received. 5. **TURN** 2WG41 Waste Gas Vent Valve Flow Bias fully counterclockwise until indicator <0%. 6. **ENSURE** with Unit 2 Control Room that 2WG41 has closed indication. 7. **POSITION** 2WG41 Selector Switch to CLOSE.	**CUE**: Control Room reports they have lost 2WG41 CLOSED indication and audible alarm received. Operator turns 2WG41 flow bias counter-clockwise until indicator reads < 0%. **CUE**: 2WG41 flow bias reads < 0% **CUE**: Control Room reports that 2WG41 has CLOSED indication Operator positions 2WG41 selector switch to CLOSE. **CUE**: 2WG41 selector switch is in CLOSED position.		
	5.2.11.E	**PERFORM** an Independent Verification of the 2WG41 Waste Gas Vent Valve Flow Bias position, AND **RECORD** the Independent Verification on Attachment 1, Section 2.0.	**CUE**: IV completed SAT		
*	5.2.11.F	**OPEN** 22WG31, GDT INLET VALVE	**Operator rotates valve counter-clockwise to open 22WG31.** **CUE**: 22WG31 is Open		
*	5.2.11.G	Slowly **OPEN** 22WG34	**Operator slowly rotates counter-clockwise to open 22WG34** **CUE**: 22WG34 is Open		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Place a Waste Gas Tank in Holdup

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.11.H	**RECORD** Independent Verification (IV) of 22 GDT discharge valves 22WG31 and 22WG34 on Attachment 1, Section 3.0, prior to commencing 22 GDT release	**CUE:** IVs completed SAT		
*	5.2.12	**COMMENCE** 22 GDT release as follows: ___ A. **POSITION** 2WG41 Selector Switch to OPEN AND **RELEASE** to AUTO position (spring return to AUTO). ___ B. SLOWLY **SET** 2WG41 Waste Gas Vent Valve Flow Bias to ≤100% position which corresponds to a maximum release rate of 32 SCFM. ___ C. **PERFORM** an Independent Verification of the positioning of 2WG41 Waste Gas Vent Valve Flow Bias on Attachment 1, Section 4.0. ___ D. **RECORD** In Progress Release Data on Attachment 2, Section 5.1.	**Operator positions 2WG41 selector switch to OPEN and RELEASE to AUTO position (spring return to Auto).** **CUE:** Selector switch released back to the AUTO position. **Operator slowly sets 2WG41 flow bias to ≤ 100% position.** **CUE**: flow bias is set to 100% Operator requests IV on 2WG41 flow bias position. **CUE**: IV completed SAT Operator records release data on Attachment 2, Section 5.1 **CUE**: 2WG38 pressure on 2PL8678 reads **7.8 psig** and IV completed SAT.		
	5.2.13	**PERFORM** the following during 22 GDT release			

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Place a Waste Gas Tank in Holdup

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	NOTE	An operator should be stationed at Panel 104-2 to immediately close 22WG34 upon receipt of a High Radiation Alarm or indication of 2WG41 closure.	**CUE:** An Operator is stationed at the 104 Panel ready to close 22WG34.		
	5.2.13.A	**CALCULATE** 22 GDT Average Release Rate every 10 minutes on Attachment 3, AND **ADJUST** 2WG41 Waste Gas Vent Valve Flow Bias position as required based on results.	Operator reads step and determines no action at this time until 10 minutes has elapsed. Operator continues on. **Evaluator's Note**: No operator action at this time until 10 mins has elapsed since the release started.		
	5.2.13.B	**RECORD** Meteorological Data in Attachment 2, Section 5.2. IF Meteorological Monitor is NOT OPERABLE, THEN **NOTIFY** the SM/CRS (UFSAR 7.7.2.12).	**CUE**: Provide the following MET Data when requested: Wind Speed **5.8 MPH** at EL **33 FT** Wind Direction **290 °**at EL **33 FT** ΔT (**33 FT** – 33 FT) = **0 °C**		
	5.2.13.C	IF Plant Vent Flow Rate Monitor is inoperable, THEN **RECORD** Plant Vent Flow Rate Discharge Estimation on Attachment 4 at least once every four hours during GDT release	**CUE**: IF asked, 2R41 is Operable		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Place a Waste Gas Tank in Holdup

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.13.D	IF at any time during the release pressure downstream of 2WG38 is >8.0 psig (2PL8678), OR 2WG41 CLOSES, THEN **TERMINATE** the GDT release as follows: ___ 1. **TURN** 2WG41 Waste Gas Vent Valve Flow Bias fully counter-clockwise until indicator is <0%. ___ 2. **PLACE** 2WG41-SWT in CLOSE position, AND **ENSURE** 2WG41 is CLOSED. ___ 3. **CLOSE** 22WG34. ___ 4. **RECORD** Final Release Data in Attachment 2, Section 5.3. ___ 5. **INITIATE** an NOTF to correct the malfunction.	Operator reads step, marks N/A and continues on. **CUE:** IF asked about conditions downstream of 2WG38, THEN state none of these conditions are present.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF 9) - Waste Gas Disposal System

TASK: Place a Waste Gas Tank in Holdup

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.2.14	When 22 GDT pressure ≈10 psig OR as directed by SM/CRS, **SECURE** the GDT release: ___ A. **TURN** 2WG41 Waste Gas Vent Valve Flow Bias fully counter-clockwise until indicator is <0%. ___ B. **PLACE** 2WG41-SWT in CLOSE position, AND **ENSURE** 2WG41 is CLOSED. ___ C. **CLOSE** 22WG34. ___ D. **RECORD** Final Release Data in Attachment 2, Section 5.3	**CUE:** 22 WGDT pressure is now **10 psig**. **Operator turns 2WG41 fully counter-clockwise until indicator is ≤ 0%.** **CUE:** Indicator reads 0% **Operator places 2WG41-SWT to the closed position.** **CUE**: 2WG41 is CLOSED **Operator closes 22WG34** **CUE**: 22WG34 is CLOSED **CUE: JPM is Complete**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM once 22WG34 is closed.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM#: 17-01 NRC IP-k

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

R 12-5-18

NA 1. Task description and number, JPM description and number are identified.

____ 2. Knowledge and Abilities (K/A) references are included.

____ 3. Performance location specified. (in-plant, control room, or simulator)

____ 4. Initial setup conditions are identified.

____ 5. Initiating and terminating Cues are properly identified.

____ 6. Task standards identified and verified by SME review.

____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

____ 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

NA 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: NA R 12-5-18 Date: _____

SME/Instructor: _____ Date: _____

SME/Instructor: _____ Date: _____

INITIAL CONDITIONS:

- Both Salem Units are operating at 100% power.
- 21 Waste Gas Decay Tank is in Standby at 15 psig
- 22 Waste Gas Decay Tank is in Holdup at 90 psig
- 23 Waste Gas Decay Tank is O/S at 15 psig
- 24 Waste Gas Decay Tank is O/S at 15 psig
- 2R41 Plant Vent radiation monitor is Operable
- Plant vent flow rate and sample flow rate monitors are Operable

INITIATING CUE:

- CRS directs you to PERFORM a release of 22 Waste Gas Decay Tank IAW S2.OP-SO.WG-0009, Discharge of 22 Gas Decay Tank to Plant vent, starting at **Step 5.2.11**.
- Section 5.1 and Steps 5.2.1 through 5.2.10 are complete.
- You have the Tag Release for 22WG31.

SALEM

17-01 NRC EXAM

SCENARIO GUIDES

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: ESG-1 [AB.CW-1, AB.CHEM-1, AB.PZR-1, TRIP-2, TRIP-1, LOCA-6, LOCA-1]

SCENARIO NUMBER: 17-01 NRC-1

EFFECTIVE DATE: See Approval Dates Below

EXPECTED DURATION: 90 minutes

REVISION NUMBER: 01

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

- New Issue for 17-01 NRC 2019 ILOT Exam. Incorporated validation comments. Deleted 21 RCP loop flow failure due to no Tech Spec call and added 21 SG NR Level Channel fails low for Tech Spec call. Changed trigger during condenser tube leak event to proceed to next event after CW is Emergency Tripped to keep the flow of scenario going. Changed initial conditions to place all PZR heaters on and adjusted steam dumps to reduce SG pressures to be below 1000 psi. Performed partial re-validation on changes on 6-22-18 using the same validation crew.
- Rev. 01 (12-4-18). Incorporated comments from NRC prep week. Added NRC ES-D-1 form to Attachment 4, Added Auto SI Block malfunctions, deleted and reinserted overrides to fix sim issue, reconfigured turbine oil pumps to manual and secured one EHC pump, corrected TS call for PZR pressure, inserted RCS leak after SGFPs are stopped, minor editorial comments.

PREPARED BY:	R. Chan **Lead Regulatory Exam Author**	12-4-18 **Date**
APPROVED BY:	McHugh **Operations Training Manager**	12/11/18 **Date**
APPROVED BY:	Myers **Facility Representative**	12/7/18 **Date**

SCAN OF SIGNED SCENARIO COVER SHEET

I. OBJECTIVES

1. Given the order raise reactor power in accordance with approved station procedures.
2. Given the order or indications of PZR Pressure control system malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW S2.OP-AB.PZR-0001.
3. Given the order or indications of a PZR Pressure control system malfunction, DIRECT the response to the PZR Pressure control malfunction in accordance with S2-OP-AB.PZR-0001.
4. Given a condenser tube leak, take corrective action IAW S2.OP-AB.CHEM-0001.
5. Given the order or indications of Abnormal Secondary Plant Chemistry, DIRECT the response to the malfunction IAW S2.OP-AB.CHEM-0001.
6. Given the order or indications of Abnormal Secondary Plant Chemistry, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW S2.OP-AB.CHEM-0001.
7. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with the approved station procedures.
8. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.
9. Given the order or indications of a reactor trip, perform actions as the shift technical advisor to RESPOND to the reactor trip in accordance with the approved station procedures.
10. Given the order or indications of a safety injection, perform actions as the nuclear control operator to RESPOND to the safety injection in accordance with the approved station procedures.
11. Given indication of a safety injection, DIRECT the response to the safety injection in accordance with the approved station procedures.
12. Given the order or indications of a safety injection, perform actions as the shift technical advisor to RESPOND to the safety injection in accordance with the approved station procedures.
13. Given the order or indications of a loss of coolant accident (LOCA-6) outside containment, complete actions as the nuclear control operator to PERFORM the immediate response to the LOCA in accordance with the approved station procedures.
14. Given indication of a loss of coolant accident (LOCA-6) outside of containment, DIRECT the immediate response to the LOCA in accordance with the approved station procedures.
15. Given the order or indications of a loss of coolant accident, perform the actions of the Shift Technical Advisor for a loss of coolant accident, IAW approved station procedures.
16. Given the order or a loss of coolant accident (LOCA-6) outside containment, perform actions to isolate the leak IAW approved station procedures.
17. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. Power Ascension and enter Mode 1 (5%)
2. PZR Pressure Channel 1 fails high
3. 21 SG Narrow Range Level fails low (TS only)
4. 21A Main Condenser tube leak
5. 22 RCP oil leak requiring Rx Trip
6. RHR Intersystem RCS Leak Outside Containment

III. SCENARIO SUMMARY

1. The crew assumes the watch at 4% power, BOL. Control Rods in manual, 21 SGFP in service, 22 SW Pump C/T for strainer motor replacement. Power ascension to 10% in progress IAW S2.OP-IO.ZZ-0003 Hot Standby to Minimum Load.
2. After assuming the watch, the crew will commence power ascension and enter Mode 1 (5%) by withdrawing control rods and using steam dumps.
3. After the crew enters Mode 1, PZR Pressure Channel 1 will fail high. The crew will respond by placing Master Pressure Controller in Manual to raise PZR pressure to program. The CRS will enter **S2.OP-AB.PZR-0001**, Pressurize Pressure Malfunction, and take actions to swap to the other controlling channel and then placing MPC back to automatic. The CRS will evaluate Tech Specs and take actions to place 2PR1 in Manual and close the block valve. (TS call)
4. After the crew addresses the PZR pressure channel, OHA G-15, ADFCS TROUBLE and console alarm for 21 SG Protection Level Lo-Lo will be received. Crew determines no impact to plant operation and evaluates Tech Specs. (TS call only)
5. After the crew evaluates Tech Specs, 21A condenser will experience a tube leak. The CRS will enter **S2.OP-AB.CW-0001**, Circulating Water System Malfunction and/or **S2.OP-AB.CHEM-0001**, Abnormal Secondary Chemistry. The crew will recognize a tube leak from secondary chemistry parameters and remove 21A circulator from service.
6. After the crew addresses condenser tube leak, the crew will receive OHA for 22 RCP oil leak. The crew will identify elevated RCP motor bearing temperatures and enter **S2.OP-AB.RCP-0001**, RCP Abnormality. The crew will respond to motor bearing temperatures > 175 F and initiate action to TRIP the Reactor and stop 22 RCP.
7. The crew will enter **2-EOP-TRIP-1**, Reactor Trip or Safety Injection, then transition to **EOP-TRIP-2** based on no SI required. While in TRIP-2, an RHR intersystem RCS leak will occur on 22 RHR Heat Exchanger. PZR level and pressure will be lowering and the crew will take the CAS action to initiate SI and return to EOP-TRIP-1. One train of SI will fail to actuate and the operator will respond by initiating the other train of SI **[Critical Task #1]**.
8. While in TRIP-1, the crew will recognize that 22 Charging pump failed to start on SEC and will respond by manually starting 22 Charging pump. In addition, the crew will identify that two (2) Phase A valves (2CV116 & 2CV284) failed to close and will respond by manually closing them. The crew will recognize 2R41D Plant Vent radiation monitor in alarm, 22 RHR sump overflow

alarms and 24 SI accumulator pressure and levels lowering indicating RCS leak inside Auxiliary Building. The crew will transition to **EOP-LOCA-6**, LOCA outside Containment.

9. While in LOCA-6, the crew will isolate the RHR intersystem leak by closing the 22SJ49 and stopping 22 RHR pump **[Critical Task #2]**
10. After the RHR intersystem leak is isolated, the crew will transition to **EOP-LOCA-1** and determine SI Termination requirements are met to transition to **EOP-TRIP-3**.
11. The scenario can be terminated when the crew performs the determination for SI Termination in LOCA-1 or by direction from Lead Evaluator.

IV. INITIAL CONDITIONS

____ **IC-256 (11-29-18)**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
____ 1	VC1and VC4 C/T
____ 2	RCPs (SELF CHECK)
____ 3	RTBs (SELF CHECK)
____ 4	MS167s (SELF CHECK)
____ 5	500 KV SWYD (SELF CHECK)
____ 6	SGFP Trip (SELF CHECK)
____ 7	23 CV PP (SELF CHECK)
____ 8	**22 SW Pump C/T**
____ 9	**SG Blowdown aligned to 22 condenser (verify correct placement of placards)**
___ 10	**S2.OP-IO.ZZ-0003 marked up to Step 4.3.19**
___ 11	**S2.OP-SO.MS-0002 open to Attachment 3**
___ 12	**Ensure OHA's for A-30 and E-24 are cleared.**
___ 13	**Examination team determine appropriate Protected Equipment.**
___ 14	Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist."

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

EVENT TRIGGERS:

Initial	ET #	Description	
	1	EVENT ACTION: COMMAND: PURPOSE:	hwka501doa //HW Var bind for ZDIPANEL(1615) DOR ka701doa <update as needed>
	2	EVENT ACTION: COMMAND: PURPOSE:	hwka701doa //HW Var bind for ZDIPANEL(1669) DOR ka501doa <update as needed>
	3	EVENT ACTION: COMMAND: PURPOSE:	kb116tcb //2CV116 SEAL W TO VCT CLOSE DMF VL0045 <update as needed>
	4	EVENT ACTION: COMMAND: PURPOSE:	kb117tcb //2CV284 SEAL W TO VCT CLOSE DMF VL0046 <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	PR0016A PZR PRESS CH I (PT455) FAILS H/L	N/A	N/A	N/A	RT-1	2500
_____ 02	CN0094A #21A CONDENSER TUBE LEAK	N/A	N/A	N/A	RT-3	50
_____ 03	SJ0312A CL LEG INJ LINE CHK VALVE 24SJ56 (RCS SIDE) LEAKS (use with SJ0312B)	N/A	N/A	N/A	RT-5	20
_____ 04	SJ0312B CL LEG INJ LINE CHK VALVE 24SJ43 (RHR SIDE) LEAKS	N/A	N/A	N/A	RT-5	10
_____ 05	RP318S2 22 CHRG PMP FAILS TO STRT ON SEC	N/A	N/A	N/A	N/A	
_____ 06	VL0045 2CV116 Fails to Position (0-100%)	N/A	N/A	N/A	N/A	100
_____ 07	VL0046 2CV284 Fails to Position (0-100%)	N/A	N/A	N/A	N/A	100
_____ 08	VL0002 21BF32 Fails to Position (0-100%)	N/A	N/A	N/A	N/A	100
_____ 09	RH0299B 22 RHR LEAK BEFORE HX	N/A	N/A	N/A	RT-5	1000
_____ 10	RH0300B 22 RHR LEAK AFTER HX	N/A	N/A	N/A	RT-5	1000
_____ 11	RC0006B RC PUMP #22 LOSS OF LUBE OIL	N/A	N/A	N/A	RT-4	
_____ 12	SG0095A 21 SG LVL XMTR (519) CH II FAIL	N/A	32	00:00:30	RT-2	0
_____ 13	RP0274A AUTO SI FAILS TO ACT, TRN A	N/A	N/A	N/A	N/A	
_____ 14	RP0274B AUTO SI FAILS TO ACT, TRN B	N/A	N/A	N/A	N/A	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	AF01D 23 AUX FP TRIP RESET	N/A	N/A	N/A	N/A	RESET
_____ 02	SW27D 22 SW PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 03	SW28D 22 SW PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 04	PR34D PORV STOP VALVE 2PR6 TAGGED	N/A	N/A	N/A	RT-10	TAGGED

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
_____ 01	A701 B DJ KA701DOA TRAIN 'B' - SI OPERATE KEYSWITCH	N/A	N/A	N/A	N/A	OFF
_____ 02	A501 B DI KA501DOA TRAIN 'A' - SI OPERATE KEYSWITCH	N/A	N/A	N/A	N/A	OFF

OTHER CONDITIONS:

	Description
____ 1.	None

V. SEQUENCE OF EVENTS

1. State shift job assignments.
2. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).
3. Inform the crew "The simulator is running. You may commence panel walkdowns at this time. SM please inform me when your crew is ready to assume the shift".
4. Allow sufficient time for panel walk-downs. When informed by the SM that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
1. Power Ascension and enter Mode 1 (5%)			
	CRS directs RO to withdraw control rods or raise demand on steam dumps to raise reactor power IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load.		
Evaluator's Note: The crew may first place steam dumps to manual to raise demand to open dump valves more, then when Tavg lowers, withdraw rods in manual to raise Tavg.			
Evaluator's Note: When manually withdrawing control rods, the RO can refer to the "Hard Card" for S2.OP-SO.RCS-0001, Attachment 4, Manual Control Rod Motion. Three (3) step increments when withdrawing rods is expected.			
	RO reports reactor power is 5% and the unit is in Mode 1.		
Proceed onto next event after the crew enters Mode 1.			
2. PZR Pressure Channel 1 fails high			
Simulator Operator: Insert RT-1 at the direction of Lead Evaluator. **MALF: PR0016A PZR PRESS CH I (PT455) FAILS H/L** **Final = 2500**			
	RO reports unexpected OHAs for D-8 RC PRESS HI and E-42 2PR1 1/2 TRIP		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports that PZR Pressure Channel 1 has failed high and RCS pressure is lowering.		
	RO places Master Pressure Controller (MPC) in Manual		
	CRS enters S2.OP-AB.PZR-0001.		
	RO reports POPs is not in service.		
	RO reports that the controlling PZR pressure channel I is failed.		
	RO reports that MPC is in Manual		
	CRS directs RO to adjust MPC demand IAW Attachment 2 to restore pressure to program.		
	RO selects channel III for control		
	RO places MPC to Auto		
	CRS refers to Tech Specs		
	CRS directs Maintenance support to remove the failed channel from service IAW S2.OP-SO.RPS-0003.		
Evaluator's Note: The crew can perform some actions in S2.OP-SO.RPS-0003, but these actions are not necessary in order to continue on.			
TS evaluation #1:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS enters TSAS for 3.3.3.1 action 6 (6 hour LCO), 3.3.2.1 action b.19 (6 hour LCO), 3.4.5 action b (1 hour LCO), and 3.2.5.b (2 hour LCO IF RCS pressure < 2200 psia (2185 psig)		
	CRS directs RO to place 2PR1 in Manual and to close 2PR6 Block Valve to comply with Tech Specs.		
	CRS directs WCC to remove control power to 2PR6 to comply with 1 hour Tech Spec		
Simulator Operator: Use REMOTE **RT-10 PR34D** set to Tagged to remove power to 2PR6 when requested. Location 78 Ft Elec Penn Area.			
Proceed on to next event when Tech Specs has been evaluated or by direction of Lead Evaluator.			
3. 21 SG Narrow Range Level Channel II fails low (TS only)			
Simulator Operator: Insert **RT-2** on direction from Lead Evaluator. **MALF: SG0095A, 21 SG LVL XMTR (519) CH II FAIL** **Value = 0** **Ramp = 30 seconds**			
	RO reports unexpected OHA G-15 ADFCS TROUBLE and 21 SG Console Alarm for PROTECTION LEVEL LO-LO.		
	RO reports that 21 SG NR Level Channel 2 has failed low.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports 2PR4 bistable illuminated for SG Lo-Lo Level Loop 1 CH II.		
	Crew refers to ARP for 2CC2 and OHA G15.		
	PO checks digital feed water Engineering Work Station (EWS) at 2RP7 and reports that alarm list identifies 21 SG CH II level has failed low.		
	Crew determines failed channel does not impact plant operation.		
	PO reports ARP for 2CC2 directs removing channel from service IAW S2.OP-SO.RPS-0004.		
TS evaluation #2:			
	CRS evaluates Tech Specs and enters TSAS 3.3.1.1 Action 6 (6 hour LCO) and 3.3.2.1 Action b.19 (6 hour LCO).		
Proceed onto next event after crew evaluates Tech Specs.			
4. 21A Condenser Tube Leak			
Simulator Operator: Insert **RT-3** on direction from Lead Evaluator. **MALF: CN0094A #21A Condenser Tube Leak Severity: 50**			
	RO reports unexpected Console Alarm for HOTWELL OUTLET CONDUCTIVITY HI.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO refers to ARP for 2CC1 and notifies CRS that entry into S2.OP-AB.CHEM-0001 is required.		
Evaluator's Note: CPD Sodium Hi, CPD Cond Hi and Dissolved Oxygen Hi console alarms come in approx.1.5 minutes.			
	Crew checks secondary plant chemistry recorders on 2RP5 and determines 21A condenser is affected hotwell based on rising Conductivity and Dissolved Oxygen for 21A Condenser.		
Evaluator's Note: The crew may enter AB.CHEM first. IF the crew enters AB.CW first then AB.CW will direct initiation of AB.CHEM. Actions for AB.CW start on **page 17.**			
S2.OP-AB.CHEM-0001 actions start here:			
	CRS enters S2.OP-AB.CHEM-0001, Abnormal Secondary Chemistry.		
	CRS directs initiation of AB.CHEM CAS.		
	PO reports condensate polisher is in service.		
	PO reports OHA G-19, CND POL AUTO SWAP in NOT in alarm.		
	RO reports HOTWELL OUTLET CONDUCTIVITY HI console alarm is in and contacts Chemistry to determine source.		
Role Play: When directed, call back in 1-2 minutes as Secondary Chemistry and report; ***grab samples confirm the source of the***			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
condenser leak is from circ water. Chemistry Supervisor recommends removal of circulator from service. IF Crew request Chemistry recommendation for SG blowdown flow rate, then state; ***maintain 35K per loop and Chemistry will continue to evaluate.***			
Evaluator's Note: At this point several console alarms are in for high sodium, conductivity and dissolved oxygen that the crew should recognize as a condenser tube leak in the condenser and refers to guidance in Attachments 1 and 2 of AB.CHEM to remove CW pump from service.			
Emergency Trip of 21A CW Pump (AB.CHEM Attachments 1 and 2):			
	PO reports that Attachment 1 CAS Step 1.0 is met for indications of a Condenser Tube Failure/Leak and Attachment 2 is applicable.		
	PO reports that Attachment 2 conditions for Gross Condenser Tube Failure is met and states **EMERGENCY TRIP** of CW pump is required.		
	CRS directs Emergency Trip of 21A CW pump.		
	PO Emergency Trips 21A CW pump, but does not press the Stop PB until after 1 minute. (This allows the water to drain from the waterbox)		
	PO reports that Condensate Polisher is not source of console		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	alarms.		
	PO reports SGBD demin is not the source of console alarm.		
	CRS contacts Chemistry to initiate sampling.		
	RO reports DO HI console alarm is in.		
	CRS refers to Attachment 4 "Chemistry Action Levels" to determine Chemistry Action Levels.		
Proceed onto to next event when either the 21A CW pump stop PB is depressed or CRS refers to Attachment 4 Chemistry Action Levels or by direction from Lead Evaluator.			
S2.OP-AB.CW-0001 starts here:			
	CRS enters S2.OP-AB.CW-0001, Circulating Water System Malfunction.		
	CRS directs initiation of AB.CW CAS.		
	PO reports no indication of CW system piping rupture.		
	PO reports all circulators in service.		
	PO reports indication of a condenser tube leak in 21A condenser based on rising secondary chemistry recorder trends and 2CC1 alarms.		
Emergency Trip or Stop of 21A CW Pump:			
	PO either initiates **STOP** on 21A circulator at step 3.27 **or**		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	initiates **EMERGENCY TRIP** based on CAS step 7.0		
Proceed onto to next event when the 21A CW pump is out of service or as directed by Lead Evaluator.			
	CRS initiates S2.OP-AB.CHEM-0001, Abnormal Secondary Chemistry, while continuing with AB.CW-0001.		
	PO ensures CPS in service IAW S2.OP-SO.CN-0001.		
5. 22 RCP Oil Level Low			
Simulator Operator: Insert **RT-4** at direction of Lead Evaluator. **RC0006B: RC PUMP #22 LOSS OF LUBE OIL**			
	RO reports unexpected OHA D-13 for 22 RCP BRG OIL LVL LO		
	PO reports alarm is for 22 RCP Upper Radial Bearing Oil Level Low		
	PO refers to ARP and reports that RCP motor bearing temperatures are rising to or exceeds 175 F and directs entry into S2.OP-AB.RCP-0001.		
	CRS enters **S2.OP-AB.RCP-0001** and implements Attachment 2 for stopping 22 RCP.		
Rx Trip and Stop 22 RCP:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS directs RO to trip the reactor, confirm the reactor trip, THEN stop 22 RCP.		
	RO trips the reactor and performs immediate actions of EOP-TRIP-1.		
	CRS enters EOP-TRIP-1, Reactor Trip or Safety Injection		
	RO and CRS review SI parameters and determine no SI is required.		
Evaluator's Note: Based on the low power level when the Rx was tripped, the AFW pumps will have not Auto started due to adequate SG levels. The crew may decide now or when directed in EOP-TRIP-2 to manually start the AFW pumps.			
	PO request to manually start AFW pumps **or** wait until CRS directs starting them in EOP-TRIP-2.		
	PO throttles AFW flow to > 22E4 lbm/hr		
	CRS transitions to EOP-TRIP-2, Reactor Trip Response		
	RO makes page announcement		
	PO reports AFW flow > 22E4 lbm/hr **or** starts AFW pumps as necessary.		
	PO stops 21 and 22 SGFPs		
Proceed on to next event when SGFPs are			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
stopped or at Lead Evaluators direction			
6. RHR Intersystem RCS Leak (LOCA outside Containment):			
Simulator Operator: Insert **RT-5** at direction of Lead Evaluator **MALF: SJ0312A CL LEG INJ LINE CHK VALVE 24SJ56 (RCS SIDE) LEAKS, Severity = 20** **MALF: SJ0312B CL LEG INJ LINE CHK VALVE 24SJ43 (RHR SIDE) LEAKS, Severity = 10** **MALF: RH0229B 22 RHR LEAK BEFORE HX, Severity = 1000** **MALF: RH0300B 22 RHR LEAK AFTER HX, Severity = 1000**			
	RO reports unexpected console alarms for 24 SI Accumulator: Level HI-Lo and Press Hi-Lo		
	RO reports that levels and pressure on 24 SI Accumulator are lowering		
	RO reports PZR pressure and levels are lowering.		
	RO reports unexpected OHA A-6 is in for 2R41D in Alarm		
	RO reports OHA A-41 is for 23 and 24 RHR Sump Pump starts.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports unexpected OHAs in for: C-34 22 RHR SUMP OVRFLO and E-36 PZR HTR OFF LVL LO		
Evaluator's Note: The crew may respond to initial indications of an RCS leak by entering **S2.OP-AB.RC-0001** and THEN taking the actions of the CAS to initiate SI.			
	CRS directs RO to estimate RCS leak rate.		
	RO reports that RCS leak rate is greater than Auto Makeup capability		
	RO recommends initiating SI		
	CRS directs RO to initiate SI		
One Train of SI fails to manually actuate by keyswitch:			
	RO actuates one train of SI and reports that train of SI failed to manually initiate.		
Simulator Operator: Ensure ET-1 or ET-2 is TRUE when the associated keyswitch is turned. This will allow the other train to actuate.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
ET-2: Train B keyswitch actuated. **ET-1: Train A keyswitch actuated**			
	RO initiates other train of SI and reports SI initiated on both trains. [Critical Task #1]		
Critical Task #1 (CT-2): Manually actuate SI before transition out of TRIP-1. **SAT:_____ UNSAT:_____**			
	CRS returns to EOP-TRIP-1		
	RO and CRS reperform immediate actions of TRIP-1.		
22 Charging pump fails to start by 2C SEC:			
	PO reports that SEC loading is not complete for 2B and 2C SEC		
	PO reports that 22 Charging pump failed to start		
	PO blocks and then resets 2C SEC		
	RO starts 22 Charging pump		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
2CV116 and 2CV284 fails to close on Phase A:			
	PO reports NOT all valves are in the safeguard positions.		
	PO reports that 2CV116 and 2CV284 did not close on Phase A signal.		
Simulator Operator: Ensure **ET-3** or **ET-4** is TRUE when the associated Close PB is depressed for 2CV116 & 2CV284. This will delete the malfunction for the valves failing open. **ET-3: 2CV116 Close PB** **ET-4: 2CV284 Close PB** **Note:** If the operator does not depress the close PB long enough the malfunction will not have enough time to delete and the valve will stay open.			
	RO manually closes 2CV116 and 2CV284.		
	RO closes 21 and 22 CA330s		
	RO reports containment pressure has remained less than 15		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	psig		
	PO reports 2RP4 does not indicate requirements to perform MSLI		
	PO reports all 4KV vital buses are energized		
	RO reports control room ventilation in AP mode.		
	RO reports correct switchgear room ventilation and 2 CCW pumps running.		
	RO reports correct ECCS injection flow for current RCS pressure.		
Evaluator's Note: During validation Charging flow was approx. 318 gpm and RCS pressure was 1882 psig and lowering.			
	PO reports AFW flow and SG NR level status.		
	RO reports 3 RCPs are running and RCS temperature trending to 547°F.		
	RO reports both Rx Trip breakers are open		
	RO reports both PZR PORVs are closed and only one (1) block valve is open (Note: 2PR6 closed previously to comply with Tech Specs)		
	RO reports RCS pressure is not less than 1350 psig		
	PO reports no indications of Faulted SGs		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports no indications of Ruptured SGs		
	PO reports no Rad Monitors in Table F are in warning, alarm or rising		
Evaluator's Note: If the crew transitions to LOCA-1 here, THEN the crew will evaluate transition to EOP-LOCA-6 at Step 16 of EOP-LOCA-1.			
	RO reports containment pressure < 4 psig		
	RO reports containment sump level < 46%		
	RO reports RCS subcooling > 0 F		
	PO reports total AFW flow > 22E4 lbm/hr		
	RO reports RCS pressure is NOT stable or rising		
	CRS directs STA to initiate CFST		
Role Play: IF asked about the status of Unit 1 Aux Bldg Rad Monitors report the following: ***1R3, 1R6A, and 1R20B are not in warning or alarm.***			
	RO reports 2R41D is in alarm and no Unit 1 Aux Bldg Rad Monitors are in warning or alarm		
	CRS dispatches field operator with RP support to investigate cause of high radiation in Aux Bldg		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Role Play: IF requested, after 5 minutes report the following: ***Rad Pro reports that the radiation dose rates are elevated on the 45 EL. Aux Bldg and steam is coming from the 22 RHR pit room. They do not recommend allowing access to the RHR rooms at this time.***			
	Crew determines based on 2R41D in alarm, OHA alarms associated with 22 RHR sump pump starts and sump overflow, and lowering PZR pressure and levels that an RCS leak is indicated down on 22 RHR pump room.		
	Crew determines that the cause of the Aux Bldg high radiation is due to a LOCA outside containment.		
	CRS transitions to EOP-LOCA-6, LOCA Outside Containment		
	STA verifies procedure transition.		
	RO resets SI, Phase A and Phase B		
	RO opens 21 and 22 CA330s		
	PO resets each SEC and associated 230V control centers		
RHR Suction Isolation:			
	RO reports 2RH1 and 2RH2 (Common Suction) are closed		
	RO closes 21 and 22 RH19s (RHR discharge cross-connect)		
	RO reports RCS pressure is NOT rising.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
RHR Hot Leg Injection Isolation:			
	RO reports 2RH26 (Hot Leg Injection) is closed		
	RO reports RCS Pressure is NOT rising		
RHR Cold Leg Injection Isolation:			
	RO reports 21RH29 is in AUTO		
	PO removes lockout for 21SJ49		
	RO closes 21SJ49 (Cold Leg Isolation)		
	RO reports RCS Pressure is NOT rising		
	RO opens 21SJ49		
	RO reports 22RH29 is in AUTO		
	PO removes lockout for 22SJ49		
	RO closes 22SJ49 (Cold Leg Isolation) [Critical Task #2]		
	RO reports RCS Pressure is rising.		
Critical Task #2 (CT-32): Isolate LOCA outside containment before transition out of LOCA-6. **SAT:_____ UNSAT:_____**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO stops 22 RHR pump		
	CRS transitions to EOP-LOCA-1		
	STA verifies procedure transition		
	RO reports no indications of Faulted SGs		
	RO reports no indications of Ruptured SGs		
	RO reports SI, Phase A and B are reset		
	PO reports all SECs are reset		
	RO resets SG B/D sample isolation bypass		
	RO opens 21 thru 24 SS94s		
	CRS directs Chemistry to sample 21 thru 24 SGs for boron and activity		
	RO reports both PZR PORVs are closed and one block valve is closed (2PR6 for Tech Spec compliance)		
SI Flow Reduction Criteria: (Note: this is a Continuous Action Step in LOCA-1)			
	RO reports RCS subcooling is > 0 F (approx. 53 F)		
	PO reports AFW flow < 22 E4 lbm/hr		
	PO reports at least one SG NR level > 9% (15% Adverse)		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports RCS Pressure is rising		
Evaluator's Note: PZR level may not be > 11% at this time, **IF so**, THEN the crew should perform the action to stabilize RCS pressure using normal spray to allow the PZR to refill.			
	RO reports PZR level is > 11% (19% Adverse)		
	CRS transitions to EOP-TRIP-3, SI Termination		
	STA verifies procedure transition		
Terminate scenario when the Crew performs any of the following: transitions to EOP-TRIP-3 or performs RCS Pressure stabilization or at by direction from Lead Evaluator.			

7. SCENARIO REFERENCES

a. Alarm Response Procedures (Various)
b. Technical Specifications
c. Emergency Plan (ECG)
d. OP-AA-101-111-1003, Use of Procedures
e. S2.OP-AB.CW-0001, Circulating Water System Malfunction
f. S2.OP-AB.CHEM-0001, Abnormal Secondary Chemistry
g. S2.OP-AB.LOAD-0001, Rapid Load Reduction
h. S2.OP-AB.PZR-0001, PZR Pressure Malfunction
i. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
j. 2-EOP-TRIP-2, Reactor Trip Response
k. 2-EOP-LOCA-1, Loss of Reactor Coolant
l. 2-EOP-LOCA-6, LOCA outside Containment

ATTACHMENT 1
UNIT TWO PLANT STATUS TODAY

MODE: 2 POWER: 4 RCS BORON: 1815 MWe 0

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

NA

REACTIVITY PARAMETERS

- Power ascension in progress following refueling outage IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load with Control Rods in Manual at D-123 steps.
- Reactor Engineering directs the use of control rods and steam dumps to raise reactor power to 10%.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Power ascension to 10% reactor power and enter Mode 1 IAW S2.OP-IO.ZZ-0003.
- Steam Dumps is in MS mode Auto. 21 SGFP in service with 22 SGFP in standby.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power.
No penalty minutes in the last 24 hrs.

PRIMARY:

SECONDARY:

- Polisher in service
- Blowdown is 35K per loop to 22 condenser.

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

- 22 SW pump C/T for strainer motor replacement.

ATTACHMENT 2

SIMULATOR READY FOR TRAINING CHECKLIST

____ 1. Verify simulator is in "TRAIN" Load

____ 2. Simulator is in RUN

____ 3. Overhead Annunciator Horns ON

____ 4. All required computer terminals in operation

____ 5. Simulator clocks synchronized

____ 6. All tagged equipment properly secured and documented

____ 7. TSAS Status Board up-to-date

____ 8. Shift manning sheet available

____ 9. Procedures in progress open and signed-off to proper step

____ 10. All OHA lamps operating (OHA Test) and burned out lamps replaced

____ 11. Required chart recorders advanced and ON (proper paper installed)

____ 12. All printers have adequate paper AND functional ribbon

____ 13. Required procedures clean

____ 14. Multiple color procedure pens available

____ 15. Required keys available

____ 16. Simulator cleared of unauthorized material/personnel

____ 17. All charts advanced to clean traces and chart recorders are on.

____ 18. Rod step counters correct (channel check) and reset as necessary

____ 19. Exam security set for simulator

____ 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter

____ With Baseline Data filled out

____ 21. Shift logs available if required

____ 22. Recording Media available (if applicable)

____ 23. Ensure ECG classification is correct

____ 24. Reference verification performed with required documents available

____ 25. Verify phones disconnected from plant after drill.

____ 26. Verify EGC paperwork is marked "Training Use Only" and is current revision.

____ 27. Ensure sufficient copies of ECG paperwork are available.

ATTACHMENT 3

CRITICAL TASK METHODOLOGY

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper performance or omission of this task by a licensee will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant.
The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...

- degradation of any barrier to fission product release
- degraded emergency core cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility license condition
- incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
- a significant reduction of safety margin beyond that irreparably introduced by the scenario

II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...

- effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
- recognize a failure or an incorrect automatic actuation of an ESF system or component.
- take one or more actions that would prevent a challenge to plant safety.
- prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 17-01 NRC-1 **REVIEWER:**

Initials Qualitative Attributes

1. The scenario has clearly stated objectives in the scenario.
2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
3. The scenario consists mostly of related events.
4. Each event description consists of:
   - the point in the scenario when it is to be initiated
   - the malfunction(s) that are entered to initiate the event
   - the symptoms/cues that will be visible to the crew
   - the expected operator actions (by shift position)
   - the event termination point
5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
6. The events are valid with regard to physics and thermodynamics.
7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
8. The simulator modeling is not altered.
9. All crew competencies can be evaluated.
10. The scenario has been validated.
11. If the sampling plan indicates that the scenario was used for training during the requalification cycle, evaluate the need to modify or replace the scenario.
12. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

Scenario No.: 1 (ESG-1)

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Initial Conditions: IC-256: 4% power, BOL; 23 Charging Pump is running, 21 SGFP is in service with AFW pumps secured, power ascension in progress at 10% per hour with control rods in manual and steam dumps in MS mode in Auto. 22 SW pump C/T for strainer motor replacement.

Turnover: Crew is directed to continue raising Rx power to 10% and enter Mode 1 using Control Rods and Main Steam Dumps IAW S2.OP-IO.ZZ-0003.

Critical Tasks:

1. Manually actuate SI (see WOG CT-2).
2. Isolate LOCA outside containment (see WOG CT-32).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ALL (R)	Power ascension at 10% per hour and enter Mode 1
2	PR0016A	RO (I) SRO (I,TS)	PZR pressure controlling channel fails high (TS exercised)
3	SG0095A	SRO (TS)	21 SG NR level fails low (TS only)
4	CN0094A	PO (C) SRO (C)	21A Main Condenser tube leak
5	RC0006B	RO (C) SRO (C)	22 RCP motor oil leak requiring manual reactor trip
6	SJ0312A SJ0312B RH0299B RH0300B	ALL (M)	RHR intersystem RCS leak on 22 RHR heat exchanger during EOP-TRIP-2
7	A701 A501	RO (I) SRO (I)	One train of SI fails to manually actuate. Operator can actuate the other train of SI from control room.
8	RP318S2	RO (I) SRO (I)	22 Charging pump fails to start by 2C SEC. Operator can manually start from control room.
9	VL0045 VL0046	RO (I) SRO (I)	2CV116 and 2CV284 fail to close on Phase A isolation. Operators can manually close from control room.
		ABs	AB.PZR-1 → AB.CW-1 → AB.CHEM-1 → AB.RCP-1
		EOPs	TRIP-1 → TRIP-2 → TRIP-1 → LOCA-6 → LOCA-1

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

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

Scenario No.: 1 (ESG-1)

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	7	-
2. Malfunctions after EOP entry (1-2)	3	7,8,9
3. Abnormal events (2-4)	3	2,4,5
4. Major transients (1-2)	1	6
5. EOPs entered/requiring substantive actions (1-2)	2	LOCA-6 LOCA-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0	-
7. Preidentified critical tasks (≥2)	2	CT-2, CT-32
8. Tech Specs exercised (≥ 2)	2	2,3

Note: See 17-01 NRC-3 (FRSM-1) and 17-01 NRC-4 (FRHS-1) for Contingency EOPs used for the scenario set

ATTACHMENT 5
ESG CRITICAL TASKS

17-01 NRC-1

CT #1: (CT-2)

Critical Task: Manually actuate SI before transition out of EOP-TRIP-1.

Basis: See WOG Rev. 2

CT #2: (CT-32)

Critical Task: Isolate LOCA outside containment before transition out of EOP-LOCA-6.

Basis: See WOG Rev. 2

ATTACHMENT 6

ESG-PRA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

Y/N	Event	Y/N	Event
N	TRANSIENTS with PCS Unavailable	N	Loss of Service Water
N	Steam Generator Tube Rupture	N	Loss of CCW
N	Loss of Offsite Power	N	Loss of Control Air
N	Loss of Switchgear and Pen Area Ventilation	N	Station Black Out
Y	LOCA		

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	N	Auxiliary Feed Pump
N	CVCS Letdown line Control and Isolation Valves	N	SBO Air Compressor

OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

Y/N	OPERATOR ACTION
N	Restore AC power during SBO
N	Connect to gas turbine
N	Trip Reactor and RCPs after loss of component cooling system
N	Re-align RHR system for re-circulation
N	Un-isolate the available CCW Heat Exchanger
N	Isolate the CVCS letdown path and transfer charging suction to RWST
N	Cooldown the RCS and depressurize the system
N	Isolate the affected Steam Generator that has the tube rupture(s)
N	Early depressurize the RCS
N	Initiate feed and bleed

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: ESG-3 [AB.COND-1, AB.LOAD-1, TRIP-1, FRSM-1, TRIP-1, TRIP-2]

SCENARIO NUMBER: 17-01 NRC-3

EFFECTIVE DATE: See Approval Below

EXPECTED DURATION: 60 minutes

REVISION NUMBER: 06

PROGRAM:

- [ ] **L.O. REQUAL**
- [X] **INITIAL LICENSE**
- [ ] **STA**
- [ ] **OTHER** _____

REVISION SUMMARY:

- Rev. 05 (10-4-18) ESG-1808 modified for use on 17-01 ILOT NRC exam. Modified scenario to change malfunctions/events to ensure overlap requirements are met. Added the following malfunctions; Cntmt Pressure channel fails low, 22 SI Accumulator gas leak, Loss of Main Condenser Vacuum, two dropped rods, and 2PR1 PORV fails open. C/T one charging pump to prevent excessive nuisance alarms for RCP seal leakoff flows oscillating due to VCT filling and seal return relief valve 2CV115 cycling following Rapid Boration.
- Rev. 06 (12-4-18) Incorporated NRC Prep week comments. Added override for 21 BAT pump C/T, clarified CT#1 to credit rod insertion or rapid boration, added note to ensure all acitons completed for SI accumulator response prior to inserting loss of vacuum event, added role play to direct makeup to SI accumulator event, deleted and reinserted overrides to fix sim issue, added NRC ES-D-1 form to Attach 4.

PREPARED BY:	R. Chan **Lead Regulatory Exam Author**	12-4-18 **Date**
APPROVED BY:	McHugh **Operations Training Manager**	12/11/18 **Date**
APPROVED BY:	Myers **Facility Representative**	12/7/18 **Date**

SCAN OF SIGNED SCENARIO COVER SHEET

I. OBJECTIVES

A. Given an instrumentation failure, evaluate for impact to plant operations and Technical Specifications.

B. Given the unit at power and a loss of condenser vacuum, take corrective action IAW AB.COND-0001.

C. Given the order or indications of a loss of vacuum, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW approved station procedures.

D. Given the order or indications of a loss of vacuum, DIRECT the response to the malfunction IAW approved station procedures.

E. Given an ECCS Accumulator with low pressure, RAISE accumulator pressure in accordance with station procedures.

F. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with the approved station procedures.

G. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.

H. Given the order or indications of a reactor trip, perform actions as the shift technical advisor to RESPOND to the reactor trip in accordance with the approved station procedures.

I. Given the order or indications of an anticipated transient without trip (ATWT), complete actions as the nuclear control operator to PERFORM the immediate response to the ATWT in accordance with the approved station procedures.

J. Given indication of an anticipated transient without trip (ATWT), DIRECT the immediate response to the ATWT in accordance with the approved station procedures.

K. Given the order or indications of an anticipated transient without trip (ATWT), PERFORM actions as the shift technical advisor to the ATWT IAW station procedures.

L. Given indication of an open PZR PORV, take corrective actions IAW AB.PZR-0001 or EOP-TRIP-2 to close the PZR block valve.

II. MAJOR EVENTS

A. Containment Pressure Channel I fails low (TS only)

B. 22 SI Accumulator gas leak (TS)

C. Loss of Main Condenser vacuum

D. Power reduction to stabilize vacuum

E. Two dropped rods and Reactor fails to Trip (ATWT)

F. 2CV175 Rapid Borate valve fails to open

G. PZR PORV (2PR1) fails open

III. SCENARIO SUMMARY

A. The crew will take the watch at ~89.5% power, MOL, Rods in Auto. 21 Charging pump C/T for oil cooler cleaning, 21A CW C/T for waterbox cleaning, 21 BAT pump C/T for pump seal replacement, 22 vacuum pump C/T for pump replacement.

B. After taking the watch, the crew will commence power ascension to 100% at 10% per hour IAW **S2.OP-IO.ZZ-0004**, Power Operation. The crew will be directed to use control rods and turbine load control to raise reactor power.

C. Once the power ascension is in progress, Containment pressure channel 1 fails low. The crew will place the power ascension on hold to address the alarm. The crew will refer to OHA ARP and determine no impact to plant operations. The crew will identify that the channel needs to be removed from service and Tech Specs evaluated. (TS only)

D. Following the response to the Containment pressure channel failure, 22 SI Accumulator will experience a gas leak inside containment. The crew will respond using Console ARP and the system operating procedure to raise SI accumulator pressure to within specification. The CRS will give an operational band for the operator to maintain accumulator pressure. CRS will evaluate Tech Specs. (TS call)

E. After the crew addresses the accumulator gas leak, a condenser tube plug will come loose in 21A CW waterbox during waterbox cleaning. The crew will recognize rising condenser backpressure and start all available vacuum pumps to stabilize vacuum. The CRS enters **S2.OP-AB.COND-0001**, Loss of Condenser Vacuum. The crew will commence a load reduction to stabilize backpressure. Once the load reduction has commenced, the missing tube plug will be re-installed and the condenser backpressure will recover.

F. Following the condenser vacuum event, two control rods will inadvertently drop causing a demand for reactor trip. The reactor will not trip using all attempts from the control room (ATWT) and a rod speed controller issue will only allow rods to insert at 8 spm in Auto. The crew responds by manually inserting rods at 48 spm. The crew will transition to **EOP-FRSM-1**, Response to Nuclear Power Generation, on the ATWT.

G. In FRSM-1, the crew will initiate Rapid Boration **[Critical Task #1].** During Rapid Boration, the crew will recognize that the 2CV175 Rapid Boration valve will not open and use the RWST path to Rapid Borate. Following verification of Rapid Boration flow the reactor trip breakers will be locally opened.

H. Once the reactor is confirmed to be tripped, the crew will transition from FRSM-1 to TRIP-1, then stabilize the plant in EOP-TRIP-2. While in TRIP-2, a PZR PORV (2PR1) fails open. The crew will recognize that a PZR PORV is open and respond by closing the block valve of the failed open PORV **[Critical Task #2].** The scenario can be terminated when open PZR PORV is isolated.

IV. INITIAL CONDITIONS

____ **IC-258 (11-29-18)**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
____ 1	VC1and VC4 C/T
____ 2	RCPs (SELF CHECK)
____ 3	RTBs (SELF CHECK)
____ 4	MS167s (SELF CHECK)
____ 5	500 KV SWYD (SELF CHECK)
____ 6	SGFP Trip (SELF CHECK)
____ 7	23 CV PP (SELF CHECK)
____ 8	**21 Charging pump C/T**
____ 9	**21A CW and 21CW26 C/T (check that DP is set for in service CW pump)**
___ 10	**21 BAT pump C/T**
___ 11	**22 Vacuum pump C/T**
___ 12	**Examination team determine which equipment should be "protected" based on equipment out of service at start of scenario.**
___ 13	Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist."

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

EVENT TRIGGERS:

Initial	ET #	Description	

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	VC0311A Containment Presssure CH I (PT948D) FAILS (NR only)	N/A	N/A	N/A	RT-1	55
_____ 02	SJ0180B 22 SI ACCUMULATOR GAS LEAK	N/A	5	00:01:14	RT-2	0.1
_____ 03	RD050113 (2C4) CONTROL ROD POSITION (ACTUAL) Fails	N/A	N/A	N/A	RT-4	0
_____ 04	RD050122 (1C1) CONTROL ROD POSITION (ACTUAL) Fails	N/A	N/A	N/A	RT-4	0
_____ 05	RP0058 FAILURE OF AUTOMATIC RX TRIP	N/A	N/A	N/A	N/A	
_____ 06	RP0059A FAILURE OF MANUAL RX TRIP	N/A	N/A	N/A	N/A	
_____ 07	RP0059B FAILURE OF MANUAL SI/RX TRIP	N/A	N/A	N/A	N/A	
_____ 08	RP0060A FAILURE OF TRAIN "A" RX TRIP BREAKER TO TRIP	N/A	N/A	N/A	N/A	
_____ 09	RP0060B FAILURE OF TRAIN "B" RX TRIP BREAKER TO TRIP	N/A	N/A	N/A	N/A	
_____ 10	RD0061 ROD SPEED CONTROL PROGRAM FAILS	N/A	N/A	N/A	RT-4	8
_____ 11	VL0095 2CV175 Fails to Position (0-100%)	N/A	N/A	N/A	RT-4	0
_____ 12	VL0297 2PR1 Fails to Position (0-100%)	N/A	N/A	N/A	RT-5	100
_____ 13	CN0086B Loss of 22 main condenser vacuum	N/A	5	00:10:00	RT-3	8

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	CV44D 21 CHG PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 02	CV45D 21 CHG PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 03	CW01A 21A CIRC WATER PUMP CONTROL PWR BKR 2CW2AD	N/A	N/A	N/A	N/A	OFF
_____ 04	WD11A 22 GAS DECAY TANK PRESSURE	N/A	N/A	N/A	N/A	20
_____ 05	RP18D Open MAIN RX TRIP BKR A	N/A	N/A	N/A	RT-10	TRIP OPEN
_____ 06	RP19D Open MAIN RX TRIP BKR B	00:00:05	N/A	N/A	RT-10	TRIP OPEN
_____ 07	RP09D 21 MG SET GEN OUTPUT BKR	N/A	N/A	N/A	RT-11	TRIPPED
_____ 08	RP07D 21 MG SET MOTOR BKR	00:00:05	N/A	N/A	RT-11	STOP

_____ 09	RP10D 22 MG SET GEN OUTPUT BKR	00:00:10	N/A	N/A	RT-11	TRIPPED
_____ 10	RP08D 22 MG SET MOTOR BKR	00:00:15	N/A	N/A	RT-11	STOP

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
_____ 01	CM01 F LO QCM01TG5 21CW26 21A-CONDEN WATER OUT VALVE CLOSE	N/A	N/A	N/A	N/A	OFF
_____ 02	C310 F DI KC310TN0 2E6D PRESSURE HEATER BUS 480V-OPEN	N/A	N/A	N/A	N/A	OFF
_____ 03	C510 F DI KC510TN0 2G6D PRESSURE HEATER BUS 480V-OPEN	N/A	N/A	N/A	N/A	OFF
_____ 04	B135 E DI KB135PBB 21 BAT PUMP-FAST START	N/A	N/A	N/A	N/A	OFF
_____ 05	B135 D DI KB135LBB 21 BAT PUMP-SLOW START	N/A	N/A	N/A	N/A	OFF

OTHER CONDITIONS:

	Description

None

V. SEQUENCE OF EVENTS

A. State shift job assignments.

B. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).

C. Inform the crew "The simulator is running. You may commence panel walkdowns at this time. SM please inform me when your crew is ready to assume the shift".

D. Allow sufficient time for panel walk-downs. When informed by the SM that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
1. Power Ascension to 100% at 10% per hour			
	Crew discusses reactivity plan for power ascension using control rods and turbine load control		
Evaluators Note: The crew may raise turbine load or withdraw control rods in any order as directed by the CRS.			
	RO withdraws control rods in Manual to maintain Tavg on program IAW **S2.OP-SO.RCS-0001**, Rod Control System, Operation or Attachment 4, Manual Control Rod Motion Hard Card.		
	PO raises turbine load using DEHC HMI panel IAW **S2.OP-SO.TRB-0001**, Turbine-Generator Startup Operations or Attachment 5, Routine Loading of Generator Hard Card.		
	Crew monitors proper response for Tavg, reactor power, and rod position during power ascension		
Proceed on to next event after Lead Evaluator has observed the power ascension activities or by direction of Lead Evaluator.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
2. Containment Pressure Channel 1 fails high (TS only).			
Simulator Operator: Insert **RT-1** on direction from Lead Evaluator **MALF: VC0311A CNTMT PRESS CH I FAILS** **Final = 55**			
	RO reports unexpected OHA alarms for C-6 "CNTMT PRESS HI-HI" and D-40 "SUBCLG CH A MARGIN LO".		
	RO reports that the Cntmt Pressure Channel 1 console indication has failed high.		
	RO may also report that Subcooling Margin monitor Channel A is reading about- 0.7 and the Adverse button is illuminated on back panel recorder.		
	Crew refers to OHA alarm response procedures (ARP) and determines that the alarm is due to a failed instrument channel and not a valid signal.		
	Crew reviews **S2.OP-SO.RPS-0005** for placing the channel in the tripped condition.		
Evaluator's Note: Actions to place the channel in the tripped condition requires the operator to perform			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
these actions in the rack room area behind the control room. These racks are NOT installed in the simulator and must be performed by the simulator operator.			
Role Play: IF CRS request support to place the CNTMT PRESS CH I in tripped condition, **THEN** state that the WCC SRO will brief the 3rd NCO to place the channel in the tripped condition IAW S2.OP-SO.RPS-0005.			
TS evaluation #1:			
	CRS reviews Tech Spec and enters TSAS 3.3.2.1.b, Action 16 (6 hour LCO) [Note: Cntmt Spray only, SI not affected. TSAS 3.3.3.7 not applicable per ST.INST-0001 is only for Wide Range].		
Proceed to next event after Tech Specs evaluated or at Lead Evaluators direction.			
3. 22 ECCS SI Accumulator gas leak			
Simulator Operator: Insert RT-2 on direction from Lead Evaluator.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
MALF: SJ0180B **Initial Value: 5** **Severity: 0.1** **Ramp: 1:14 mins**			
Evaluator's Note: The low pressure console alarm will annunciate just after the ramp is finished.			
	RO reports unexpected 22 Accumulator low pressure alarm.		
Evaluator's Note: The alarm setpoint of 595.5 is also the Tech Spec required gas pressure.			
	PO reports ARP directs restoration of accumulator pressure IAW S2.OP-SO.SJ-0002, Accumulator Operations.		
Role Play: IF the crew takes no action to restore accumulator pressure, **THEN**, call as SM and state; ***SM directs restoring accumulator pressure to acceptable band.***			
	PO restores 22 Accumulator pressure by opening 2NT32 nitrogen supply valve and 22SJ93 nitrogen supply valve, then closing 22SJ93 and 2NT32 when desired pressure is reached.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports 22 accumulator pressure is lowering **very slowly**.		
	CRS assigns operating band for RO to maintain accumulator pressure.		
	CRS contacts WCC to begin actions to investigate leak.		
TS evaluation #2:			
	CRS recognizes TSAS 3.5.1.d Action a (24 hour LCO) was applicable for the time 22 Accumulator gas pressure was <595.5.		
Continue to next event after the crew completes actions to address the accumulator issue or by direction from Lead Evaluator.			
4. Loss of Main Condenser Vacuum (missing tube plug)			
Evaluator's Note: During downpower, the crew may collect penalty deviation minutes for AFD being outside the target band.			
	Crew records AFD penalty deviation minutes IF AFD is outside the target band during downpower. [reference TS 3.2.1 surveillance requirement 4.2.1.2]		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Enter **RT-3** on direction from Lead Evaluator. **MALF: CN0086B, Loss of 22 Main Condenser Vacuum** **Initial Value: 5** **Final Value: 8** **Ramp: 00:10:00** **Depending on the pace of the crew, you may have to MODIFY the final value to slow the rate of rise of backpressure to allow for a load reduction.** **Trend backpressure to monitor rate of raise and any necessary adjustments to MALF CN0086B.**			
	PO reports rising condenser backpressure.		
	CRS enters S2.OP-AB.COND-0001, Loss of Condenser Vacuum.		
	CRS assigns responsibility for CAS.		
	CRS sends operators to perform local vacuum checks IAW Attachment 2.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Role Play: IF required, call back in 5-10 minutes that ***you've completed the local vacuum checks IAW Attach 2 and all checks are Sat.***			
	PO reports NO abnormal vacuum pump indications.		
	PO reports normal CW system operation.		
Simulator Operator: IMMEDIATELY after the crew starts all available vacuum pumps; **MODIFY CN0086B** as follows: **Start = 11** **Final = 13** **Ramp = 00:10:00 mins** **Depending on when the crew recognizes the rising backpressure, Simulator Operator may have to make several adjustments to achieve a rate of rise that's not too fast or too slow.** When vacuum pumps are started, back pressure will recover quickly. Modifying malfunction promptly will ensure that backpressure will continue to rise and ensure crew commences a power reduction to stabilize backpressure.			
Start All Vacuum Pumps:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO starts all available vacuum pumps, manually opens AR25 valves as required, and reports condenser vacuum stabilizes then continues to degrade.		
Role Play: IF directed to locally check parameters for 25 Vacuum pump, THEN state as necessary: ♦ ***Seal water pressure is 15 psig*** ♦ ***Suction pressure is 29.0" Hg.***			
	PO reports the Turbine is latched.		
	CRS enters S2.OP-AB.LOAD-0001, Rapid Load Reduction.		
	CRS directs performance of AB.LOAD-0001 CAS.		
Load Reduction to stabilize backpressure:			
	CRS directs a load reduction in an attempt to stabilize condenser backpressure IAW S2.OP-AB.LOAD-0001.		
	RO calculates required boron addition required for downpower.		
	CRS verifies boron addition calculation.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO commences boration.		
	PO initiates a load reduction at rate specified by the CRS.		
Evaluator's Note: OHA G-3 CNDSR VAC LO and console alarm come in ≈ 5 " Hg Abs.			
Proceed to next action to delete backpressure **MALF when power reduction has commenced** or by direction from Lead Evaluator.			
Field report of missing tube plug and backpressure recovery:			
Simulator Operator: DELETE MALF **CN0086B** and verify that backpressure is recovering.			
Role Play: After malfunction is deleted report ***as one of the operators cleaning 21A CW waterbox that you heard a loud sucking noise and noticed a missing tube plug in the inlet waterbox. You found the missing plug and have reinserted the plug back into the tube.***			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports that condenser backpressure is recovering		
	RO energizes all PZR heaters.		
	PO monitors condensate pump suction temperature.		
	RO announces and inserts control rods to maintain Tavg within prescribed band.		
Proceed to next event at Lead Evaluators direction after evaluating load reduction activities AND backpressure is recovering.			
5. Two Control Rods drop, failure of rod speed controller, and 2CV175 fails to open:			
Simulator Operator: Insert **RT-4** at Lead Evaluator's direction. **MALF RD050113 Control Rod Position Fails, Final = 0** **MALF RD050122 Control Rod Position Fails, Final = 0** **MALF RD0061 Rod Speed Controller Program Fails, Final = 8** **MALF VL0095 2CV175 fails to position, Final = 0**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports that two (2) control rods fully inserted and a demand for Reactor Trip is present.		
	RO reports that the reactor failed to auto trip and ATWT has occurred.		
6. ATWT			
	RO reports Rx trip handles **did not trip** the Rx and crew recognizes an ATWT has occurred.		
	RO reports RTBs will not open.		
	RO reports PZR heater bus breakers will not open.		
	RO trips the Main Turbine.		
Rod speed controller fails at 8 spm in Auto:			
	RO reports rod speed only at 8 spm with rods in Auto.		
Critical Task #1 (CT-52): Insert negative reactivity into to the core by at least one of the following methods prior to dispatching operators to locally trip the reactor and/or the turbine: • De-energize RDMG sets			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
• Insert control rods • Establish Emergency Boration flow to the RCS **SAT_____ UNSAT_____**			
Operator manually inserts rods:			
	RO inserts rods in Manual at 48 spm [Critical Task#1]		
	RO reports immediate actions of EOP-TRIP-1 are complete.		
	CRS/RO verify the Rx will NOT trip and control rods are being inserted in Manual.		
	CRS enters EOP-FRSM-1, Response to Nuclear Power Generation.		
	PO starts 21 and 22 AFW pumps.		
	PO reports total AFW flow.		
	RO/PO starts 22 Charging pump (21 CV pump is C/T).		
	PO reports SI has not actuated.		
Rapid Boration:			
	PO starts both boric acid pumps in fast speed. (21 BAT pump C/T)		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports 22 BAT pump is running.		
2CV175 Rapid Boration Valve fails to open:			
	PO reports 2CV175 Rapid Borate Stop Valve failed to open.		
	PO reports NO flow is indicated on Rapid Borate flowmeter.		
Rapid Boration using RWST flow path:			
	PO isolates letdown by closing: 2CV3, 2CV4, 2CV5; 2CV2 and 2CV277; and 2CV7.		
	PO opens 2SJ1 and 2SJ2; and 2SJ4, 2SJ5, 2SJ12, and 2SJ13.		
	PO closes 2CV40 and 2CV41; and 2CV68 and 2CV69. **[Rapid Boration is considered complete when all of the above <u>bolded</u> steps are completed correctly]**		
Open the RTBs when Rapid Boration has been established or by direction from Lead Evaluator:			
Locally Open Rx Trip breakers:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Open the RTBs after rapid boration has been established. Use **RT-10** to open the RTBs and **RT-11** to open the MG set breakers as directed by the CRS.			
	RO reports PZR pressure is less than 2335 psig.		
	RO reports both PZR PORVs are closed and Block valves open.		
	RO reports 2VC5 and 2VC6 are closed.		
	RO reports RTBs and Rod Drive MG set breakers are open.		
	PO reports all turbine stop valves are closed.		
	RO reports PRNIs indicate < 5%.		
	RO reports IRNI SUR is negative.		
	CRS GOES TO Step 20.		
Step 20 begins here:			
	CRS directs chemistry to sample the RCS for boron.		
	CRS directs performance of SDM.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS returns to procedure in effect, EOP-TRIP-1.		
	RO performs/verifies immediate actions of EOP-TRIP-1.		
	CRS verifies TRIP-1 immediate actions are complete.		
	RO reports SI is not actuated and not required by 2RP4 or First Out OHA.		
	CRS transitions to EOP-TRIP-2, Reactor Trip Response.		
	RO makes page announcement		
	PO reports total AFW is > 22 E4 lbm/hr and stops both SGFPs.		
	PO lowers 23 AFW speed demand to minimum speed.		
	RO reports all RCPs are running		
	RO reports Tavg is stable or trending to 547 F.		
	RO reports both RTBs are open.		
	RO reports all rods have inserted.		
Proceed to the next event when the crew has stabilized the plant in			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
TRIP-2 or by direction from Lead Evaluators.			
PZR PORV 2PR1 fails open:			
Simulator Operator: Insert **RT-5** prior to crew performs MCA for checking PZR Pressure Status or by direction from Lead Evaluator. **MALF: VL0297 2PR1 fails to position (0-100%)** **Final Value: 100**			
	RO reports PZR level is > 17%.		
	RO reports charging flow is established.		
	RO maintains charging flow to maintain PZR level at 22%.		
	RO reports no Fire on unit 1.		
	RO reports letdown is not in service.		
	RO reports PZR pressure is > 1765 psig.		
	RO reports unexpected OHA for 2PR1/2 NOT CLSD.		
	RO reports PZR pressure is not stable or trending to 2235 psig.		
	RO reports PZR pressure is not > 2235 psig.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Operator recognizes failed open PZR PORV:			
	RO reports PZR pressure lowering, and identifies 2PR1 failed open.		
Evaluator's Note: The crew may enter S2.OP-AB.PZR-0001 for guidance on isolating 2PR1 or take the action of EOP-TRIP-2 Step 9, PZR PRESSURE STATUS.			
	RO reports 2PR1 will NOT close in manual.		
Critical Task #2 (CT-10): Close the block valve upstream of the stuck open PZR PORV by the completion of Step 9 of EOP-TRIP-2. **SAT_____ UNSAT_____**			
	RO closes PORV Block valve 2PR6. [Critical Task #2]		
Terminate scenario after 2PR6 is closed or at the Lead Evaluator's direction.			

VI. SCENARIO REFERENCES

A. Alarm Response Procedures (Various)
B. Technical Specifications
C. Emergency Plan (ECG)
D. OP-AA-101-111-1003, Use of Procedures
E. S2.OP-IO.ZZ-0004, Power Operation
F. S2.OP-SO.RCS-0001, Rod Control System Operation
G. S2.OP-SO.TRB-0001, Turbine-Generator Startup Operations
H. S2.OP-AB.COND-0001, Loss of Condenser Vacuum
I. S2.OP-AB.LOAD-0001, Rapid Load Reduction
J. S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction
K. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
L. 2-EOP-FRSM-1, Response to Nuclear Power Generation.
M. 2-EOP-TRIP-2, Reactor Trip Response

ATTACHMENT 1
UNIT TWO PLANT STATUS TODAY

MODE: 1 POWER: 89.5% RCS BORON: 725 MWe 1060

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

NA

REACTIVITY PARAMETERS

- Control Rods in Auto with D bank at 180 steps.
- Reactor Engineering directs crew to use control rods and turbine load control to raise power.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- 3.5.2.a action a, 21 Charging pump, 68 hours remain

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Main Turbine valve testing was completed last shift.
- Crew to commence power ascension to 100% at 10% per hour IAW S2.OP-IO.ZZ-0004 using control rods and turbine load control. The crew is at step 4.1.25, calorimetric was performed last shift and MSRs are in Auto.
- Shift Manager directs power to be raised 1% every 6 minutes at 1%/min ramp rate to comply with 10%/hr ascension.

ABNORMAL PLANT CONFIGURATIONS:

-

CONTROL ROOM:

- Hope Creek and Salem 1 are at 100% power.
- No penalty minutes in the last 24 hrs.

PRIMARY:

- 21 Charging pump C/T for oil cooler cleaning
- 21 BAT pump C/T for pump seal replacement

SECONDARY:

- 22 Vacuum pump C/T for pump replacement
- Blowdown is service at 35K per loop to 23 condenser / Flashtank
- Polisher in service

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

- 21A CW C/T for waterbox cleaning

ATTACHMENT 2

SIMULATOR READY FOR TRAINING CHECKLIST

____ 1. Verify simulator is in "TRAIN" Load

____ 2. Simulator is in RUN

____ 3. Overhead Annunciator Horns ON

____ 4. All required computer terminals in operation

____ 5. Simulator clocks synchronized

____ 6. All tagged equipment properly secured and documented

____ 7. TSAS Status Board up-to-date

____ 8. Shift manning sheet available

____ 9. Procedures in progress open and signed-off to proper step

____ 10. All OHA lamps operating (OHA Test) and burned out lamps replaced

____ 11. Required chart recorders advanced and ON (proper paper installed)

____ 12. All printers have adequate paper AND functional ribbon

13. Required procedures clean

____ 14. Multiple color procedure pens available

____ 15. Required keys available

____ 16. Simulator cleared of unauthorized material/personnel

____ 17. All charts advanced to clean traces and chart recorders are on.

____ 18. Rod step counters correct (channel check) and reset as necessary

____ 19. Exam security set for simulator

____ 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter

____ with Baseline Data filled out

____ 21. Shift logs available if required

____ 22. Recording Media available (if applicable)

____ 23. Ensure ECG classification is correct

____ 24. Reference verification performed with required documents available

____ 25. Verify phones disconnected from plant after drill.

____ 26. ECG paperwork is marked "For Training Use Only".

ATTACHMENT 3

CRITICAL TASK METHODOLOGY

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper performance or omission of this task by a licensee will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant.
The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...

- degradation of any barrier to fission product release
- degraded emergency core cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility license condition
- incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
- a significant reduction of safety margin beyond that irreparably introduced by the scenario

II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...

- effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
- recognize a failure or an incorrect automatic actuation of an ESF system or component.
- take one or more actions that would prevent a challenge to plant safety.
- prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 17-01 NRC-3 **REVIEWER:**

Initials Qualitative Attributes

1. The scenario has clearly stated objectives in the scenario.
2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
3. The scenario consists mostly of related events.
4. Each event description consists of:
   - the point in the scenario when it is to be initiated
   - the malfunction(s) that are entered to initiate the event
   - the symptoms/cues that will be visible to the crew
   - the expected operator actions (by shift position)
   - the event termination point
5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
6. The events are valid with regard to physics and thermodynamics.
7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
8. The simulator modeling is not altered.
9. All crew competencies can be evaluated.
10. The scenario has been validated.
11. If the sampling plan indicates that the scenario was used for training during the requalification cycle, evaluate the need to modify or replace the scenario.
12. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

Scenario No.: 3 (ESG-3)

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Initial Conditions: IC-258: 89.5% power, MOL; 23 Charging Pump is in service. The following equipment is out of service: 21 Charging pump C/T for oil cooler cleaning, 21A CW pump is C/T for waterbox cleaning, 21 BAT pump C/T for pump seal replacement, 22 vacuum pump C/T for pump replacement.

Turnover: Main turbine valve testing was completed last shift. Calorimetric was performed SAT and MSRs are in Auto. The crew is directed to continue power ascension to 100% power at 10% per hour IAW S2.OP-IO.ZZ-0004 using control rods and turbine load control.

Critical Tasks:

1. Insert negative reactivity into the core (see WOG CT-52)
2. Close PZR PORV Block valve (see WOG CT-10)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ALL (R)	Power ascension to 100% at 10% per hour
2	VC0311A	SRO (TS)	Containment Pressure Channel fails high (TS only)
3	SJ0180B	RO (I) SRO (I,TS)	22 SI Accumulator gas leak (TS exercised)
4	CN0086B	ALL (C)	▪ Loss of Main Condenser vacuum due to loose tube plug. ▪ Unit power reduction to stabilize condenser vacuum
5	RD050113 RD050122 RP0058 RP0059A RP0059B RP0060A RP0060B	ALL (M)	▪ Two dropped control rods requiring manual reactor trip. ▪ ATWT event.
6	RD0061	RO (I) SRO (I)	Rod Control speed controller fails at 8 spm in Auto. Operator can insert rods in Manual at 48 spm.
7	VL0095	PO (I) SRO (I)	2CV175 Rapid Boration valve fails to open in EOP-FRSM-1. Rapid borate via the RWST.
8	VL0297	RO (I) SRO (I)	2PR1 PZR PORV fails open during EOP-TRIP-2. Operators can manually close PZR block valve.
		ABs	AB.COND-1 → AB.LOAD-1
		EOPs	TRIP-1 → FRSM-1→ TRIP-1 → TRIP-2

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

Notes: None

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

Scenario No.: 3 (ESG-3)

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	6	-
2. Malfunctions after EOP entry (1-2)	3	6,7,8
3. Abnormal events (2-4)	2	3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	1	FRSM-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1	FRSM-1
7. Preidentified critical tasks (≥2)	2	CT-52, CT-10
8. Tech Specs exercised (≥ 2)	2	2,3

ATTACHMENT 5

ESG CRITICAL TASKS

17-01 NRC-3

CT-1 (CT-52):

Critical Task: Insert negative reactivity into to the core by at least one of the following methods prior to dispatching operators to locally trip the reactor and/turbine:

- **De-energize RDMG sets**
- **Insert control rods**
- **Establish Emergency Boration flow to the RCS**

Basis: See WOG Rev. 2.

CT-2 (CT-10):

Critical Task: Close the block valve upstream stuck open PZR PORV by the completion of Step 9 of TRIP-2.

Basis: See WOG Rev. 2.

ATTACHMENT 6

ESG-PSA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

Y/N	Event	Y/N	Event
N	TRANSIENTS with PCS Unavailable	N	Loss of Service Water
N	Steam Generator Tube Rupture	N	Loss of CCW
N	Loss of Offsite Power	N	Loss of Control Air
N	Loss of Switchgear and Pen Area Ventilation	N	Station Black Out
N	LOCA		

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	N	Auxiliary Feed Pump
N	CVCS Letdown line Control and Isolation Valves	N	SBO Air Compressor

OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

Y/N	OPERATOR ACTION
N	Restore AC power during SBO
N	Connect to gas turbine
N	Trip Reactor and RCPs after loss of component cooling system
N	Re-align RHR system for re-circulation
N	Un-isolate the available CCW Heat Exchanger
N	Isolate the CVCS letdown path and transfer charging suction to RWST
N	Cooldown the RCS and depressurize the system
N	Isolate the affected Steam Generator that has the tube rupture(s)
N	Early depressurize the RCS
N	Initiate feed and bleed

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:	ESG-5 [AB.PZR-1, AB.NIS-1, AB.CN-1, TRIP-2, FRHS-1 with SGFP Recovery]
SCENARIO NUMBER:	17-01 NRC-4
EFFECTIVE DATE:	See Approval Dates Below
EXPECTED DURATION:	60 minutes
REVISION NUMBER:	06
PROGRAM:	[ ] **L.O. REQUAL**
	[X] **INITIAL LICENSE**
	[ ] **STA**
	[ ] **OTHER** _____

Revision Summary:

- Rev. 04 (5-30-18) (formerly ESG-1708) Updated for 2018 Annual Exam. Modified malfunctions to include 21 SG NR level channel failure to exercise Tech Specs and 23 AFW pump fails to auto start and then subsequently trips for loss of all AFW flow. Incorporated comments from validation.
- Rev. 05 (10-4-18) Modified ESG-1814 for 17-01 NRC Exam. Deleted the following: CCW pump trip and SG NR level failure. Added PZR PORV leak, 2N41 fails high, Loss of 2A 4KV Vital Bus, and 23 AFW pump auto start failure with subsequent trip on overpseed.
- Rev. 06 (12-4-18) Incorporated NRC prep week comments. Added step & note that AFD deviation penalty minutes may be accrued, added role play for 2SW26, added NRC ES-D-1 form to Attach 4, minor editorial changes.

PREPARED BY:	R. Chan **Lead Regulatory Exam Author**	12-4-18 **Date**
APPROVED BY:	McHugh **Operations Training Manager**	12/11/18 **Date**
APPROVED BY:	MEN S **Facility Representative**	12/7/18 **Date**

SCAN OF SIGNED SCENARIO COVER SHEET

I. OBJECTIVES

1. Given the indications of a PZR PORV leak, perform actions as the the nuclear control operator to RESPOND to the malfunction in accordance with approved station procedures.
2. Given the indication of a PZR PORV leak, DIRECT the response to the PZR PORV malfunction in accordance with approved station procedures.
3. Given the indications of a NIS control malfunction, perform actions as the the nuclear control operator to RESPOND to the malfunction in accordance with approved station procedures.
4. Given the indication of a NIS control malfunction, DIRECT the response to the NIS malfunction in accordance with approved station procedures
5. Given the unit at power and a trip of an operating main feedwater pump, take corrective action IAW S2.OP-AB.CN-0001.
6. Given the order or indications of a feedwater or condensate system malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with the approved station procedures.
7. Given indication of a feedwater or condensate system malfunction, DIRECT the response to the malfunction in accordance with the approved station procedures.
8. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with the approved station procedures.
9. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.
10. Given the order or indications of a reactor trip, perform actions as the shift technical advisor to RESPOND to the reactor trip in accordance with the approved station procedures.
11. Given the order or indications of a loss of secondary heat sink, perform actions as the nuclear control operator to RESPOND to the loss of heat sink in accordance with the approved station procedures.
12. Given indication of a loss of secondary heat sink, DIRECT the response to the heat sink loss in accordance with the approved station procedures.
13. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. PZR PORV (2PR2) leaks (TS)
2. 2N41 Power Range channel fails high (TS)
3. 21 SGFP trip with failure of Auto MT runback
4. Main Turbine inadvertent trip and failure of Automatic Rx Trip
5. Loss of 2B 4KV Vital Bus (loss of 22 AFW pump)
6. Loss of All AFW Flow using SGFP Prompt Recovery

III. SCENARIO SUMMARY

1. The crew assumes the watch with the unit at 88% power, MOL. 23 Charging pump in service. 21 AFW pump C/T for oil bubbler leak repairs, 21 SI pump C/T for coupling inspection and alignment checks.
2. Shortly after taking the watch, 2PR2 PZR PORV will leak. The crew will recognize elevated PORV tailpipe temperatures and enter **S2.OP-AB.PZR-0001**, Pressurizer Pressure Malfunctions. The crew will isolate the PORVs and identify that 2PR2 is leaking. The crew will isolate 2PR2 by closing 2PR7 block valve. CRS evaluates Tech Specs. (TS)
3. After the crew addresses the leaking PORV; 2N41 Power Range channel will fail high. The operator will recognize rods are stepping in with no turbine runback in progress and respond by placing rods in Manual. The crew will enter **S2.OP-AB.NIS-0001**, NIS Malfunction. The crew will remove the failed NIS channel from service, withdraw rods to restore Tavg to progam, and place rods to Auto. CRS evaluates Tech Specs. (TS)
4. Following the 2N41 channel failure, 21 SGFP develops a high Thrust Bearing Oil pressure condition and automatically trips. The crew recognizes a trip of a main feedpump and responds by performing immediate actions IAW **S2.OP-AB.CN-0001**, Main Feedwater/Condensate Abnormality. The operator recognizes that the Main Turbine failed to runback automatically and responds by manually initiating the turbine runback. The crew will stabilize the unit around 66% by boration and rods.
5. After SG NR levels have returned to > 44%, an inadvertent Main Turbine trip will occur. The crew will recognize that the reactor did not automatically trip. The crew will respond by manually tripping the reactor. **[Critical Task #1]**
6. The crew performs immediate actions in **2-EOP-TRIP-1** and transition to **2-EOP-TRIP-2** with no SI required. After stopping the remaining 22 SGFP, 22 AFW will trip shortly after the reactor was tripped. The operator recognizes no AFW pumps are running and responds by manyally starting 23 AFW pump. After a time delay (30 seconds) the 23 AFW pump will trip resulting in loss of all AFW flow capability. The crew recognizes a total loss of AFW flow and initiates **S2.OP-SO.CN-0007**, Prompt SGFP Recovery, procedure as the crew validates for CFST RED path conditions for Heat Sink to occur. Once the crew validates RED path for Heat Sink, the crew will transition to **2-EOP-FRHS-1,** Loss of Secondary Heat Sink.

7. The crew will perform a **Prompt SGFP Recovery using 22 SGFP** (21 SGFP has trip signal present) while in EOP-FRHS-1 and establish main feed flow to at least one (1) SG to raise Wide Range level. **[Critical Task #2]**
8. The scenario will terminate once main feed flow is established and Wide Range levels is rising in at least one SG.

IV. INITIAL CONDITIONS

____ **IC- 260 (10-10-18)**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
___	1 VC1and VC4 C/T
___	2 RCPs (SELF CHECK)
___	3 RTBs (SELF CHECK)
___	4 MS167s (SELF CHECK)
___	5 500 KV SWYD (SELF CHECK)
___	6 SGFP Trip (SELF CHECK)
___	7 23 CV PP (SELF CHECK)
___	8 **21 SI pump C/T**
___	9 **21 AFW Pump C/T**
___	10 **Examination Team determine appropriate Protected Equipment.**
___	11 Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist."

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

EVENT TRIGGERS:

Initial	ET #	Description	
	1	EVENT ACTION: COMMAND: PURPOSE:	MONP254 < 10. //CONT ROD BANK C < 10 (RX TRIP) <update as needed>
	2	EVENT ACTION: COMMAND: PURPOSE:	kb610pbp //23 AUX FEED PUMP-START <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	PR0018B PZR PORV 2PR2 DEVELOPS LEAK	N/A	N/A	N/A	RT-1	15000
_____ 02	NI0193A PR CH N41 FAILS HI/LO	N/A	N/A	N/A	RT-2	200
_____ 03	BF0105A 21 STM GEN FEED PUMP TRIP	N/A	N/A	N/A	RT-3	THRUST BEARING PRESSURE HIGH
_____ 04	EH0327 TURBINE FAILS TO RUNBACK ON SGFP TRIP	N/A	N/A	N/A	N/A	
_____ 05	TU0066 MN TURBINE INADVERTENTLY TRIPS	N/A	N/A	N/A	RT-4	
_____ 06	RP0058 FAILURE OF AUTOMATIC RX TRIP	N/A	N/A	N/A	N/A	
_____ 07	RP0059B FAILURE OF MANUAL SI/RX TRIP	N/A	N/A	N/A	N/A	
_____ 08	EL0145 LOSS OF 2B 4160V VITAL BUS	N/A	N/A	N/A	ET-1	
_____ 09	AF0353C 23 AFP FAILURE TO AUTO START ON ANY (ALL) SIGNALS	N/A	N/A	N/A	N/A	
_____ 10	AF0183 23 AUX FW PMP OVERSPEED TRIP	00:00:30	N/A	N/A	ET-2	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	SJ13D 21 SI PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 02	SJ14D 21 SI PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 03	WD11A 22 GAS DECAY TANK PRESSURE	N/A	N/A	N/A	N/A	20
_____ 04	AF20D 21 AFW PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 05	AF21D 21 AF PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

OTHER CONDITIONS:

	Description
____	1. None

V. SEQUENCE OF EVENTS

1. State shift job assignments.
2. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).
3. Inform the crew "The simulator is running. You may commence panel walkdowns at this time. SM please inform me when your crew is ready to assume the shift".
4. Allow sufficient time for panel walk-downs. When informed by the SM that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
1. PZR PORV 2PR2 leak			
Simulator Operator: Insert **RT-1** on direction from Lead Evaluator. **MALF: PR0018B PZR PORV 2PR2 DEVELOPS LEAK SEVERITY : 15000**			
	RO reports either one of the following parameter changes: lowering PZR pressure, or PORV tailpipe temp has risen, or charging flow rising, or lower spray valve demand, or PRT indications of a 2PR2 leak.		
Evaluator's Note: S2.OP-AB.RC-0001 may be entered if PORV leak is not promptly identified, but AB.PZR should be entered when PORV leak is identified.			
	CRS enters S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction.		
	CRS directs initiation of Attachment 1 CAS.		
	RO reports POPS not in service.		
	RO reports PZR Pressure Control channel has NOT failed.		
	RO reports Master Pressure Controller has NOT failed.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports a spray valve has NOT failed.		
	RO reports a PORV is NOT failed.		
PORV tailpipe temps elevated:			
	RO reports PORV tailpipe temp is elevated.		
	RO closes 2PR6 and 2PR7 and reports tailpipe temp is lowering.		
	RO opens 2PR6 and reports tailpipe temps are lowering or stable.		
	RO opens 2PR7 and reports tailpipe temp is rising.		
2PR2 PORV is isolated:			
	RO closes 2PR7, and reports lowering PORV tailpipe temperature.		
	CRS directs placing 2PR2 in Manual.		
TS evaluation #1:			
	CRS enters TSAS 3.4.5 action a (1 hour LCO). IF RCS pressure < 2185 psig THEN TSAS 3.2.5.b (2 hour LCO) is applicable.		
Evaluator's Note: Tech Specs does not require power removed			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
from PZR Block Valve for excessive seat leakage.			
Proceed to next event after Tech Specs is evaluated or by direction from Lead Evaluator.			
2. 2N41 Power Range Channel fails high			
Simulator Operator: Enter **RT-2** on direction of Lead Evaluator. **MALF: NI0193A PR CH41 Fails High** **Severity: 200**			
	RO reports rods stepping in and no runback in progress		
	RO places rod control in Manual		
	CRS enters S2.OP-AB.NIS-0001, NIS Malfunction. (see Evaluator's Note)		
Evaluator's Note: The crew may enter S2.OP-AB.ROD-0003 which will transition you to AB.NIS-0001			
	RO reports rod control is in Manual		
	PO reports no turbine load change in progess		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports that 2N41 channel is failed high		
	RO reports the following OHA alarms are in: ▪ E-15 PR HI RNG FLUX HI ▪ E-31 PR OVRPWR ROD STOP ▪ E-39 PR CH DEV ▪ E-47 PR NEUT FLUX RATE HI		
	CRS directs PO to remove PR channel from service IAW S2.OP-SO.RPS-0001, NI Channel Trip/Restoration		
Evaluator's Note: Depending how far rods stepped in, the crew may collect penalty deviation minutes for AFD being outside the target band.			
	Crew records AFD penalty deviation minutes IF AFD is outside the target band. [reference TS 3.2.1 surveillance requirement 4.2.1.2]		
Placing 2N41 in Tripped Condition IAW S2.OPSO.RPS-0001, Steps 5.1.1 to 5.1.5:			
	PO ensures that tripping of associated bistable(s) will NOT result in an ESF OR RPS actuation		
	PO ensures 2N41 Channel is NOT selected on NIS Recorder 2NR45		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO ensures Rod Control is in Manual		
TS evaluation #2:			
	CRS enters TSAS 3.3.1.1, Actions 2 and 6 (6 hour LCO) Reactor Trip System Instrumentation for 2N41		
Evaluator's Note: The following steps to remove the NI channel from service are performed in the back rack room area.			
	At NI Rack No. 81, PO performs the following:		
	PO places DETECTOR CURRENT COMPARATOR, UPPER SECTION, switch in PRN41 position AND ENSURE the following: ___ CHANNEL DEFEAT lamp illuminates. ___OHA E-38, UPPER SECT DEV ABV 50% PWR, clears. Note: E-38 was not in.		
	PO places DETECTOR CURRENT COMPARATOR, LOWER SECTION, switch in PRN41 position AND ENSURE the following: ___CHANNEL DEFEAT lamp illuminates.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	___OHA E-46, LOWER SECT DEV ABV 50% PWR, clears. Note E-46 was not in.		
	PO places POWER MISMATCH BYPASS switch in BYPASS PR N41. (Defeats input to Rod Control)		
	PO places ROD STOP BYPASS switch in BYPASS PR N41AND ENSURE the following: ___ 2RP4 - OVER POWER ROD STOP MANUAL BYPASS, CH I is illuminated. ___ OHA E-31, PR OVERPWR ROD STOP, is clear		
	PO places COMPARATOR CHANNEL DEFEAT switch in N41 AND ENSURE the following: ___COMPARATOR DEFEAT lamp is illuminated. ___ OHA E-39, PR CH DEV, is clear		
Evaluator's Note: After the above steps are complete Maintenance support is needed to complete the rest of the procedure for tripping bistables.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Rod control can be placed in Auto at this time if the CRS directs. IF the CRS directs leaving Rods in Manual, then the operator will have to insert rods in Manual or place them Auto following the SGFP trip event coming next.			
Note: S2.OP-SO.RPS-0001 Steps 5.1.6 and 5.1.7 needs Maintenance support			
	CRS directs Maintenance to remove 2N41 channel from service IAW S2.OP-SO.RPS-0001.		
Evaluator's Note: The crew may reset the NI rate Trip for 2N41 to clear OHA for E-47.			
	RO withdraws rods to the ARO position.		
	CRS may elect to restore rod control to Auto or leave in Manual until the bistables are tripped.		
Proceed to next event after rods are withdrawn to ARO or by direction from Lead Evaluator.			
3. 21 SGFP trip with failure of Auto Main Turbine Runback			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Insert **RT-3** on direction from Lead Evaluator. **MALF: BF0105A 21 SGFP Trip Final = Thrust Bearing Pressure High**			
	PO reports unexpected console alarm TURB THRUST BEARING OIL PRESSURE HI for 21 SGFP		
Evaluator's Note: The SGFP will auto trip ≈ 1 minute.			
	Crew dispatches NEO to investigate		
	CRS may brief immediate actions of S2.OP-AB.CN-0001 in anticipation of SGFP trip.		
Auto Turbine Runback fails to actuate:			
	PO reports 21 SGFP tripped, and the Main Turbine auto runback has not occurred.		
	CRS directs operators to perform immediate actions of S2.OP-AB.CN-0001.		
Manual initiation of Turbine Runback:			
	PO depresses GO PB on Digital EHC, and reports turbine load reduction in progress.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Evaluator's Note: IF rods are in Manual at this point, the CRS may direct rods to be placed in Auto or direct the operator to manually insert rods to restore Tavg to Tref.			
	RO ensures control rods are in Auto and inserts when expected or inserts rods in Manual to restore Tavg to Tref.		
	CRS directs PO to initiate Attachment 1 CAS.		
	PO reports 21 SGFP tripped.		
Role Play: IF an operator was dispatched to investigate why 21 SGFP trip, then report the following after 1-2 minutes; ***21 SGFP has a trip up for SGFP Thrust Bearing Oil Pressure Hi and alarm will not reset.***			
	RO reports Rx power >P-10.		
	RO initiates RCS boration.		
Evaluator's Note: The crew may perform a Rapid Boration in anticipation of receiving RIL Lo-Lo.			
Evaluator's Note: Rapid Boration can be performed using either "Hard Card" Attachments 2 or 3 of			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
S2.OP.SO.CVC-0008.			
	PO ensures 22 SGFP speed rises.		
During validation, SG NR levels turned around 28-29%.			
	PO ensures 21-23 CN108s are open.		
	PO ensures 2CN47 open and ensures 21-24GB4 and 21-24GB185 are closed.		
	PO depresses 21 SGFP TURBINE TRIP bezel pushbutton and verifies AFP AUTO ARMED bezel lit.		
	Crew identifies AFD outside normal band. **Note:** Crew should expect OHA E-16, RIL Lo-Lo, and perform Rapid Boraton IAW S2.OP-SO.CVC-0008.		
	RO energizes all PZR heaters.		
	Crew monitors and maintains AFD within limits.		
	Crew monitors for stable plant conditions.		
Proceed to next event after crew has stabilized the unit <u>and</u> SG NR levels are resotred to >44% or at Lead Evaluators direction.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
4. Main Turbine Trip, Auto Rx Trip Fails, and Loss of 2B 4KV Vital Bus (loss of 22 AFW pump)			
Simulator Operator: Insert **RT-4** at Lead Evaluators direction to initiate Main Turbine Trip. **MALF: TU0066 MN Turbine Inadvertently Trips**			
	RO reports valid demand for Rx trip has occurred with No AUTO Rx trip		
Critical Task #1 (CT-1): Manually trip the Rx from the control room prior to a transition to FRSM-1 being required. **SAT_____ UNSAT_____**			
Manually trips the reactor:			
	RO manually trips the reactor by using either one of the reactor trip pistol grip switches. [Critical Task #1]		
	RO reports the reactor is tripped		
	RO performs Immediate Actions of TRIP-1: -Confirms the Rx trip. -Reports the Main Turbine is tripped and		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	backs up Main Turbine trip. -Reports all 4KV vital busses energized. -Reports SI has not been initiated, reports no demand on 2RP4 or First Out Overhead for a SI, and board indications do not require SI initiation.		
	CRS and RO verify Immediate Actions complete.		
	CRS and RO report that SI is not required		
	CRS transitions to 2-EOP-TRIP-2.		
	RO announces Rx trip on station PA.		
23 AFW pump fails to auto start:			
Simulator Operator: Ensure **ET-1** is TRUE when the Rx is tripped. This will insert MALF for loss of 2B 4KV Vital Bus resulting in loss of 22 AFW pump **MALF: EL0145 Loss of 2B Vital Bus**			
	PO reports that 22 AFW pump did not start due to loss of power and 23 AFW pump did not Auto start.		
Simulator Operator: IF directed, use Remote **AF25D** to remove control power for 22 AFW pump.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Manually start 23 AFW pump:			
	PO manually starts 23 AFW pump.		
Simulator Operator: Ensure **ET-2** is TRUE when the operator starts 23 AFW pump. This will insert malfunction for 23 AFW overspeed trip after time delay. **MALF: AF0183, 23 AFP Overspeed Trip** **Delay = 30 seconds**			
Loss of All AFW Flow capability:			
	PO reports 23 AFW pump started but tripped moments later.		
	PO reports NO AFW pumps are running and total AFW flow is NOT >22E4 lbm/hr.		
Evaluator's Note: During validation time to reach RED path on Heat Sink was ≈ 2-3 minutes from Rx Trip. **EOP-FRHS-1 starts on page 24.**			
	PO reports all BF19's and BF40's are closed		
	PO reports that Tavg is < 554 F and **resets**		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	FW interlock		
Evaluator's Note: IF crew initiates **S2.OP-SO.CN-0007** here then **GO TO page 26** for steps:			
	PO stops 22 SGFP if not tripped (Note: 22 SGFP tripped post Rx Trip during validation on high discharge pressure)		
Evaluator's Note: SGFP high discharge trip will auto clear when the high pressure conditions clears post Rx Trip.			
	PO maintains total AFW flow >22E4 lbm/hr until at least one SG NR level is > 9% (15% adverse), then maintains SG NR levels between 19% and 33%.		
	RO reports all RCPs are running, and RCS Tavg is trending to 547°F.		
	RO reports both Reactor Trip Breakers are open.		
Evaluator's Note: Due to loss of 2B Vital Bus, there will be no power to operate the 21 & 22 BF22's.			
	PO verifies Tavg < 554°F, and closes 21-24BF19, 21-24BF40, and 21-24BF22		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Evaluator's Note: Some of the following EOP-TRIP-2 actions may not be performed prior to the transition to FRHS-1 based on scenario timing.			
	RO reports all rods inserted on Rx trip.		
	RO reports PZR level > 17%.		
	RO reports charging is in service and maintains PZR level at 22%.		
	CRS determines no fire on Unit 1.		
	RO reports letdown status.		
	RO reports PZR pressure status.		
	Crew reports when a valid RED path on Heat Sink is present when SG NR levels are <9% with <22E4 lbm/hr AFW flow.		
EOP-FRHS-1 steps here:			
	CRS transitions to 2-EOP-FRHS-1, Loss of Secondary Heat Sink.		
	PO reports it was not operator action which caused total AFW flow to lower < 22E4 lbm/hr.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports RCS pressure is > all SGs and RCS Thots are > 350°F.		
	CRS reads Bleed and Feed transition criteria.		
Evaluator's Note: Bleed and Feed criteria is 3 WR levels < 20% (25% Adverse)			
	PO closes 21-24GB4 and 21-24SS94 valves are closed.		
	PO reports NO AFW pumps can be started.		
	CRS dispatches operators to investigate cause of AFW pump failures.		
Role Play: IF requested to investigate the status of the AFW pumps, give the following info as applicable, after 2-3 minutes: ***23 AFW pump tripped on overspeed and trip lever can not be reset; 21 AFW pump will take 1 hour to backout of the maintenance.***			
	RO stops all RCPs.		
	CRS dispatches operator to start the MSPI AFW pump IAW SC.OP-SO.AF-0001.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Role Play: After 1-2 minutes, call back to control room to state the following: ***the MSPI AFW Diesel started but tripped moments later on overspeed.***			
	PO reports condensate system is in operation.		
EOP-FRHS-1 SGFP Prompt Recovery actions start here:			
	PO reports 22 SGFP is available.		
	RO reports SI has not actuated.		
Evaluator's Note: To expedite this task, the operator can request permission from the CRS to use two hands to adjust the BF19 & BF40 demands or use of two operators.			
	PO sets all BF19 and BF40 demands to zero.		
	RO resets FW interlock (if not previously performed).		
Evaluator's Note: Due to loss of 2B Vital Bus, there will be no OPEN indication for 21 & 22 BF13's.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
These valves have not been closed and remain in their last known position which is OPEN.			
	PO reports all BF13s are open. (see Note)		
Evaluator's Note: Due to the loss of 2B Vital Bus, there will be no indication for 23 & 24 BF22's. Since the BF22's were not closed, the last known position is in the RELEASE position.			
	PO releases selected BF22s (see Note)		
Role Play: IF directed to check the local position of 2SW26, SW to Turbine Area Header Isolation Valve, **THEN *report that the 2SW26 valve is fully open.***			
S2.OP-SO.CN-0007 Prompt Recovery Steps start here using 22 SGFP only:			
	PO starts 22 SGFP IAW S2.OP-SO.CN-0007, Prompt Recovery From SGFP Trip.		
	PO verifies prerequisites are met. (this should include dispatching an operator to check for alarms locally at the the feedpump)		
	PO determines that section 4.1, Reset SGFPs Trips from the Ovation Controller Station on		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	Panel 2RP7 is NOT required based on no indications of Overspeed, Rate or Silent Trips.		
Role Play: If dispatched by control room, report that no alarms or trip signals are present on the local alarm panel for 22 SGFP and walk around looks good for a start.			
Relatching SGFP section 4.2:			
	PO reports all SGFP trip signals are clear.		
	PO reports that SGFP suction pressure > 350 psig.		
	PO reports 21 and 22 SGFP SPEED CONTROLLERs are in MANUAL and Output is set to 0%		
	PO reports 21 and 22 SGFP SPEED CONTROLLER Speed setpoint is set to 0 rpm.		
	PO reports no trip signals present for 22 SGFP. (**see previous Role Play if needed**)		
	PO reports that 22 SGFP MODE is selected to 22 SGFP SPEED SETTER on the MASTER SGFP SPEED CONTROLLER.		
	PO opens 22TD24 and verifies 22CN36 is open.		
	PO determines casing DT is < 40 F.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO depresses MODULATE RECIRC VALVE pushbutton and reports 22BF32 RECIRC is open		
	PO reports all permissives to latch SGFP are met.		
	PO depresses TURBINE LATCH pushbutton and reports 22 SGFP is latched.		
	PO ensures 22 SGFP SPEED CONTROLLER Speed setpoint is set to 0 rpm		
	PO places 22 SGFP SPEED CONTROLLER in AUTO		
	PO adjusts 22 SGFP SPEED CONTROLLER Speed setpoint to 1100 rpm		
	PO dispatches field operator to MONITOR pump during warmup for rubbing, vibration and unusual noises		
Role Play: When dispatched to monitor 22 SGFP, report after 1 minute no rubbing, vibration or unusual noises from 22 SGFP.			
Feeding SGs with 22 SGFP section 4.3:			
	PO ensures 21 and 22 CN48s are closed		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Evalautor's Note: Due to the loss of power, the 21 & 22 BF13's and BF22's have no indications. These remain in their last known position and feed flow path is available.			
	PO reports 21-24 BF13s are open		
	PO reports 21-24 BF22's are open		
	PO slowly adjusts 22 SGFP PUMP SPEED controller to 3960-3980 rpm and verifies differential pressure is > 50 psid.		
	PO places BF19 or BF40 controllers to MANUAL AND ensures 0% demand.		
	RO resets FW INTERLOCK on Train A and B		
	PO adjusts the demand on the selected BF19 or BF40 AND feeds at the desired rate.		
Evaluator's Note: Approx. 40% demand on a BF40 will result in ≈ 6 % main feed flow. **6% main feedflow is ≥ 22E4 lbm/hr.**			
	PO closes 22TD24.		
	PO reports SG NR levels all less than 9% (15% adverse).		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Evaluator's Note: There is no specific direction on how many SGs to establish feed to. Crew can feed all SGs to a rate < 10% feed flow. Use of BF40s is preferred for better flow control.			
Critical Task #2 (CT-43): Establish main feedwater or condensate flow to SG(s) before Bleed and Feed is required. **SAT_____ UNSAT_____**			
	PO reports indications of main feed flow <u>AND</u> SG WR level(s) rising. [Critical Task #2]		
	With Bleed and Feed having NOT been established, CRS returns to procedure in effect (EOP-TRIP-2)		
Lead Evaluator Terminate scenario when crew has established feed flow <u>and</u> SG WR levels are rising <u>or</u> at direction by Lead Evaluator.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment

VI. SCENARIO REFERENCES

1. Alarm Response Procedures (Various)
2. Technical Specifications
3. Emergency Plan (ECG)
4. OP-AA-101-111-1003, Use of Procedures
5. S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction
6. S2.OP-AB.NIS-0001, NIS Malfunction
7. S2.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality
8. S2.OP-SO.CN-0007, Prompt Recovery from SGFP Trip
9. 2-EOP-TRIP-1, Rx Trip or Safety Injection
10. 2-EOP-TRIP-2, Rx Trip Response
11. 2-EOP-FRHS-1, Loss of Secondary Heat Sink

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 89.6% RCS BORON: 725 MWe 1080

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

NA

REACTIVITY PARAMETERS

- Power was reduced last shift in preparation for Main Turbine valve testing.
- Control Bank D is at 180 steps.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- 3.7.1.2.a Action a, 21 AFW pump, 60 hours remain.
- 3.5.2.b Action a, 21 SI pump, 68 hours remain

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Preparation for Main Turbine valve testing to be performed next shift.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power.
No penalty minutes in the last 24 hrs.

PRIMARY:

- 21 SI pump C/T for coupling inspection and alignment checks

SECONDARY:

- Polisher in service
- Blowdown 35K per loop to 23 Condenser / Flashtank.
- 21 AFW pump C/T for oil bubbler repair.

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

ATTACHMENT 2

SIMULATOR READY FOR TRAINING CHECKLIST

____ 1. Verify simulator is in "TRAIN" Load

____ 2. Simulator is in RUN

____ 3. Overhead Annunciator Horns ON

____ 4. All required computer terminals in operation

____ 5. Simulator clocks synchronized

____ 6. All tagged equipment properly secured and documented

____ 7. TSAS Status Board up-to-date

____ 8. Shift manning sheet available

____ 9. Procedures in progress open and signed-off to proper step

____ 10. All OHA lamps operating (OHA Test) and burned out lamps replaced

____ 11. Required chart recorders advanced and ON (proper paper installed)

____ 12. All printers have adequate paper AND functional ribbon

13. Required procedures clean

____ 14. Multiple color procedure pens available

____ 15. Required keys available

____ 16. Simulator cleared of unauthorized material/personnel

____ 17. All charts advanced to clean traces and chart recorders are on.

____ 18. Rod step counters correct (channel check) and reset as necessary

____ 19. Exam security set for simulator

____ 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter

____ With Baseline Data filled out

____ 21. Shift logs available if required

____ 22. Recording Media available (if applicable)

____ 23. Ensure ECG classification is correct

____ 24. Reference verification performed with required documents available

____ 25. Verify phones disconnected from plant after drill.

____ 26. Verify EGC paperwork is marked "Training Use Only" and is current revision.

____ 27. Ensure sufficient copies of ECG paperwork are available.

ATTACHMENT 3

CRITICAL TASK METHODOLOGY

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper *performance or omission of this task by a licensee will result in direct adverse consequences or in* significant degradation in the mitigative capability of the plant.
The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...

- degradation of any barrier to fission product release
- degraded emergency core cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility license condition
- incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
- a significant reduction of safety margin beyond that irreparably introduced by the scenario

II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...

- effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
- recognize a failure or an incorrect automatic actuation of an ESF system or component.
- take one or more actions that would prevent a challenge to plant safety.
- prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 17-01 NRC-4 **REVIEWER:**

Initials	Qualitative Attributes
	1. The scenario has clearly stated objectives in the scenario.
	2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
	3. The scenario consists mostly of related events.
	4. Each event description consists of: • the point in the scenario when it is to be initiated • the malfunction(s) that are entered to initiate the event • the symptoms/cues that will be visible to the crew • the expected operator actions (by shift position) • the event termination point
	5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
	6. The events are valid with regard to physics and thermodynamics.
	7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
	8. The simulator modeling is not altered.
	9. All crew competencies can be evaluated.
	10. The scenario has been validated.
	11. If the sampling plan indicates that the scenario was used for training during the requalification cycle, evaluate the need to modify or replace the scenario.
	12. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

Scenario No.: 4 (ESG-5)

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Initial Conditions: IC-260: 88% power, MOL; 23 Charging Pump is in service. The following equipment is out of service: 21 AFW pump C/T for oil bubbler leak repair, 21 SI pump C/T for coupling inspection and alignment checks.

Turnover: Reactor power was lowered for preparation for main turbine valve testing. Testing will commence next shift.

Critical Tasks:

1. Manually trip the reactor (see WOG CT-1)
2. Establish main feed water flow to SGs before bleed and feed is required (see WOG CT-43)

Event No.	Malf. No.	Event Type*	Event Description
1	PR0018B	RO (C) SRO (C,TS)	2PR2 PZR PORV leaks (TS exercised)
2	NI0193A	RO (I) SRO (I,TS)	2N41 Power Range channel fails high (TS exercised)
3	BF0105A EH0327	ALL (C)	▪ 21 SGFP trips on turbine thrust pressure high ▪ Failure of Turbine Runback following SGFP trip. Operator can manually initiate runback from control room. ▪ Load reduction to 66% power per AB.CN-0001
4	TU0066	ALL (M)	Inadvertent Main Turbine trip signal
5	RP0058 RP0059B	RO (I) SRO (I)	Reactor fails to auto trip. Operator can manually trip the reactor from control room.
6	EL0145 AF0353C AF0183	PO (I) SRO (I)	▪ Loss of 2B 4K Vital Bus (loss of 22 AFW pump) ▪ 23 AFW pump fails to auto start. Operator can manually start, but will trip shortly after time delay. (loss of all AFW flow)
		ABs	AB.PZR-1 → AB.NIS-1 → AB.CN-1
		EOPs	TRIP-1 → FRHS-1 with prompt SGFP recovery

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

Notes: None

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

Scenario No.: 4 (ESG-5)

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	5	-
2. Malfunctions after EOP entry (1-2)	1	6
3. Abnormal events (2-4)	3	1,2,3
4. Major transients (1-2)	1	4
5. EOPs entered/requiring substantive actions (1-2)	1	FRHS-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1	FRHS-1
7. Preidentified critical tasks (≥2)	2	CT-1, CT-43
8. Tech Specs exercised (≥ 2)	2	1,2

ATTACHMENT 5
ESG CRITICAL TASKS

17-01 NRC-4

CT-1 (CT-1):

Critical Task: Trip the Rx prior to a transition to FRSM-1 being required.

BASIS: See WOG Rev. 2

CT-2 (CT-43):

Critical Task: Establish main feedwater or condensate flow to SG(s) before Bleed and Feed is required.

BASIS: See WOG Rev. 2

ATTACHMENT 6

ESG-PRA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

Y/N	Event	Y/N	Event
N	TRANSIENTS with PCS Unavailable	N	Loss of Service Water
N	Steam Generator Tube Rupture	N	Loss of CCW
N	Loss of Offsite Power	N	Loss of Control Air
N	Loss of Switchgear and Pen Area Ventilation	N	Station Black Out
N	LOCA		

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	Y	Auxiliary Feed Pump
N	CVCS Letdown line Control and Isolation Valves	N	SBO Air Compressor

OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

Y/N	OPERATOR ACTION
N	Restore AC power during SBO
N	Connect to gas turbine
N	Trip Reactor and RCPs after loss of component cooling system
N	Re-align RHR system for re-circulation
N	Un-isolate the available CCW Heat Exchanger
N	Isolate the CVCS letdown path and transfer charging suction to RWST
N	Cooldown the RCS and depressurize the system
N	Isolate the affected Steam Generator that has the tube rupture(s)
N	Early depressurize the RCS
N	Initiate feed and bleed

Complete this evaluation form for each ESG.