OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the maximum reactor vessel vent time in response to head voiding IAW Attachment 1 of 2-EOP-FRCI-3

TASK NUMBER: N1150410501

JPM NUMBER: 2021 NRC RO-A1

ALTERNATE PATH: [ ]

K/A NUMBER: 2.1.25

IMPORTANCE FACTOR: 3.9

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

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

EVALUATION SETTING/METHOD: Classroom

REFERENCES: 2-EOP-FRCI-3, Rev 40 (checked 1-10-22)

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan, Instructor** **Date: 1-10-22**

Validated By: **Wilcox / Pompper, SME or Instructor** **Date: 1-10-22**

Approved By: **M. Wadusky(signature on file), Training Department** **Date: 2-11-22**

Approved By: **W. Hargrave, Operations Department** **Date: 1-10-22**

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: 2021 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	8-13-21	Checked New EOP revision for changes and changed to reflect new step numbers and new calculation for $T_{fact.}$ Verified values given will result in same calculation.	Yes
02	1-10-22	Incorporated NRC comments and Prep Week comments.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the maximum reactor vessel vent time in response to head voiding IAW Attachment 1 of 2-EOP-FRCI-3

TASK NUMBER: N1150410501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS: None

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the maximum reactor vessel vent time in response to head voiding IAW Attachment 1 of 2-EOP-FRCI-3

TASK NUMBER: N1150410501

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 17.3 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 2.3%
  - RCS pressure is 1600 psig
- During your calculations, **ONLY** perform "rounding" when determining the vent time to the **nearest tenths**.

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. **Calculates Maximum Venting Time of 4.5 mins (4.2 – 4.7 mins acceptable band).**

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**

TASK: **Determine the maximum reactor vessel vent time in response to head voiding IAW Attachment 1 of 2-EOP-FRCI-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)
	CUE:	Provide the following: ▪ 2-EOP-FRCI-3 Attachment 1, and ▪ 2-EOP-FRCI-3 Figure 1, Hydrogen Flow Rate			
	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 = <u>600 R</u>**		
*	2.2	Calculate containment temperature standardization factor, T_{fact} T_{fact} = 492°R/T_{abs} = _____ (T_{fact})	**Calculates (T_{fact})=492/600=0.82**		
*	2.3	Calculate containment air volume (V) at STP: V = 2.62E06 x T_{fact} = _____ ft^3	**Calculates (V) = 2.62E06 X 0.82 = <u>2,148,400 ft3</u>**		
	3	Determine maximum hydrogen vent volume			

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**

TASK: **Determine the maximum reactor vessel vent time in response to head voiding IAW Attachment 1 of 2-EOP-FRCI-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)
	3.1	Record containment hydrogen concentration • (from Step 1.2) H = _____ %	Records hydrogen value from step 1.2		
	3.2	Record containment air volume at STP (from Step 2.3) V = _____ ft3	Records air volume from step 2.3		
*	3.3	Calculate maximum vent volume (M) M = (3.0% - H) x V / 100% M = _____ ft3	**Calculates (M) as:** **M = (3% - 2.3%) x 2,148,400 / 100%** **M = 15,038.8 ft3**		
	4	Determine maximum vent time			
	4.1	Record RCS pressure (from Step 1.3) _____ psig	Records RCS pressure from step 1.3		
	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 3333 cfm** **Evaluator's Note:** determining hydrogen flow rate will have some readability errors. A +/- 100 cfm allowance was factored into the max vent time.		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**

TASK: **Determine the maximum reactor vessel vent time in response to head voiding IAW Attachment 1 of 2-EOP-FRCI-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)
*	4.4	Calculate maximum vent time (Tv) Tv = M / F Tv = _____ minutes	**Calculates maximum vent time as:** **(Tv) = 15,038.8 ft3 / 3333 cfm = 4.5 mins (-0.3/+0.2mins)** Due to rounding and readability errors, a maximum vent time of **4.2 – 4.7 mins** is acceptable.		
	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#: 2021 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.

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

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

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

____RC____ 4. Initial setup conditions are identified.

____RC___ 5. Initiating and terminating Cues are properly identified.

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

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

__RC___ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __40___ Date ____1-10-22__

__RC___ 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.

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

SME/Instructor:___R. Chan_____ Date: ___1-10-22_____

SME/Instructor:___S. Pompper_____ Date: ___1-10-22_____

SME/Instructor:___M. Wilcox_____ Date: ___1-10-22_____

Applicants Name: _____

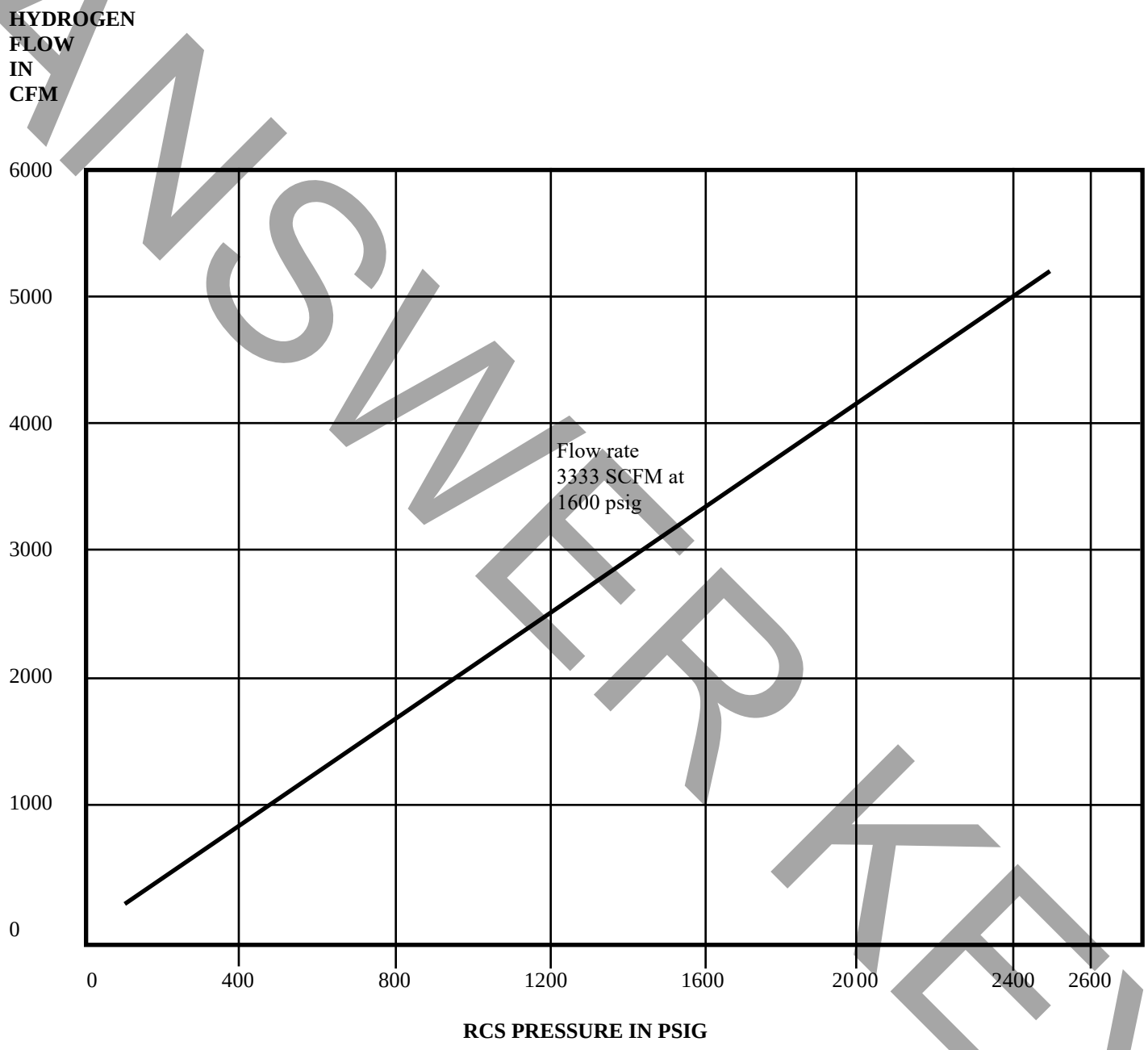
INITIAL CONDITIONS:

- 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 17.3 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 2.3%
  - RCS pressure is 1600 psig
- During your calculations, **ONLY** perform “rounding” when determining the vent time to the **nearest tenths**.

FIGURE 1
HYDROGEN FLOW RATE



MAXIMUM VENT TIME DETERMINATION

1. Record the following data:

   1.1 Containment temperature _____140_____ °F

   1.2 Containment hydrogen concentration (H) _____2.3_____ %

   1.3 RCS pressure _____1600_____ psig

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

   2.1 Calculate containment absolute temperature, T_{abs}

   T_{abs} = Containment temperature (°F) + 460 = _____600_____ °R

   2.2 Calculate containment temperature standardization factor, T_{fact}

   $T_{fact} = 492°R/T_{abs}$ = _____0.82____ (T_{fact})

   2.3 Calculate containment air volume (V) at STP:

   $V = 2.62E06 \times T_{fact}$ = ____2,148,400_ ft^3

3. Determine maximum hydrogen vent volume

   3.1 Record containment hydrogen concentration

   (from Step 1.2) H = _____2.3_____ %

   3.2 Record containment air volume at STP

   (from Step 2,3) V = ____2,148,400__ ft^3

   3.3 Calculate maximum vent volume (M)

   $M = \frac{(3.0\% - H) \times V}{100\%}$ M = _____15,038.8 _ ft^3

4. Determine maximum vent time

4.1 Record RCS pressure

(from Step 1.3) _____1600_____ psig

4.2 Record calculated maximum vent volume

(from Step 3.3) M = ___15,000_____ ft^3

4.3 Record hydrogen vent flow rate

(from Figure 1) F = _____3333_____ cfm

4.4 Calculate maximum vent time (T_v)

$T_v = M / F$ T_v = ____4.5_____ minutes

COMMENTS:

PERFORMED BY:_____ DATE:_____

REVIEWED BY:_____ DATE:_____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the amount of time to borate for 3 stuck rods and the final BAST level IAW 2-EOP-TRIP-2.

TASK NUMBER: N1150030501

JPM NUMBER: 20-01 ILOT RO A2

ALTERNATE PATH: ☐

K/A NUMBER: 2.1.20

IMPORTANCE FACTOR: 4.6

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

EO ☐ **RO** ☒ **STA** ☐ **SRO** ☐

EVALUATION SETTING/METHOD: Classroom

REFERENCES: 2-EOP-TRIP-2, Rev 41, S2.OP-TM.ZZ-0002, Rev 8 (checked 1-10-22)

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: 1-10-22**
Validated By:	**M. Wilcox / S. Pompper** **SME or Instructor**	**Date: 1-10-22**
Approved By:	**M. Wadusky(Signature on file)** **Training Department**	**Date: 2-11-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-10-22**

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: 20-01 ILOT RO A2

Rev #	Date	Description	Validation Required
00	8-20-21	**NEW JPM for 20-01 ILOT**	Yes
01	1-10-22	Incorporated NRC comments and Prep week comments.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the amount of time to borate for 3 stuck rods and the final BAST level IAW 2-EOP-TRIP-2.

TASK NUMBER: N1150030501

SIMULATOR IC: **N/A**

MALFUNCTIONS/REMOTES/OVERRIDES: **N/A**

SPECIAL INSTRUCTIONS: None

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the amount of time to borate for 3 stuck rods and the final BAST level IAW 2-EOP-TRIP-2.

TASK NUMBER: N1150030501

INITIAL CONDITIONS:

- Unit 2 experienced an automatic Reactor Trip from an inadvertent Main Turbine Trip.
- SI is not required and the crew is implementing 2-EOP-TRIP-2, Reactor Trip Response
- Three Control Rods from Control Bank Delta have failed to FULLY insert.
- Current BAST levels:
  - 21 BAST level: 94%
  - 22 BAST level: 76%

INITIATING CUE:

- You are the extra NCO.
- The CRS has directed you to determine the amount of time Rapid Boration is required IAW 2-EOP-TRIP-2 **Step 4** for the Three Control rods that have failed to insert on Control Bank Delta
  1. How many total minutes of Rapid Boration is required?
  2. What will be the final BAST levels?
     - Assume the Rapid Boration flowrate remains at 40 GPM for the entire duration required in question 1, and Both BAST's lower equal amounts.

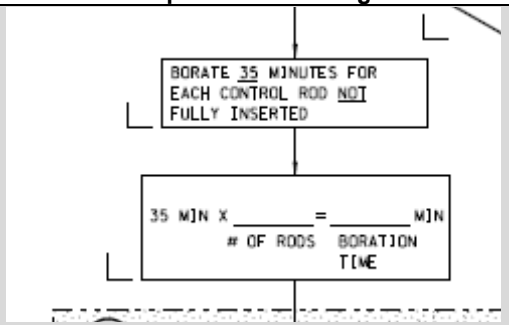
Successful Completion Criteria:
1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC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

Task Standard for Successful Completion:

1. **CALCULATES the total boration time for 3 stuck control rods to be 105 minutes**
2. **Calculates Total amount of Gallons injected to be 4200 gallons and final BAST levels are at 21: 67% ± 2% and 22: 49% ± 2%**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Conduct of Operations
TASK: Determine the amount of time to borate for 3 stuck rods and the final BAST level IAW 2-EOP-TRIP-2.

* #	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	Provide the Following: • EOP TRIP 2 sheet 2 • S2.OP-TM.ZZ-0002 • Calculator • Ruler			
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
		The following steps are from 2-EOP-TRIP-2, Major Action for "Control Rod Insertion", Step 4. **<u>Evaluator's Note</u>: Figure 1 is a snapshot that shows the exact EOP steps to follow along.**			
*	1	 **How many total minutes of Rapid Boration is required?**	**Operator Determine based on Cue that 3 control rods have failed to FULLY insert and determines the boration time required is 105 Minutes.** **35 MIN X ___3___ = ___105___ MIN** **# OF RODS BORATION TIME**		
	2.0	What will be the final BAST levels?			

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Conduct of Operations
TASK: Determine the amount of time to borate for 3 stuck rods and the final BAST level IAW 2-EOP-TRIP-2.

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	2.1	**Determines total volume added to allow them to determine tank level changes.**	**Operator determines the total volume required to be added is 4200 Gallons.** **105 MIN X 40 GPM = 4200 Gallons** **The stem stated that BAST tanks lower in equal amounts. Therefore, the amount that each tank will lower will be;** **4200 gals / 2 = 2100 gallons per tank**		
*	2.2	**Determining 21 BAST Tank Final Level (in %):** Operator will be utilizing S2.OP-TM.ZZ-0002 Rev. 8 TANK CAPACITY DATA to interpret the curves from page 6 of 34 and determine level change, additionally operator may perform calculations slightly different than listed below. May just utilize the tank curve to determine volume change per percent level or overall change in level had just one tank been drained and then divide by two. **Figure 2 is snapshot of tank level curve**	**Using Figure 2 to determine final level after 2100 gallons of boric acid used.** **Start Level = 94% = 7400 Gallons** **Amount boric acid used = 2100 Gallons** **Final Level = 7400 -2100 = 5300 gals.** **Using Figure 2 tank curve, 5300 gallons equates to a final tank level of <u>67% (+/-2%)</u>**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Conduct of Operations
TASK: Determine the amount of time to borate for 3 stuck rods and the final BAST level IAW 2-EOP-TRIP-2.

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	2.3	**Determining 22 BAST Tank Final Level (in %)** **<u>Examiners Note</u>: +/-2% acceptance band was determined from the readability error using Figure 2 BAST tank curve. The applicant is required to convert BAST levels to gallons using the curve, and then convert BAST volume in gallons back to % level. In both these determinations, there is a +/- 1% readability error (half a 2% increment on the curve) that must be considered each time. Therefore, it was determined that a +/- 2% band would be appropriate to bound the readability errors when using the curve.**	**Using Figure 2 to determine final level after 2100 gallons of boric acid used.** **Start Level = 76% = 6000 Gallons** **Amount boric acid used = 2100 Gallons** **Final Level = 6000 -2100 = 3900 gals.** **Using Figure 2 tank curve, 3900 gallons equates to a final tank level of <u>49% (+/-2%)</u>**		
	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 the JPM when the operator determines BAST level changes.**		

Figure 1
2-EOP-TRIP-2 SHT 2 step 4

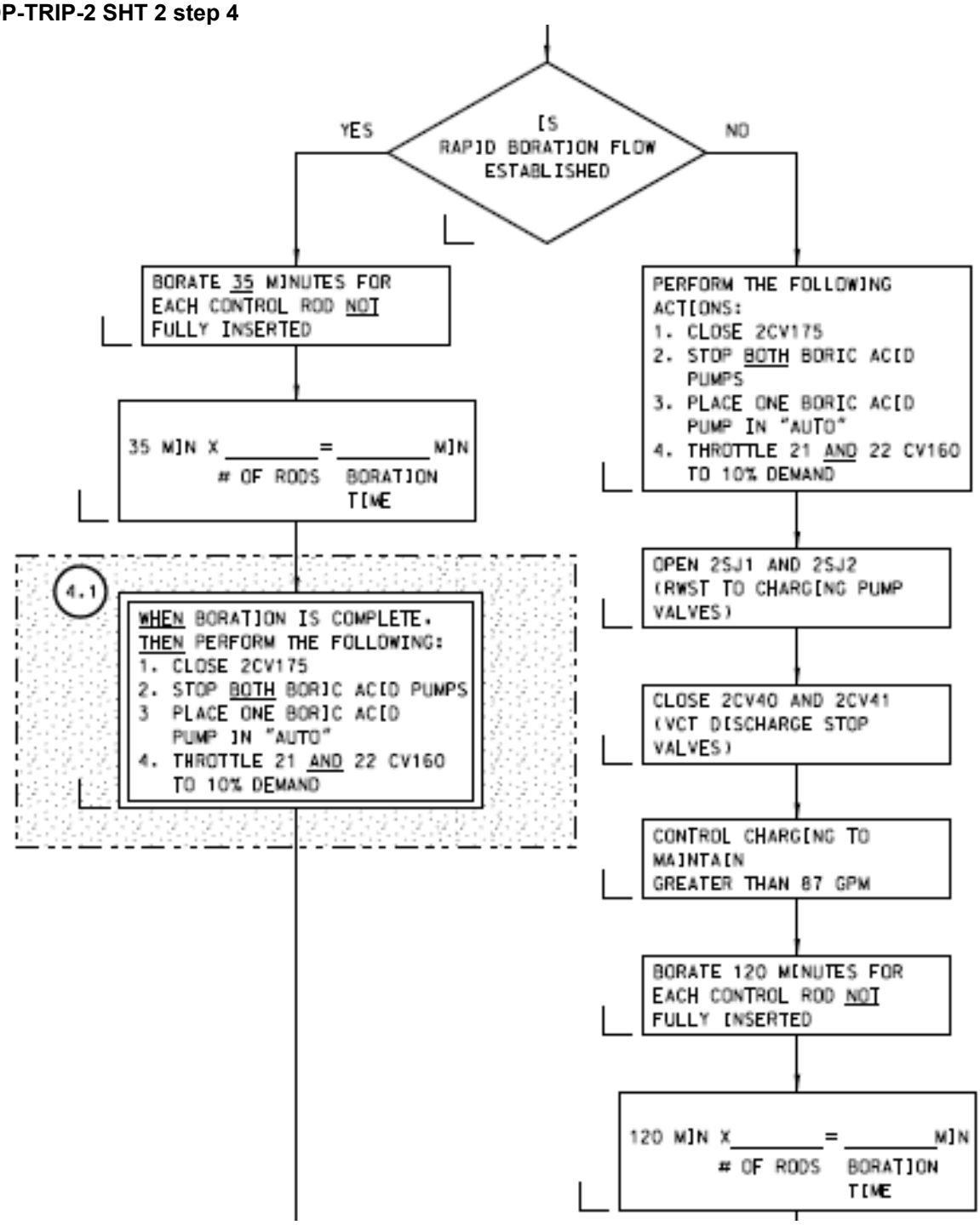
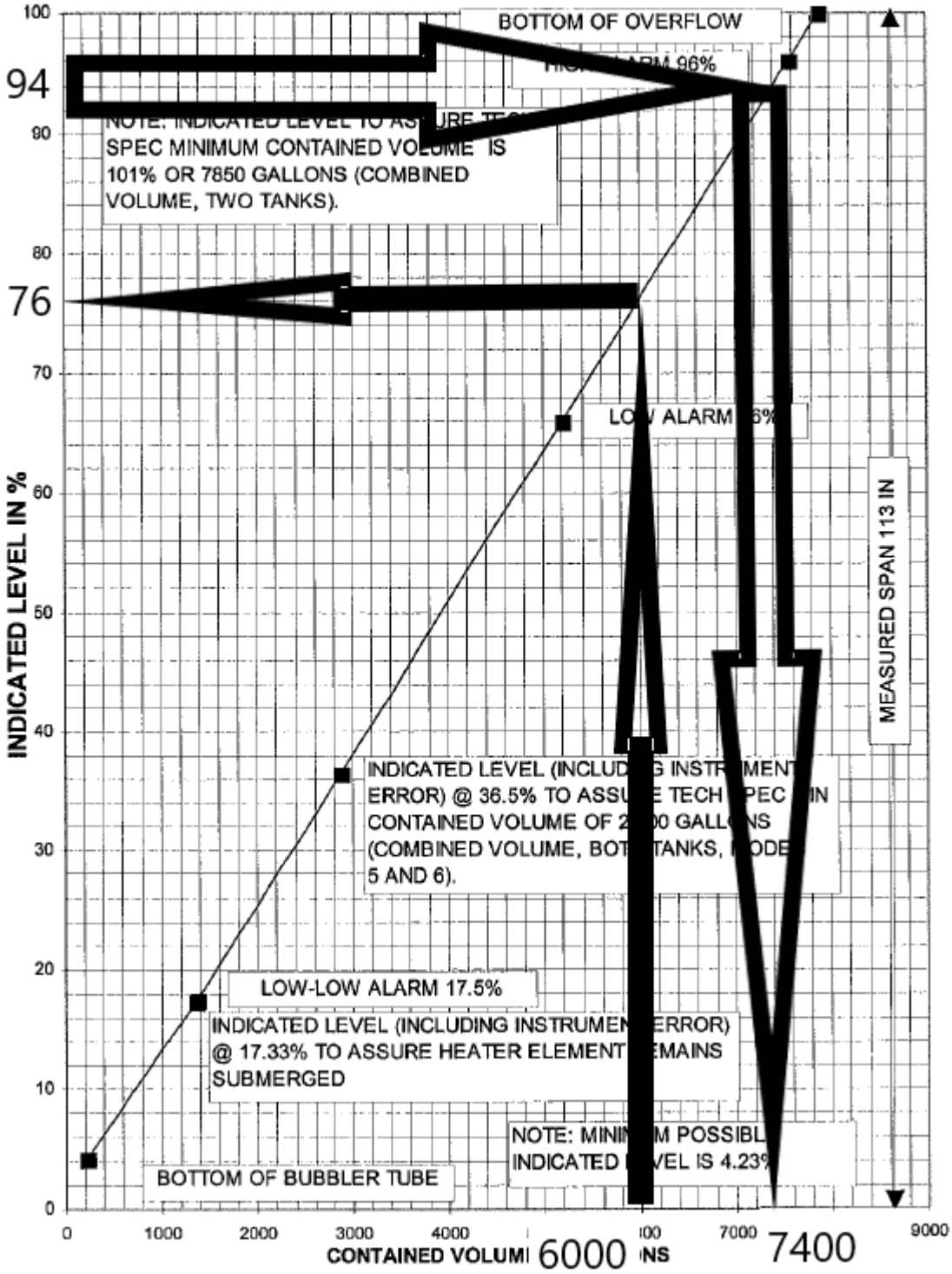


Figure 2
S2.OP-TM.ZZ-0002 page 6 of 34

UNIT 2 BORIC ACID TANK



JPM: 20-01 ILOT RO A2

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.

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

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

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

___RC_____ 4. Initial setup conditions are identified.

___RC_____ 5. Initiating and terminating Cues are properly identified.

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

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

___RC_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __41___ Date ___1-10-22_____

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

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

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

SME/Instructor:	R. Chan	Date:	1-10-22
SME/Instructor:	S. Pompper	Date:	1-10-22
SME/Instructor:	M. Wilcox	Date:	1-10-11

OPERATOR CUE SHEET

Applicant Name:_____

INITIAL CONDITIONS:

- Unit 2 experienced an automatic Reactor Trip from an inadvertent Main Turbine Trip.
- SI is not required and the crew is implementing 2-EOP-TRIP-2, Reactor Trip Response
- Three Control Rods from Control Bank Delta have failed to FULLY insert.
- Current BAST levels:
  - 21 BAST level: 94%
  - 22 BAST level: 76%

INITIATING CUE:

- You are the extra NCO.
- The CRS has directed you to determine the amount of time Rapid Boration is required IAW 2-EOP-TRIP-2 **Step 4** for the Three Control rods that have failed to insert on Control Bank Delta

1. How many total minutes of Rapid Boration is required?

_____ Minutes

2. What will be the final BAST levels in percent?
   - Assume the Rapid Boration flowrate remains at 40 GPM for the entire duration required in question 1, and Both BAST's lower equal amounts.

21 BAST level: _____ %

22 BAST level: _____ %

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Conduct of Operations

TASK: Perform manual QPTR calculation surveillance IAW S2.OP-ST.NIS-0002

TASK NUMBER: N0150020201

JPM NUMBER: 20-01 ILOT RO-A3

ALTERNATE PATH: [ ]

K/A NUMBER: 2.2.12

IMPORTANCE FACTOR: 3.7

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

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

EVALUATION SETTING/METHOD: Classroom

REFERENCES: S2.OP-ST.NIS-0002 Rev. 15 (checked 6-28-21)
Reactor Engineering Manual Data, Salem 2 Cycle 25 Rev 33

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 20 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-10-22**
Validated By:	**Wilcox / Pompper** **SME or Instructor**	**Date: 1-10-22**
Approved By:	**M. Wadusky(Signature on file)** **Training Department**	**Date: 2-11-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-10-22**

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: 20-01 ILOT RO-A3

Rev #	Date	Description	Validation Required
00	6-13-17	Added revision history and simulator setup pages. Updated NI currents from Rev. 5 of REM dated 6/4/17. Editorial comments from IP 71111.11 FASA.	Yes
01	3-20-18	Revised calculations and initial conditions based on new REM values for Table 2 Rev 27. Changed K/A to better match task.	Yes
02	1-10-19	Updated calculation to reflect revised REM Manual for Unit 2 Cycle 24 Rev 8.	Yes
03	6-22-20	Updated calculation to reflect revised REM Manual for Unit 2 Cycle 25 Rev 7.	Yes
04	6-28-21	Updated calculation and value for N43 upper to reflect revised REM Manual for Unit 2 Cycle 25 Rev 30.	Yes
05	8-17-21	Revised REM Manual for Unit 2 Cycle 25 Rev 33.	Yes
06	1-10-22	Incorporated NRC comments and Prep week comments.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin – Conduct of Operations

TASK: Perform manual QPTR calculation surveillance IAW S2.OP-ST.NIS-0002

TASK NUMBER: N0150020201

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS: None

NAME: _____

DATE: _____

SYSTEM: Generic Admin – Conduct of Operations

TASK: Perform manual QPTR calculation surveillance IAW S2.OP-ST.NIS-0002

TASK NUMBER: N0150020201

INITIAL CONDITIONS:

- Unit 2 was operating at 100% power when rod 2D4 dropped fully into the core. OHAs E-46, LOWER SECT DEV ABV 50% PWR, and E-38 UPPER SECT DEV ABV 50% PWR, annunciated, cleared and continue to annunciate then clear.
- Operators have not yet started reducing power to 74% to comply with TSAS 3.1.3.1.c.3.d IAW S2.OP-AB.ROD-0002, Dropped Rod.

INITIATING CUE:

- The CRS has directed you to perform a Manual QPTR Calculation IAW S2.OP-ST.NIS-0002. Maintain all calculations at three significant digits to the right of the decimal point (Thousandths) unless otherwise directed by procedure.
- All pre-requisites are completed SAT.
- Notify CRS of test results after Step 5.3 is complete and compliance with Technical Specification.

NI currents are:

	Upper Detectors	Lower Detectors
N41	**189**	**188**
N42	**206**	**221**
N43	**192**	**193**
N44	**135**	**151**

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. **Manually calculates the highest QPTR as UNSAT (highest N42T AND N42B) with a value of 1.041 and 1.032 respectively (+/- 0.002).**
2. **Identifies Maximum Power Tilt exceeds 1.02 and identifies T/S LCO 3.2.4 is NOT met.**

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**

TASK: **Perform manual QPTR calculation surveillance IAW S2.OP-ST.NIS-0002**

* #	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: ▪ Markup copy of S2.OP-ST.NIS-0002, Power Distribution - Quadrant Power Tilt Ratio, ▪ **REM Tables Salem 2 Cycle 25, Rev. 33**, and ▪ Salem Unit 2 Tech Spec 3.2.4.			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	3.0	**PRECAUTIONS AND LIMITATIONS**	Reads PRECAUTIONS AND LIMITATIONS 3.1-3.5		
	5.1.2	**RECORD** the following data on Attachment 2 • Date • Time • Reactor Power • Reason for performing QPTR Calculation	Records current date, current time, 100% reactor power and checks OHA E-46 as reason for performance in Attachment 2.		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**

TASK: **Perform manual QPTR calculation surveillance IAW S2.OP-ST.NIS-0002**

* #	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)
	5.1.3	**RECORD** the following data on Attachment 1: • NI Channels N-41, N-42, N43 and N-44 Upper Detector current readings • NI Channels N-41, N-42, N43 and N-44 Lower Detector current readings • Respective 100% NI Current Values for Channels N-41, N-42, N43 and N-44 Detectors from S2.RE-RA.ZZ-0011, Table 2	Records on Attachment 1: (From initial conditions) • NI channels N41-44 Upper Detector Current Readings • NI channels N41-44 Lower Detector Current Readings • 100% NI Current Values from S2.RE-RA.ZZ-0011, TABLES **NOTE:** Attachment 1, Section 3 is NOT required to be performed to determine detector currents. It was added at Rev. 12 to use "when any NIS meter is suspect." If asked, **CUE** that all Power Range Detectors are Operable.		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**

TASK: **Perform manual QPTR calculation surveillance IAW S2.OP-ST.NIS-0002**

* #	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)
*	5.1.4	**COMPLETE** Attachment 1 calculations.	**For Top and Bottom Detectors: (numbers as per key for evaluator)** • Calculates Detector Ratio for each top and bottom detector. • Adds detector ratios to get Sum of detector ratios. • Divides Sum by number of operable detectors (4) to get Average Detector Ratios. • Places Average Detector Ratios in 4th column of Att. 1 • Divides each detector ratio by the average ratio to get the power tilt for each detector. **CUE:** IV is complete when asked for IV of calculations		
*	5.1.5	**RECORD** the following on Attachment 2 1. "Power Tilt" for each detector. 2. "Maximum Power Tilt" and applicable detector identification information. 3. Test Results by initialing SAT or UNSAT column IAW stated Acceptance Criteria.	**Records information on Attachment 2 (as per key for evaluator)** **Maximum Power Tilt for N42T OR N42B will be marked UNSAT at 1.041 and 1.032 respectively (+/- 0.002).**		
	5.1.6	**DIRECT** a second Operator to perform Independent Verification of calculations in Attachment 1, Sections 1.0, 2.0 and 3.0 as applicable.	**CUE:** IV is complete SAT.		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Generic Admin – Conduct of Operations**

TASK: **Perform manual QPTR calculation surveillance IAW S2.OP-ST.NIS-0002**

* #	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)
*	5.1.7	IF the Maximum Power Tilt for any detector exceeds 1.02, THEN **REFER** to T/S 3.2.4 for corrective actions.	**Determines maximum power tilt exceeds 1.02 and determines Tech Spec LCO 3.2.4 is NOT MET.**		
	5.3.1	This surveillance is satisfactory when Attachment 2 or 3 is completed with the Test data meeting the Acceptance Criteria stated.	Determines surveillance is UNSAT and marks step N/A.		
*	5.3.2	This surveillance is unsatisfactory. A. **INITIATE** NOTF(s) to correct the unsatisfactory condition(s). B. **RECORD** the NOTF number(s) AND the reason for unsatisfactory completion on Attachment 4 in the Comments Section. C. **NOTIFY** Reactor Engineering.	**Records surveillance as UNSAT.** **CUE:** The CRS will initiate the NOTF and Notify Reactor Engineering.		
	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 5.3.**		

TABLE 2
100% N.I. CURRENTS 0% AXIAL, RADIAL TILT

NOTE

1. The expiration date and time is the date and time by which the circuitry must be recalibrated with the new values. The expiration date is 14 days after the measurement date.
2. The new values will take effect as soon as I&C recalibrates the first NIS channel; the alarm must be declared inoperable. Refer to TS 4.2.4 for surveillance requirements. Ensure that all new values are used to perform the surveillance.
3. If the expiration date and time is reached prior to the circuitry recalibration, the alarm must be declared INOPERABLE.
4. The Alarm can be declared INOPERABLE when new Currents are issued.

Date	N41		N42		N43		N44		Expiration	
Measured	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Date	Time
BOC	214.7	221.0	217.7	234.5	190.4	189.5	160.8	170.4	05/26/20	22:00
05/12/20	186.4	192.1	197.1	213.7	191.8	191.5	141.5	150.8	06/08/20	15:28
05/25/20	195.6	198.7	206.7	220.4	202.3	198.9	148.1	155.2	08/31/20	9:07
08/17/20	184.0	188.8	193.6	207.7	189.3	188.5	138.2	146.3	11/03/20	8:56
10/20/20	184.4	187.6	192.9	204.3	186.4	182.7	137.9	144.6	01/04/21	0:02
12/21/20	189.4	192.2	197.3	208.1	188.9	184.1	141.1	147.3	04/05/21	6:00
03/22/21	203.1	207.6	209.3	222.6	200.2	196.9	150.5	158.0	07/05/21	6:51
06/21/21	221.1	226.0	229.1	243.8	218.6	215.6	163.7	172.1		

ANSWER KEY

	Manual Calculation				
		100% value	Detector ratio	Average upper detector ratio	Power Tilt
N41T	189	221.1	0.855	0.864	0.990
N42T	206	229.1	0.899	0.864	1.041
N43T	192	218.6	0.878	0.864	1.016
N44T	135	163.7	0.825	0.864	0.955
		Sum	3.457		
		# oper	4.000		
		AUDR	0.864		
		100% value	Detector ratio	Average upper detector ratio	Power Tilt
N41B	188	226	0.832	0.878	0.948
N42B	221	243.8	0.906	0.878	1.032
N43B	193	215.6	0.895	0.878	1.019
N44B	151	172.1	0.877	0.878	0.999
		Sum	3.510		
		# oper	4.000		
		AUDR	0.878		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 ILOT 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.

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

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

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

____RC__ 4. Initial setup conditions are identified.

____RC__ 5. Initiating and terminating Cues are properly identified.

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

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

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

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

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

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

SME/Instructor:	R. Chan	Date:	1-10-22
SME/Instructor:	M. Wilcox	Date:	1-10-22
SME/Instructor:	S. Pompper	Date:	1-10-22

Applicant Name: _____

INITIAL CONDITIONS:

- Unit 2 was operating at 100% power when rod 2D4 dropped fully into the core. OHAs E-46, LOWER SECT DEV ABV 50% PWR, and E-38 UPPER SECT DEV ABV 50% PWR, annunciated, cleared and continue to annunciate then clear.
- Operators have not yet started reducing power to 74% to comply with TSAS 3.1.3.1.c.3.d IAW S2.OP-AB.ROD-0002, Dropped Rod.

INITIATING CUE:

- The CRS has directed you to perform a Manual QPTR Calculation IAW S2.OP-ST.NIS-0002. Maintain all calculations at three significant digits to the right of the decimal point (Thousandths) unless otherwise directed by procedure.
- All pre-requisites are completed SAT.
- Notify CRS of test results after Step 5.3 is complete and compliance with Technical Specification.

NI currents are:

	Upper Detectors	Lower Detectors
N41	**189**	**188**
N42	**206**	**221**
N43	**192**	**193**
N44	**135**	**151**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Radiation Control - Administrative

TASK: Determine radiological dose and stay time limits for a Containment entry.

TASK NUMBER: N1200100104

JPM NUMBER: 20-01 ILOT RO-A4

ALTERNATE PATH: [ ]

K/A NUMBER: 2.3.13

IMPORTANCE FACTOR: 3.4 (RO) 3.8 (SRO)

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

EVALUATION SETTING/METHOD: Classroom

REFERENCES: Radiological Survey Map Dated 8-5-21, RP-AA-300, Rev 6 (checked 10-25-21)

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 10 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan Instructor**	**Date: 1-10-22**
Validated By:	**Pompper / Wilcox SME or Instructor**	**Date: 1-10-22**
Approved By:	**M. Wadusky(Signature on file) Training Department**	**Date: 2-11-22**
Approved By:	**W. Hargrave Operations Department**	**Date: 1-10-22**

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: 20-01 ILOT RO-A4

Rev #	Date	Description	Validation Required
00	10-1-21	New JPM	Yes
01	1-10-22	Incorporated NRC comments and Prep week comments.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: RADIATION CONTROL - ADMINISTRATIVE

TASK: Determine radiological dose and stay time limits for a Containment entry.

TASK N1200100104

INITIAL

- Salem is in mode 1 at 100%.
- The 22 CFCU has been declared inoperable.
- Tagging has been completed.

INITIATING CUE:

- You have been directed by the WCCS to determine stay times for entering containment to hang additional tags on 22 CFCU.
- **Assume** the following:
  - Safety has determined the heat stress stay time to be 15 minutes
  - Radiation protection has limited total dose received by individual to 0.002 REM gamma and 0.008 REM Neutron

1. In accordance with the provided survey map perform the following:

1.1. Calculate the following for the Operator:
- Gamma dose stay time _____minutes
- Neutron dose stay time _____minutes

1.2. Determine most limiting allowable time for containment entry team based on ALARA and Heat Stress:
- Limiting containment entry time _____minutes

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.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

Task Standard for Successful Completion:

1. **Determines that based on the dose limits Gamma dose stay time is 24 minutes, Neutron dose stay time is 12 minutes, and heat stress stay time is 15 minutes. Determines that limiting entry time will be based on Neutron dose at 12 minutes.**

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: RADIATION CONTROL – ADMINISTRATIVE

TASK: Determine radiological dose and stay time limits for a Containment entry.

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	**Provide** the following: ♦ **Survey map** (#2213000, dated 8-5-21) for S2 CTMT 130' GENERAL AREA ♦ **RP-AA-300**, Radiological Survey Program ♦ **Calculator**	**Examiners Note:** **MAKE SURE THAT THE SURVEY MAP IS ENLARGED TO ATLEAST A 11 X 17 SIZE PRINT FOR READABILITY.**		
	CUE	**START TIME: _____**			
*	1.1.A	Calculate the following for the operator, **Neutron dose stay time**:	**Operator refers to survey map** **Per the survey map and using the given assumption for 22 CFCU Area dose rate; selects neutron dose rate of 40 mrem/hr** Limit is 0.008 REM or 8 mrem neutron. (8 mrem/40 mrem/hr) X 60 min/hr = **12 Minutes**		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: RADIATION CONTROL – ADMINISTRATIVE

TASK: Determine radiological dose and stay time limits for a Containment entry.

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	1.1.B	**Gamma dose stay time**:	**Per the survey map and using the given assumption for 22 CFCU Area dose rate; selects <u>gamma</u> dose rate of <u>5 mrem/hr</u>** Limit is 0.002 REM or 2 mrem gamma (2 mrem/5mrem/hr) X 60 minutes/hr = **24 minutes**		
*	1.2	Determine most limiting allowable time for containment entry team based on ALARA and Heat Stress	**12 minutes due to Neutron Dose**		
		STOP TIME: _____	**Terminate JPM when candidate has submitted cue sheet to Evaluator.**		

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.

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

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

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

___KH__ 4. Initial setup conditions are identified.

___KH__ 5. Initiating and terminating Cues are properly identified.

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

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

___KH__ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _06____ Date ___1/25/2017__

___KH__ 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.

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

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

Applicant Name: _____

INITIAL CONDITIONS:

- Salem is in mode 1 at 100%.
- The 22 CFCU has been declared inoperable.
- Tagging has been completed.

INITIATING CUE:

- You have been directed by the WCCS to determine stay times for entering containment to hang additional tags on 22 CFCU.
- **Assume** the following:
    - Safety has determined the heat stress stay time to be 15 minutes
    - Radiation protection has limited total dose received by individual to 0.002 REM gamma and 0.008 REM Neutron

1. In accordance with the provided survey map perform the following:

    1.1 Calculate the following for the Operator:

    - Gamma dose stay time _____minutes
    - Neutron dose stay time _____minutes

    1.2 Determine most limiting allowable time for containment entry team based on ALARA and Heat Stress:

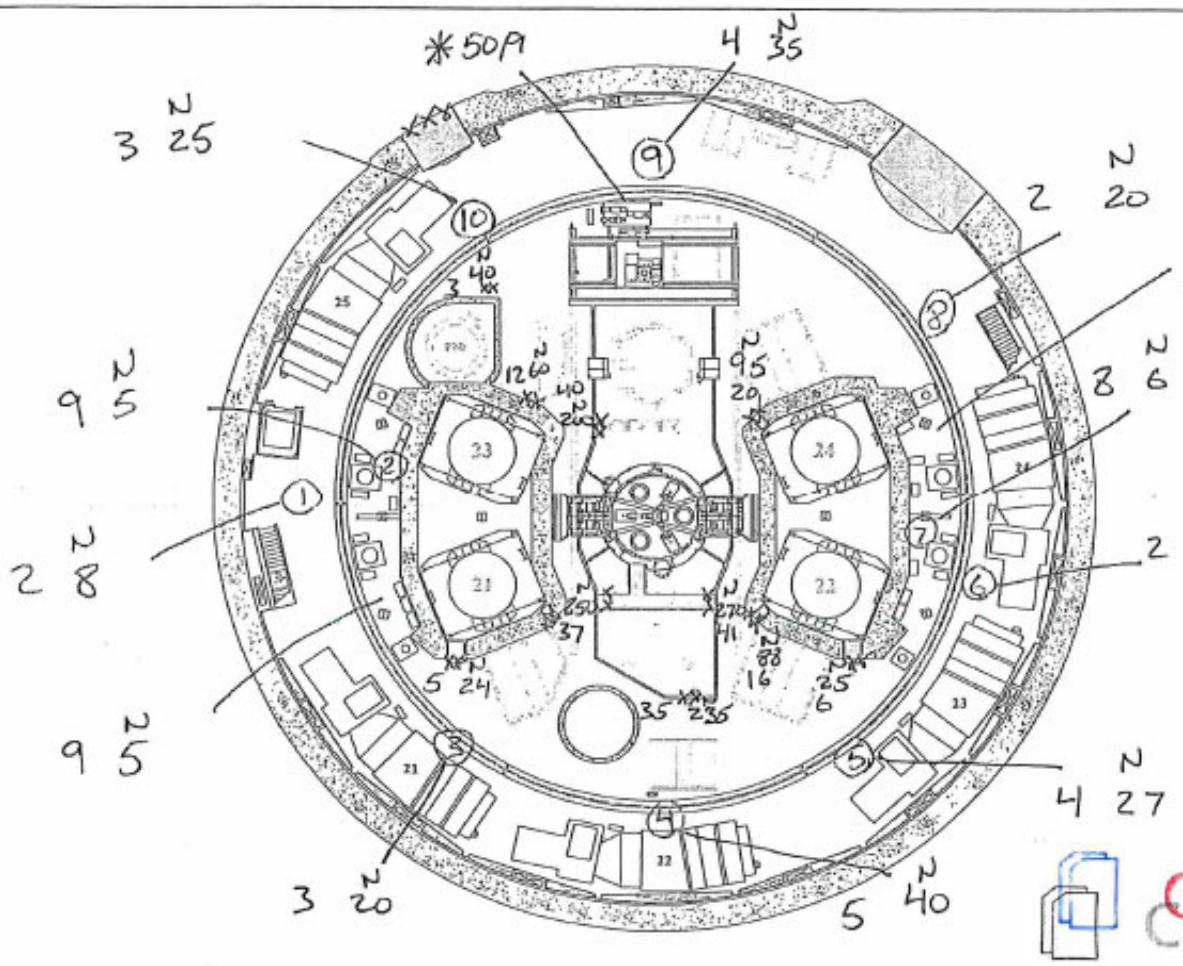
    - Limiting containment entry time _____minutes

[**Place your response on this cue sheet**]

Salem GENERATING STATION

Radiological Survey

MAP #	2213000



Location: S2 CTMT 130' GENERAL AREA			Date: 8/5/21		Time: 1340		RWP: 3
Surveyed By:		Radiation Survey		Contamination Survey			
Print: KRUPA / BURDSALL		Instrument: TPOLE	Serial#: 6610-064	β,γ	Instrument: RM14	Serial#: 8275	
Sign:		Instrument: LUD 30	Serial#: 7003	α	Instrument: N	Serial#: A	

Contamination β,γ								Contamination α		
LOC	dpm/100cm²	LOC	dpm/100cm²	LOC	dpm/100cm²	LOC	dpm/100cm²	LOC	ccpm	dpm/100cm²
1	<1K	6	<1K	N						
2		7								
3		8								
4		9								
5	<1K	10	<1K							A

n/a	n/a
X	Routine
N/A	S.O.J.
N/A	Other

COMMENTS: CTMT HRA NA ARA CA NRP (LOCKED) | PZR LHRA NRP (LOCKED) | 'D' RING LHRA NRP (LOCKED) | Rx CAVITY LHRA NRP (LOCKED) | 101°WBGT | Rx Power: 100%

Supervisor Review

Print / Sign: B. ACHUFF /

DATE: 8/5/21

JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Conduct of Operations - Administrative

TASK: Identify and Isolate Non-Essential Chilled Water Loads IAW S2.OP-SO.CH-0001, Attachment 2

TASK NUMBER: 0980020202

JPM NUMBER: 20-01 NRC SRO-A1

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.1.7

IMPORTANCE FACTOR: RO: | SRO: 4.7

APPLICABILITY:

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

EVALUATION SETTING/METHOD: Classroom

REFERENCES: S2.OP-SO.CH-0001 Rev. 36 (checked 1-10-22)
Salem 2 Tech Specs

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 15 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan Instructor**	**Date: 1-10-22**
Validated By:	**M. Protesto SME or Instructor**	**Date: 1-10-22**
Approved By:	**M. Wadusky (signature on file) Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave Operations Representative**	**Date: 1-10-22**

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: 20-01 NRCSRO-A1

Rev #	Date	Description	Validation Required
00	10-3-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	No
01	1-10-22	Used for 20-01 NRC exam. Incorporated NRC Prep week comments.	Yes

JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Conduct of Operations - Administrative

TASK: Identify and Isolate Non-Essential Chilled Water Loads IAW S2.OP-SO.CH-0001

TASK NUMBER: 0980020202

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS: None

JOB PERFORMANCE MEASURE

SYSTEM: Conduct of Operations - Administrative

TASK: Identify and Isolate Non-Essential Chilled Water Loads IAW S2.OP-SO.CH-0001

TASK NUMBER: 0980020202

INITIAL CONDITIONS:

- It is July 15th time 1800 and you have just assumed the watch as the Unit 2 CRS. It was turned over that both 21 and 22 Chillers tripped at 1600 and you are currently in T/S 3.7.10 action 'b', entered at 1600.
- To comply with the T/S action, the crew is implementing S2.OP-SO.CH-0001, Chilled Water System Operation, Section 4.6, Isolation of Non-Essential Heat Loads.
- During preparations to align #2 ECAC cooling to Service Water IAW S2.OP-SO.CA-0001, Control Air System Operation, it was reported that the spool pieces required to align to service water cannot be located.
- Unit 2 CREACS has been removed from service IAW step 4.6.2 of S2.OP-SO.CH-0001.
- CW Inlet Water Temperature Readings from SC.OP-DL.ZZ-0008(Q), Circulating / Service Water Log are:

  2TL3756 = 83.4°F
  2TL3757 = 83.6°F

INITIATING CUE:

- You are the Unit 2 CRS.
- The Shift Manager directs you to NOT isolate the #2 ECAC and to re-perform the Non-Essential heat load determination IAW Attachment 2.

  DETERMINE the total Non-Essential heat load and **SELECT** the required components for isolation IAW S2.OP.SO-CH-0001, Chilled Water System Operation, Attachment 2 to comply with Tech Specs.

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 the Total Heat Load Isolation value required is 902.8 kBTU / HR.**
2. **Selects the required components on Table B for isolation and ensures that the total value (906.6 kBTU / HR) is greater than 902.8 kBTU / HR.**

System: Conduct of Operations - Administrative **Name:**
Task: Identify and Isolate Non-Essential Heat Loads IAW S2.OP-SO.CH-0001 **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 the following: ▪ Unit 2 Tech Specs ▪ S2.OP-SO.CH-0001, Chilled Water System Operation.			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:_____**			

System: Conduct of Operations - Administrative **Name:**
Task: Identify and Isolate Non-Essential Heat Loads IAW S2.OP-SO.CH-0001 **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)
	Attach 2 1.A	**RECORD** the following data for use in Table A: Inlet Water Temperature from SC.OP-DL.ZZ-0008(Q), Circulating / Service Water Log: 2TL3756=____ °F 2TL3757=_____°F From the above indicated 2TL3756/2TL3757 temperatures, **RECORD** the highest temperature AND **ADD** 1.5°F to account for instrument uncertainty. Utilize this temperature when referring to Table A _____°F + 1.5°F = _____°F (highest temp)	Enters temperatures from cue sheet onto Attachment 2 form. [83.6 F + 1.5 F = **85.1 F**]		
	1.B	Number of inoperable Chiller Units:___	Lists 2 Chillers Inoperable.		

System: Conduct of Operations - Administrative **Name:**
Task: Identify and Isolate Non-Essential Heat Loads IAW S2.OP-SO.CH-0001 **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)
*	1.C	**RECORD** the TOTAL HEAT LOAD ISOLATION from Table A: _____kBTU / HR	**From Table A, Determines 902.8 kBTU / HR. (Based on Inlet water temp of 85.1 F, 2 chillers Inoperable and in Maintenance Mode with Unit 2 EACS Out of Service)**		
	1.D	**IDENTIFY** the components to be isolated in Table B as follows:			
*	1.E	**RECORD** the value from the HEAT LOAD column into the Isolation column for the components selected for isolation.	**Selects the value of heat load by annotating the values in Table B to ensure value greater than value recorded in step 1.C.** **21 PACU = 145.7** **22 PACU = 145.7** **23 PACU = 145.7** **Secondary Lab = 192.1** **Primary Lab = 165.9** **Counting Room = 73.0** **PASS = 38.5**		
*	1.F	**RECORD** "N/A" for the components selected to remain available.	**Selects N/A for Emergency Control Air Compressor (ECAC)**		

System: Conduct of Operations - Administrative **Name:**
Task: Identify and Isolate Non-Essential Heat Loads IAW S2.OP-SO.CH-0001 **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)
*	1.G	**ADD** the values recorded in the Isolation column AND **RECORD** the Total Isolation value in Table B.	Determines that the Total Heat Load Isolation value per Table B is **906.6 kBTU / HR**.		
*	1.H	**ENSURE** that the Total Isolation value recorded in Table B is ≥ the Total Heat Load Isolation recorded in Step C of this attachment.	**Determines the Total Heat load Isolation value recorded in Table B (906.6 kBTU / HR) is greater than or equal to the Total Heat Load Isolation in Step C (902.8 kBTU / HR).**		
	1.I	**ISOLATE** the selected components IAW Section 4.6 of this procedure.	**CUE:** The NCO will isolate the selected components IAW Section 4.6.		
	CUE:	**JPM is Complete** THEN **RECORD** the STOP TIME. **STOP TIME:_____**	**Terminate JPM when operator determines the loads that need to be isolated.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM #: 20-01 NRCSRO-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.

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

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

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

____RC__ 4. Initial setup conditions are identified.

____RC__ 5. Initiating and terminating Cues are properly identified.

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

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

____RC___ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __36___ Date ___1-10-22_____

_____RC__ 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.

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

SME/Instructor:	R. Chan	Date:	1-10-22
SME/Instructor:	M. Protesto	Date:	1-10-22
SME/Instructor:		Date:	

JOB PERFORMANCE MEASURE

Applicant Name: _____

INITIAL CONDITIONS:

- It is July 15th time 1800 and you have just assumed the watch as the Unit 2 CRS. It was turned over that both 21 and 22 Chillers tripped at 1600 and you are currently in T/S 3.7.10 action 'b', entered at 1600.
- To comply with the T/S action, the crew is implementing S2.OP-SO.CH-0001, Chilled Water System Operation, Section 4.6, Isolation of Non-Essential Heat Loads.
- During preparations to align #2 ECAC cooling to Service Water IAW S2.OP-SO.CA-0001, Control Air System Operation, it was reported that the spool pieces required to align to service water cannot be located.
- Unit 2 CREACS has been removed from service IAW step 4.6.2 of S2.OP-SO.CH-0001.
- CW Inlet Water Temperature Readings from SC.OP-DL.ZZ-0008(Q), Circulating / Service Water Log are:

  2TL3756 = 83.4°F
  2TL3757 = 83.6°F

INITIATING CUE:

- You are the Unit 2 CRS.
- The Shift Manager directs you to NOT isolate the #2 ECAC and to re-perform the Non-Essential heat load determination IAW Attachment 2.

1. **DETERMINE** the total Non-Essential heat load value and **SELECT** the required components for isolation IAW S2.OP.SO-CH-0001, Chilled Water System Operation, Attachment 2, to comply with Tech Specs.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Generic Admin – Conduct of Operations
TASK:	Determine the amount of the time to borate for 3 stuck control rods and evaluate final BAST levels to determine any applicable TS LCO(s) and action(s)
TASK NUMBER:	N1150510502
JPM NUMBER:	20-01 ILOT SRO A2
ALTERNATE PATH:	[ ]
K/A NUMBER:	2.1.20
IMPORTANCE FACTOR:	RO: SRO: 4.6
APPLICABILITY:	EO [ ] RO [ ] STA [ ] SRO [X]
EVALUATION SETTING/METHOD:	Classroom
REFERENCES:	2-EOP-TRIP-2, Rev 40, S2.OP-TM.ZZ-0002, Rev 8, TS sect 3.1, S2.OP-ST.CVC-0009 R27 and 10 R13 (checked 10-6-21)
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	10 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A
Developed By:	**R. Chan, Instructor** — **Date: 1-10-22**
Validated By:	**M. Protesto, SME or Instructor** — **Date: 1-10-22**
Approved By:	**M. Wadusky (signature on file), Training Department** — **Date: 2-10-22**
Approved By:	**W. Hargrave, Operations Department** — **Date: 1-10-22**

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: 20-01 ILOT SRO A2

Rev #	Date	Description	Validation Required
00	8-20-21	**NEW JPM for 20-01 ILOT**	Yes
01	1-10-22	Incorporated NRC comments submitted in ES-301-7. JPM will be validated during NRC Prep Week.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the amount of the time to borate for 3 stuck control rods and evaluate final BAST levels to determine any applicable TS LCO(s) and action(s)

TASK NUMBER: N1150510502

SIMULATOR IC: N/A

MALFUNCTIONS/REMOTES/OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

1. Complete copy of Unit 2 TS is required for each applicant.
2. Copies of S2.OP-ST.CVC-0009 and 0010 are available, if requested.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Admin – Conduct of Operations

TASK: Determine the amount of the time to borate for 3 stuck control rods and evaluate final BAST levels to determine any applicable TS LCO(s) and action(s)

TASK NUMBER: N1150510502

INITIAL CONDITIONS:

- Unit 2 experienced an automatic Reactor Trip from an inadvertent Main Turbine Trip.
- 2SJ2 was tagged for emergent repairs prior to the trip.
- SI is not required and the crew is implementing 2-EOP-TRIP-2, Reactor Trip Response.
- Three Control Rods from Control Bank Delta have failed to FULLY insert.
- RWST Concentration is 2350ppm, and BAST concentration is 6,650 ppm.
- Unit 2 remains in Mode 3 throughout the boration.
- Current BAST levels:
  - 21 BAST level: 70%
  - 22 BAST level: 70%

INITIATING CUE:

- You are the CRS.
- Determine the amount of time Rapid Boration is required IAW 2-EOP-TRIP-2 **Step 4** for the Three Control rods that have failed to insert on Control Bank Delta
  1. How many total minutes of Rapid Boration is required?
  2. What will be the final BAST levels in percent IAW S2.OP-TM.ZZ-0002?
     - Assume the Rapid Boration flowrate remains at 40 GPM for the entire duration required in question 1, and Both BAST's lower equal amounts.
  3. Based on plant conditions after completion of the boration, identify any Tech spec(s) and Tech Spec action statement(s) required related to the boric acid system.

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. **Calculates the total boration time for 3 stuck control rods to be 105 minutes**
2. **Determines final BAST tank levels for 21 tank at 43% ± 2% and 22 tank at 43% ± 2%**
3. **Determines that TS LCO 3.1.2.6.a.1 is not met and action is required.**

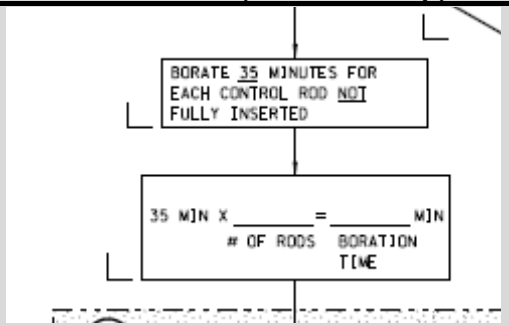
OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Conduct of Operations
TASK: Determine the amount of the time to borate for 3 stuck control rods and evaluate final BAST levels to determine any applicable TS LCO(s) and action(s)

* #	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	Provide the Following: • EOP TRIP 2 sheet 2 • S2.OP-TM.ZZ-0002 • Unit 2 Technical Specification • Calculator If requested provide the following: • S2.OP-ST.CVC-0009 • S2.OP-ST.CVC-0010			
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
		The following steps are from 2-EOP-TRIP-2, Major Action for "Control Rod Insertion", Step 4. **<u>Evaluator's Note</u>: Figure 1 is a snapshot that shows the exact EOP steps to follow along.**			

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Conduct of Operations
TASK: Determine the amount of the time to borate for 3 stuck control rods and evaluate final BAST levels to determine any applicable TS LCO(s) and action(s)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	1	 **How many total minutes of Rapid Boration is required?**	**Operator Determine based on Cue that 3 control rods have failed to FULLY insert and determines the boration time required is 105 Minutes.** **35 MIN X ___3___ = ___105___ MIN** **# OF RODS BORATION TIME**		
	2.0	What will be the final BAST levels?			
*	2.1	**Determines total volume added to allow them to determine tank level changes.**	**Operator determines the total volume required to be added is 4200 Gallons.** **105 MIN X 40 GPM = 4200 Gallons** **The stem stated that BAST tanks lower in equal amounts. Therefore, the amount that each tank will lower will be;** **4200 gals / 2 = 2100 gallons per tank**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Conduct of Operations
TASK: Determine the amount of the time to borate for 3 stuck control rods and evaluate final BAST levels to determine any applicable TS LCO(s) and action(s)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	2.2	**Determining 21 BAST Tanks Final Level (in %):** Operator will be utilizing S2.OP-TM.ZZ-0002 Rev. 8 TANK CAPACITY DATA to interpret the curves from page 6 of 34 and determine level change, additionally operator may perform calculations slightly different than listed below. May just utilize the tank curve to determine volume change per percent level or overall change in level had just one tank been drained and then divide by two. **Figure 2 is snapshot of tank level curve**	**Using Figure 2 to determine final level after 2100 gallons of boric acid used.** **Start Level = 70% = 5500 Gallons** **Amount boric acid used = 2100 Gallons** **Final Level = 5500 -2100 = 3400 gals.** **Using Figure 2 tank curve, 3400 gallons equates to a final tank level of <u>43% (+/-2%)</u>**		
*	2.3	**Determining 22 BAST Tank Final Level (in %)** **<u>Examiners Note</u>: +/-2% acceptance band was determined from the readability error using Figure 2 BAST tank curve. The applicant is required to convert BAST levels to gallons using the curve, and then convert BAST volume in gallons back to % level. In both these determinations, there is a +/-1% readability error (half a 2% increment on the curve) that must be considered each time. Therefore, it was determined that a +/- 2% band would be appropriate to bound the readability errors when using the curve.**	**Using Figure 2 to determine final level after 2100 gallons of boric acid used.** **Start Level = 70% = 5500 Gallons** **Amount boric acid used = 2100 Gallons** **Final Level = 5500 -2100 = 3400 gals.** **Using Figure 2 tank curve, 3400 gallons equates to a final tank level of <u>43% (+/-2%)</u>**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Admin – Conduct of Operations
TASK: Determine the amount of the time to borate for 3 stuck control rods and evaluate final BAST levels to determine any applicable TS LCO(s) and action(s)

* #	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	**Based on plant conditions after completion of the boration, identify any Tech specs and Tech Spec action statements required related to the boric acid system.**	**Based on the RWST boron concentration of 2350 ppm and the BAST tank boron concentration of 6650 ppm, the required tank level per TS 3.1.2.6 Figure 3.1-2 will be > 96.5%. The final BAST tank levels are at 86%, which is below the TS required levels combined.** **Operator will determine that the volume does not meet requirements of TS and the following LCO apply;** **LCO 3.1.2.6.a.1 Action a (restore storage system to operable status within 72 hours or Hot Standby within next 6 hours), and**		
	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 the JPM when the operator has completed calculations and evaluates Tech Specs.**		

Figure 1
2-EOP-TRIP-2 SHT 2 step 4

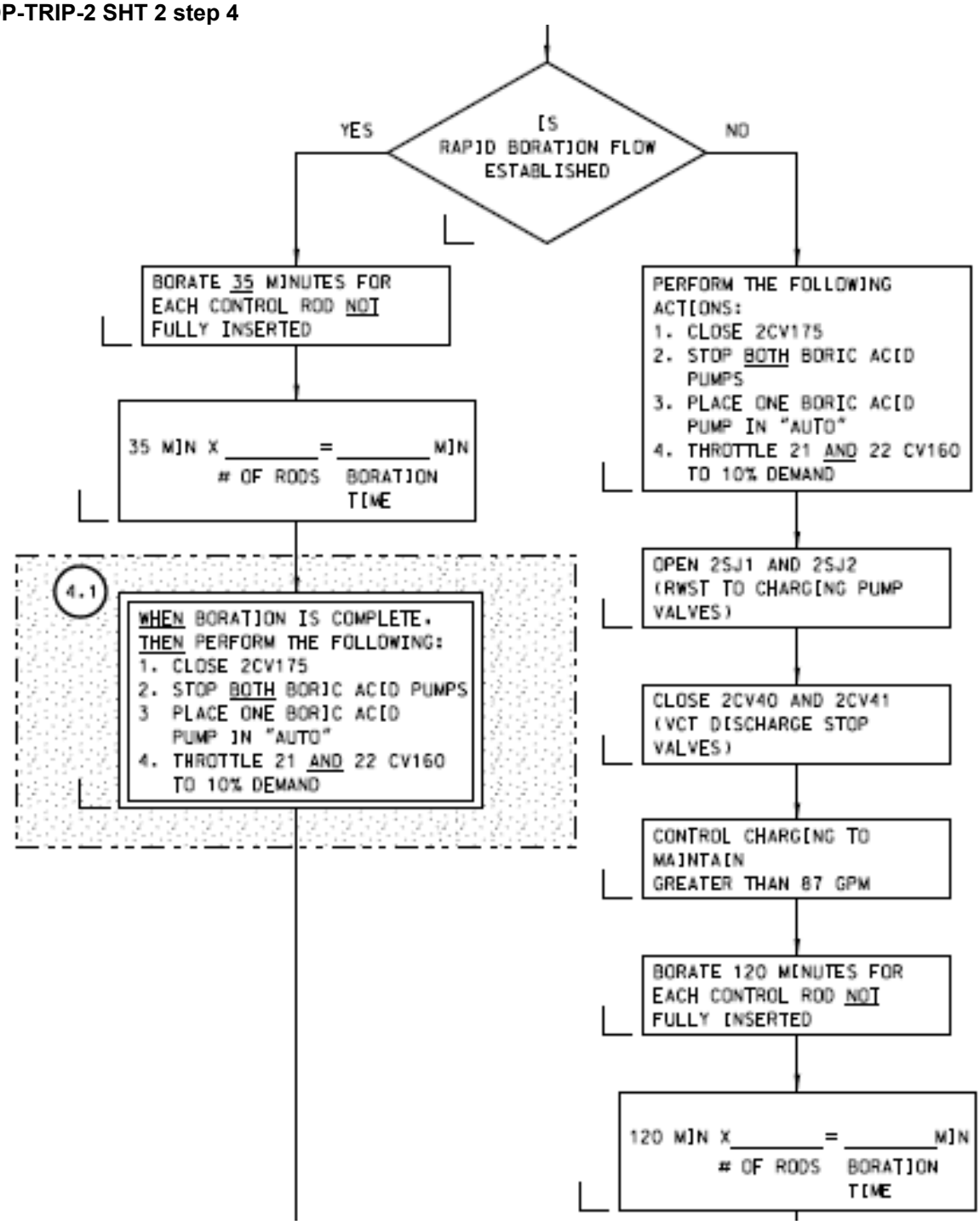


Figure 2
S2.OP-TM.ZZ-0002 page 6 of 34

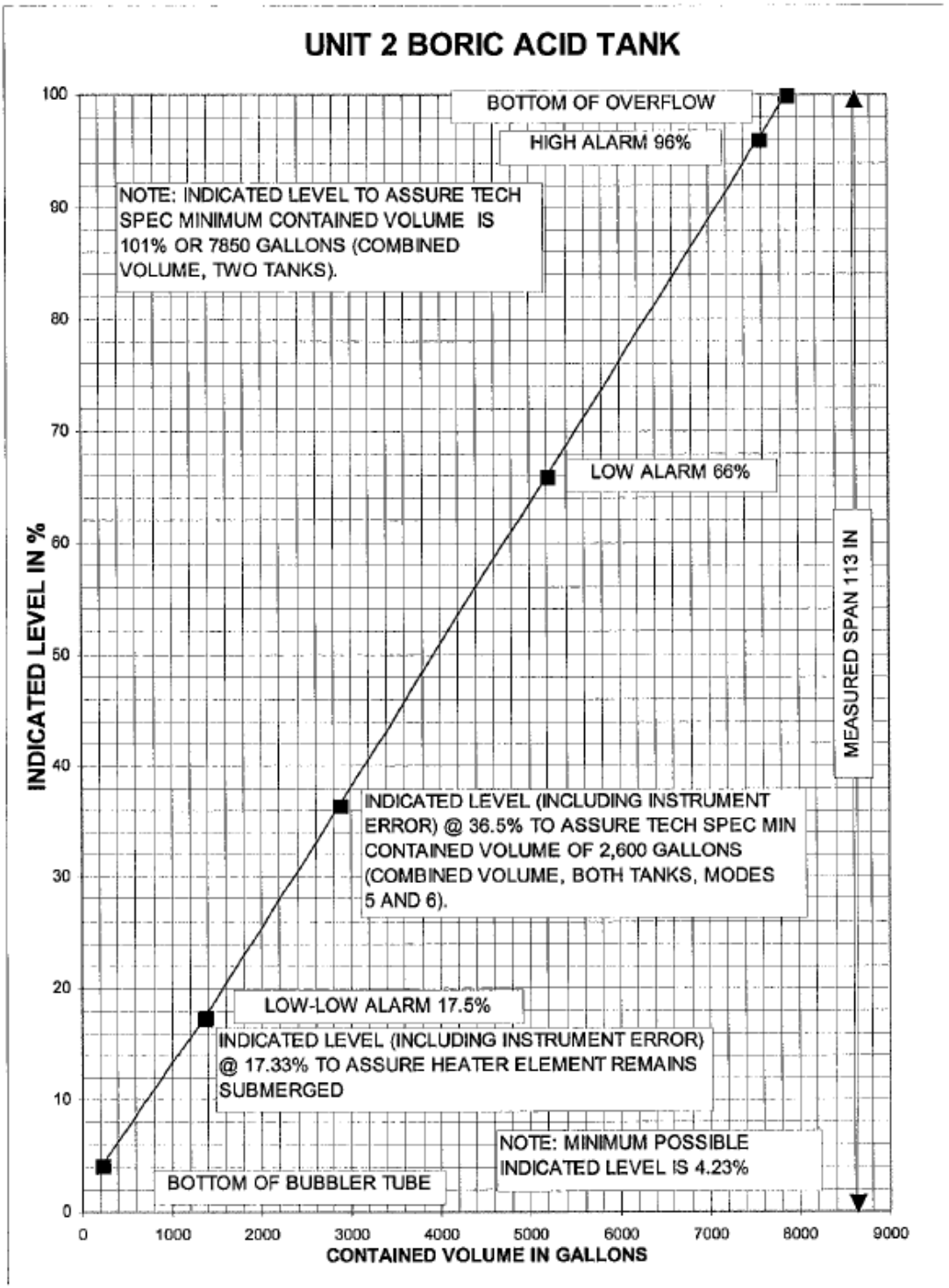


Figure 3 TS 3.1.2.6

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 As a minimum, the following borated water source(s) shall be OPERABLE as required by Specifications 3.1.2.1 and 3.1.2.2:

a. A boric acid storage system with:

1. A contained volume of borated water in accordance with figure 3.1-2,
2. A Boron concentration in accordance with Figure 3.1-2, and
3. A minimum solution temperature of 63°F.

b. The refueling water storage tank per Specification 3.5.5

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable and being used as one of the above required borated water sources, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, perform the Action in Specification 3.5.5.

SURVEILLANCE REQUIREMENTS

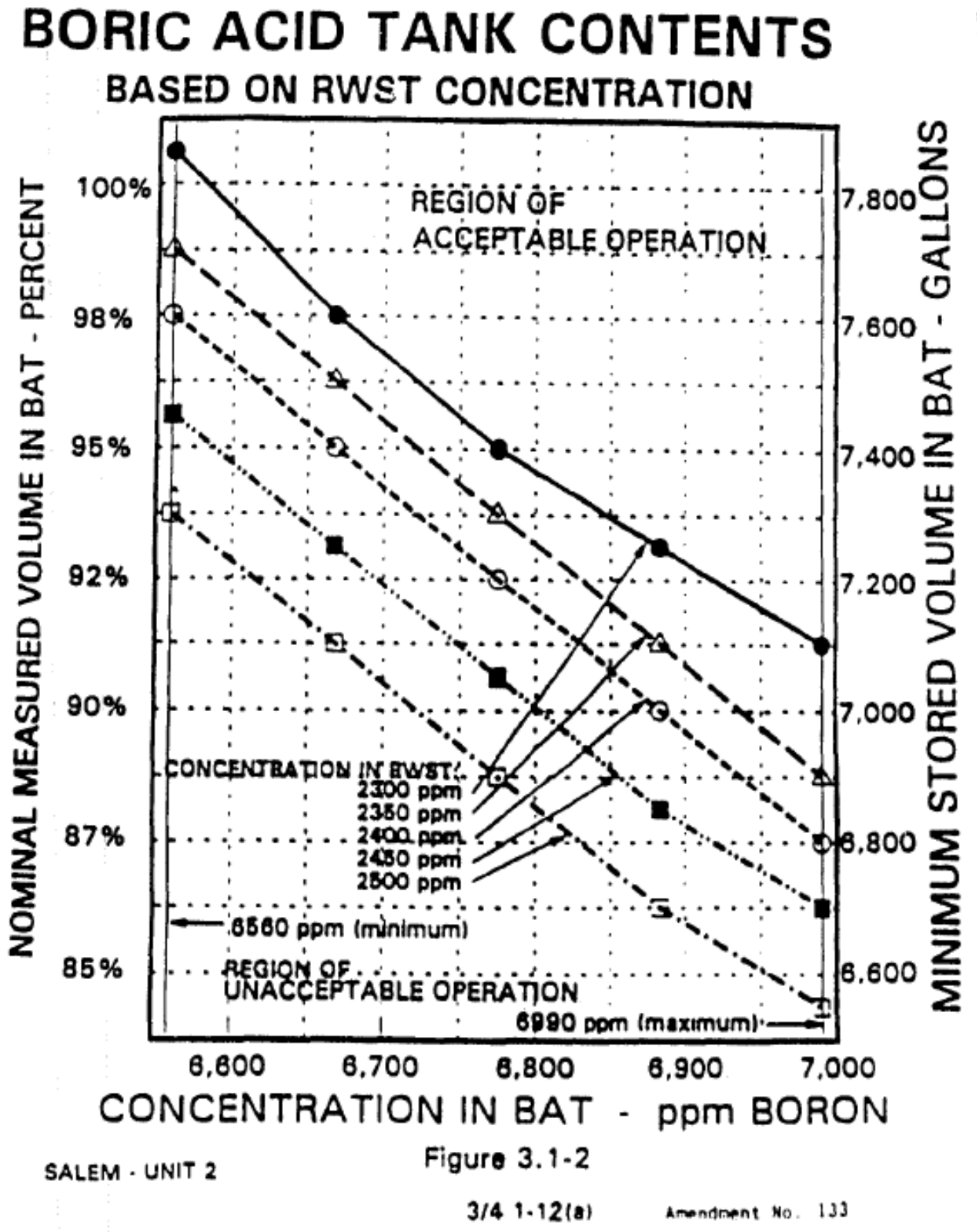
4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

a. For the boric acid storage system, when it is the source of borated water in accordance with the Surveillance Frequency Control Program by:

1. Verifying the boron concentration in each water source.
2. Verifying the water level of each water source, and
3. Verifying the boric acid storage system solution temperature.

b. For the refueling water storage tank per Surveillance Requirement 4.5.5.

Figure 4
TS 3.1.2.6 Figure3.1-2



OPERATIONS DEPARTMENT
JOB PERFORMANCE MEASURE

JPM: 20-01 ILOT SRO A2

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.

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

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

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

___KH_____ 4. Initial setup conditions are identified.

___KH_____ 5. Initiating and terminating Cues are properly identified.

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

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

___KH_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __40___ Date ___4-1-21_____

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

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

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

SME/Instructor: K.Hantho Date: -21

SME/Instructor: Date:

SME/Instructor: Date:

OPERATOR CUE SHEET

Applicant Name: _____

IN NITIAL CONDITIONS:

- Unit 2 experienced an automatic Reactor Trip from an inadvertent Main Turbine Trip.
- 2SJ2 was tagged for emergent repairs prior to the trip.
- SI is not required and the crew is implementing 2-EOP-TRIP-2, Reactor Trip Response.
- Three Control Rods from Control Bank Delta have failed to FULLY insert.
- RWST Concentration is 2350ppm, and BAST concentration is 6,650 ppm.
- Unit 2 remains in Mode 3 throughout the boration.
- Current BAST levels:
    - 21 BAST level: 70%
    - 22 BAST level: 70%

INITIATING CUE:

- You are the CRS.
- Determine the amount of time Rapid Boration is required IAW 2-EOP-TRIP-2 **Step 4** for the Three Control rods that have failed to insert on Control Bank Delta
    1. How many total minutes of Rapid Boration is required?

       _____ **Minutes**
    2. What will be the final BAST levels in percent IAW S2.OP-TM.ZZ-0002?
        - Assume the Rapid Boration flowrate remains at 40 GPM for the entire duration required in question 1, and Both BAST's lower equal amounts.

       21 BAST level: _____%

       22 BAST level:_____%
    3. Based on plant conditions after completion of the boration, identify any Tech spec(s) and Tech Spec action statement(s) required related to the boric acid system.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Administrative – Equipment Control

TASK: Review and approve a completed Containment Ventilation Valve surveillance.

TASK NUMBER: N1230010302

JPM NUMBER: 20-01 NRC SRO-A3

ALTERNATE PATH: [ ] **K/A NUMBER:** G 2.2.12

IMPORTANCE FACTOR: RO: ____ SRO: 4.1

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

EVALUATION SETTING/METHOD: Classroom / Simulate

REFERENCES: S2.OP-ST.CBV-0001 Rev 9, S2.RA-ST.CBV-0001 Rev 7,(checked 8-25-21)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: **N/A**

Developed By:	**R. Chan** **Instructor**	**Date: 1-10-22**
Validated By:	**M. Protesto** **SME or Instructor**	**Date: 1-10-22**
Approved By:	**M. Wadusky(Signature On file)** **Training Department**	**Date: 2-11-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-10-22**

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: 20-01 NRC SRO-A3

Rev #	Date	Description	Validation Required
00	8-25-21	**This is a NEW JPM**.	Yes
01	12-29-21	Incorporated NRC comments from ES-301-7.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Administrative – Equipment Control

TASK: Review and approve a completed Containment Ventilation Valve surveillance.

TASK NUMBER: N1230010302

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **Ensure complete copies of Unit 2 TS are available for each applicant.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Administrative – Equipment Control

TASK: Review and approve a completed Containment Ventilation Valve surveillance.

TASK NUMBER: N1230010302

INITIAL CONDITIONS:

- Completed surveillance was given to you at turnover and is in your inbox for review.
- Turnover stated it is just awaiting review and approval.

INITIATING CUE:

- You are the Unit 2 CRS
- Review the completed surveillance for compliance with Acceptance Criteria and document 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.

Task Standard for Successful Completion:

1. **Upon reviewing the completed surveillance procedure, the SRO identifies that 2VC5 stroke time is in the Required Action Range, declares the 2VC5 Inoperable, and determines TS LCO 3.6.3 is NOT met.**

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: Administrative – Equipment Control

TASK: Review and approve a completed Containment Ventilation Valve surveillance.

* #	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: • Completed S2.OP-ST.CBV-0001 • S2.RA-ST.CBV-0001 • Complete copy of Unit 2 Tech Specs **PROVIDE** if requested • Drawing 205338 sheets 1 and 2			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:_____**			
	5.4.3.A	**REVIEW** this procedure with Attachments 1-4 for completeness and accuracy.	Operator should initial after the correction is made to the Surveillance procedure		
	5.4.3.B	IF valve stroke times are within the ACCEPTABLE RANGE, THEN **DECLARE** the applicable valve(s) OPERABLE.	Operator will initial this step since all the valves, except 2VC5, were in the Acceptable Range.		

SYSTEM: Administrative – Equipment Control
TASK: Review and approve a completed Containment Ventilation Valve surveillance.

* #	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)
	5.4.3.C	IF ANY valve's stroke time is within the REQUIRED EVALUATION RANGE, THEN:	This step is N/A valve is in required action range. Cue: If operator requests to re-stroke valve, tell them it's unavailable to be tested.		
*	5.4.3.D.1	IF ANY valve's stroke time is in the REQUIRED ACTION RANGE, THEN: Immediately **DECLARE** the respective valve(s) inoperable.	**Operator will declare 2VC5 inoperable based on the stroke time of 2.83 seconds exceeding the Required Action Range of > 2.0 seconds.**		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: Administrative – Equipment Control

TASK: Review and approve a completed Containment Ventilation Valve surveillance.

* #	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)
*	5.4.3.D.2	**EVALUATE** Technical Specification requirements for system operability.	**Operator will evaluate Tech Specs and determine that TS action 3.6.3 is NOT MET for 2VC5.** **Minimum TS action 1a is currently applicable** TS action 1.b the 2VC6 must be closed and deactivated within four hours of the stroke time. OR TS action 1.c the penetration must be isolated within four hours of the stroke time. OR TS action 3.6.3 action 1.d - HOT STANDBY in the next 6 hours and COLD SHUTDOWN in the following 30 hours.		
	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 Operator reports that the 2VC5 valve is inoperable and TS 3.6.3 is applicable.**		

ATTACHMENT 2
(Page 2 of 2)

STROKE TIME DATA

2.0 **CONTAINMENT VENTILATION VALVES OPERATED FROM SSPS CABINETS**:

Component Description	Stroke	Stroke Time (sec)	Stopwatch Number	Stroke Date/ Time	Initials	Test Results		
						Acceptable Range SAT	Required Evaluation Range SAT	Required Action Range UNSAT
2VC6 Cont Press/Vac Relief Isol	X	1.08	220940	Today	JD	JD		
2VC5 Cont Press/Vac Relief Isol	X	2.83	220940	Today	JD	JD		
Acceptance Criteria:	Measured values are within bands specified in S2.RA-ST.CBV-0001(Q), Inservice Testing Containment Ventilation Valves Modes 1-6 Acceptance Criteria OR data represents new baseline data as determined by the IST Implementation Engineer.							

Attachment 1, STROKE TIME DATA ACCEPTANCE CRITERIA (continued)

1.0 (Continued)

Component	Stroke	Reference Value (seconds)	Date	Test Results					
				Acceptable Range (seconds)	Required Evaluation (seconds)		Required Action Range (seconds)		TS/FSAR (seconds)
					Low	High	Low	High	
2VC6	X (1)	0.8 (2)	10/02/95	≤ 2.0	N/A	N/A	N/A	> 2.0 (4)	≤ 2.0
2VC5	X (1)	0.51 (2)	10/02/95	≤ 2.0	N/A	N/A	N/A	> 2.0 (4)	≤ 2.0

(4) Exceeding the Required Action Range High Value may affect Technical Specification 4.3.2.1.3, Table 3.3-3, Functional Units 3.a and 3.c, Response Time surveillance requirements.

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 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.

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

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

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

__ KH ___ 4. Initial setup conditions are identified.

__ KH ___ 5. Initiating and terminating Cues are properly identified.

__ KH ___ 6. Task standards identified and verified by SME review.

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

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

___ KH __ 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.

___ KH __ 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

Applicant Name: _____

INITIAL CONDITIONS:

- Completed surveillance was given to you at turnover and is in your inbox for review.
- Turnover stated it is just awaiting review and approval.

INITIATING CUE:

- You are the Unit 2 CRS
- Review the completed surveillance for compliance with Acceptance Criteria and document results.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Radiation Control

TASK: Determine Personnel Exposure and Authorization for Containment entry at power

TASK NUMBER: 1200100104

JPM NUMBER: 20-01 NRC SRO-A4

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.3.4

IMPORTANCE FACTOR: RO: ____ SRO: 3.7

APPLICABILITY:

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

EVALUATION SETTING/METHOD: Classroom / Simulate

REFERENCES: Radiological Survey Map Dated 8-5-21, RP-SA-102 R0, SC.SA-ST.ZZ-0001 R5, RP-AA-300 R6, RP-AA-463 R6, RP-AA-203 R6 (checked 10-5-21)

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: 12-29-21**
Validated By:	**M. Protesto** **SME or Instructor**	**Date: 1-4-22**
Approved By:	**M. Wadusky(Signature On file)** **Training Department**	**Date: 2-11-22**
Approved By:	**W Hargrave** **Operations Department**	**Date: 1-10-22**

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: 20-01 NRC SRO-A4

Rev #	Date	Description	Validation Required
00	10-5-21	**This is a NEW JPM**.	Yes
01	12-29-21	Incorporated NRC comments from ES-301-7.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative – Radiation Control

TASK: Determine Personnel Exposure and Authorization for Containment entry at power

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 dated 8-5-21 (**MAKE SUREY MAP ENLARGED TO 11 X 17**)
- RP-SA-102, Containment entries at power
- SC.SA-ST.ZZ-0001 Salem containment entries in Modes 1 through 4
- RP-AA-300, Radiological Survey Program
- RP-AA-463, High radiation area key controls
- RP-AA-203, Exposure control and authorization

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Administrative – Radiation Control

TASK: Determine Personnel Exposure and Authorization for Containment entry at power

TASK NUMBER: 1200100104

INITIAL CONDITIONS:

- Salem 2 is at 100% power reducing power at 10% per hour to perform Turbine valve testing.
- The 22 CFCU has been declared inoperable.
- Tagging has been completed.

INITIATING CUE:

- You are the WCCS and need to send operators into containment to remove tags to allow work on 22 CFCU disassembly to continue.
- Operator A has 1992 mrem TEDE for the year and Operator B has 1496 mrem TEDE for the year so far.
- Using the provided Radiological Survey Map and procedures, determine the following:

1. Whose authorization outside of Operations, by position, is needed to enter the containment during the downpower?

2. In accordance with the provided survey map perform the following:

2.1. Calculate the dose for each operator (Assume both operators **each** take 12 minutes in the area to perform their tagging evolution):

- Gamma dose _____mrem
- Neutron dose _____mrem

2.2. Will the operators exceed the Administrative Annual Dose limit? If so, identify which Operator(s)?

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 the Radiation Protection Supervisor must authorize entry**
2. **Determines Gamma dose for each operator 1 mrem**
3. **Determines Neutron Dose each operator 8 mrem**
4. **Determines Operator A total dose is 2001 mrem and Operator B total dose is 1505 mrem, Operator A exceeds administrative dose control limit of 2000 mrem.**

SYSTEM: Generic Administrative – Radiation Control
TASK: Determine Personnel Exposure and Authorization for Containment entry at power

* #	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: ♦ RP-AA-463, High Radiation Area Key Controls ♦ Radiological Survey Map dated 8-5-21 ♦ RP-SA-102, Containment entries at power ♦ SC.SA-ST.ZZ-0001 Salem containment entries in Modes 1 through 4 ♦ RP-AA-300, Radiological Survey Program ♦ RP-AA-203, Exposure control and authorization			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:_____**			

SYSTEM: Generic Administrative – Radiation Control
TASK: Determine Personnel Exposure and Authorization for Containment entry at power

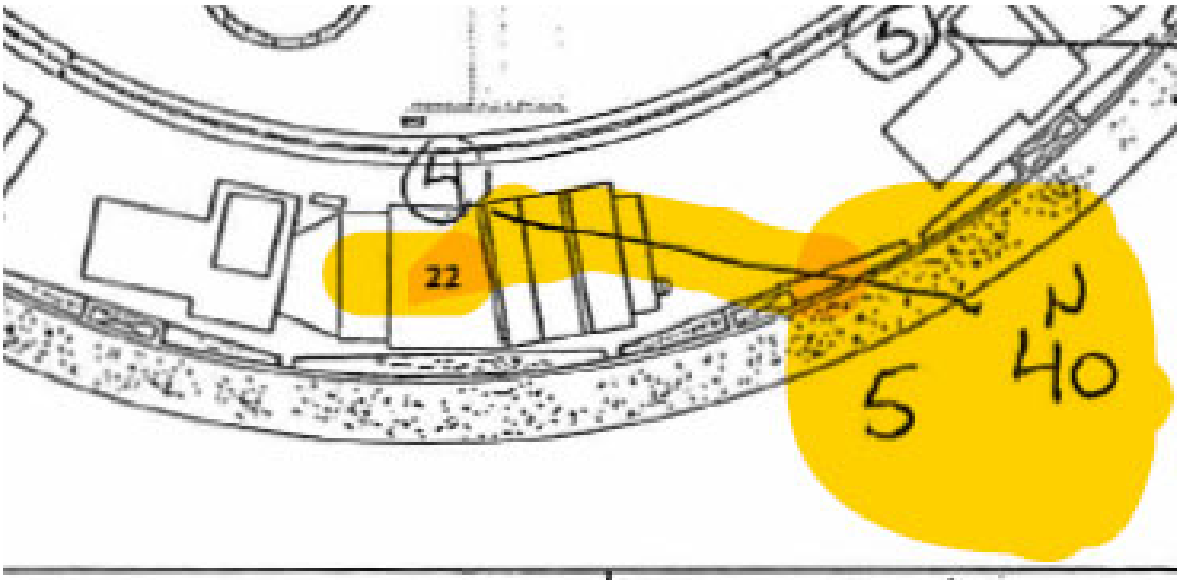
* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	1.0	Whose authorization outside of Operations, by position, is needed to enter the containment during the downpower?	**Radiation Protection Supervisor(RPS) as designated in RP-SA-102 and SC.SA-ST.ZZ-0001**		
*	2.1.A	Calculate the dose for each team member: • Gamma dose ____ mrem	**Gamma dose** **12 minutes/60 minutes X 5 mrem/hr = 1 mrem**		
*	2.1.B	Calculate the dose for each team member: • Neutron dose _____mrem	**Neutron dose** **12 minutes/60 minutes X 40 mrem/hr = 8 mrem**		
*	2.2	Will the operators exceed the Administrative Annual Dose limit? If so, identify which Operator(s)?	**Yes, Operator A only** **Operator A is at 2001 mrem** **Operator B is at 1505 mrem** **Administrative dose control limit(ADCL) is 2000 mrem** **A – 1 mrem above ADCL** **B - 495 mrem below ADCL**		

SYSTEM: Generic Administrative – Radiation Control
TASK: Determine Personnel Exposure and Authorization for Containment entry at power

* #	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.**		

___ 2.4 **ENSURE** that prior approval from the Radiation Protection Supervisor (RPS) is obtained by RP for access to the following restricted areas during Modes 1 and 2:

- Entry into the containment during planned power changes (up or down) in excess of five percent per hour.
- Entry into containment during abnormal operating conditions/evolutions that may affect containment radiological conditions during the time of entry, i.e. placing excess letdown in service, significantly changing charging flow, letdown flow, or pressurizer spray flow including changing pressurizer heaters.



4.2. Authorization To Raise Administrative Dose Control Levels (ADCLs)

4.2.1. **USE** Attachment 1, Dose Control Level Extension Form, or a computerized equivalent, to authorize exposures for adult individuals in excess of 2000 mrem routine TEDE in a year.

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 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.

_____ 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.

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

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

Applicant Name: _____

INITIAL CONDITIONS:

- Salem 2 is at 100% power reducing power at 10% per hour to perform Turbine valve testing.
- The 22 CFCU has been declared inoperable.
- Tagging has been completed.

INITIATING CUE:

- You are the WCCS and need to send operators into containment to remove tags to allow work on 22 CFCU disassembly to continue.
- Operator A has 1992 mrem TEDE for the year and Operator B has 1496 mrem TEDE for the year so far.
- Using the provided Radiological Survey Map and procedures, determine the following:

1. Whose authorization outside of Operations, by position, is needed to enter the containment during the downpower?

2. In accordance with the provided survey map perform the following:

2.1. Calculate the dose for each operator (Assume both operators **<u>each</u>** take 12 minutes in the area to perform their tagging evolution):

- Gamma dose _____mrem
- Neutron dose _____mrem

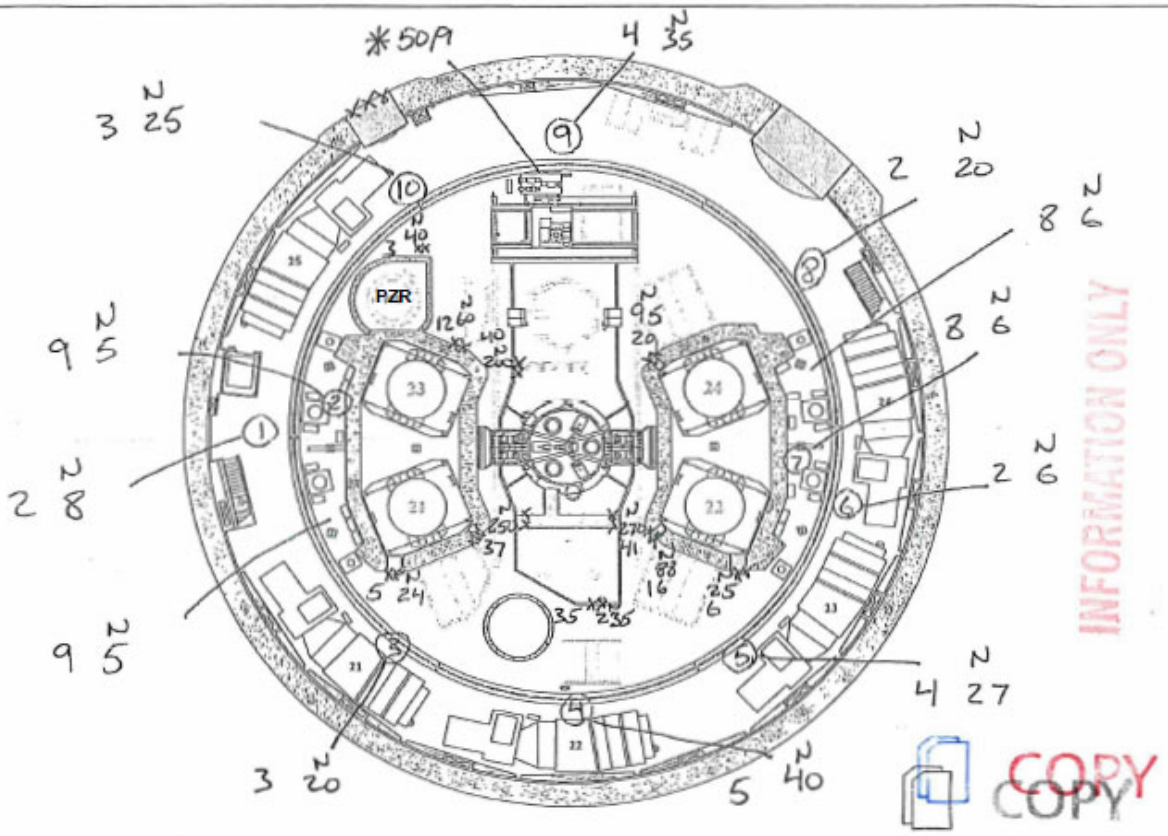
2.2. Will the operators exceed the Administrative Annual Dose limit? If so, identify which Operator(s)?

[Provide your answers on this cue sheet]

Salem GENERATING STATION

Radiological Survey

MAP # 2213000



Location: S2 CTMT 130' GENERAL AREA					Date: 8/5/21		Time: 1340		RWP: 3
Surveyed By:		Radiation Survey			Contamination Survey				
Print: BURDSALL		Instrument: TPOLE	Serial#: 6610-064		β,γ	Instrument: RM14	Serial#: 8275		
Sign:		Instrument: LUD 30	Serial#: 7003		α	Instrument: N	Serial#: A		
Contamination β,γ								Contamination α	
LOC	dpm/100cm²	LOC	dpm/100cm²	LOC	dpm/100cm²	LOC	dpm/100cm²	LOC	ccpm	dpm/100cm²
1	<1K	6	<1K	N						
2		7								
3		8								
4		9								
5	<1K	10	<1K							A

		COMMENTS: CTMT HRA NA ARA CA NRP (LOCKED)	PZR LHRA NRP (LOCKED)	'D' RING LHRA NRP (LOCKED)	Rx CAVITY LHRA NRP (LOCKED)	101°WBGT
n/a	n/a					
X	Routine					
N/	S.O.J.					
/A	Other				Rx Power: 100%	

Supervisor Review

Print / Sign: B. ACHUFF / [signature] DATE: 8/5/21

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin - Emergency Plan

TASK: Classify an Event and Determine PARs

TASK NUMBER: 1240020502

JPM NUMBER: 20-01 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-325-114 (Section S1), Rev 00 (checked 6-28-21)
EP-SA-325-F4 (GE), Rev 01

TOOLS AND EQUIPMENT: ECG Books

VALIDATED JPM COMPLETION TIME: 10 mins

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: 15 / 15 mins

Developed By:	**R. Chan** **Instructor**	**Date: 1-10-22**
Validated By:	**M. Protesto** **SME or Instructor**	**Date: 1-10-22**
Approved By:	**M. Wadusky(Signature On file)** **Training Department**	**Date: 2-11-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-10-22**

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: 20-01 NRC SRO-A5

Rev #	Date	Description	Validation Required
00	4-10-18	**NEW JPM for 2018 Annual**. Incorporated comments from validation.	Yes
01	1-10-19	Updated references to the new EAL books (EP-SA-325). No change to EAL # or classification.	Yes
02	1-10-22	Incorporated NRC comments from Prep week.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin - Emergency Plan

TASK: Classify an Event and Determine PARs

TASK NUMBER: 1240020502

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **ENSURE** sufficient copies of Attachments 1 thru 4.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Admin - Emergency Plan

TASK: Classify an Event and Determine PARs

TASK NUMBER: 1240020502

INITIAL CONDITIONS:

- Salem Units 1 and 2 are at 100% power.
- 23 Station Power Transformer (SPT) is tagged and is 12 hours into a 24 hour scheduled maintenance window.
- An electrical grid disturbance on the 500 kV lines has caused the Unit 2 Main Generator protection circuit to automatically trip the Unit 2 reactor.
- The crew is transitioning from EOP-TRIP-1 to EOP-TRIP-2.
- Following transition to TRIP-2, 24 SPT de-energizes due to actuation of electrical protection relays.
- The 2A Emergency Diesel Generator (EDG) started then tripped on overspeed and could not be reset; and the 2B 4 KV Vital Bus de-energized following a Bus Differential protection trip.
- Minutes later the Primary Operator reports a loud sound from the EDG rooms and 2C EDG trips.

INITIATING CUE:

- Maintenance provides you the following updates:
    - 2A EDG will take 5 hours to repair the bent linkage to the fuel racks.
    - 2B 4 KV Vital Bus has sustained significant damage to the bus bars due to a ground fault.
    - 2C EDG has sustained significant engine damage due to an engine piston failure.
    - 23 SPT needs 8 hours to restore and release tags.
    - 24 SPT sustained an internal fault and will need outside vendor support. Vendor is expected to be on-site in 3.5 hours.
- You are the Emergency Coordinator:
    1. **Classify the emergency event, and**
    2. **Complete the Initial Contact Message Form (ICMF)** .
- MET computer 33 FT. level wind direction is steady from 90 degrees at 2 mph.
- 2R41D, Plant Vent Radiation monitor is reading normal.

*****THIS IS A TIME CRITICALL 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 GENERAL EMERGENCY (GE) based on SG1.1 ≤ 15 mins.**
2. **Completes Attachment 4 Sections I thru V of the ICMF and selects Default PAR (No RPSA) ≤ 15 minutes from event declaration (see ICMF Answer Key).**

Page left intentionally blank

System: Generic Admin - Emergency Plan

Task: Classify an Event and Determine PARs

* #	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 Emergency Action Levels (EALs) Flowcharts & Attachments book ▪ Salem Emergency Action Levels (EALs) Technical Basis book ▪ Attachments 1 thru 4 (EP-SA-325-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.		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Admin - Emergency Plan

Task: Classify an Event and Determine PARs

* #	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)
*	1	**Classify the emergency event:**	**SRO classifies the event as a GENERAL EMERGENCY (GE) based on ECG – EAL Section S- System Malfunction, S1 Loss of AC Power, EAL# SG1.1 for GE.**		
*	2	**Complete the ICMF:**	**SRO accurately completes Attachment 4 Sections I thru V of the ICMF.** See attached Answer Key.		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Admin - Emergency Plan

Task: Classify an Event and Determine PARs

* #	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 Cont.	APPENDIX 1 - PREDTERMINED PROTECTIVE ACTION RECOMMENDATIONS	Operator uses Attachment 4, EP-SA-325-F4, Appendix 1, and correctly answers the following questions to determine PARs: ▪ Initial PAR – Yes ▪ GE based on Loss of Three Fission Product Barriers? – No ▪ Is there a Hostile Action Event in Progress affecting the GE? – No ▪ **Selects Default PAR (No RPSA)** ➢ **Evacuate All Sectors 0-5 miles** ➢ **Monitor & Prepare All Sectors 5-10 miles**		
	CUE:	**JPM is Complete** **RECORD** the STOP TIME**:** **STOP TIME:**_____	**Terminate JPM when SRO submits the ICMF form.**		

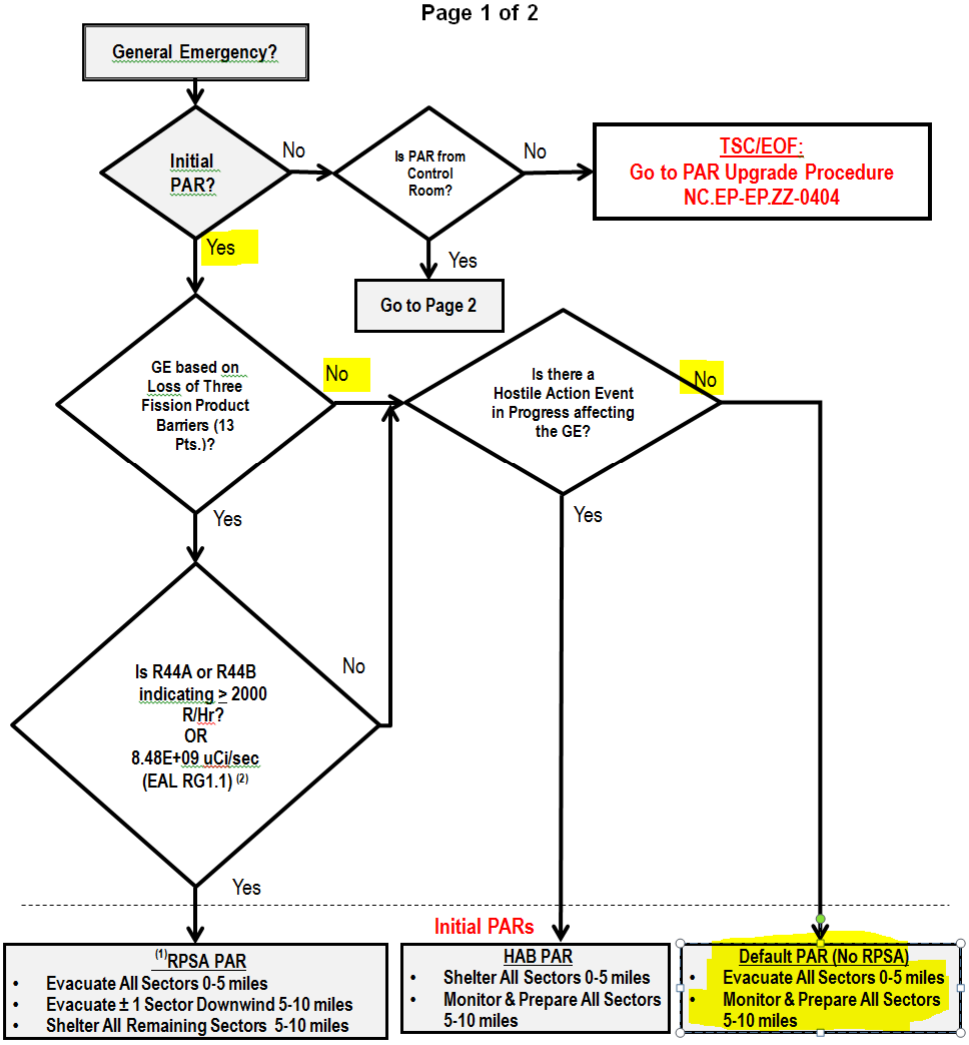
Section S – System Malfunction
S1 – Loss of AC Power

Initiating Condition	Loss of **ALL** offsite power and **ALL** onsite AC power to vital buses for 15 minutes or longer	Prolonged loss of **ALL** offsite and **ALL** onsite AC power to vital buses
MODE	1, 2, 3, 4	1, 2, 3, 4
EAL #	SS1.1	SG1.1
EMERGENCY ACTION LEVELS	IF Loss of **ALL** offsite and **ALL** onsite AC power to 4 KV vital buses **AND** **≥ 15 minutes** have elapsed (Note 1) **THEN**	IF Loss of **ALL** offsite and **ALL** onsite AC power to 4 KV vital buses **AND** **EITHER** of the following: • Restoration of at least one Vital Bus in **< 4 hrs** is **NOT** likely • CFST Core Cooling **RED** path exists (Note 1) **THEN**
Action Required	Refer to Attachment 3 **SITE AREA EMERGENCY**	Refer to Attachment 4 **GENERAL EMERGENCY**

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

S1

APPENDIX 1
PREDETERMINED PROTECTIVE ACTION RECOMMENDATIONS
Page 1 of 2



SEE LAST PAGE OF ATTACHMENT TO DETERMINE DOWNWIND SECTORS

ANSWER KEY

INITIAL CONTACT MESSAGE FORM

I. THIS IS _____, COMMUNICATOR IN THE ☑ CONTROL ROOM
(NAME) ☐ TSC
☐ EOF

AT THE **SALEM** NUCLEAR GENERATING STATION, **UNIT**(s) No. 2

IIa. ☑ THIS IS NOTIFICATION OF AN **GENERAL EMERGENCY** WHICH WAS

DECLARED AT	Current Time (Time - 24 HR CLOCK)	ON	Today (DATE)

EAL #	SG1.1	,		,	
DESCRIPTION OF EVENT:	Prolonged Loss Of Power To All Vital Buses				

OR

IIb. ☐ THIS IS NOTIFICATION OF A PROTECTIVE ACTION RECOMMENDATION UPGRADE MADE AT _____ (Time - 24 HR CLOCK) HRS ON _____ (DATE)

Reason for PAR Upgrade:

III. ☐ THERE **IS** A RELEASE IN PROGRESS DUE TO THE EVENT
☑ THERE IS **NO** RELEASE IN PROGRESS DUE TO THE EVENT

} Any release above normal, attributable to the event. See Basis for examples

IV. 33 FT. LEVEL WIND DIRECTION (**From**): 90 (DEGREES) WIND SPEED: 2 (MPH)
(From MET Computer /SPDS)

V.	Sectors	Dist. - Mile
☑ WE RECOMMEND **EVACUATION** AS FOLLOWS	ALL	0-5
☐ WE RECOMMEND **SHELTERING** AS FOLLOWS		
☑ WE RECOMMEND **MONITOR AND PREPARE** AS FOLLOWS	ALL	5-10
☑ WE RECOMMEND THE **USE OF KI** IN ACCORDANCE WITH STATE PROCEDURES		

_____
EC Initials
(Approval to Transmit ICMF)

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM #: 20-01 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.

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

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

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

____RC__ 4. Initial setup conditions are identified.

____RC__ 5. Initiating and terminating Cues are properly identified.

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

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

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

____RC__ 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.

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

SME/Instructor: R. Chan Date 1-10-22

SME/Instructor: M. Protesto Date: 1-10-22

SME/Instructor: Date:

Applicant Name:_____

INITIAL CONDITIONS:

- Salem 2 is at 100% power.
- 23 Station Power Transformer (SPT) is tagged and is 12 hours into a 24 hour scheduled maintenance window.
- An electrical grid disturbance on the 500 kV lines has caused the Unit 2 Main Generator protection circuit to automatically trip the Unit 2 reactor.
- The crew is transitioning from EOP-TRIP-1 to EOP-TRIP-2.
- Following transition to TRIP-2, 24 SPT de-energizes due to actuation of electrical protection relays.
- The 2A Emergency Diesel Generator (EDG) started then tripped on overspeed and could not be reset; and the 2B 4 KV Vital Bus de-energized following a Bus Differential protection trip.
- Minutes later the Primary Operator reports a loud sound from the EDG rooms and 2C EDG trips.

INITIATING CUE:

- Maintenance provides you the following updates:
  - 2A EDG will take 5 hours to repair the bent linkage to the fuel racks.
  - 2B 4 KV Vital Bus has sustained significant damage to the bus bars due to a ground fault.
  - 2C EDG has sustained significant engine damage due to an engine piston failure.
  - 23 SPT needs 8 hours to restore and release tags.
  - 24 SPT sustained an internal fault and will need outside vendor support. Vendor is expected to be on-site in 3.5 hours.
- You are the Emergency Coordinator:
  1. **Classify the emergency event, and**
  2. **Complete the Initial Contact Message Form (ICMF).**
- MET computer 33 FT. level wind direction is steady from 90 degrees at 2 mph.
- 2R41D, Plant Vent Radiation monitor is reading normal.

*****THIS IS A TIME CRITICAL JPM*****

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

TASK NUMBER: 50638

JPM NUMBER: 20-01 NRC Sim-a

ALTERNATE PATH: [X]

K/A NUMBER: 001 A2.11

IMPORTANCE FACTOR: 4.4 (RO) 4.7 (SRO)

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

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-ST.RCS-0001 Rev. 25 (checked 8-2-21)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 Minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**K. Hantho** **Instructor**	**Date: 8-2-21**
Validated By:	**Rydell/Zirkle** **SME or Instructor**	**Date: 8-12-21**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-10-22**

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: 20-01 NRC Sim-a

Rev #	Date	Description	Validation Required
00	8-13-19	**Modified JPM**. Added Alternate Path for continuous rod motion when rod bank selected to Auto or Manual requiring operator to Manually trip the reactor. 001 K/A A2.11: Ability to (a) predict the impacts of the following malfunction or operation on the CRDS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: situations requiring a reactor trip	Yes
01	8-2-21	Updated revision of procedures, added new steps for the three steps cycling prior to large rod movement.	
02	1-10-22	Incorporated NRC comments from ES-301-7 and Prep week.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

TASK NUMBER: 50638

SIMULATOR IC: IC-250

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	RD0045, Uncontrolled Rod Insert in Auto	N/A	N/A	N/A	ET-1	TRUE
02						

3. These malfunctions will simulate failure of rod control system when rods are selected to Auto or Manual (Alt Path) resulting in continuous rod insertion. The operator will mitigate the event by manually tripping the reactor.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	KB433W1D, Rod Bank Selector Sw in Auto				ET-1	ON
02						
03						
04						

EVENT TRIGGERS:

ET#	Description	Command
1	KB433W1D, Rod bank Selector SW to Auto	

SPECIAL INSTRUCTIONS:

- Rod bank selector switch selected to **CBC position**
- **Ensure** ARPI screen is up on P-250.
- For efficiency, provide the procedures to the operators up front to allow time to read and review.

NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

TASK NUMBER: 50638

INITIAL CONDITIONS:

- Unit 2 is at 100% power BOL.
- No major equipment is out of service and no Tech Specs are active.
- The rod control system surveillance is in progress. All sections are complete, except for exercising Control Bank D.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to complete the rod control system surveillance IAW S2.OP-ST.RCS-0001, Reactivity Control System Rod Control Assemblies.
- A Maintenance Technician is stationed at the Rod Control Power Cabinets (Relay Room)
- CRS directs that 15 steps of rod insertion will be performed to ensure each rod moves at least 10 steps.
- Notify the CRS when the testing is complete.
- Your evaluator will take care of 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:
1. **Exercises Control Bank D at least 10 steps and upon completion of the test recognizes unexpected continuous rod movement requiring a manual reactor trip.**

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	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)
		♦ **ENSURE** marked up copy of S2.OP-ST.RCS-0001 is open and marked up on console. ♦ Provide copy of OP-AP-300-1001, PWR Control Rod Movement Requirements.			
		Operator reads and reviews procedures prior to start.	Operator reads P&Ls and reviews OP-AP-300-1001 prior to start		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	4.1.10.1	1. IF the reactor is critical, THEN **ENSURE** TAVG is within ±1°F of TREF.	Operator checks Tave/Tref recorder on 2RP4 and determines Tavg is within +/-1 F of Tref.		
*	4.1.10.2	2. **PLACE** Bank Selector Switch in the "CBD" position.	**Operator rotates selector switch clockwise to the CBD position**		

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	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)
	4.1.10.3	3. **ENSURE** GRP. SELECT "B" lights are illuminated on Rod Control System Power Cabinets 21BD and 22BD.	Contacts Maint Technician at Power Cabinets. **CUE**: *Technician reports GRP SELECT 'B' lights are illuminated on Cabinets 21 BD and 22BD*.		
		Evaluators Note: Steps 4.1.10.4 and 4.1.10.5 will be performed three times consecutively prior to the 15 step insertion in step 6. **Evaluators Note:** IF the applicant moves the rods only one and a half a steps, THEN instruct the applicant to move the rods in the same direction then come back two full steps prior to reversing direction.			
	4.1.10.4	Insert Control Bank D 1 step.	**Operator inserts one step.**		
	4.1.10.5	Withdraw Control Bank D 1 step.	**Operator withdraws one step.**		
	4.1.10.4	Insert Control Bank D 1 step.	**Operator inserts one step.**		
	4.1.10.5	Withdraw Control Bank D 1 step.	**Operator withdraws one step.**		
	4.1.10.4	Insert Control Bank D 1 step.	**Operator inserts one step.**		
	4.1.10.5	Withdraw Control Bank D 1 step.	**Operator withdraws one step.**		

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	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)
*	4.1.10.6	6. **MANEUVER** Control Bank **D** at least 10 steps in any one direction.	**Operator inserts Control Bank D 15 steps.**		
	4.1.10.7	7. **ENSURE** each rod in Control Bank **D** indicated rod movement of at least 10 steps.	**Evaluator's Note:** Operator may request to insert rods additional steps, IF so, just restate the request. Operator monitors rod position on P-250 and determines D bank rods all moved at least 10 steps. **Optional CUE**: *Reactor Engineer reports rods indicate 10 step movement.*		
*	4.1.10.8	8. **RECORD** CONTROL BANK **D** "Test Results" by initialing the SAT or UNSAT column using the Acceptance Criteria in Attachment 1, Rod Control Assembly Data.	**Operator records test results as SAT.**		
*	4.1.10.9	9. **RESTORE** Control Bank **D** to the pre-test position.	**Operator withdraws Bank D to previous position (ARO)**		
	4.1.11	**ALIGN** the Rod Control System as follows:			
		ALTERNATE PATH STARTS HERE:	**Continuous rod movement when rod bank is selected to Auto or Manual**		

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	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)
	4.1.11.1	A. IF the reactor is critical, THEN **ENSURE** TAVG is within ±1°F of TREF.	Operator checks Tave/Tref recorder on 2RP4 and determines Tavg is within 1 F of Tref**.**		
	4.1.11.2	2. IF Turbine Power is ≤15%, THEN **PLACE** Bank Selector Switch in the "MAN" position. **Simulator Operator**: **ENSURE ET-1** is TRUE when rods selected to Auto. This will insert **MALF: RD0045, Uncontrolled Rod Insertion in AUTO AND MANUAL.**	N/A		

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	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)
*	4.1.11.3	3. IF Turbine Power is >15%, THEN **PLACE** Bank Selector Switch in the "AUTO" OR "MAN" position as directed by the SM/CRS.	**CUE:** IF asked, *CRS directs rod bank selected to AUTO*. Operator determines that Rx power is > 15% and rotates selector switch counterclockwise to the AUTO position. Operator announces that rods are stepping in and no runback in progress. **CUE:** IF operator recommends to CRS to place rods in Manual, THEN state; ***understand placing rods to manual.*** Operator places rod bank switch to Manual and reports rod motion has NOT stopped. **Operator Manually trips the Reactor.** **JPM Complete once Reactor is Tripped.**		
		Examiner's Note: **The operator may refer to S2.OP-AB.ROD-0003, Continuous Rod Motion and take the actions in the AB to manually trip the reactor.**			

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	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 the JPM when Reactor is tripped.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 NRC Sim-a

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

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

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

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

KH 4. Initial setup conditions are identified.

KH 5. Initiating and terminating cues are properly identified.

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

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

KH 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __25___ Date ____7-22-21_____

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

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

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

SME/Instructor: Date:

SME/Instructor: Date:

SME/Instructor: Date:

INITIAL CONDITIONS:

- Unit 2 is at 100% power BOL.
- No major equipment is out of service and no Tech Specs are active.
- The rod control system surveillance is in progress. All sections are complete, except for exercising Control Bank D.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to complete the rod control system surveillance IAW S2.OP-ST.RCS-0001, Reactivity Control System Rod Control Assemblies.
- A Maintenance Technician is stationed at the Rod Control Power Cabinets (Relay Room)
- CRS directs that 15 steps of rod insertion will be performed to ensure each rod moves at least 10 steps.
- Notify the CRS when the testing is complete.
- Your evaluator will take care of all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Chemical and Volume Control System (CVCS)

TASK: Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006

TASK NUMBER: 0040130101

JPM NUMBER: 20-01 NRC Sim-b

ALTERNATE PATH: [ ]

K/A NUMBER: 004 A4.04

IMPORTANCE FACTOR:	3.2	3.6
	RO	**SRO**

APPLICABILITY:

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

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-SO.CVC-0006, Rev. 25 (checked 8-3-21)
S2.OP-AB.CVC-0001, Rev. 14
S2.RE-RA.ZZ-0012 Rev. 225

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **K.Hantho** **Date: 8-3-21**
Instructor

Validated By: **Rydell/Zirkle** **Date: 8-12-21**
SME or Instructor

Approved By: **M. Wadusky (signature on file)** **Date: 2-10-22**
Training Department

Approved By: **W. Hargrave** **Date: 1-11-22**
Operations Department

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: 20-01 NRC Sim-b

Rev #	Date	Description	Validation Required
00	9-8-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-15-17	Added note for evaluator for step 5.2.4 that 2CV179 when placed in manual will initially go open from the closed position as per design.	No
02	8-3-21	Updated to current procedure revisions. JPM not affected by revisions.	Yes
03	1-3-22	Incorporated NRC comments from ES-301-7.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Chemical and Volume Control System (CVCS)

TASK: Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006

TASK NUMBER: 0040130101

SIMULATOR IC: IC-251

MALFUNCTIONS / REMOTES:

1. Reset the simulator to IC-251
2. The following malfunctions have been INSERTED:
   - **MALF CV0037 VCT LEVEL XMTR LT112 FAILS H/L, Final Value: 100.**
3. This completes the setup for this JPM.

OVERRIDES: None

SPECIAL INSTRUCTIONS:

- **Ensure the VCT level is about 30%.**
- **Ensure a marked up (partial procedure usage) of S2.OP-SO.CVC-0006 is available for candidate.**
- **Setup Plant computer on 2CC1 to CVCS system so operator can monitor VCT level using 2LT114.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Chemical and Volume Control System (CVCS)

TASK: Perform Manual Makeup to VCT IAW S2.OP-SOCVC-0006.

TASK NUMBER: 0040130101

INITIAL CONDITIONS:

- 100% power, MOL. RCS boron concentration is 900 ppm.
- The crew has entered S2.OP-AB.CVC-0001, Loss of Charging, due to VCT level channel 2LT112 failing high.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to PERFORM a manual makeup of the VCT to RESTORE VCT level to 53% IAW **S2.OP.SO.CVC-0006, Boron Concentration Control, Section 5.2, Manual Makeup Mode**.
- All prerequisites are complete.
- Boric Acid Storage Tank boron concentration is 6,700 ppm.

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 manual makeup to VCT and stops the makeup when informed that VCT level is at 53%.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Chemical and Volume Control System (CVCS)**

TASK: **Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006**

* #	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:	Provide the operator the initial conditions, marked up S2.OP-SO.CVC-0006, and initiating cue sheet.			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	Pre-Reqs 2.0	PREREQUISITES 2.1 THRU 2.3	**Cue**: All prerequisites are completed SAT with no issues.		
	P&Ls	Precautions and Limitations 3.1 thru 3.22	Operator reviews all P&Ls.		
	5.2	**MANUAL MAKEUP MODE**	N/A		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Chemical and Volume Control System (CVCS)**

TASK: **Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.2.1	**DETERMINE** Boric Acid Flow Setpoint from S2.RE-RA.ZZ-0012, Figure(s), 100A, 100C, and 105 as applicable, OR as calculated and verified by the CRS/STA, AND **RECORD** Boric Acid Flow Setpoint.	**Cue:** If asked about Boric Acid Tank Boron concentration, state all required information given in Initiating Cue. **Cue: IF** operator uses the current makeup boric acid flow setpoint as displayed on the control console, **THEN CUE** that the CRS directs you to perform Step 5.2.1 to verify the Boric Acid Flow setpoint is correct. **Evaluator's Note**; Correct Figure to Use is 100A for 62 gpm Primary Water Flow with BAST concentration at normal ppm. 100C is wrong figure because it is for 9000 ppm boron which is not used during normal ops. Figure 105 is the correction factor for RCS temperatures less than 547, which is N/A at 100% power. **If operator uses the graph; then setpoint is about 10 gpm.** **If operator calculates; then setpoint is 9.6 gpm.** **Operator determines setpoint between 9-11 gpm.** **Evaluator's Note**: If operator performs calculation using 900 ppm in RCS and 6,700 ppm in BAST, result is 9.62 gpm. Boric Acid flow setter is in 1 gallon increments.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Chemical and Volume Control System (CVCS)**

TASK: **Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.2.2	IF required, THEN **RESET** COUNT A on the Makeup Flow Registers to zero IAW Exhibit 1.	Resets COUNT A for Boric Acid and Primary Water flow IAW Exhibit 1.		
*	5.2.3	**PRESS** Makeup Control Mode Select STOP pushbutton.	**Presses Makeup Control Mode Select STOP pushbutton and verifies bezel illuminates**.		
*	5.2.4	**PLACE** 2CV179, PRIMARY WATER FLOW, in MANUAL, AND **CLOSE** 2CV179.	**Depresses 2CV179 MANUAL PB until bezel illuminates.** **Note:** when selected to manual the 2CV179 will go full open. This is expected. **Depresses 2CV179 CLOSE PB until bezel illuminates.**		
*	5.2.5	**PLACE** 2CV172, BORIC ACID FLOW, in MANUAL, AND **CLOSE** 2CV172.	**Depresses 2CV172 MANUAL PB until bezel illuminates.** **Depresses 2CV172 CLOSE PB until bezel illuminates.**		
	NOTE	Makeup from Boric Acid Blender to Charging Pump suction is the preferred alignment.	Operator reads and initials the Note.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Chemical and Volume Control System (CVCS)**

TASK: **Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.2.6	**ALIGN** outlet of Boric Acid Blender to one of the following: A. **OPEN** 2CV185, MAKEUP FLOWPATH OR B. **OPEN** 2CV181, MAKEUP FLOWPATH	**Operator selects one (1) flowpath alignment by depressing the MANUAL PB until bezel illuminates, THEN the OPEN PB for 2CV185 or 2CV181 until OPEN bezel illuminates.** **Evaluator's Note**: The "NOTE" prior to Step 5.2.6 states that charging pump suction is the preferred path, (but not required) which is accomplished by opening the 2CV185. Opening either 2CV185 or 2CV181 is acceptable.		
	CAUTION	Pump damage may occur while operating in a parallel configuration IF both a Fast and Slow speed Boric Acid pump is aligned to the same header.	Operator reads the Caution Note		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Chemical and Volume Control System (CVCS)**

TASK: **Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
* *	5.2.7	**PERFORM** the following as required to support current plant conditions: • **START** a Primary Water Pump • **PLACE** a Boric Acid Pump in MANUAL/FAST START	**Evaluator's Note**: Normal configuration is ONE Boric acid pump running in AUTO SLOW, and NO Primary Water pumps running. **Operator depresses MANUAL PB for selected PW pump and verifies bezel illuminates.** **Operator depresses START PB for selected PW Pump and verifies bezel illuminates.** **Operator depresses MANUAL PB for selected BAT pump and verifies bezel illuminates.** **Operator depresses FAST START PB for selected BAT Pump and verifies bezel illuminates.**		
*	5.2.8	**ADJUST** 2CV172 flow (FI110A) to the value recorded in step 5.2.1	**Adjusts Boric Acid Flow on FI110A to the value recorded in Step 5.2.1 by depressing the 2CV172 OPEN PB to raise setpoint or 2CV172 CLOSE PB to lower setpoint.**		
	5.2.9	IF required Boric Acid flow is NOT achieved, THEN: • **CLOSE** 21CV160, RECIRC VALVE • **CLOSE** 22CV160, RECIRC VALVE	Determines closing of the CV160 valves will NOT be required.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Chemical and Volume Control System (CVCS)**

TASK: **Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.2.10	Manually **ADJUST** 2CV179 Setpoint to 62 gpm (or as calculated) to obtain the required flow as indicated on FI111A (Refer to step 3.12)	**Adjusts Primary Water flow on FI111A to 62 gpm (acceptable range 60-64 gpm) by depressing the 2CV179 OPEN PB to raise setpoint or 2CV179 CLOSE PB to lower setpoint.** **Cue:** Once makeup is in progress and operator is monitoring VCT level via LT-114 using the Plant Computer**,** inform operator that VCT level is now at 53%.		
	5.2.11	**ENSURE** required Boric Acid AND Primary Water Flow are being maintained OR **ADJUST** 2CV172 and 2CV179 as required to obtain required flows.	Monitors Boric Acid and Primary Water flows being maintained as required and adjusts 2CV172 and 2CV179 as required to obtain required flows.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Chemical and Volume Control System (CVCS)**

TASK: **Perform Manual Makeup to VCT IAW S2.OP-SO.CVC-0006**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.2.12	When desired makeup is completed: **A. CLOSE** the following valves:			
* * * *		• 2CV179 • 2CV172 • 2CV185 • 2CV181	**Depresses the CLOSE PBs for 2CV179 and 2CV172, and whichever of the 2CV185 or 2CV181 was opened in Step 5.2.6; verifies that the CLOSE PB bezels are illuminated.**		
*		**B. STOP** Primary Water Pump	Depresses STOP pushbutton for Primary Water Pump which was started.		
*		**C. PLACE** Boric Acid Pump selected in SLOW Speed **D. PLACE** the system in Automatic Makeup Mode IAW Section 5.1	Places the selected Boric Acid Pump in SLOW speed and verifies SLOW speed bezel illuminates. **Terminate the JPM once the selected Boric Acid Pump has been placed in SLOW speed.**		
	CUE:	**JPM is Complete.** **RECORD STOP TIME** **STOP TIME**:_____	**Terminate the JPM when the Boric Acid Pump is in SLOW speed.**		

JPM: 20-01 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.

_____ 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 (*).

___KH__ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __25___ Date __3-10-17

___KH_ 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.

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

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

INITIAL CONDITIONS:

- 100% power, MOL. RCS boron concentration is 900 ppm.
- The crew has entered S2.OP-AB.CVC-0001, Loss of Charging, due to VCT level channel 2LT112 failing high.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS has directed you to PERFORM a manual makeup of the VCT to RESTORE VCT level to 53% IAW S2.OP.SO.CVC-0006, Boron Concentration Control, Section 5.2, Manual Makeup Mode.
- All prerequisites are complete.
- Boric Acid Storage Tank boron concentration is 6,700 ppm.

STATION: SALEM

SYSTEM: Emergency Core Cooling System (ECCS)

TASK: Isolate the ECCS Accumulators in EOP-LOCA-1

TASK NUMBER: N0060100101

JPM NUMBER: 20-01 NRC Sim-c

ALTERNATE PATH: [X]

K/A NUMBER: 006 A3.01

IMPORTANCE FACTOR:	4.0*	3.9
	RO	**SRO**

APPLICABILITY:

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

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: 2-EOP-LOCA-1 Rev. 40 (checked 8-3-21)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 8 Minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**K. Hantho** **Instructor**	**Date: 8-3-21**
Validated By:	**Rydell/Zirkle** **SME or Instructor**	**Date: 8-12-21**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-11-22**

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: 20-01 NRC Sim-c

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	12-11-17	Incorporated comments from NRC Prep week. Modified malfunction for 24SJ54 to fail at intermediate position.	Yes
02	8-3-21	Revised to LOCA-1 from TRIP-6. Updated with new EOP revision	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Emergency Core Cooling System (ECCS)

TASK: Isolate the ECCS Accumulators in EOP-LOCA-1

TASK NUMBER: N0060100101

SIMULATOR IC: IC-252

MALFUNCTIONS / REMOTES:

1. Reset the simulator to above IC.

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	RC0001A, 21RC LOOP	N/A	N/A	N/A	N/A	TRUE
02	VL0018, 24SJ54 fails to position (0-100%)	N/A	N/A	N/A	N/A	100%

OVERRIDES:

None

SPECIAL INSTRUCTIONS:

1. Marked up copy of 2-EOP-LOCA-1 on center console.

NAME: _____

DATE: _____

SYSTEM: Emergency Core Cooling System (ECCS)

TASK: Isolate the ECCS Accumulators in EOP-LOCA-1

TASK NUMBER: N0060100101

INITIAL CONDITIONS:

- The reactor was tripped when a RCS leak occurred.
- The operating crew has progressed through the EOP's and is now in 2-EOP-LOCA-1, LOSS OF REACTOR OR SECONDARY COOLANT

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to isolate the SI Accumulators IAW Step 14 of 2-EOP-LOCA-1, LOSS OF REACTOR OR SECONDARY COOLANT
- Notify the CRS when Step 14 is completed.
- Your evaluator will take care of 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:

1. **Closes 21, 22, and 23 SJ54's.**
2. **Vents 24 SI Accumulator to atmospheric pressure.**

SYSTEM: **Emergency Core Cooling System (ECCS)**

TASK: **Isolate the ECCS Accumulators in EOP-LOCA-1**

* #	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-EOP-LOCA-1 is open and marked up on console.	Reviews conditions and the marked up EOP-LOCA-1 LOSS OF REACTOR OR SECONDARY COOLANT		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	14	ARE AT LEAST TWO RCS T-HOTs LESS THAN 405°F	YES. Operator verifies AT LEAST TWO RCS T-HOTs LESS THAN 405°F		
*	14.1	REMOVE LOCKOUT FROM 21-24SJ54 (ACCUMULATOR OUTLET VALVES)	**At 2RP4 Panel, operator selects VALVE OPERABLE on 21-24 SJ54 ACCUMULATOR OUTLET VALVES LOCKOUT Switch**		
*	14.1 Contd	CLOSE 21 Thru 24 SJ54	**Operator depresses CLOSE pushbuttons for 21 thru 24 SJ54s, ACCUMULATOR OUTLET VALVES and verifies each CLOSE bezel illuminates.**		

ALTERNATE PATH STARTS HERE:

SYSTEM: **Emergency Core Cooling System (ECCS)**

TASK: **Isolate the ECCS Accumulators in EOP-LOCA-1**

* #	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)
	14.2	ARE 21 Thru 24 SJ54 CLOSED	**NO. Operator determines 24SJ54, ACCUMULATOR OUTLET VALVE, is OPEN** **Note**: Operator observes valve not repositioning. May re-check LOCKOUT Switch position or attempt to depress the Close PB again.		
*	14.2 Contd.	VENT ANY UNISOLATED ACCUMULATOR(s): • SJ93 (N2 SUPPLY VALVE) AND 2NT35 (N2 HDR VALVE) **Evaluators note:** Operator vents 24 accumulator	**Operator depresses OPEN PB for 2NT35 (N2 HDR VALVE) until OPEN bezel illuminates**. Note: If 2NT35 is throtled opened, this may be acceptable so long as Accumulator pressure is sufficiently lowering in next step.		
*			**Operator depresses OPEN PB for 24SJ93 N2 SUPPLY VALVE until OPEN bezel illuminates** and observes 24 Accumulator pressure lowering. When the operator checks that Accumulator pressure is lowering, **THEN,** provide the following cue: **Cue*:*** 24 Accumulator pressure is now reading ZERO.		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: **Emergency Core Cooling System (ECCS)**

TASK: **Isolate the ECCS Accumulators in EOP-LOCA-1**

* #	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 the JPM when the step 14.2 is complete.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 NRC Sim-c

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

_____ 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 (*).

___KH__ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _40__ Date __4-1-21_____

___KH__ 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.

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

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

INITIAL CONDITIONS:

- The reactor was tripped when a RCS leak occurred.
- The operating crew has progressed through the EOP's and is now in 2-EOP-LOCA-1, LOSS OF REACTOR OR SECONDARY COOLANT

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to isolate the SI Accumulators IAW Step 14 of 2-EOP-LOCA-1, LOSS OF REACTOR OR SECONDARY COOLANT
- Notify the CRS when Step 14 is completed.
- Your evaluator will take care of all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

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

TASK: Respond to low standpipe level on 21 RCP IAW S2.OP-AR.ZZ-0011

TASK NUMBER: N0020160101

JPM NUMBER: 20-01 NRC Sim-d

ALTERNATE PATH: [ ]

K/A NUMBER: 003 A1.10

	RO	SRO
IMPORTANCE FACTOR:	2.5	2.7

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

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-AR.ZZ-0011, Rev 63 (checked 10-6-21)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 6 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan** **Instructor** **Date: 10-6-21**

Validated By: **Stokes / Militti** **SME or Instructor** **Date: 10-14-21**

Approved By: **M. Wadusky(Signature On file)** **Training Department** **Date: 2-11-22**

Approved By: **W. Hargrave** **Operations Department** **Date: 1-10-22**

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: 20-01 NRC Sim-d

Rev #	Date	Description	Validation Required
00	9-18-18	**NEW JPM**. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	10-6-21	Changed ET-1 to use 2WR62 open light to trigger deleting malfunction for better reliability (QAJ02PRH).	Yes
02	1-3-22	Incorporated NRC comments from ES-301-7.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

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

TASK: Respond to low standpipe level on RCP IAW S2.OP-AR.ZZ-0011

TASK NUMBER: N0020160101

SIMULATOR IC: **IC-258**

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	RC009A, 21 RCP #3 seal fails					100
02						
03						
04						

3. These malfunctions will simulate a leak on #3 RCP seal resulting in the low level in the standpipe. The operator will be required to fill the standpipe IAW the 2CC1 console alarm ARP.

OVERRIDES / REMOTES:

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

EVENT TRIGGERS:

ET#	Description	Command
ET-1	QAJ02PRH, 21WR62 RCP standpipe open light	DMF RC009A

SPECIAL INSTRUCTIONS:

- None

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

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

TASK: Respond to low standpipe level on RCP IAW S2.OP-AR.ZZ-0011

TASK NUMBER: N0020160101

INITIAL CONDITIONS:

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

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all alarms and indications.
- 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. **Upon receipt of a RCP standpipe low level alarm, the operator aligns valves to fill the standpipe with primary water, and terminates the fill when the high level alarm is received.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: **Heat Removal From Reactor Core (SF 4) – Reactor Coolant Pump System**
TASK: **Respond to low standpipe level on RCP 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)
		Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	CUE	**Simulator Operator**: **INSERT RT-1** for malfunction RC0009A, Value = 100 for : 21 RCP #3 seal fails			
		21 RCP standpipe low console alarms illuminated.	Operator reports that standpipe level low console alarm for 21 RCP		
		The following steps are from S2.OP-AR.ZZ-0011, 2CC1 Console Alarm Response (**Page 138**)			
	1.0	CAUSES: Low level in the affected RCP standpipe (likely causes are listed beloew): ♦ Low seal flow across #2 seal ♦ Excessive flow through #3 seal	Operator reads likely causes and continues on.		
	2.0	AUTOMATIC ACTIONS: NONE	Operator continues on		
	3.0	OPERATOR ACTIONS:			

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

TASK: **Respond to low standpipe level on RCP 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)
	NOTE	Since standpipe level establishes the head across #3 seal, low level could result in #3 seal running dry.	Operator reads note and continues on		
	3.1	IF AT ANY TIME, standpipe low level occurs AND Seal water leakoff flow alarm occur together, THEN **GO TO** S2.OP-AB.RCP-0001(Q), Reactor Coolant Pump Abnormality.	Operator determines no seal leakoff flow alarm concurrent with standpipe level low. Marks step as N/A		
	3.2	**PERFORM** the following to fill the affected standpipe:			
	3.2.A	A. IF required, **START** 21 or 22 Primary Water Pump.	Operator selects one Primary Water pump in Manual and depresses START PB. Verifies start PB illuminates **OR** acceptable to not start a Primary Water pump and continue on. **Evaluator's Note:** This is a conditional step; the operator can still fill the standpipe without starting a Primary Water pump the fill will just take a little longer.		
*	3.2.B	B. **OPEN** 2WR80, PW TO CONTMT STOP V.	**Operator depresses OPEN PB for 2WR80 and verifies OPEN PB illuminates.** **Location: 2CC2 on the PRT bezels**		

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

TASK: **Respond to low standpipe level on RCP 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.C	C. IF desired, **ADJUST** applicable WR63 valve to maintain standpipe level.	**Evaluator's Note**: This valve is not located in Control Room and is not needed to accomplish the task. **CUE**: ***CRS states adjustments to WR63 is NOT required***. Operator marks step as N/A		
*	3.2.D	D. **OPEN** the Standpipe Supply Valve for the affected RCP: 21RCP – 21WR62 22RCP – 22WR62 23RCP – 23WR62 24RCP – 24WR62 **Simulator Operator**: **ENSURE ET-1** is TRUE when 21WR62 is open. This will delete MALF RC009A and allow the standpipe to refill and clear the low level alarm.	**Operator depresses the OPEN PB for 21WR62 and verifies OPEN PB illuminates.** **Location: on 21 RCP bezel**		
	3.2.E	E. **LOG** the RCP Standpipe fill IAW SH.OP-DL.ZZ-0027(Q), Temporary Reading Log and Log Supplement.	**CUE**: ***The PO will log the standpipe fill***.		

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

TASK: **Respond to low standpipe level on RCP 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)
	3.3	WHEN low level alarm clears and hi level alarm comes in, THEN ;	**Evaluator's Note:** The standpipe low level will clear in a short period of time followed by receiving standpipe level high console alarm which is expected.		
*		A. **STOP** the Primary Water Pump.	**Operator depresses the STOP PB for the running Primary Water pump, if previously started, and verifies STOP PB illuminates.**		
*		B. **CLOSE** 2WR80, PW TO CONTMT STOP V.	**Operator depresses the CLOSED PB for 2WR80 and verifies CLOSED PB is illuminated.**		
*		C. **CLOSE** the previously opened STANDPIPE SUPPLY VALVE.	**Operator depresses the CLOSED PB for 21WR62 and verifies CLOSED PB illuminates.**		
			JPM complete once 21WR62 is closed		
	CUE:	**JPM is Complete** **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate the JPM when the operator CLOSES 21WR62.**		

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

TASK: **Respond to low standpipe level on RCP IAW S2.OP-AR.ZZ-0011**

SYSTEM	21 (22, 23, 24) REACTOR COOLANT PUMP Alarms	STANDPIPE LEVEL LO
	BEZEL 2-5 (2-6, 2-7, 2-8)	
BEZEL	N/A	

	21 RCP	22 RCP	23 RCP	24 RCP
DEVICES:	2LC-487	2LC-489	2LC-491	2LC-493
SETPOINT:	1 ft below normal			

1.0 **CAUSE(S)**:

1.1 Low level in the affected RCP standpipe (likely causes are listed below):

- Low seal flow across #2 seal.
- Excessive flow through #3 seal.

2.0 **AUTOMATIC ACTIONS**:

2.1 None

3.0 **OPERATOR ACTIONS**:

NOTE

Since standpipe level establishes the head across #3 seal, low level could result in #3 seal running dry.

3.1 IF AT ANY TIME, standpipe low level occurs
AND Seal water leakoff flow alarm occur together,
THEN **GO TO** S2.OP-AB.RCP-0001(Q), Reactor Coolant Pump Abnormality.

3.2 **PERFORM** the following to fill the affected standpipe:

A. IF required, **START** 21 or 22 Primary Water Pump.

(Continued)

3.2 (continued)

B. **OPEN** 2WR80, PW TO CONTMT STOP V.

C. IF desired, **ADJUST** applicable WR63 valve to maintain standpipe level.

D. **OPEN** the Standpipe Supply Valve for the affected RCP:

21 RCP	22 RCP	23 RCP	24 RCP
21WR62	22WR62	23WR62	24WR62

E. **LOG** the RCP Standpipe fill IAW SH.OP-DL.ZZ-0027(Q), Temporary Reading Log and Log Supplement.

3.3 WHEN low level alarm clears and hi level alarm comes in, THEN ;

A. **STOP** the Primary Water Pump.

B. **CLOSE** 2WR80, PW TO CONTMT STOP V.

C. **CLOSE** the previously opened STANDPIPE SUPPLY VALVE.

3.4 **MONITOR** the following RCP seal indications for excessive #3 seal leakage:

Indication	21 RCP	22 RCP	23 RCP	24 RCP
Seal water flow	2FI-144	2FI-143	2FI-116	2FI-115
Seal Water Outlet Temperature	2TI-148	2TI-146	2TI-132	2TI-125
#1 Seal Differential Pressure	2PI-188	2PI-187	2PI-186	2PI-183
Seal Leakoff Flow	2FA-5241	2FA-5242	2FA-5243	2FA-5244

3.5 IF excessive #3 seal leakage is suspected, THEN:

A. **INITIATE** S2.OP-ST.RC-0008(Q), Reactor Coolant System Water Inventory Balance.

B. **NOTIFY** the CRS/SM.

References: Dwg. 211539, 211540, 211542, 211543, 211545, 211546, 211548, 211549

JPM: 20-01 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.

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

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

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

____RC____ 4. Initial setup conditions are identified.

____RC____ 5. Initiating and terminating Cues are properly identified.

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

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

____RC____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __63___ Date __10-14-21_____

____RC____ 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: __10-14-21_____

SME/Instructor:___P. Stokes_____ Date: __10-14-21_____

SME/Instructor:___J. Militti_____ Date: ___10-121_____

INITIAL CONDITIONS:

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

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all alarms and indications.
- Your evaluator will respond to all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Main Turbine Generator System

TASK: Perform immediate actions for a loss of a SGFP IAW S2.OP-AB.CN-0001

TASK NUMBER: N1140100401

JPM NUMBER: 20-01 NRC Sim-e

ALTERNATE PATH: [X] **K/A NUMBER:** 059 A4.01

IMPORTANCE FACTOR: 3.1 (RO) 3.1 (SRO)

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

EVALUATION SETTING/METHOD: Simulator

REFERENCES: S2.OP-AB.CN-0001, Rev. 31, S2.OP-SO.TRB-0001 (checked 1-3-22)

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: 1-3-22**
Validated By:	**Pompper / Protesto** **SME or Instructor**	**Date: 1-10-22**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-10-22**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

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

REASON, IF UNSATISFACTORY:

DATE:

EVALUATOR'S SIGNATURE:

REVISION HISTORY

JPM NUMBER: 20-01 NRC Sim-e

Rev #	Date	Description	Validation Required
00	5-30-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	No
01	5-18-21	Revised to update IC Change SGFP that trips and validate Procedure revision	Yes
02	1-3-22	Revised JPM to have the operator perform actions at the DEHC panel to manually setup for a 15%/min runback to 66%.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Rod Control System

TASK: Perform immediate actions for a loss of a SGFP IAW S2.OP-AB.CN-0001

TASK NUMBER: N1140100401

SIMULATOR IC: IC-259

MALFUNCTIONS:

1. Reset the simulator to IC above.
2. Verify the following on the summary/ET trigger lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	BF0105A, 21 SGFP Trip	N/A	N/A	N/A	N/A	TRUE
02	EH0327, Turbine fails to run back on SGFP trip	N/A	N/A	N/A	N/A	TRUE
03	RD0057, All rods fail to move(Auto/Man)	N/A	N/A	N/A	N/A	TRUE

OVERRIDES/ REMOTES: None

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	REMF ANCGA555 CGAOVRD Rod-Urgent Failure alarm	N/A	N/A	N/A	N/A	OFF
02	OVRD OHA-E-40 ZLOANN_E40 E40 Rod Bank Urgent Failure	N/A	N/A	N/A	ET-1	OFF
03	OVRD B434CDI KB434HSD Rod Bank-Alarm Reset	N/A	N/A	N/A	N/A	ON

EVENT TRIGGERS: None

ET#	Description	Command
1	KB433WAD//Rod Bank Selector SW Manual	DMF RD0057

SPECIAL INSTRUCTIONS:

1. **Marked up S2.OP-SO.TRB-0001 Attachment 5 (HARCARD) up to step 4 (just circle).**
2. **Turn off ALL P-250 monitors in the horseshoe**. **Not required to perform JPM successfully**.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Perform immediate actions for a loss of a SGFP IAW S2.OP-AB.CN-0001

TASK NUMBER: N1140100401

INITIAL CONDITIONS:

- Unit 2 power ascension is in progress to 90% at 10% per hour.
- S2.OP-SO.TRB-0001 Attachment 5 is in progress up to step 4.

INITIATING CUE:

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

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 a manual Main Turbine load reduction at 15%/min to 66% and inserts control rods in MANUAL due to failure of the rods to insert in AUTO.

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Perform immediate actions for a loss of a SGFP IAW S2.OP-AB.CN-0001

* #	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**:_____			
		Simulator Operator: Insert **RT-1** on direction from Lead Evaluator. - SGFP Trip - Main Turbine Fails to runback when demanded. - Rods fail to move in Auto			
	2.3	2.2 **IF** Turbine Power is ≥ 70% (P_{TIP} ≥526 psia) **AND** loss of a single SGFP has occurred, **THEN:** 2.3.1 **PERFORM** one of the following at the TURBINE E-H CONTROL & STATUS "touch screen" monitor – OPERATIONS screen:	Acknowledges alarms and indications of SGFP trip. Performs the Immediate Actions of S2.OP-AB.CN-0001, Main Feedwater / Condensate System Abnormality as below:		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Perform immediate actions for a loss of a SGFP IAW S2.OP-AB.CN-0001

* #	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)
	2.3.1.A	A. **VERIFY** Automatic Turbine Runback has or is occurring as indicated: • SGFP RUNBACK OPERATE (red) • GENERATOR LOAD trending to ~775 MW • TURBINE INLET PRESSURE trending to $\leq$ 491 psia OR	Identifies that an AUTO MT runback has NOT occurred.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Perform immediate actions for a loss of a SGFP IAW S2.OP-AB.CN-0001

* #	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)
*	2.3.1.B	B. **INITIATE** Main Turbine load reduction until <u>≤</u>66% Turbine Power (P_{TIP} ~491 psia) <u>OR</u> SGFP suction pressure >320 psig is achieved. 1. <u>IF RAMP RATES</u> ARE NOT PRESET…. 2. **SELECT** <u>SETTER</u> - GO	**Identifies ramp rates are NOT pre-set for a SGFP runback. As found is 90% at 10%/HR.** **Operator depresses the MIN/HR TOGGLE to select ramp rate from %/HR to <u>%/MIN</u> and then adjusts ramp rate to <u>15</u>.** **Operator then adjusts the SETTER to <u>66</u> and THEN selects GO.**		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Perform immediate actions for a loss of a SGFP IAW S2.OP-AB.CN-0001

* #	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)
*	2.3.2	**CONTROL** T_{AVG} by one of the following: A. **ENSURE** ROD BANK SELECTOR SWITCH in AUTO, OR B. **INSERT** control rods to restore T_{AVG} to T_{REF} (Refer to Attachment 2, Section 3.0)	**Initially ensures Rod Control is in AUTO.** As the RCS heats up during the downpower identifies rods not inserting when demanded due to Terr. **Places Rod Bank Selector Switch to MANUAL and inserts rods** **CUE:** CRS has assigned another operator to commence Boration.		
	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**:_____	**Terminate JPM once Main Turbine load reduction has been initiated and control rod insertion initiated,**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#:__20-01 NRC Sim-e

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

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

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

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

___RC___ 4. Initial setup conditions are identified.

___RC___ 5. Initiating and terminating Cues are properly identified.

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

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

___RC___ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _31_ Date __1-3-22___

____RC__ 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.

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

SME/Instructor:	R. Chan	Date:	1-10-22
SME/Instructor:	M. Protesto	Date:	1-10-22
SME/Instructor:		Date:	

INITIAL CONDITIONS:

- Unit 2 power ascension is in progress to 90% at 10% per hour.
- S2.OP-SO.TRB-0001 Attachment 5 is in progress up to step 4.

INITIATING CUE:

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

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and position Phase B Valves in EOP-TRIP-1 During a LOCA

TASK NUMBER: N1150500502

JPM NUMBER: 20-01 NRC Sim-f

ALTERNATE PATH: [X]

K/A NUMBER: 026 A2.03

IMPORTANCE FACTOR: RO 4.1 SRO 4.4

APPLICABILITY:

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

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: 2-EOP-TRIP-1, Rev. 41 (checked 1-10-22)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 8 Minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**K. Hantho** **Instructor**	**Date: 8-2-21**
Validated By:	**Rydell / Zirkle** **SME or Instructor**	**Date: 8-12-21**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave** **Operations Representative**	**Date: 1-11-22**

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: 20-01 NRC Sim-f

Rev #	Date	Description	Validation Required
00	5-30-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	No
01	4-16-18	Corrected minor editorial errors and added Figure 1 to provide snapshot of EOP section used during JPM and added improved malfunctions table.	Yes
02	9-17-19	**MODIFIED** JPM to add 2CS16 and 2CS17 NaOH valves fail to open.	Yes
03	8-2-21	Changed to reflect new EOP rev	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1

TASK NUMBER: N1150500502

SIMULATOR IC:

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	RC0001A, RCS Rupture of RC Loop 21	N/A	N/A	N/A	N/A	N/A
02	VL0087, 2CC131 Fails to Position	N/A	N/A	N/A	N/A	100
03	VL0056, 2CC190 Fails to Position	N/A	N/A	N/A	N/A	100
04	RP0277A, Auto CS fails to actuate	N/A	N/A	N/A	N/A	N/A
05	RP0277B, Auto CS fails to actuate	N/A	N/A	N/A	N/A	N/A
06	RP0276A, Auto Phase B fails to actuate	N/A	N/A	N/A	N/A	N/A
07	RP0276B, Auto Phase B fails to actuate	N/A	N/A	N/A	N/A	N/A
08	VL0013, 2CS16 fails to position	N/A	N/A	N/A	N/A	0
09	VL0014, 2CS17 fails to position	N/A	N/A	N/A	N/A	0

3. These malfunctions will simulate failure of CS to actuate. The operator will be required to manually actuate Phase B and CS using key switches. [**Alternate Path**] The operator will recognize that not all Phase B/CS valves are in their safeguards positions. The operator will manually reposition the valves to their safeguards position (closes 2CC131 and 2CC190, opens 2CS16 and 2CS17).

OVERRIDES / REMOTES:

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

EVENT TRIGGERS:

ET#	Description	Command
1	KA617TCM, 2CC131 Closed PB	DMF VL0087
2	KA618TCM. 2CC190 Closed PB	DMF VL0056
3	KA404PNT, 2CS16 Open PB	DMF VL0013
4	KA406PNT, 2CS17 Open PB	DMF VL0014

SPECIAL INSTRUCTIONS: None

NAME: _____

DATE: _____

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1

TASK NUMBER: N1150500502

INITIAL CONDITIONS:

- A Large Break LOCA has occurred.
- The Reactor Automatically Tripped and SI was actuated
- The crew has completed Steps 1 through 8 of 2-EOP-TRIP-1, Rx Trip or Safety Injection.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to continue on with EOP-TRIP-1 starting at **STEP 9**.
- Your evaluator will respond to any alarms not associated with 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:

1. Manually initiates Containment Spray and Phase B isolation.
2. Closes 2CC131 OR 2CC190 Phase B valves.
3. Opens 2CS16 OR 2CS17 NaOH Discharge Valves

OPERATOR TRAINING PROGRAM **NAME:** _____

JOB PERFORMANCE MEASURE **DATE:** _____

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1

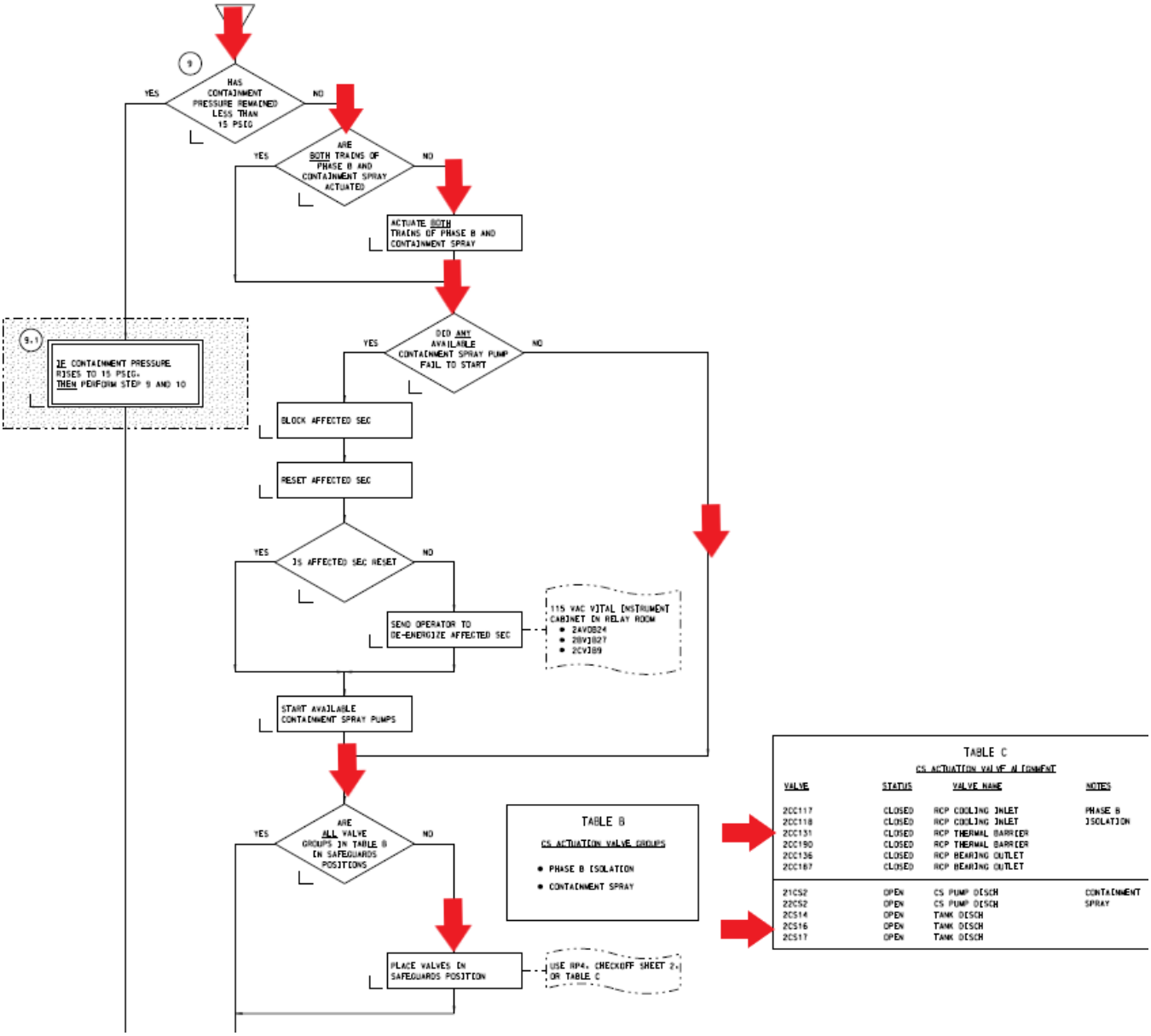
* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
		The following steps are from 2-EOP-TRIP-1, Major Action for "Containment Spray Actuation Verification", Step 9. **Examiner's Note: Figure 1 is a snapshot that shows the exact EOP steps to follow along.**	**Evaluator's Note**: The following EOP CAS actions were already implemented: ♦ STOP RCPs ♦ CLOSE charging pump mini flows		
	Step 9.a	Has Containment Pressure remained less than 15 psig	**NO**, Operator determines containment pressure has NOT remained less than 15 psig.		
*	Step 9.b	Initiate Phase B and Spray Actuation	**Operator uses both Safeguards Keys and simultaneously rotates both keys on 2CC1 to actuate Phase B and Spray Actuation on at least one Safeguards train.** **Examiner's Note:** Operator can use one key at a time so long as the key switch is not rotated back to the initial position prior to removing the key.		
	Step 9.c	Did any available CNMT Spray pump fail to start	No, Operator determines that both CS pumps are running.		

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1

* #	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)
		ALTERNATE PATH STARTS HERE:	**2CC131 and 2CC190 failed to close on Phase B AND 2CS16 and 2CS17 fail to open on CS signal.**		
	Step 9.d	Are valve groups in Table B in Safeguards positions	NO, operator identifies that 2CC131 and 2CC190 remain OPEN AND 2CS16 and 2CS17 remain CLOSED.		
*	Step 9.e	Place Valves in Safeguards position **Simulator Operator**: **ENSURE** the following Event Triggers are TRUE, this will delete the following malfunctions to enable the valves to reposition: **ET-1: VL0013 for 2CS16** **ET-2: VL0014 for 2CS17** **ET-3: VL0087 for 2CC131** **ET-4: VL0056 for 2CC190**	**Operator depresses CLOSED pushbutton for 2CC131 OR 2CC190 and verifies CLOSED bezel are illuminated.** **Operator depresses the OPEN pushbutton for 2CS16 OR 2CS17 and verifies OPEN bezel are illuminated.** **CUE: JPM is Complete** **Examiner's Note:** Selecting Manual for 2CC131 is NOT required to close the valve. Only 1 vale is required for each, closing both is acceptable.		
	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 repositions Phase B isolation and Containment Spray valves of EOP-TRIP-1.**		

Figure 1 (EOP-TRIP-1, Sheet 2):



JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 NRC Sim-f

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

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

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

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

KH 4. Initial setup conditions are identified.

KH 5. Initiating and terminating Cues are properly identified.

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

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

KH 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __40___ Date _____4-1-21_____

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

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

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

SME/Instructor: Date:

SME/Instructor: Date:

SME/Instructor: Date:

INITIAL CONDITIONS:

- A Large Break LOCA has occurred.
- The Reactor Automatically Tripped and SI was actuated
- The crew has completed Steps 1 through 8 of 2-EOP-TRIP-1, Rx Trip or Safety Injection.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to continue on with EOP-TRIP-1 starting at **STEP 9**.
- Your evaluator will respond to any alarms not associated with your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: A.C. Electrical Distribution

TASK: Respond to loss of 2A 4KV Vital Bus IAW S2.OP-AB.4KV-0001

TASK NUMBER: N1140050401

JPM NUMBER: 20-01 NRC Sim-g

ALTERNATE PATH: [X] **K/A NUMBER:** 062 A2.04

IMPORTANCE FACTOR: 3.1 (RO) 3.4* (SRO)

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

EVALUATION SETTING/METHOD: Simulator

REFERENCES: S2.OP-AB.4KV-0001, Rev. 11 (checked 8-3-21)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**K. Hantho** **Instructor**	**Date:**	**8-3-21**
Validated By:	**Rydell / Zirkle** **SME or Instructor**	**Date:**	**8-12-21**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date:**	**2-10-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date:**	**1-11-22**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

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

REASON, IF UNSATISFACTORY:

DATE:

EVALUATOR'S SIGNATURE:

REVISION HISTORY

JPM NUMBER: 20-01 NRC Sim-g

Rev #	Date	Description	Validation Required
00	8-3-21	New JPM	Yes
01	1-3-22	Incorporated NRC comments from ES-301-7.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: A.C. Electrical Distribution

TASK: Respond to loss of 2A 4KV Vital Bus IAW S2.OP-AB.4KV-0001

TASK NUMBER: N1140050401

SIMULATOR IC: IC-256

MALFUNCTIONS:

1. Reset the simulator to IC above.
2. Verify the following on the summary/ET trigger lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	EL0144 LOSS OF 2A 4160V VITAL BUS	N/A	N/A	N/A	RT-1	TRUE
02	CV0208A 21 CHARGING PUMP TRIP	N/A	N/A	N/A	ET-1	TRUE

OVERRIDES/ REMOTES: None

EVENT TRIGGERS:

ET #	Description	Assigned malfunction
1	Kb417pbj//21CHGPump-START(Remote-SHTDWN	CV0208A

SPECIAL INSTRUCTIONS: None

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: A.C. Electrical Distribution

TASK: Respond to a loss of 2A 4KV Vital bus IAW S2.OP-AB.4KV-0001

TASK NUMBER: N1140050401

INITIAL CONDITIONS:

100% power, BOL.

INITIATING CUE:

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

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. **Operator closes the 2CV55 and starts 21 Charging Pump. Upon receiving indications that 21 Charging Pump trips; starts 22 Charging Pump.**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Respond to a loss of 2A 4KV Vital bus IAW S2.OP-AB.4KV-0001

* #	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**:_____			
		Simulator Operator: Insert **RT-1** on direction from Evaluator. - Loss of 2A 4KV Vital Bus			
		Evaluator note: Many OHA's will actuate and additional required equipment will automatically start. Operator is expected to acknowledge and review alarms and make transition to Abnormal procedure of the loss of A 4KV vital bus based on indications and Alarm Response Procedure's available to the operator.	**Acknowledges alarms and indications of vital bus loss.** **Enters procedure S2.OP-AB.4KV-0001. Operator enters based on assessment of Overhead alarms or from direction of overhead alarm response procedures.**		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Respond to a loss of 2A 4KV Vital bus IAW S2.OP-AB.4KV-0001

* #	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)
	3.1	**INITIATE** Attachment 1, Continuous action summary	**Operator will review CAS and determine if any actions required.** **Operator determines no actions required at this time.** **Cue:** CRS will assign the CAS to another NCO.		
	3.2	**INITIATE** Diesel Generator running checks for any operating Diesel Generator(s) IAW applicable procedures, while continuing with this procedure: ♦ S2.OP-SO.DG-0001(Q), 2A Diesel Generator Operation ♦ S2.OP-SO.DG-0002(Q), 2B Diesel Generator Operation ♦ S2.OP-SO.DG-0003(Q), 2C Diesel Generator Operation	**Identifies that A EDG has started and pages primary plant operator or tells CRS that the A EDG needs running checks completed.** **Cue:** CRS will direct an operator to perform running checks.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Respond to a loss of 2A 4KV Vital bus IAW S2.OP-AB.4KV-0001

* #	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)
	3.3	IF 23 Charging Pump was providing Seal Injection and Charging Flow to Unit 1, THEN **NOTIFY** Unit 1 NCO.	**Identifies 23 CV pump was in operation to unit 2 RCS.**		
*	3.4	Was 23 Charging Pump providing Seal Injection and Charging Flow to Unit 2?	**Operator answers YES and continues to step 3.5**		
*	3.5	**CLOSE** 2CV55. **Evaluators note:** Valve has a long stroke time approximately two minutes.	**Operator Closes 2CV55.**		
*	3.6	**START** 21 Charging Pump.	**Operator starts 21 Charging pump by depressing pushbutton and subsequently identifies that the pump has tripped and acknowledges flashing stop pushbutton.**		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control System

TASK: Respond to a loss of 2A 4KV Vital bus IAW S2.OP-AB.4KV-0001

* #	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)
		ALTERNATE PATH STARTS HERE:	**21 CHARGING PUMP TRIPS AFTER THE INITIAL START**		
*	3.7	Is 21 Charging Pump running?	**Operator answers the step NO and continues to step 3.8**		
*	3.8	**START** 22 Charging Pump.	**Operator starts 22 Charging pump by depressing pushbutton.** **Cue:** JPM is Complete		
	CUE:	WHEN operator starts 22 charging pump, 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**:_____	**Terminate JPM once 22 Charging pump has been started.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#:___20-01 NRC Sim-g_____

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

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

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

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

_____KH_ 4. Initial setup conditions are identified.

_____KH_ 5. Initiating and terminating Cues are properly identified.

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

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

___KH_ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _11__ Date _8/27/2015__

___KH__ 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.

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

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

INITIAL CONDITIONS:

100% power, BOL.

INITIATING CUE:

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

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Fire Protection System (SF 8)

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

TASK NUMBER: N0220080101

JPM NUMBER: 20-01 NRC Sim-h

ALTERNATE PATH: [ ]

K/A NUMBER: 086 A4.02

IMPORTANCE FACTOR:	**RO**	**SRO**
	3.5	3.5

APPLICABILITY:

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

EVALUATION SETTING/METHOD: Simulator

REFERENCES: S2.OP-AB.FIRE-0001, Rev. 12, S2.OP-AR.ZZ-0001, Rev 59 (checked 1-3-22)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan** **Instructor** **Date: 1-3-22**

Validated By: **Protesto / Pompper** **SME or Instructor** **Date: 1-10-22**

Approved By: **M. Wadusky (signature on file)** **Training Department** **Date: 2-10-22**

Approved By: **W. Hargrave** **Operations Department** **Date: 1-10-22**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

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

REASON, IF UNSATISFACTORY:

DATE:

EVALUATOR'S SIGNATURE:

REVISION HISTORY

JPM NUMBER: 20-01 NRC Sim-h

Rev #	Date	Description	Validation Required
00	1-3-22	New JPM 086 K/A A4.02 3.5/3.5 – Ability to manually operate and/or monitor in the control room: Fire detection panels	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

TASK NUMBER: N0220080101

SIMULATOR IC: IC-260

MALFUNCTIONS:

1. Reset the simulator to IC-260
2. Verify the following on the summary/ET trigger lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Final Value
01						
02						
03						
04						

OVERRIDES/ REMOTES:

REMF	Description	Assigned value
1	FP15D, Fire, Aux. Bldg., Relay & Bat Rooms (code 91)	FIRE

EVENT TRIGGERS:

ET #	Description	Assigned malfunction
1		
2		
3		
4		
5		
6		

SPECIAL INSTRUCTIONS: None

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

TASK NUMBER: N0220080101

INITIAL CONDITIONS:

- 100% power.
- All systems are in Automatic and normal alignment.

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. **Upon fire alarm in control room, the operator makes page announcement for fire location, places Control Room Ventilation in FIRE INSIDE MODE, places the 2PR1 and 2PR2 in Manual and Closed, Closes 2PR6 and 2PR7, and dispatches operator to place the PZR PORV valves in EMERG CLOSE.**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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 has had sufficient time to review the procedure and acknowledges the Initiating Cue. **START TIME**:_____			
	CUE	**Simulator Operator: INSERT <u>RT-1</u> at direction from Examiner.** **Remote: FP15D** **This malfunction will actuate OHA A-7 FIRE PROT TRBL, A-8 FIRE PROT CO2/HALON DISCH, and coded fire alarm #91 on 2RP5 for Aux. Bldg., Relay & Battery Room Fire.**	**<u>Examiners Note</u>:** Audible coded fire alarm will also be heard in the control room and will stop after approx..30 seconds. No operator action required to silence**.**		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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)
	NOTE	**Examiners Note**: The operator should respond to the 2RP5 coded alarm to identify fire location and then refer to OHA A-7 and A-8 alarm response procedure per S2.OP-AR.ZZ-0001. ARP for OHA A-7 & A-8 will direct the operator to go to S2.OP.AB-FIRE-0001 for valid fire alarm.			
		Actions for OHA A-7 and A-8, S2.OP-AR.ZZ-0001 start here:	Operator implements OHA A-7 & A-8 alarm response procedure per S2.OP-AR.ZZ-0001		
	1.0	CAUSES: A. Coded fire alarm B. Fire alarm on 2RP5	Operator determines entry conditions to ARP is met based on 2RP5 fire alarm		
	2.0	AUTOMATIC ACTIONS: None			
	3.0	OPERATOR ACTIONS:			

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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)
*	**3.1**	**SCAN 2RP5 to determine Fire Zone, Area, and Elevation OR DETERMINE location IAW Alarm code List**	**Operator identifies fire alarm on 2RP5 is for Relay Room, 100 Ft. Elevation**		
	3.2	**IF** AT ANY TIME, fire indication for both Zones 59 and 74 on 2RP5 are received, THEN **OPEN** 2FP147, Fire Protection Containment Isolation	Operator marks step as N/A fire is not in containment.		
	3.3	**PERFORM** the following: A. **NOTIFY** the Emergency Services Department. B. **DISPATCH** Fire Brigade Liaison to the scene and determine extent/existence of the fire. C. **NOTIFY** Rad Protection to expedite access to the RCA or containment, as necessary. D. **NOTIFY** SM to implement the ECG	**CUE:** All notifications to the responsible individuals have been made **and** the Fire Brigade Liaison will be dispatch.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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)
	3.4	**IF** alarm is valid, **THEN GO TO** S2.OP-AB.FIRE-0001(Q), Control Room Fire Response	Operator goes to S2.OP-AB.FIRE-0001 **CUE:** IF applicant dispatches operator to validate fire, THEN state, **operator says the room door is hot to the touch and will not go in for safety reasons.**		
		Actions for S2.OP-AB.FIRE-0001 start here:			
	3.1	RECORD the following information (as applicable):	Operator records the following applicable information in step 3.1. Unit: 2 Building: Auxiliary Bldg. Elevation: 100 Ft. Callers Name: Not required Location: Relay Room Zone Number from 2RP5: 91 Fire Suppression System activated: YES		
	3.2	**NOTIFY** the Fire Department of the above information (by radio or phone X-2800)	**CUE**: Fire Department has been notified		

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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)
*	3.3	**IF a station page system announcement has NOT yet been made, THEN ANNOUNCE the following:** **"Attention all personnel - Attention all personnel. A fire is reported in Unit 2: (Indicate Building, Elevation & Location).** ♦ **All personnel please evacuate the area."**	**Operator completes page announcement for fire in Unit 2 Relay Room 100 Ft. elevation.**		
	NOTE	The Operations Representative/Fire Brigade Liaison will make recommendations to SM/CRS what equipment needs to be removed from service to mitigate the fire and/or help stabilize the Unit. This procedure provides actions that are on-going and dependent on degree of plant degradation	Operator reads note and continues with procedure.		
	3.4	**DIRECT** an Operations Representative to assist the Fire Department as Fire Brigade Liaison (FBL) with the following information:	**CUE:** Shift Manager will direct an Ops Representative to be Fire Brigade Liaison (If not already performed in the Alarm Response Procedure for OHA A-7 & A-8)		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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)
	3.5	IF the fire is within the RCA, THEN **NOTIFY** the Radiation Protection Department (X-2644) to provide any needed support to the Fire Department	Marks step as N/A. Fire is outside the RCA.		
	3.6	**NOTIFY** Security (X-2648) of the fire location and to provide any needed support to the Fire Department	**CUE:** Security has been notified		
	3.7	**IMPLEMENT** Attachment 1, while continuing with this procedure. (Continuous Action Summary - Fire Department Support)	**CUE:** Extra NCO will implement Attachment 1, continue with procedure.		
	3.8	Is the fire in an area serviced by the Control Area Air Conditioning System OR Chiller Room?	Operator marks step as YES, the Relay Room is in the area serviced by CAACS and goes to Step 3.9.		
*	3.9	At 2RP2 Panel, **SELECT** "FIRE INSIDE CONTROL AREA"	**At 2RP2. Operator depresses the pushbutton for FIRE INSIDE CONTROL AREA**		
*	3.10	**DIRECT** Unit 1 NCO to SELECT "FIRE INSIDE CONTROL AREA"	**Operator directs Unit 1 to select FIRE INSIDE** **CUE**: Unit 1 NCO will select FIRE INSIDE CONTROL AREA		
	3.11	**GO TO** Step 3.14	Operator goes to step 3.14		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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)
	3.14	**IMPLEMENT** S2.OP-SO.CAV-0001(Q), Control Area Ventilation Operation, for component alignment verification.	**CUE**: Extra NCO will perform S2.OP-SO.CAV-0001, continue on with procedure.		
	3.15	Is the fire located in either the 4KV or 460/230V Switchgear Room?	Operator marks step as NO, the fire is not in this area and goes to Step 3.18.		
	3.18	Is the fire located in either the Relay Room or Control Room Area?	Operator marks step as YES.		
	3.19	**ISOLATE** Pressurizer Power Operated Relief Valves (PORVs) for RCS inventory and pressure control:			
*	3.19.A	A. **SELECT** MANUAL AND CLOSE on the following PORVs: ___ 2PR1 ___ 2PR2	**Operator depresses MANUAL pushbutton for 2PR1 and 2PR2 on 2CC2 console.** **Examiners Note:** 2PR1 and 2PR2 are normally closed during power operation.		
*	3.19.B	B. **CLOSE** the following PORV Block Valves: ___ 2PR6, STOP VALVE ___ 2PR7, STOP VALVE	**Operator depresses the CLOSE pushbutton for 2PR6 and 2PR7 on 2CC2 console.**		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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)
*	3.20	**DISPATCH** an Operator to align the PORV Block Valve circuits to EMERG CLOSE per Attachment 15, Section 1.0	**Operator dispatches operator to perform 3.20** **CUE**: Operator will be dispatched to perform step 3.20.		
	3.21	**EVALUATE** implementation of S2.OP-AB.CR-0002(Q), Control Room Evacuation Due To Fire In Control Room, Relay Room, 460/230V Switchgear Room, or 4KV Switchgear Room	**CUE**: CRS will evaluate implementation of S2.OP-AB.CR-0002		
	3.22	**GO TO** Step 3.114	**CUE: JPM IS COMPLETE**		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Fire Protection System

TASK: Respond to Fire Alarm IAW S2.OP-AB.FIRE-0001

* #	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 completes step 3.22, 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**:_____	**Terminate JPM once step 3.22 is complete.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#:___20-01 NRC Sim-h_____

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

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

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

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

__RC__ 4. Initial setup conditions are identified.

__RC__ 5. Initiating and terminating Cues are properly identified.

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

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

__RC_ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _12__ Date _1-3-22__

__RC_ 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.

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

SME/Instructor:	R. Chan	Date:	1-10-22
SME/Instructor:	M. Protesto	Date:	1-10-22
SME/Instructor:	S. Pompper	Date:	1-10-22

INITIAL CONDITIONS:

- 100% power.
- All systems are in Automatic and normal alignment

INITIATING CUE:

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

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Pressurizer Pressure Control System (SF 3)

TASK: Transfer the 22 Backup Group Pressurizer heaters to the Emergency Power source

TASK NUMBER: 1130040501

JPM NUMBER: 20-01 NRC IP-i

ALTERNATE PATH: [ ]

K/A NUMBER: 010 A4.02

IMPORTANCE FACTOR: 3.6 (RO) 3.4 (SRO)

APPLICABILITY:

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

EVALUATION SETTING/METHOD: In-Plant / Simulate

REFERENCES: S2.OP-AB.LOOP-0001, Rev. 32 (checked 1-3-22)
S2.OP-SO.PZR-0010, Rev 10

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 20 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-3-22**
Validated By:	**Grauel / Harris** **SME or Instructor**	**Date: 1-11-22**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-3-22**

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: 20-01 NRC IP-i

Rev #	Date	Description	Validation Required
00	4-3-18	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	6-10-20	Reviewed new revision to AB.LOOP-1 and no impact to JPM.	No
--	1-3-22	Used on 20-01 NRC exam. K/A 010 A4.02 3.6/3.4 - Ability to manually operate and/or monitor in the control room: PZR heaters	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Pressurizer Pressure Control System (SF 3)

TASK: Transfer the 22 Backup Group Pressurizer heaters to the Emergency Power source

TASK NUMBER: 1130040501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is NOT located inside the RCA.**
- **Task will be performed in the Electrical Penetration Area 78 Ft. elevation.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Pressurizer Pressure Control System (SF 3)

TASK: Transfer the 22 Backup Group Pressurizer heaters to the Emergency Power source

TASK NUMBER: 1130040501

INITIAL CONDITIONS:

- A Loss of Offsite Power has occurred on Units 1 and 2.
- The Unit 2 CRS has initiated S2.OP-AB.LOOP-0001, Loss of Offsite Power.

INITIATING CUE:

- You have been directed to **TRANSFER** the 22 Backup Group Pressurizer Heaters to the Emergency Power Supply IAW Section 5.3 of S2.OP-SO.PZR-0010, Pressurizer Backup Heaters Power Supply Transfer.

SUCCESSFUL COMPLETION CRITERIA:

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

Task Standard for Successful Completion:

1. Transfers the 22 Backup Group Pressurizer heaters to the Emergency Power source by placing 11 of 14 disconnects in OFF, placing the 2EP PZR HTR BUS EMERGENCY FEED DISCONNECT SWITCH in ON, and using the interlock key to unlock breaker 2AX1AX14X.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME:_____
DATE:_____

SYSTEM: **Pressurizer Pressure Control System (SF 3)**
TASK: **Transfer the 22 Backup Group Pressurizer heaters to the Emergency Power source**

* #	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 operator with a marked up copy of S2.OP-SO.PZR-0010.	Operator obtains procedure.		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	3.0	Precaution and Limitations	**CUE**: IF asked about PZR level, THEN state: PZR level is 45%.		
	4.0	Equipment/Material Required	**CUE:** IF asked about JAM Key, THEN state: You have been provided a JAM key.		
	5.3.1	**ENSURE** 2AX1AX14X, 2EP PRESSURIZER HEATER BUS FEED (EMERGENCY) is OPEN (84' Swgr Rm).	Verifies breaker is OPEN. **CUE**: Breaker is Open		
*	5.3.2	Request NCO to **PERFORM** the following: ___ A. **PLACE** 22 Backup Group in MANUAL. ___ B. **PRESS** 22 BACKUP OFF pushbutton	**Directs NCO to place 22 B/U Group in Manual and PRESS 22 B/U OFF pushbutton.** **CUE**: The NCO reports that the 22 B/U Group is in Manual and OFF pushbutton has been depressed.		
	5.3.3	**ENSURE** 2EX1EP2EPX, 2EP 480V PRESSURIZER HEATER BUS MAIN BREAKER, is OPEN (78' Electrical Penetration).	Verifies breaker is OPEN. **CUE**: Breaker is Open		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME:_____
DATE:_____

SYSTEM: **Pressurizer Pressure Control System (SF 3)**
TASK: **Transfer the 22 Backup Group Pressurizer heaters to the Emergency Power source**

* #	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)
*,#	5.3.4	**REMOVE** interlock key from breaker 2EX1EP2EPX	**Operator simulates removing interlock key from breaker.** **CUE**: The key is removed.		
	5.3.5	**PLACE** any eleven of the following disconnects in OFF * (only three disconnects are to remain ON), * AND **MARK** the remaining disconnects as N/A:			
*, #	5.3.5	___2EX1EP1X, 12, 13, 14 PZR HTR B/U GRP 22 ___ 2EX1EP2X, 21, 22, 48 PZR HTR B/U GRP 22 ___ 2EX1EP3X, 23, 24, 50 PZR HTR B/U GRP 22 ___ 2EX1EP4X, 25, 26, 53 PZR HTR B/U GRP 22 ___ 2EX1EP5X, 27, 28, 55 PZR HTR B/U GRP 22 ___ 2EX1EP6X, 29, 30, 58 PZR HTR B/U GRP 22 ___ 2EX1EP7X, 31, 32, 60 PZR HTR B/U GRP 22 ___ 2EX1EP8X, 33, 62, 63 PZR HTR B/U GRP 22 ___ 2EX1EP9X, 35, 36, 65 PZR HTR B/U GRP 22 ___ 2EX1EP10X, 37, 38, 67 PZR HTR B/U GRP 22 ___ 2EX1EP11X, 39, 40, 70 PZR HTR B/U GRP 22 ___ 2EX1EP12X, 41, 42, 72 PZR HTR B/U GRP 22 ___ 2EX1EP13X, 43, 44, 75 PZR HTR B/U GRP 22 ___ 2EX1EP14X, 45, 46, 77 PZR HTR B/U GRP 22	**Operator selects three (3) disconnects to remain ON and the PLACES eleven (11) disconnects to OFF position**. **CUE**: The 11 disconnects selected are in in the OFF position.		
*, #	5.3.6	**PLACE** 2AX1AX14X-1, 2EP PZR HTR BUS EMERGENCY FEED DISCONNECT SWITCH in the ON position (Elev. 78' Electrical Penetration).	**Simulates using JAM Key to unlock disconnect <u>AND</u> then placing the disconnect switch to the ON position.** **CUE**: The JAM Key is inserted and disconnect switch is unlock and is in the ON position.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME:_____
DATE:_____

SYSTEM: **Pressurizer Pressure Control System (SF 3)**
TASK: **Transfer the 22 Backup Group Pressurizer heaters to the Emergency Power source**

* #	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)
*,#	5.3.7	**INSERT** interlock key, AND **UNLOCK** breaker 2AX1AX14X	**Operator simulates inserting key into breaker and then rotating to unlock the breaker**. **CUE:** The breaker is unlocked.		
	5.3.8	**NOTIFY** NCO that PZR Htr 22 B/U Group has been transferred to the emergency power supply (2A 460V Vital Bus).	**CUE**: NCO has been notified that 22 B/U Group is transferred to the emergency power supply. **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 report NCO is notified.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 NRC IP-i

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. _32 and 10____ Date ____1-3-22_____

___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: ____1-3-22_____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

INITIAL CONDITIONS:

- A Loss of Offsite Power has occurred on Units 1 and 2.
- The Unit 2 CRS has initiated S2.OP-AB.LOOP-0001, Loss of Offsite Power.

INITIATING CUE:

- You have been directed to **TRANSFER** the 22 Backup Group Pressurizer Heaters to the Emergency Power Supply IAW Section 5.3 of S2.OP-SO.PZR-0010, Pressurizer Backup Heaters Power Supply Transfer

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Locally Open Reactor Trip Breakers IAW AB.CR-0001.

TASK NUMBER: 1130070501

JPM NUMBER: 20-01 NRC IP-j

ALTERNATE PATH: [ ]

K/A NUMBER: 012 A4.06

IMPORTANCE FACTOR:	4.3	4.3
	RO	**SRO**

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

EVALUATION SETTING/METHOD: In Plant / Simulate

REFERENCES: S1.OP-AB.CR-0001, Rev. 19 (checked 9-10-21)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 25 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**K, Hantho** **Instructor**	**Date: 9-20-21**
Validated By:	**Harris / Stockton** **SME or Instructor**	**Date: 9-20-21**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-11-22**

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: 20-01 NRC ILOT IP-j

Rev #	Date	Description	Validation Required
00	6-20-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA. Incorporated comments from validation.	No
N/A	6-25-19	Last used on 2019 Annual Exam. Re-validation not required.	No
01	9-10-21	Checked revision of procedure for changes and updated attachment 5 sht 1 of 4 only change was rev. number.	No

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Locally Open Reactor Trip Breakers IAW AB.CR-0001.

TASK NUMBER: 1130070501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is located inside the <u>Unit 1</u> RCA <u>AND</u> 84' Switchgear Room.**

NAME: _____

DATE: _____

SYSTEM: Instrumentation (SF 7) – Reactor Protection System

TASK: Locally Open Reactor Trip Breakers IAW AB.CR-0001.

TASK NUMBER: 1130070501

INITIAL CONDITIONS:

- The Unit 1 Control Room has been evacuated in accordance with S1.OP-AB.CR-0001, Control Room Evacuation.
- A reactor trip was **NOT** initiated prior to evacuating the Control Room.

INITIATING CUE:

- You are directed to perform **Unit 1** S1.OP-AB.CR-0001, Control Room Evacuation, Attachment 5.

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. **Locally opens Reactor Trip and Bypass Breakers**
2. **Locally opens breakers for 13 Charging Pump and 1CV175 Rapid Borate valve.**

SYSTEM: **Instrumentation (SF 7) – Reactor Protection System**

TASK: **Locally Open Reactor Trip Breakers IAW AB.CR-0001.**

* #	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)
		Evaluator provide blank copy of Attachment 5, and state: "You have a radio and all required keys."			
		Operator reviews S1.OP-AB.CR-0001, Att. 5, and proceeds to El. 84 switchgear room.			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	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)	**Cue: You have all the necessary materials for your task.**		

SYSTEM: **Instrumentation (SF 7) – Reactor Protection System**

TASK: **Locally Open Reactor Trip Breakers IAW AB.CR-0001.**

* #	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)
*	2.0	**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 2.3 Reactor Trip Bypass Breaker A 2.4 Reactor Trip Bypass Breaker B.	**Operator simulates opening breakers by simulating removing cover <u>and</u> depressing the trip (open) Pushbuttons.** **<u>CUE</u>: *After simulating opening closed breakers state the following: the breaker is OPEN*.**		
	3.0	**CONFIRM** with the Hot Shutdown Panel Operator (PO) that 11 or 12 Charging Pump is operating.	**<u>CUE</u>: *11 charging pump is operating*.**		
*	4.0	**PROCEED** to 1AX1AX7X, #13 Charging Pump breaker AND **OPEN** the breaker.	**Locates 1AX1AX7X, #13 Charging Pump breaker AND simulates depressing the trip PB to open the breaker.** **<u>CUE</u>: *After simulating opening breaker state the following: the breaker is OPEN*.**		

SYSTEM: **Instrumentation (SF 7) – Reactor Protection System**

TASK: **Locally Open Reactor Trip Breakers IAW AB.CR-0001.**

* #	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)
*	5.0	**PROCEED** to 1C West Valve & Misc 230V Control Center-El 84', AND **OPEN** Breaker 1CY2AX4I, 1CV175-Rapid Borate Stop Valve.	**Locates 1C West Valve & Misc 230V Control Center-El 84', and simulates opening Breaker 1CY2AX4I, 1CV175-Rapid Borate Stop Valve.** **CUE: *After simulating opening breaker state the following: the breaker is OPEN.***		
	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.	Contact CRS and reports the Reactor Trip and Bypass breakers are open and #13 Charging Pump Breaker is open. **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 6.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 20-01 NRC ILOT IP-j

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.

_____ 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. _19____ Date _____3/18/21_____

____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: _1-11-22_____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

INITIAL CONDITIONS:

- The Unit 1 Control Room has been evacuated in accordance with S1.OP-AB.CR-0001, Control Room Evacuation.
- A reactor trip was **NOT** initiated prior to evacuating the Control Room.

INITIATING CUE:

You are directed to perform **Unit 1** S1.OP-AB.CR-0001, Control Room Evacuation, Attachment 5.

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

___ 2.3 Reactor Trip Bypass Breaker A

___ 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.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Radioactivity Release (SF-9) - Liquid Radwaste System
TASK:	Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-0001
TASK NUMBER:	N0685140104
JPM NUMBER:	20-01 NRC IP-k
ALTERNATE PATH: [ ]	**K/A NUMBER:** 068 A4.03
	IMPORTANCE FACTOR: 3.9 (RO) 3.8 (SRO)
APPLICABILITY:	

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

EVALUATION SETTING/METHOD: In-Plant / Simulate

REFERENCES: S2.OP-SO.WL-0001, Rev. 28 (checked 9-10-21)
S2.OP-TM.ZZ-0002, Rev. 8

TOOLS AND EQUIPMENT: S2.OP-TM.ZZ-0002 Tank Capacity Data

VALIDATED JPM COMPLETION TIME: 25 mins

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**K.Hantho** **Instructor**	**Date: 9-10-21**
Validated By:	**Harris/Stockton** **SME or Instructor**	**Date: 9-10-21**
Approved By:	**M. Wadusky (signature on file)** **Training Department**	**Date: 2-10-22**
Approved By:	**W. Hargrave** **Operations Department**	**Date: 1-11-22**

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: 20-01 NRC IP-k

Rev #	Date	Description	Validation Required
00	10-2-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-14-07	Incorporated NRC Prep week comments. Changed validation time to 20 minutes. Added cue to provide SAP screenshots if requested for location of 2WR59 valve. Step 5.5.9 cannot be credited towards critical step and alternate path since no action is performed by operator in the field. Also revised outline (ES-301-2) to change this JPM as not an alternate path JPM.	No
02	5-8-18	Minor editorial changes. Used for 2018 Annual Exam.	Yes
03	9-26-19	Modified to a failure of the flow monitor versus high radiation monitor alarm.	Yes
04	9-10-21	Updated title and verified procedures	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Radioactivity Release (SF-9) - Liquid Radwaste System

TASK: Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-0001

TASK NUMBER: N0685140104

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES:

N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is located inside the RCA**.
- **ENSURE** Evaluator has a copy of S2.OP-TM.ZZ-0002, Tank Capacity Data, to provide to Operator when requested. Note: Field Copy does exist at the Radwaste Operator desk by the 104 Panel.
- **ENSURE** Evaluator has the SAP (eSOMs) screenshots for 2WR59 location information**.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF-9) - Liquid Radwaste System

TASK: Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-0001

TASK NUMBER: N0685140104

INITIAL CONDITIONS:

- Preparations for a release of 21 CVCS Monitor Tank via Unit 2 SW system to Unit 1 CW system is in progress IAW S2.OP-SO.WL-0001, RELEASE OF RADIOACTIVE LIQUID WASTE FROM 21 CVCS MONITOR TANK.
- Chemistry has granted permission to release 21 CVCS MT at a Maximum Release Rate of **45 gpm** due to the high activity (Curie) content of the tank.
- 2R18 Radiation Monitor AND 2FR1064 Flow Recorder are both OPERABLE.
- All Unit 1 CW pumps are in service.

INITIATING CUE:

- You are the extra NCO.
- The CRS directs you to release 21 CVCS MT IAW Section 5.5 of S2.OP-SO.WL-0001.
- The Maximum Release Rate and Release Path are recorded on Attachment 2, Section 2.2 of the procedure.

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. **Controls the discharge of 21 CVCS MT to less than the Maximum Release rate of 45 gpm.**
2. **Notifies control room to close 2WL51 following high alarm on the 2R18 radiation monitor.**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF-9) - Liquid Radwaste System

TASK: Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-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)
		Provide candidate with marked up procedure (partial procedure) S2.OP-SO.WL-0001, RELEASE OF RADIOACTIVE LIQUID WASTE FROM 21 CVCS MONITOR TANK.	Give operator marked up copy of S2.OP-SO.WL-0001.		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	5.5	**Release of 21 CVCS MT via SW System to CW System**			
	5.5.1	IF 2FR1064, RADWASTE OVERBOARD DISCH FLOW RECORDER is INOPERABLE, THEN **INITIATE** Attachment 4, Section 4.0.	Marks step N/A; 2FR1064 is OPERABLE.		
		Evaluator Note: Pictures available for indications listed below to be utilized.			
*	5.5.2	**DIRECT** Unit 2 NCO to OPEN 2WL51, LIQUID RELEASE STOP VALVE	**Operator simulates using the plant page or phone to call control room**. **Operator DIRECTS Unit 2 NCO to OPEN 2WL51.** **CUE**: Unit 2 NCO reports 2WL51 is OPEN.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF-9) - Liquid Radwaste System

TASK: Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-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)
	5.5.3	**DIRECT** second Operator to PERFORM Independent Verification of 2WL51, LIQUID RELEASE STOP VALVE, position in Attachment 2, Step 4.1.2 OR 4.2.2, as applicable (ODCM).	**CUE:** IV has been performed.		
*	5.5.4	THROTTLE **OPEN** 2WR59, MT PMPS OB STOP VALVE, to obtain less than or equal to Maximum Release Rate recorded in Attachment 2, Step 2.2.2. **Evaluator Note:** Picture available.	**Operator locates 2WR59 and simulates opening valve by turning valve hand wheel in the counterclockwise direction. [location: Gas Stripper Feed Pump Room, 64' El. Aux Bldg.]** **CUE:** The 2WR59 is full open. **CUE**: **IF** the operator has problems locating this valve and requests to access SAP (now eSOMs) to obtain location information on this valve, THEN provide the SAP (eSOMs) screenshots for location info on 2WR59. **CUE**: When operator checks the 2FR1064 flow recorder on the 104 panel, THEN report; flow is reading **5 gpm**.		
	5.5.5	**DIRECT** second Operator to PERFORM Independent Verification of 2WR59, MT PMPS OB STOP VALVE, position in Attachment 2, Step 4.1.3 OR 4.2.3, as applicable (ODCM).	**CUE**: IV has been performed.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF-9) - Liquid Radwaste System

TASK: Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-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)
	Caution	Completely closing 21WR53 will NOT provide sufficient recirculation to protect the pump should 2WL51 isolate due to high radiation alarm.	Operator reads Caution and continues on.		
*	5.5.6	IF Maximum Release Rate recorded in Attachment 2, Step 2.2.2, NOT obtained with 2WR59, MT PMPS OB STOP VALVE, fully open, THEN **THROTTLE** 21WR53, MT RECIRC V, to obtain less than or equal to Maximum Release Rate recorded in Attachment 2, Step 2.2.2. **Evaluator Note:** Picture available.	**Operator locates 21WR53 and simulates throttling valve CLOSED by turning the hand wheel in the clockwise direction to raise flow. [location: CVCS MT Room, 64' EL. Aux Bldg. 21WR53 is about 7 feet above the floor]** **Cue**: When operator checks the 2FR1064 flow recorder on the104 panel after going in the CLOSED direction, THEN report; flow is 50 gpm. **When flow is > 45 gpm, the operator lowers flow by OPENING 21WR53 in the counterclockwise direction until flow is less than 45 gpm.** **Cue**: When the operator adjusts the 21WR53 in the OPEN direction, THEN report that flow is reading 40 gpm. Note: During actual releases, the best flow achieved during this evolution is about 50 gpm.		
	5.5.7	IF 2FR1064 flow monitor is OPERABLE, THEN **RECORD** time, date, and tank identification on recorder.	Operator simulates annotating recorder with time, date and tank.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF-9) - Liquid Radwaste System

TASK: Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-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)
	5.5.8	**COMPLETE** Attachment 2, Section 5.1 21 CVCS MT Release Initial Data:	Operator Records data IAW with the provide information below.		
		▪ 21 CVCS MT Level (2LIS180)	**CUE**: When operator reads 21 CVCS Monitor Tank Level on the 104 panel, state; ***2LIS-180 indicates 90%.***		
		▪ 21 CVCS MT Volume (1) (1) Obtain tank volume from S2.OP-TM.ZZ-0002(Q), Tank Capacity Data.	**CUE**: When operator reports the need to obtain S2.OP-TM.ZZ-0002, Tank Capacity Data (Note 1), ***THEN provide the data sheet for CVCS Monitor Tank***. Operator uses provided data sheet and determines a tank volume of 19,500 gallons (acceptable range between 19,200 to 19,800 gallons).		
		▪ Dilution Flow Rate	**CUE:** ***Chemistry paperwork indicates dilution water flowrate is 200,000 gpm***. Records Dilution Water Flowrate of 200,000 gpm. Initial conditions stated all circulators were in service. 2 Circulators used x 100,000 = 200,000.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Radioactivity Release (SF-9) - Liquid Radwaste System

TASK: Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-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)
		▪ Discharge Flow Rate (3) (2FR1064)	Records 40 gpm for Discharge Flow Rate. **CUE**: 2FR1064 reads 40 gpm.		
		▪ 2R18 Monitor Reading (5)	**CUE**: When operator reads the 2R18 on the 104 panel state; **2R18 reads 10^5 counts per minute and the 2R18 High Radiation light is illuminated**.		
*	5.5.9	IF any of the following occur during release, THEN **DIRECT** NCO to CLOSE 2WL51, LIQUID RELEASE STOP VALVE: ❖ LOSS of dilution water flow ❖ 2FR1064 becomes inoperable ❖ 2R18 Monitor ALARMS ❖ MT Pump pressure falls below MDP allowed IAW Attachment 4	**Operator simulates calling the main control room to report that the 2R18 is in ALARM and DIRECTS the NCO to CLOSE 2WL51.** **CUE: Unit 2 NCO reports that the 2WL51 is CLOSED.**		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: **Radioactivity Release (SF-9) - Liquid Radwaste System**

TASK: **Perform a Radioactive Liquid Release IAW S2.OP-SO.WL-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 Control Room reports that 2WL51 is CLOSED.**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM #: 20-01 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____ 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 _____

____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: ____1-11-22_____

SME/Instructor:_____ Date: _____

SME/Instructor:_____ Date: _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Preparations for a release of 21 CVCS Monitor Tank via Unit 2 SW system to Unit 1 CW system is in progress IAW S2.OP-SO.WL-0001, RELEASE OF RADIOACTIVE LIQUID WASTE FROM 21 CVCS MONITOR TANK.
- Chemistry has granted permission to release 21 CVCS MT at a Maximum Release Rate of **45 gpm** due to the high activity (Curie) content of the tank.
- 2R18 Radiation Monitor AND 2FR1064 Flow Recorder are both OPERABLE.
- All Unit 1 CW pumps are in service.

INITIATING CUE:

- You are the extra NCO.
- The CRS directs you to release 21 CVCS MT IAW Section 5.5 of S2.OP-SO.WL-0001.
- The Maximum Release Rate and Release Path are recorded on Attachment 2, Section 2.2 of the procedure.

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: NRC-1 [AB.COND-1, AB.ROD-3, AB.RC-1, TRIP-1, LOCA-1, LOCA-5]

SCENARIO NUMBER: 20-01 NRC ESG-1

EFFECTIVE DATE: See Approval Dates

EXPECTED DURATION: 90 minutes

REVISION NUMBER: 05

PROGRAM:

- [ ] **L.O. REQUAL**
- [X] **INITIAL LICENSE**
- [ ] **STA**
- [ ] **OTHER** _____

Revision Summary:

- See ESG-1807 for previous revisions.
- Rev. 03 (last used 2019 Annual ESG-1913) Modified for 19-01 ILOT NRC exam. Modified abnormal events. Incorporated comments from validation; added 22 vacuum pump trip.
- Rev 04 Incorporated comments from NRC working mtg on 2-14-20 to reduce the scenario duration. Deleted Loss of Off-site Power and Loss of 2A 4KV Vital Bus. Added 21 RHR Pump is C/T for maintenance to support LOCA-5 conditions. Added comments from NRC Prep Week 6-17-20.
- Rev 05 Incorporated NRC comments following phone call on 10-2-21 to delete SG pressure channel failure and modify RCS leak to 20 gpm to allow observing actions in AB.RC-1 and exercise Tech Specs.

PREPARED BY:	R. Chan	1-28-22
	Lead Regulatory Exam Author	**Date**
APPROVED BY:	M. Wadusky (signature on file)	2-10-22
	Operations Training Manager or designee	**Date**
APPROVED BY:	W. Hargrave	1-28-22
	Facility Representative	**Date**

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 1

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____ESG-1_____ Op-Test No.: __20-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-240: Unit 2 is at 100% power, EOL; 21 Charging Pump I/S. The following equipment is out of service: 23 Charging Pump and 21 RHR Pump are C/T for maintenance.

Turnover: The crew is directed to reduce power to 89% power at 10% per hour IAW S2.OP-IO.ZZ-0004 using boration, control rods and turbine load control in preparation for Main Turbine Valve testing.

Critical Tasks:

1. Manually actuate at least one train of SI before transition out of TRIP-1
2. Manually start one low head ECCS pump before transition out of TRIP-1
3. Make up to the RWST, minimize RWST outflow, and if RWST Lo-Lo level alarm received stops ECCS pumps prior to cavitation

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ATC (R) BOP (N) CRS (N)	Load reduction to 89% at 10% per hour IAW IOP-4
2	VC0087C	BOP (C) CRS (C)	24 vacuum pump trips
3	RC0015D	ATC (I) CRS (I, TS)	24 Loop Cold Leg RTD fails high
4	RC0002	ATC (C) CRS (C,TS)	RCS leak inside containment (20 gpm)
5	RC0002 RC0001A	ALL (M)	-RCS leak worsens to 350 gpm/ Large Break LOCA
6	RP0108	ATC (I) CRS (I)	-Auto Safety Injection fails to actuate **(CT-1)**
7	RP318A2	ALL (I)	22 RHR Pump fails to start on SEC signal **(CT-2)**
8	RH0026B	ALL (C)	22 RHR Pump trips **(CT-3)**
		ABs	IOP-4 → AB.COND-1 → AB.ROD-3 → AB.RC-1
		EOPs	TRIP-1 → LOCA-1 → LOCA-5

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

Scenario No.: 1

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	7	2-8
2. Malfunctions after EOP entry (1-2)	3	6,7,8
3. Abnormal events (2-4)	3	2,3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	1	5 (LOCA-1)
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1	8 (LOCA-5)
7. Preidentified critical tasks (≥2)	3	6,7,8
8. Tech Specs exercised (≥ 2)	2	3,4

I. OBJECTIVES

A. Given the order, perform a turbine load reduction in accordance with station procedures.

B. Given indications of a loss of vacuum, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW approved station procedures.

C. Given indications of a loss of vacuum, DIRECT the response to the malfunction IAW approved station procedures.

D. Given indications of a RCS RTD instrument failure, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with approved station procedures.

E. Given indications of a RCS RTD instrument failure, DIRECT the response to the malfunction in accordance with approved station procedures.

F. Given an RCS leak at power, respond to the event IAW approved station procedures.

G. Given the indications of a reactor coolant system (RCS) malfunction or leak, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with the approved station procedures.

H. Given the indications of a reactor coolant system (RCS) malfunction or leak, DIRECT the response to the malfunction in accordance with the approved station procedures.

I. 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.

J. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.

K. 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.

L. Given indication of a safety injection DIRECT the response to the safety injection in accordance with the approved station procedures.

M. 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.

N. Given a safety injection has occurred and equipment has failed to start, START equipment that has failed to automatically start in accordance with station procedures.

O. Given the order or indications of a loss of coolant accident (LOCA), complete actions as the nuclear control operator to PERFORM the immediate response to the LOCA in accordance with the approved station procedures.

P. Given indication of a loss of coolant accident (LOCA), DIRECT the immediate response to the LOCA in accordance with the approved station procedures.

Q. Given the order or a loss of coolant accident (LOCA) with indication of a loss of emergency recirculation, perform actions as the nuclear control operator to RESPOND to the loss of emergency recirculation in accordance with the approved station procedures.

R. Given a loss of coolant accident (LOCA) and a loss of emergency recirculation, DIRECT actions to respond to the emergency recirculation loss in accordance with the approved station procedures.

S. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. Planned Load Reduction to 89% at 10%/hour
2. 24 Vacuum Pump trips
3. RC Loop 24 Cold Leg RTD Fails High (TS)
4. RCS Leak (20 gpm) (TS)
5. LBLOCA
6. Auto SI fails to actuate
7. 22 RHR Pump Fails to Start on SEC Signal
8. Loss of Emergency Recirculation capability (22 RHR Pump Trips)

III. SCENARIO SUMMARY

1. The crew assumes the watch at 100% power, EOL. 23 Charging Pump is C/T for pulsation damper repairs with 21 Charging Pump in service, 21 RHR is C/T for motor bearing replacement.
2. After assuming the watch, the crew will brief a planned load reduction to 89% at 10%/hour IAW **S2.OP-IO.ZZ-0004**, Power Operation, in preparation for Main Turbine Valve testing next shift.
3. After the power reduction has commenced, 24 condenser vacuum pump will trip. The crew will recognize that condenser backpressure is slowly rising and enter **S2.OP-AB.COND-0001**, Loss of Condenser Vacuum. The crew will start all available vacuum pumps and stabilize condenser back pressure. The 25AR25 will fail to open and the operator will manually open from control room.
4. After the crew addresses vacuum pump trip, 24 Loop Cold Leg RTD will fail high causing control rods to continuously insert. The crew will verify no turbine runback in progress and place rods in manual. The crew will enter **S2.OP-AB.ROD-0003**, Continuous Rod Motion, and place rods to manual, defeat the failed channel, place Charging Flow in manual, then restore rods to AUTO. The CRS will enter TS 3.3.1.1, Action 6 and 3.3.2.1.b Action 19.
5. Once actions for 24 Loop RTD failure is addressed, a RCS leak (20 gpm) will occur resulting in lowering PZR level and rising counts on the 2R11A containment radiation monitor. The CRS will enter **S2.OP-AB.RC-0001, RCS Leak**, and adjust Charging flow to stabilize PZR level. The CRS will evaluate TS and enter TS 3.4.7.2.b, Action b. Once TS has been evaluated, the RCS leak will worsen to 350 gpm. The crew will take CAS actions in S2.OP-AB.RC-0001 and manually trip the reactor, at which time the RCS leak will escalate into a Large Break LOCA.
6. Immediately following the Rx Trip a malfunction will prevent Auto Safety Injection from actuating. The crew will respond by manually initiating SI [**Critical Task #1**]. The crew will enter **EOP-TRIP-1,** Reactor Trip or Safety Injection.
7. While in EOP-TRIP-1, the crew will recognize that 22 RHR Pump failed to start on SEC signal. The crew will block and reset 2B SEC, then manually start 22 RHR Pump [**Critical Task #2**].

8. The crew will perform diagnostics in EOP-TRIP-1 and eventually transition to **EOP-LOCA-1**, Loss of Reactor Coolant, based on containment pressure > 4 psig. While in EOP-LOCA-1, the 22 RHR Pump will trip and the crew will determine a loss of emergency recirculation capability and transition to **EOP-LOCA-5**, Loss of Emergency Recirculation. The crew will perform the following actions in LOCA-5; make-up to RWST, stop Containment Spray Pumps, and then reduce ECCS to a single train [**Critical Task #3**]. During LOCA-5, the crew may reach the RWST Lo-Lo Level Alarm (1.2 feet) and be required to stop all ECCS pumps taking suction from the RWST prior to cavitation [**Critical Task #3**].
9. The scenario can be terminated when the crew reduces ECCS to one train, stops all ECCS pumps taking suction from the RWST if the Lo-Lo level alarm is received, or by direction from Lead Examiner.

IV. INITIAL CONDITIONS

____ **IC-240**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
____ 1	2VC1and 2VC4 C/T
____ 2	RCPs (SELF CHECK)
____ 3	RTBs (SELF CHECK)
____ 4	21-24MS167s (SELF CHECK)
____ 5	500 KV SWYD (SELF CHECK)
____ 6	21 and 22 SGFP Trip (SELF CHECK)
____ 7	**21 CV Pump (SELF CHECK)**
____ 8	**21 RHR Pump C/T**
____ 9	**23 Charging pump C/T**
___ 10	**Suggested Protected Equipment:** ▪ **22 RHR Pump**
___ 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:	KCK02PBZ //22 VACUUM PUMP-START <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	VC0087C TRIP OF VACUUM PUMP 24	N/A	N/A	N/A	RT-1	
_____ 02	RC0015D LOOP 24 COLD LEG RTD FAILS HI/L	N/A	N/A	N/A	RT-2	630
_____ 03	RC0002 RCS LEAK INTO CONTAINMENT (equiv to 0-4 inches)	N/A	N/A	N/A	RT-3	20
_____ 04	RP0108 FAILURE OF AUTOMATIC SI	N/A	N/A	N/A	N/A	
_____ 05	RC0001A RCS RUPTURE OF RC LOOP 21	N/A	N/A	N/A	ET-1	
_____ 06	VC0087A TRIP OF VACUUM PUMP 22	00:00:02	N/A	N/A	ET-2	
_____ 07	RP318A2 RHR PUMP 22 Fails to Start on SEC	N/A	N/A	N/A	N/A	
_____ 08	RH0026B 22 RHR PUMP TRIP	N/A	N/A	N/A	RT-4	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	MC32A CROSS FLOW CORRECTION FACTOR	N/A	N/A	N/A	N/A	.99867
_____ 02	CV20A 2CV182 BLENDER ISO VLV	N/A	N/A	N/A	RT-10	100
_____ 03	CV21A 2CV184 BLENDER DISC TO RWST	N/A	N/A	N/A	RT-10	100
_____ 04	RH26D 21 RHR PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 05	RH27D 21 RHR PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 06	CV52D 23 CHG PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 07	CV53D 23 CHG 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

_____ 01	AH03 C1 LO QAH03HRK RWST HEATER PUMP START	00:00:02	N/A	N/A	RT-11	ON
_____ 02	AH03 C2 LO QAH03KGK RWST HEATER PUMP STOP	N/A	N/A	N/A	RT-11	OFF

OTHER CONDITIONS:

	Description

____ 1. 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	Comments
1. **Power Reduction to 89%**			
	CRS briefs crew on power reduction to 89% at 10%/hour IAW S2.OP-IO.ZZ-0004, Section 4.3 Power Reduction.		
	RO briefs boration plan for load reduction.		
	PO briefs turbine load control plan.		
	RO initiates boration IAW S2.OP-SO.CVC-0006.		
	PO initiates turbine load reduction IAW S2.OP-SO.TRB-0002, Turbine Generator Shutdown Operation.		
	RO monitors Tavg and control rods for proper response.		
Proceed to next event by direction from Lead Examiner.			
Examiner's Note: The crew may at any time stop the load reduction to respond to the next events.			
2. 24 Vacuum Pump Trips:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Simulator Operator: At direction from Lead Evaluator insert **RT-1**. This will trip 24 vacuum pump: **VC0087C, Trip of Vacuum Pump 24**			
	PO reports unexpected trip of 24 Vacuum Pump.		
	CRS enters S2.OP-AB.COND-0001, Loss of Condenser Vacuum.		
	PO initiates Attachment 1 CAS.		
	CRS dispatches operator to perform Attachment 2, Loss of Vacuum Local Checks.		
Role Play: When dispatched to perform Attachment 2, THEN after 2-5 minutes report the following: ***I've completed Attachment 2 and have found no abnormal conditions except for the vacuum pump breaker being tripped open***.			
	PO reports 24 Vacuum pump is stopped and the 24AR25 is closed.		
	PO reports condenser backpressure is rising rapidly.		
	PO reports rising backpressure is not attributed to CW System malfunctions.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	PO starts all available vacuum pumps.		
22 Vacuum Pump trips following start:			
Simulator Operator: Ensure **ET-2** is TRUE IF 22 Vacuum pump is started. This will cause the pump to trip following start.			
	IF 22 Vacuum Pump is started, the PO reports that the pump started then tripped seconds later.		
25AR25 fails to open following start of 25 Vacuum Pump:			
	PO reports that 25 Vacuum Pump started but the 25AR25 failed to open.		
Role Play: IF requested to check local indications at the Vacuum Pump, THEN report that ***the local gauge reading is within the normal band and all other parameters are within their normal bands.***			
	PO manually opens 25AR25.		
	PO reports that condenser back pressure is improving.		
Proceed to next event at direction from Lead Examiner.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
3. 24 Loop Cold Leg RTD Fails High			
Simulator Operator: Insert **RT-2** on direction from Lead Examiner. **RC0015D, 24 Cold Leg RTD Fails H/L Value = 630**			
	RO reports unexpected continuous rod insertion with no turbine runback in progress.		
Examiner's Note: RO may request to take manual control of Master Flow Controller prior to direction provided in S2.OP-AB.ROD-0003.			
	RO places rod control in Manual.		
	RO reports rod motion has stopped.		
	CRS enters S2.OP-AB.ROD-0003, Continuous Rod Motion.		
	RO reports that 24 RC Loop Tavg Channel has failed high. (may also report DT is reading zero indicating failed high Cold Leg input)		
Examiner's Note: RO could place MFC in Manual at anytime or wait until directed in AB.ROD-0003.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO places Master Flow Controller (MFC) to Manual		
	RO reports various 2CC2 console alarms in for: RC Loop Tavg Deviation, Tavg-Tref Deviation, RC Tavg Hi or Lo-Lo, RC Loops DT Dev.		
	CRS confirms control rods are in manual and rod motion has stopped.		
	CRS directs RO to adjust rods in manual to maintain Tavg within 1.5 deg of T program. Any rod manipulation is pre-announced, and the RO monitors control board indications for plant response to rod motion.		
	RO reports rod motion was in the inward direction and a NIS channel has NOT failed.		
	CRS directs RO to stop any dilution in progress.		
	RO reports 24 loop Tavg channel has failed High.		
	CRS directs RO to return PZR level to program.		
	RO places Charging System Master Flow Controller in manual (if not previously performed).		
	RO adjusts charging flow to restore PZR level to program IAW Attachment 2.		
	RO defeats 24 loop Reactor Coolant Differential Temperature and 24 loop Reactor Coolant Average Temperatures on 2CC2.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO selects channel other than 24 loop for Reactor Coolant Differential Temperature and Reactor Coolant Average Temperature.		
	When PZR level has been restored to program, RO places Charging System Master Flow Controller in auto.		
	RO reports control rods are above the rod insertion limit.		
Examiners Note: At this time, Tavg can be outside the +/- 1.5 °F band in order for rods to be restored to Manual. The crew may either withdraw rods and/or reduce turbine load to bring Tavg to within 1.5 °F of program to restore rods to Auto. If the crew decides to leave rods in manual, this will not effect the subsequent steps of the major event of the scenario and may proceed on to the next event.			
	RO restores control rods to previous position at time of load reduction and/or reduces turbine load.		
	RO places rod control in Auto after ensuring Tavg is within 1.5 degrees of Tref.		
TS evaluation #1:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	CRS enters: • **TS 3.3.1.1 Action 6 (place channel in the tripped condition within 72 hours), and** • **TS 3.3.2.1.b Action 19* (place channel in the tripped condition within 72 hours).**		
Examiner's Note: Operator actions already performed in AB.ROD-0003, no additional actions in control room, I&C Maintenance is required to complete S2.OP-SO.RPS-0002.			
	CRS initiates S2.OP-SO.RPS-0002 to place 24 loop Tavg in tripped condition.		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			
4. RCS Leak (20 gpm)			
Simulator Operator: Insert **RT-3** by direction from Lead Examiner. **RC0002, RCS Leakage** **Value = 20** **Ramp = None**			
	RO reports counts on the 2R11A containment radiation monitor is rising.		
	RO reports PZR level is lowering and/or RCS pressure is lowering.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports RCS leak inside containment.		
	RO determines RCS leak rate.		
Examiners Note: The CRS can also enter S2.OP-AB.RAD-0001, Abnormal Radiation, in response to OHA A-6. If so, the CRS can direct the PO to perform actions of AB.RAD-1 while the CRS directs actions in AB.RC-1.			
	CRS enters S2.OP-AB.RC-0001, RCS Leakage.		
	PO initiates Attachment 1 CAS		
	RO reports RCS temperature is above 350 ˚F.		
	RO reports Unit is not in Mode 3.		
	RO reports PZR level is lowering.		
	RO reports a centrifugal charging pump is in service.		
	CRS directs RO to adjust charging flow to stabilze PZR level.		
	RO adjusts charging flow to stabilize PZR level and then determines RCS leak rate.		
TS evaluation #2:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	CRS enters: • **TS 3.4.7.2.b (1 gpm unidentified leakage), action b (reduce leakage rate to within limits within 4 hours or be in Hot Standby)**		
Proceed on to next event after TS has been evaluated or by direction from the Lead Examiner			
5. RCS leak worsens to 350 gpm and Large Break LOCA (Major Transient):			
Simulator Operator: Modify **RT-3** to 350 at the direction of the Lead Examiner. **RC0002, RCS Leakage** **Value = 350** **Ramp = None**			
	RO reports PZR level is lowering rapidly.		
	RO attempts to maintain PZR level by adjusting charging flow.		
	RO reports RCS leak rate exceeds make up capability.		
	CRS implements the Attachment 1 CAS action and briefs the RO to Trip the Reactor and actuate Safety Injection.		
	RO trips the reactor and actuates SI.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Simulator Operator: Ensure **ET-1** is TRUE following Rx Trip. This will insert LBLOCA malfunction. **RC0001A, RCS rupture on RC loop 21**			
6. Auto SI fails to actuate on both trains:			
	RO may report SI failed to Auto actuate (depending on where RCS pressure is at during time SI is manually actuated)		
Critical Task-1 (CT-2): Manually actuate at least one train of SI before transition out of TRIP-1, Reactor Trip or Safety Injection. **SAT_____ UNSAT_____**			
	Critical Task #1 - RO manually actuates SI on one Train and verifies the other train actuated.		
	RO continues Immediate Actions of TRIP-1: ▪ Reports the Main Turbine is tripped and backs up Main Turbine trip. ▪ Reports all 4KV vital busses energized. ▪ Reports SI has been initiated.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	CRS and RO verify Immediate Actions complete.		
	CRS directs initiation of the following EOP-TRIP-1 CAS actions when RCS pressure meets the criteria: • **Stops RCPs (1350 psig)** • **Close Charging Mini-flows (1500 psig)**		
	RO announces Rx Trip and Safety Injection on the station PA.		
	PO reports ALL Vital Buses are energized.		
	PO reports SEC loading for 2B vital bus is NOT complete.		
7. 22 RHR Pump fails to start on SEC signal (No low head ECCS pumps running):			
	PO reports 22 RHR pump failed to start.		
Critical Task-2 (CT-5): Manually start one low head ECCS pump before transition out of EOP-TRIP-1, Reactor Trip or Safety Injection. **SAT_____ UNSAT_____**			
	Critical Task #2 - PO blocks and resets 2B SEC.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	Critical Task #2 - RO starts 22 RHR pump.		
	PO throttles AFW flow to no less than 22E4lbm/hr while SG NR levels remain <9%. (15% adverse)		
	RO reports containment pressure has NOT remained <15 psig.		
	RO reports Phase B and Spray actuation Auto initiated.		
	RO reports 21 and 22 CS pumps are running.		
	RO reports MSLI Auto initiated.		
	RO reports all valves groups in Table B are in the safeguards positions.		
	PO reports 2RP4 indicates High-High Containment Pressure.		
	RO reports both trains of MSLI has actuated.		
	PO reports all valves in Table D are closed.		
	PO reports no indication of High Steam flow on 2RP4.		
	RO reports 2 CCW pumps are running.		
	RO reports both CCW HXs are in Auto.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports 2CC131 (Thermal Barrier Return) is closed.		
	RO reports Phase B has occurred and 2CC131 should not be opened.		
	CRS notifies WCC to monitor Spent Fuel Pool temperature and level.		
	RO reports RWST Lo Level Alarm has not actuated (this is a CAS step)		
	PO reports all valves in Table E are in the safeguards positions.		
	RO reports 21 and 22 CA330s are closed.		
	RO reports CAV is in Accident Pressurize Mode.		
	RO reports CAV is not in Maintenance Mode Alignment		
	RO reports two switchgear fans and one switchgear exhaust fan are running		
	RO reports Charging, SI pump and RHR pump flows are consistent with RCS pressure.		
	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%.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Examiner's Note: Based on the pace of the crew, they may perform the following CAS steps sooner or later in EOP-TRIP-1.			
	RO closes charging pump mini flows IAW TRIP-1 CAS when RCS pressure is < 1500 psig with BIT flow established. [TRIP-1 CAS]		
	RO stops RCPs IAW TRIP-1 CAS when RCS pressure is <1350 psig with ECCS flow established. [TRIP-1 CAS]		
	RO reports RCP status, and CRS determines whether a MSLI for temperature control is required.		
	RO reports PZR spray valves response are normal.		
	RO reports RCS pressure < 1350 psig and ECCS flow established.		
Examiner's Note: SG pressure could be lowering slowly based on the break flow from the LBLOCA.			
	PO reports NO indications of a Faulted SG exist.		
	PO reports NO indications of a SGTR exist.		
	RO reports two or more channels in Table J are NOT indicating normal on the P250 computer **OR** reports Containment Pressure > 4 psig.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
EOP-LOCA-1 steps here:			
	CRS transitions to 2-EOP-LOCA-1, Loss of Reactor Coolant.		
Examiner's Note: During LOCA-1, the crew may reach the low RWST alarm (15.2 feet) and then transition to EOP-LOCA-3. IF so, the CAS in LOCA-3 will direct transition to LOCA-5 following the trip of the last remaining RHR Pump.			
Simulator Operator: IF the crew transitions to LOCA-3, THEN insert **RT-4** to trip the 22 RHR Pump immediately upon transition to LOCA-3.			
Examiners Note: A CFST PURPLE Path on Thermal Shock may exist during LOCA-1, if so, the crew will enter and exit FRTS-1 with no actions performed.			
	RO reports all RCPs are stopped.		
	PO reports no indications of faulted SGs.		
	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 resets Phase A.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO opens 21 and 22 CA330s.		
	RO resets SG B/D Sample Isolation Bypass		
	RO opens 21 thru 24 SS94s (SG B/D Sample Valves)		
	PO reports ALL secondary radiation monitors in Table B are indicating Normal.		
	RO reports both PZR PORVs are Closed and Block valves are Open.		
	RO reports subcooling is NOT greater than 0 F.		
	RO reports both CS Pumps are running.		
	RO resets both trains of SI.		
	PO resets each SECs.		
	RO reports RCS pressure is not greater than 300 psig.		
Proceed to next event following Stopping Unloaded DGs			
	PO stops all unloaded EDGs.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Role Play: IF requested to verify EDG is reset to Auto, THEN state the following: ***EDG is reset for Auto start IAW EOP-APPX-9***. Verify OHA J-4, J-12 and J-20 for associated EDG is cleared. **Simulator Operator**: No Actions.			
8. Trip of 22 RHR Pump (Loss of Emergency Recirculation Capability):			
Simulator Operator: Insert **RT-4** at direction from Lead Examiner to trip the last running RHR Pump. This malfunction will result in the crew entering EOP-LOCA-5. **RH0026B, 22 RHR Pump Trip Value = TRUE**			
	RO reports that 22 RHR Pump tripped.		
	RO reports NO RHR pumps are available.		
Role Play: IF an operator is dispatched to investigate why 22 RHR pump trip, THEN report the following: ***the breaker tripped on overcurrent (relay flag is dropped).***			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	CRS determines that no RHR Pumps are available and transitions from Step 11 to EOP-LOCA-5, Loss of Emergency Recirculation		
EOP-LOCA-5 steps here:			
Examiner's Note: **IF** crew transitions to EOP-LOCA-3 at this point, **THEN** LOCA-3 CAS will direct them to EOP-LOCA-5.			
	CRS transitions to 2-EOP-LOCA-5, Loss of Emergency Coolant Recirculation.		
	RO reports both trains of ECCS pumps are indicating normal (no oscillations in amps, flow, or discharge pressure)		
	RO resets SI (if not performed in LOCA-1).		
	PO resets each SECs (if not performed in LOCA-1).		
	RO reports containment sump level >62% light are illuminated.		
	RO reports NO train of Emergency Recirculation is available due to no RHR Pumps available.		
	CRS directs investigation into both RHR pump trips.		
	RO reports all <u>available</u> CFCUs are running in low speed.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports RWST Lo-Lo level alarm is clear.		
Examiner's Note: Critical Task-3 is broken down into a series of three (3) actions to conserve RWST inventory. Make up to the RWST, minimize RWST outflow, and if RWST Lo-Lo level alarm received stops ECCS pumps prior to cavitation **Part 1 is stopping CS Pumps** **Part 2 is RWST makeup.** **Part 3 is reducing SI to one train** **Part 4 if RWST Lo-Lo alarm is received then stop ECCS pumps taking suction from the RWST prior to cavitation**.			
Examiner's Note: During validations, RWST level was 14.2 ft., Cntmt Pressure was 17 psig, and 4 CFCUs were running.			
	CRS determines NO CS pumps are required to be running at Step 8 IAW Table C.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Critical Task-3 Parts 1 and 2 (CT-29): Stopping CS pumps and making up to the RWST. **SAT_____ UNSAT_____** **Steps shaded are required to complete the CT.**			
CT-3 Part 1 - Stopping CS pumps:			
	Critical Task #3 - RO resets Spray actuation.		
	Critical Task #3 - RO stops 21 AND 22 CS pump. [Critical Task #3, Part 1 complete]		
	RO closes 21 and 22 CS2s.		
CT-3 Part 2 – Make-up to RWST:			
	RO initiates makeup to the RWST IAW S2.OP-SO.CVC-0006.		
S2.OP-SO.CVC-0006 Section 5.8 steps start here:			
GO TO Page 34 to continue on with LOCA-5 steps.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	PO directs field operator to start RWST Heater Pump		
Simulator Operator: Insert **RT-11** to simulate RWST Heater Recirc Pump in service bezel illuminated: **AH03 C2: RWST Heater Pump Stop** **Final = Override OFF** **AH03 C1: RWST Heater Pump Start** **Final = Override ON** **Delay = 2 seconds** **NOTIFY** control room when RWST heater recirc pump is in service.			
	PO ensures VCT level is adequate.		
	Critical Task #3 - PO obtains Boric Acid flow setpoint from REM Figure 100B or 100D. (at least ≥ 20 gpm)		
	PO resets COUNT A on makeup flow register to zero IAW Exhibit 1.		
	Critical Task #3 - PO places makeup control mode select in stop		
	Critical Task #3 - PO places 2CV179 in Manual (goes full open)		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	Critical Task #3 - PO places 2CV172 in Manual.		
	PO dispatches field operator to locally check 2BR170 is closed.		
Role Play: After 1-2 minutes report 2BR170 is CLOSED**.** No action needed by Simulator Operator.			
	PO notifies CRS to evaluate TS for applicability.		
	Critical Task #3 - PO starts 22 Primary Water pump.		
	Critical Task #3 - PO dispatches field operator to locally open 2CV182 and 2CV184.		
Simulator Operator: Insert **RT-10** when crew requests 2CV182 and 2CV184 to be locally opened in support of RWST makeup. CV20A, 2CV182 Blender Isol Valve (ramp 30 secs) CV21A, 2CV184 Blender Isol Valve (time delay 30 secs, ramp 30 secs) Value = 100 **NOTIFY** control room when valves are open.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Examiner's Note: When the 2CV182 and 2CV184 are opened the Primary Water flow counter will start.			
	Critical Task #3 - PO places 22 Boric Acid Pump in Manual/Fast start		
	Critical Task #3 - PO adjusts 2CV172 flow to the value recorded previously. (at least ≥ 20 gpm)		
	PO closes 21 and 22 CV160, if flow not achieved.		
	Critical Task #3 - PO adjusts 2CV179 to 50 gpm using open/close pushbuttons. [**Critical Task-3, Part 2 complete**]		
	PO reports makeup to RWST has been initiated.		
LOCA-5 continued here:			
	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%.		
	CRS directs performance of Shutdown Margin.		
RCS cooldown at 100 F/hr:			
	PO plots RCS cooldown.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	PO reports intact SGs available for cooldown		
	PO reports steam dumps NOT available due to MSLI.		
	PO dumps steam using intact available MS10's		
CT-3 Part 3 - SI flow reduction to one train:			
	RO reports BIT flow is established.		
	Critical Task #3 - RO stops all but <u>one</u> charging pump.		
	Critical Task #3 - RO runs only <u>one</u> SI pump. [Critical Task-3, Part 3 complete]		
Critical Task-3 Part 3 (CT-29): Reducing SI flow to one Train. **SAT_____ UNSAT_____** **Steps shaded are required to complete the CT.**			
	RO reports no RHR pumps are running.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports RWST Lo-Lo Level alarm actuated.		
	CRS takes the CAS action from Step 7 and goes to Step 29.		
	Critical Task #3 - RO stops ALL Pumps taking suction from the RWST (RHR, SI, Charging, CS)		
Critical Task-3 Part 4: Stop all ECCS pumps taking suction from the RWST prior to cavitation **IF** the RWST Lo-Lo Level Alarm actuates. **SAT_____ UNSAT_____**			
Terminate the scenario when the crew stops all but one SI Pump, or stops ECCS pumps taking suction from RWST if the Lo-Lo level alarm is received, or at Lead Examiners direction.			

VI. SCENARIO REFERENCES

A. Alarm Response Procedures (various)
B. Technical Specifications
C. Emergency Plan (ECG)
D. S2.OP-AB.COND-0001, Loss of Condenser Vacuum
E. S2.OP-AB.ROD-0003, Continuous Rod Motion
F. S2.OP-AB.RC-0001, RCS Leak
G. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
H. 2-EOP-LOCA-1, Loss of Reactor Coolant
I. 2-EOP-LOCA-5, Loss of Emergency Recirculation

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 100% RCS BORON: 27 ppm MWe 1220

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

NA

REACTIVITY PARAMETERS:

- Rx Plan: To lower Rx power to 89% at 10%/hour add 120 gallons of boric acid along with inserting control rods to maintain Tavg on program. Reactor Engineering directs the crew to perform a boration first. Expect D bank at 193 steps when load reduction is complete.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- 3.5.2.c Action a, 21 RHR Pump, 68 hours remain

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Load reduction to 89% at 10%/hour in preparation for Main Turbine valve testing.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Hope Creek and Salem 1 are at 100% power.

PRIMARY:

- 23 Charging Pump C/T for pulsation damper replacement.
- 21 RHR Pump C/T for motor bearing inspection.

SECONDARY:

- Heating Steam is aligned to Unit 1
- Polisher is in service
- Blowdown is 35K per loop to 23 Condenser / Flashtank

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: 20-01 NRC Scenario #1 REVIEWER: R. Chan

Initials		Qualitative Attributes
R	1.	The scenario has clearly stated objectives in the scenario.
R	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.
R	3.	The scenario consists mostly of related events.
R	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
R	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.
R	6.	The events are valid with regard to physics and thermodynamics.
R	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
R	8.	The simulator modeling is not altered.
R	9.	All crew competencies can be evaluated.
R	10.	The scenario has been validated.
NA	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.
R	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5
ESG CRITICAL TASKS

20-01 NRC Scenario #1

Critical Tasks

CT-1 (CT-2) – Manually actuate at last one train of Safety Injection before transition out of TRIP-1, Reactor Trip or Safety Injection

SAFETY SIGNIFICANCE -- Failure to manually actuate SI under the postulated conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent "degraded emergency core cooling system (ECCS)…capacity."

In this case, SI can be manually actuated from the control room. Therefore, failure to manually actuate SI also represents a failure by the crew to "demonstrate the following abilities:

- Effectively direct or manipulate engineered safety feature (ESF) controls that would prevent (degraded emergency core cooling system (ECCS)…capacity)
- 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"

Additionally, under the postulated plant conditions, failure to manually actuate SI (when it is possible to do so) results in a "significant reduction of safety margin beyond that irreparably introduced by the scenario." Finally, failure to manually actuate SI under the postulated conditions is a "violation of the facility license condition."

In the scenario postulated by the plant conditions, failure to manually actuate SI results in the needless continuation of a situation in which there has been no systematic and thorough actuation of even one train of SIS-actuated safeguards. (Some safeguards components such as AFW and feedwater isolation components may be running because of other actuation signals. However, safeguards systems such as ECCS, phase A containment isolation, CCW/SW, and containment fan coolers will not be operating in their safeguards mode.)

Although the completely degraded status is not due to the crew's action (was not initiated by operator error), continuation in the completely degraded status is a result of the crew's failure to manually actuate SI.

The acceptable results obtained in the FSAR analyses are predicated on the assumption that, at the very least, one train of safeguards actuates. If SI is not actuated, the FSAR assumptions and results are invalid. Because compliance with the assumptions of the FSAR is part of the

facility license condition, failure to manually actuate at least one train of SI (under the postulated
conditions and when it is possible to do so) constitutes a violation of the license condition.

The following information is quoted from the ERG Executive Volume, Generic Issues section, document on Foldout Page Items:

The SI actuation criteria are only found on the FOLDOUT PAGE for the ES-0.1, ES-0.2, ES-0.3,
and ES-0.4 guidelines for both the HP and LP plants. Although the criteria are identical to the ones found in the SI Reinitiation criteria, the actions are different. The operator is instructed to actuate safety injection rather than operate SI pumps as necessary. The criteria selected for SI actuation are either loss of RCS subcooling or the inability to maintain pressurizer level with charging. Each of these limits indicate that control of the plant is lost and that SI actuation is necessary.

Note the last line of the preceding quote. Clearly, if control of the plant is lost, the preferred action is to manually actuate SI, rather than to manually operate individual safeguards components.

Cues:

- Indication and/or annunciation that SI is required
  - PRZR pressure or SG pressure less than SI actuation setpoint
  - Containment pressure greater than SI actuation setpoint
  - Subcooled margin less than the foldout page criterion for SI actuation in ES-0.1
  - PRZR water level less than the foldout page criterion for SI actuation in ES-0.1
- No indication or annunciation that SI is actuated

Measurable Performance Standard:

Manually actuate at last one train of Safety Injection before entry into any of the following: transition to any LOCA, SGTR, or LOSC series procedures or transition to any FRG

- Indication and/or annunciation that at least one train of SI is actuated

Feedback:
Indication and/or annunciation that at least one train of SI is actuated

CT-2 (CT-5) – Manually start at least one low head ECCS pump before transition out of TRIP-1, Reactor Trip or Safety Injection.

SAFETY SIGNIFICANCE -- Failure to manually start at least one low-head ECCS pump under the postulated conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent “degraded emergency core cooling system (ECCS) …capacity.”
In this case, at least one low-head ECCS pump can be manually started from the control room. Therefore, failure to manually start a low-head ECCS pump also represents a failure by the crew to “demonstrate the following abilities:

- Effectively direct or manipulate engineered safety feature (ESF) controls that would

prevent a significant reduction of safety margin (beyond that irreparably introduced by the scenario)

- Recognize a failure or an incorrect automatic actuation of an ESF system or component"

Additionally, under the postulated plant conditions, failure to manually start a low-head ECCS pump (when it is possible to do so) is a "violation of the facility license condition."

The acceptable results obtained in the FSAR analysis of a large-break LOCA are predicated on the assumption of minimum ECCS pumped injection. The analysis assumes that a minimum pumped ECCS flow rate, which varies with RCS pressure, is injected into the core. The flow rate values assumed for minimum pumped injection are based on operation of one each of the following ECCS pumps: high-head pump, intermediate-head pump, and low-head pump. Operation of this minimum required complement of ECCS injection pumps is consistent with the
FSAR assumption that only minimum safeguards are actuated.

For both the minimum and maximum cases specified in Comment 1 of this critical task worksheet and for all cases in between, failure to perform the critical task means that the plant is needlessly left in an unanalyzed condition. Performance of the critical task would return the plant to a condition for which analysis shows acceptable results.

Because compliance with the assumptions of the FSAR is part of the facility license condition, failure to perform the critical task (under the postulated plant conditions) constitutes a violation of the license condition.

Cues:

- Indication and/or annunciation that low-head ECCS pumped injection is required

– SI actuation
– RCS pressure below the shutoff head of the low-head ECCS pumps
AND

- Indication and/or annunciation that no low-head ECCS pump is injecting into the core

– Control switch indication that the circuit breakers or contactors for both low-head ECCS pumps are open
– All low-head ECCS pump discharge pressure indicators read zero
– All flow rate indicators for low-head pumped injection read zero

Measurable Performance Standard:
Manually start at least one low head ECCS pump before transition out of TRIP-1, Reactor Trip or Safety Injection.

- Control switch indication that the circuit breaker or contactor for at least one low-head ECCS pump is closed

Feedback:
Indication and/or annunciation that at least one low-head ECCS pump is injecting

- Flow rate indication of injection from at least one low-head ECCS pump

CT-3 (CT-29) – Make up to the RWST, minimize RWST outflow, and if RWST Lo-Lo level alarm is received stops ECCS pumps prior to cavitation.

SAFETY SIGNIFICANCE -- Under the postulated plant conditions, failure to establish makeup flow to the RWST and/or to minimize RWST outflow leads to (or accelerates) depletion of RWST inventory to the point at which ECCS pumps taking suction on the RWST must be stopped. Loss of pumped injection (coincident with loss of emergency cooling recirculation) will lead to a severe or an extreme challenge to the core cooling CSF. Failure to perform the critical task causes these challenges to occur needlessly or, at best, prematurely (that is, before they would occur if the critical task is performed).

Thus, failure to perform the critical task under the postulated plant conditions leads to “a significant reduction of safety margin beyond that irreparably introduced by the scenario.” It also represents a demonstrated inability by the crew to “take one or more actions that would prevent a challenge to plant safety.”

Cues:

- Indication and/or annunciation that SI is required

– RCS pressure
– Containment pressure
AND

- Indication and/or annunciation that emergency cooling recirculation is not established despite continuing attempts to establish it

– Indication that both containment sump to RHR suction isolation MOVs remain closed despite attempts to open them remotely and locally
– [Indication of insufficient water level in the containment recirculation sump to allow recirculation][11]
AND

- Indication and/or annunciation that RWST inventory is being depleted

– RWST level indication decreasing (See Comment 1.)
AND

- Procedural cue to make up to the RWST and/or to minimize outflow from the RWST

Measurable Performance Standard:

Make up to the RWST, minimize RWST outflow, and if the RWST Lo-Lo alarm is received stop running ECCS pumps prior to cavitation:

- Stopping containment Spray Pumps
- Initiating RWST makeup
- Reducing SI to one train
- If RWST Lo-Lo alarm is received then stops running ECCS pumps prior to cavitation

Feedback:

- Flow rate indication of makeup to the RWST
- Reduced depletion rate of RWST inventory

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
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: NRC-3 [AR.ZZ-11, AB.CVC-1, AB.CN-1, AR.ZZ-13, TRIP-1, FRHS-1 w/Condensate Recovery using MS10]

SCENARIO NUMBER: 20-01 NRC ESG-3

EFFECTIVE DATE: See Approval Below

EXPECTED DURATION: 60 minutes

REVISION NUMBER: 13

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

- For previous revision summaries see ESG-1512
- Rev. 11 (last used on 2019 Annual ESG-1908). Modified for 19-01 NRC exam.
- Rev. 12 Incorporated NRC comments from 2-14-20 working mtg to reduce the scenario duration. Removed starting 23 CN Pump, 24MS29 failing closed (note: 5%/min ramp rate no longer applicable), 2PT-506 failure, failure of Phase A to actuate, and moved Loss of 2B 4KV bus following Rx Trip. Added 22 ABV Exhaust fan damper failure and 2PT-505 failure. Changed CT-12 to CT-13 MT failure to Auto Trip no MSLI required. Added comments from NRC Prep Week 6-17-20.
- Rev. 13 (last used 19-01 NRC Exam). Modified for 20-01 NRC exam. Modified scenario to add malfunctions not used during the previous two NRC exams that include; 21 CRDM Vent Fan damper failure, PZR level failing high, 21CN22 failing close, and main turbine failing to trip by all means in the control room. The flow path in FRHS-1 was also changed to perform cooldown using MS10 vice steam dumps. Incorporated comments from NRC free look.

PREPARED BY:	R. Chan	2-4-22
	Lead Regulatory Exam Author	**Date**
APPROVED BY:	M. Wadusky (signature on file)	2-10-22
	Operations Training Manager or designee	**Date**
APPROVED BY:	W. Hargrave	1-28-22
	Facility Representative	**Date**

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 3

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____ESG-3_____ Op-Test No.: __20-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-242: Unit 2 is at 93% power, MOL; 2A EDG is running unloaded for maintenance run. The following equipment is out of service: 21 AFW Pump C/T for oil bubbler replacement and 21 Containment Spray pump for lube.

Turnover: The crew is directed to continue power ascension to 98% power at 10% per hour IAW S2.OP-IO.ZZ-0004 by use of dilution, control rods and turbine load control.

Critical Tasks:

1. Manually actuate main steamline isolation before a Red path to either subcriticality or the integrity CFST or transition to LOSC-2
2. Establish feed flow to one SG before RCS bleed and feed is required

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ATC (R) BOP (N) CRS (N)	Power ascension to 98% at 10% per hour IAW IOP-4
2	RD0316A	BOP (C) CRS (C)	21 CRDM Vent Fan damper fails closed.
3	PR0017A	ATC (I) CRS (I,TS)	PZR Level Controlling Channel fails high.
4	BF0109A	ALL (C)	21CN22 Low Pressure FWH Inlet fails closed.
5	EL0161	CRS (TS)	2A EDG emergency trip.
6	RC0006C RC43CX RC43CY	ATC (C) CRS (C)	23 RCP Motor Oil Level low.
7	RP0279A RP0279B RP0073 RP0069 AF0353C	ALL (M)	-Main Turbine fails to trip by all means from the control room. **(CT-1)** -Main Steam Line Isolation fails to Auto actuate. (Expect Auto Safety Injection – No SGFPs available and No Steam Dumps are available) -23 AFW Pump fails to Auto start
8	AF0181B AF0183	ALL (C)	-22 AFW Pump trips -23 AFW Pump trips during EOP-TRIP-1 (Loss of All AFW flow, CFST Heat Sink Red Path) **(CT-2)**
		ABs	AR.ZZ-11 → AB.CVC-1 → AB.CN-1 → AR.ZZ-13
		EOPs	TRIP-1 → FRHS-1

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

Scenario No.: 3

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	7	2-8
2. Malfunctions after EOP entry (1-2)	1	8
3. Abnormal events (2-4)	4	2,3,4,6
4. Major transients (1-2)	1	7
5. EOPs entered/requiring substantive actions (1-2)	0	----- (*)
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1	8 (FRHS-1)
7. Preidentified critical tasks (≥2)	2	7,8
8. Tech Specs exercised (≥ 2)	2	3,5

(*) NUREG-1021, Appendix D, Section C.2.f, *"EOPs Used,"* states *"Moreover, the primary scram response procedure that serves as the entry point for the EOPs is **not** counted."* An Attribute Value of "0" for Table Item 5 was determined to be acceptable by the Chief Examiner on the basis that (a) Scenario #3 is a complex scenario that exercises Contingency EOP Procedure FRHS-1 for the Loss of Secondary Heat Sink, (b) FRHS-1 requires the use of alternate decision paths and prioritization of actions within the EOP to mitigate a CSFST Heat Sink Red Path condition, and (c) FRHS-1 has measurable actions that must be taken by the crew.

I. OBJECTIVES

A. Given the order, the crew will commence a power ascension IAW S2.OP-IO.ZZ-0004.

B. Given an indication of 21 CRDM Vent Fan damper failure, the crew will take corrective actions IAW S2.OP-AR.ZZ-0011 and stop 21 CRDM vent fan and start the standby fan..

C. Given an indication of loss of a PZR Level Controlling channel, th crew will take corrective actions IAW S2.OP-AB.CVC-0001. CRS will exercise Tech Specs.

D. Given an indication of 21CN22 LP FW Heater inlet valve closure, the crew will take corrective actions IAW S2.OP-AR.ZZ-0013 and S2.OPAB.CN-0001. The crew will perform a load reduction IAW station procedures.

E. Given indication of 2A EDG emergency tripping, the CRS will exercise Tech Specs.

F. Given indication of a loss of oil level in 22 RCP, the crew will take immedaite actions IAW S2.OP-AB.RCP-0001 to trip the reactor and stop 22 RCP.

G. 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.

H. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.

I. 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.

J. Given indication of a safety injection DIRECT the response to the safety injection in accordance with the approved station procedures.

K. 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.

L. Given indication of a loss of secondary heat sink, DIRECT the response to the heat sink loss in accordance with the approved station procedures.

M. Given the order or indications of a loss of secondary heat sink, PERFORM actions as the shift technical advisor for a loss of heat sink IAW approved station procedures.

N. 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 to 100% at 10%/hour.
2. 21 CRDM Vent Fan damper fails closed
3. PZR Level controlling channel fails high
4. 21CN22 FWH Inlet valve fails closed
5. 2A EDG emergency trip
6. 23 RCP motor oil level low
7. Main turbine fails to trip by all means in the control room
8. Loss of all AFW flow and recovery by initiating Condensate flow using MS10.

III. SCENARIO SUMMARY

1. The crew will continue the power ascension to raise reactor power to 98% at 10% per hour. The reactivity plan calls for performing a dilution first, before raising turbine load. After the crew commences the power ascension, Event #2 will be entered.

2. 21 CRDM vent fan discharge damper will fail closed. The crew will receive console alarm for sequence not complete. The crew will take actions as directed in the Alarm Response Procedure to stop 21 CRDM vent fan and start 23 CRDM vent fan. Once the standby fan is started, Event #3 can be entered.

3. The controlling PZR level channel will fail high. The crew will respond per S2.OP-AB.CVC-0001, Loss of Charging, and take manual control of charging to raise charging flow. The crew will select an operable control channel. The CRS will evaluate Tech Specs and enter 3.3.1.1 action 6. After Tech Specs has been evaluated, Event #4 will be entered.

4. 21CN22 low pressure feedwater heater inlet valve will fail closed. The crew will respond per S2.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality, to reduce turbine load to less than 1098 MWe per Attachment 2 (about a 2-3% downpower is required), and may take actions to bypass the condensate polisher depending on SGFP suction pressure. After the crew completed the load reduction, Event #5 will be entered.

5. 2A EDG will emergency trip. The crew will receive console alarm for 2A EDG tripping. No impact to plant operations. The CRS will evaluate Tech Specs and enter TS 3.8.1.1 action b. The CRS will direct performance of an 1 hour line surveillance to comply with TS action. After the CRS evaluates Tech Specs, Event #6 will be entered.

6. 23 RCP motor bearing oil level OHA will actuate and the crew will recognize elevated motor bearing temperatures in excess of S2.OP-AB.RCP-0001, RCP Abnormality, trip criteria of 175 °F, requiring the crew to manually trip the reactor and stop 23 RCP. During immediate actions of EOP-TRIP-1, Reactor Trip or Safety Injection, the RO will recognize that the main turbine failed to Auto trip following the Rx trip (MLSI will fail to automatically actuate). All attempts to trip the turbine

from the control room will fail. The crew will take the action to actuate Fast Closure of the MSIVs (CT#1). Due to the turbine failing to trip, a Safety Injection signal is expected which will trip both SGFPs and setup conditions for condensate flow recovery in EOP-FRHS-1, Response to Loss of Secondary Heat Sink. 23 AFW pump will fail to Auto start. The PO will manually start 23 AFW pump.

7. During EOP-TRIP-1, 22 AFW Pump will trip on overcurrent, the 23 AFW pump will trip on overspeed, and a CFST Heat Sink Red path will exist. The CRS will transition to EOP-FRHS-1. The crew will take actions to depressurize one SG using a SG Atmospheric Dump valve (MS10) and feed one SG using condensate feed flow. The scenario can be terminated when SG Wide Range level is rising or CETs are lowering (CT#2).

8. The Lead Examiner may terminate the scenario after condensate flow has been established and/or WR level is rising.

A. INITIAL CONDITIONS

____ **IC-242**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
	• VC1and VC4 C/T
	• RCPs (SELF CHECK)
	• RTBs (SELF CHECK)
	• MS167s (SELF CHECK)
	• 500 KV SWYD (SELF CHECK)
	• SGFP Trip (SELF CHECK)
	• 21 CV PP (SELF CHECK)
	• **2A EDG running unloaded for maintenance run**
	• **21 CS Pump C/T**
	• **21 AFW Pump C/T**
	• **Suggested Protected Equipment:** ▪ **None**
	• 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:	MONP254 < 10. //CONT ROD BANK C < 10 (RX TRIP)
		COMMAND:	
		PURPOSE:	<update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	EL0161 2A EMERG DIESEL GENERATOR TRIP	N/A	N/A	N/A	RT-4	
_____ 02	RD0316A 21 CONTROL ROD DRIVE VENT FAN DAMPER FAILS CLOSED	N/A	N/A	N/A	RT-1	
_____ 03	PR0017A PZR LEVEL CH I (LT459) FAILS H/L	N/A	N/A	N/A	RT-2	100
_____ 04	RP0073 MN TURB. TRIP FAILURES (VARIOUS)	N/A	N/A	N/A	N/A	ALL ABOVE (20/AST,20-2/AST,20-ET) FAIL
_____ 05	RP0069 MN TURBINE TRIP (INT. VLV) FAIL	N/A	N/A	N/A	N/A	
_____ 06	RP0279A AUTO MSLIS FAILS TO ACT, TRN A	N/A	N/A	N/A	N/A	
_____ 07	RP0279B AUTO MSLIS FAILS TO ACT, TRN B	N/A	N/A	N/A	N/A	
_____ 08	AF0181B 22 AUX FEEDWATER PUMP TRIP	N/A	N/A	N/A	RT-6	
_____ 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	N/A	N/A	N/A	RT-6	
_____ 11	BF0109A 22A FW HTR LSHH FAILS CLOSED	N/A	N/A	N/A	RT-3	
_____ 12	RC0006C RC PUMP #23 LOSS OF LUBE OIL	N/A	N/A	00:05:00	RT-5	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	AF20D 21 AFW PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 02	AF21D 21 AF PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED

_____ 03	AF25D 22 AFW PUMP BKR CONTROL POWER	N/A	N/A	N/A	RT-10	OFF
_____ 04	CS01D 21 CS PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 05	CS02D 21 CS PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 06	RC43CX 23 RCP NOMINAL MOTOR x Vibration Reading	00:00:10	.5	00:04:00	RT-5	4.5
_____ 07	RC43CY 23 RCP NOMINAL MOTOR y Vibration Reading	00:00:10	.5	00:04:00	RT-5	4.5

OVERRIDES:

SELF-CHECK	**Description**	**Delay Time**	**Initial Value**	**Ramp Time**	**Trigger**	**Condition/ Severity**
_____ 01	CB04 B2 LO QCB04FB3 2A DIESEL GEN-LOCAL MANUAL	N/A	N/A	N/A	N/A	ON
_____ 02	CB04 B1 LO QCB04DW3 2A DIESEL GEN-AUTO	N/A	N/A	N/A	N/A	OFF

OTHER CONDITIONS:

	Description

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 98%			
	CRS briefs crew on power ascension to 98% at 10%/hour IAW S2.OP-IO.ZZ-0004, Power Operation.		
	RO briefs reactivity plan for power ascension.		
	PO briefs turbine load control plan.		
	RO initiates dilution IAW S2.OP-SO.CVC-0006 or uses control rods.		
	PO initiates turbine load control IAW S2.OP-SO.TRB-0001, Turbine Generator Startup Operation.		
	RO monitors Tavg and control rods for proper response.		
Proceed to next event by direction from Lead Examiner.			
2. 21 CRDM Vent Fan Damper Fails Closed:			
Simulator Operator: Insert **RT-1** by direction from Lead Evaluator. **RD0316A, 21 CRDM Vent Fan Damper Fails Closed**			
	PO announces console alarm for 21 CRDM Vent Fan Low Flow		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO refers to ARP for 2CC1.		
	PO reports that the sequence complete light for 21 CRDM Fan is not illuminated.		
	CRS directs PO to start standby CRDM Vent Fan IAW ARP for 2CC1.		
	PO stops 21 CRDM Fan		
	PO starts 23 CRDM Fan		
	PO reports 23 CRDM Fan in service.		
Proceed to next event at Lead Examiner's direction.			
3. PZR Level Controlling Channel Fails High:			
Simulator Operator: Insert **RT-2** on direction from Lead Evaluator. **PR0017A, PZR Level CH I fails H/L Value = 100**			
	RO reports unexpected alarms OHA E-4 PZR LVL HI, E-20, PZR HTR ON LVL HI.		
	PO refers to 2CC1 ARP		
	RO reports PZR Level Channel I has failed high.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports charging flow has lowered.		
	RO places Master Flow Control in Manual and raises charging flow to restore PZR level to program.		
	CRS enters S2.OP-AB.CVC-0001		
	PO initiates Attachment 1 CAS.		
	RO reports charging pump is running and no signs of cavitation.		
	RO reports that a PZR level controlling channel has failed high.		
	CRS directs RO to take manual control of charging (if not already performed)		
	RO selects operable Channel 3 for control and an operable Channel 2 or 3 for recorder.		
	RO reports letdown in service.		
	CRS directs PO to review S2.OP-RPS-0003 to remove the failed channel from service. (**No action by PO**)		
TS evaluation #1:			
	CRS enters: • **TS 3.3.1.1 action 6 (72 hours to place the channel in the tripped condition)**		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			
4. 21CN22 FWH Inlet Valve Fails Closed:			
Simulator Operator: Insert **RT-3** at direction from Lead Examiner. **BF0109A, 22A FW HTR LSHH Fails CLosed.**			
	PO reports unexpected alarm is OHA G-22, FW HTR IN VLV TRIP & LVL HI.		
	PO referes to OHA Alarm Response Procedure. • ARP directs depressing STOP VALVE CLOSED on 2CC2 panel stop valve extraction control bezel • **PO depresses STOP VALVE CLOSED**		
	PO reports 21CN22 is closed.		
Role Play: IF NEO is dispatched to investigate, THEN state the following, “21CN22 looks closed and I see no other abnormal issues”.			
	CRS enters S2.OP-AB.CN-0001.		
	PO initiates Attachment 1 CAS.		
	PO reports a SGFP did not trip.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports a Condensate Pump did not trip.		
	PO reports OHA G-7 ADFCS ALTERNATE ACTION not in alarm.		
	CRS reviews Attachment 2 for load limitations for isolated FW heaters.		
	PO reports SGFP suct pressure, and if less than 320 psig, takes CAS actions to open 21-23 CN108's		
	CRS determines that a load reduction is required to 1098 MWe.		
	RO briefs reactivity plan for load reduction.		
	PO briefs turbine load control plan for load reduction.		
	CRS directs load reduction to lower MWe below 1098 MWe.		
	RO uses control rods or initiaites boration		
	PO initiates load reduction.		
Proceed to next event by direction from Lead Examiner.			
5. 2A EDG Emergency Trips:			
Simulator Operator: Insert **RT-4** at direction from Lead Examiner. **EL0161, 2A EDG Trip**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports console alarm for 2A EDG Emergency Trip		
Role Play: Field operator reports he emergency tripped the 2A EDG due to an oil leak on the filter housing. The leak has stopped and is contained. Maintenance request the EDG be tagged out to repair.			
TS evaluation #2:			
	CRS enters: • **TS 3.8.1.1 action b.1 (1 hour line surveillance) and action b.4 (72 hours to restore EDG to Operable status)**		
	CRS directs an operator to perform the 1 hour line surveillance. This could be delegated to the WCC supervisor to perform.		
Role Play: IF requested for assistance in line surveillance, state the WCC NCO will perform the line surveillance.			
Proceed to next event by direction from Lead Examiner.			
6. 23 RCP Motor Oil Level Low:			
Simulator Operator: Insert **RT-5** at direction from Lead Examiner. **RC0006C, RC Pump #23 Loss of Lube Oil**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports OHA alarm for 23 RCP low oil level.		
	RO reports motor bearing temperatures and vibrations rising for 23 RCP.		
	CRS enters S2.OP-AB.RCP-0001.		
	PO initiates Attachment 1 CAS.		
	PO reports either of the following limits have been exceeded: 1. Motor bearing temp > 175 °F 2. Motor vibrations > 5 mils		
	CRS directs RO to trip the reactor and stops 23 RCP IAW Attachment 2.		
	RO trips the reactor and stops 23 RCP		
	RO performs immediate actions of 2-EOP-TRIP-1		
7. Main Turbine Fails to Auto Trip, MSLI fails to Auto actuate, <u>AND</u> 23 AFW pump fails to AUTO start (Major Transient):			
	RO reports that Main Turbine failed to Auto trip.		
	RO reports Main Turbine failed to manually trip using Pistol Grip switch AND console pushbutton.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Critical Task #1 (CT-12): Manually actuate MSLI before a RED path to either subcriticality or the integrity CFST, or transition to EOP-LOSC-2, Uncontrolled Depressurization of All Steam Generators. **SAT _____ UNSAT _____**			
	Critical Task #1 - RO isolates turbine by manually initiating MSLI using Fast Close pushbuttons on 2CC2.		
Examiner's Note: IF the crew isolates the main turbine by actuating MSLI, this action meets CT #1.			
	RO reports SI Auto actuated and manually backs up SI signal.		
	CRS enters 2-EOP-TRIP-1, Reactor Trip or Safety Injection.		
	CRS directs PO to throttle AFW flow to no less than 22E4 lbm/hr.		
Simulator Operator: MONITOR SG NR levels. IF any SG NR levels recovers to 6-7 %, **THEN** insert **RT-6** to trip 22 & 23 AFW Pump. This will ensure that a valid			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Heat Sink Red path exists prior to Step 17 in EOP-TRIP-1.			
	PO reports 22 AFW Pump running and 23 AFW Pump failed to start.		
	PO manually starts 23 AFW Pump		
	CRS and RO review immediate actions.		
	PO reports SEC loading not complete for B bus.		
	PO reports all available equipment started.		
	RO reports Containment Spray actuation not required.		
	RO reports 2 CCW Pumps running and both CCW HX are in Auto.		
	RO reports 2CC131 is open.		
	PO reports all Safeguard Valves are in their safeguards position per Table E.		
	RO reports CAV is in Accident Pressurize Mode and not in Maintenance Mode.		
	RO reports two SWGR supply fans and one exhaust fan is running.		
Proceed to next event when **ECCS Flow Evaluation** is in progress:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports expected ECCS flow for plant conditions.		
8. 22 AFW pump trips <u>AND</u> 23 AFW Pump trips (loss of all AFW flow):			
Simulator Operator: Insert **<u>RT-6</u>** during ECCS flow evaluation steps in TRIP-1. **AF0183, 23 AFW Pump trips**			
	PO reports that 22 and 23 AFW Pump tripped.		
Role Play: If requested to why 23 AFW Pump trip, then report that ***investigation is underway and no obvious signs why it tripped, but the trip linkage looks bent.***			
Simulator Operator: If directed to remove control power for 22 AFW Pump breaker then insert **<u>RT-10</u>**. AF25D, 22 AFW breaker control power. Location: 64 ft. Switchgear A Bus			
Role Play: IF directed to determine why 22 AFW Pump tripped, then after 2-3 minutes report the following: ***the overcurrent relay flag is up for 22 AFW Pump.***			
Note: RCS pressure will be low due to the MT failure to trip.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports NO AFW flow		
	PO reports no SG NR levels are > 9% (15% adverse)		
	PO reports total AFW flow is less than 22E4 lbm/hr.		
	CRS transitions to 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink.		
	PO reports operator action was not cause of AFW flow <22E4 lbm/hr.		
	RO reports RCS pressure is > SG pressure.		
	RO reports RCS Thots > 350°.		
	CRS reads Bleed and Feed criteria. (3 WR levels < 20% (25% Adverse))		
	PO closes all GB4s.		
	RO closes all SS94's.		
	PO reports no AFW flow.		
	CRS dispatches operators to investigate loss of AFW pumps.		
	RO stops all RCPs.		
	PO reports Condensate System is in service.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: Both SGFPs tripped due to Auto SI actuation following MT failure to trip.			
	PO reports NO SGFPs are available (SI actuation)		
	CRS directs MSPI (mitigating systems performance index) AFW Pump to be started.		
Role Play: When directed to start MSPI AFW pump, then after 1-2 minutes report the following: ***the MSPI Diesel started but tripped on overspeed***.			
	RO reports SI has actuated (Auto initiated following Rx Trip)		
	PO verifies SI valve alignment IAW 2-EOP-APPX-3, SI Verification.		
	RO resets SI, Phase A, and Phase B isolation		
	RO opens both CA330s		
	RO resets all SECs and 230V control centers.		
EOP-FRHS-1 Condensate Recovery steps start here:			
	Crew selects only **ONE** SG for depressurization to < 575 psig.		
Depressurize SGs using MS10's (Atmospheric Steam Line Dump			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Valves):			
	PO reports steam dumps are NOT available (Note: IF MSLI performed earlier, then steam dumps will not be available.		
	RO initiates MSLI on all Loops.		
	PO fully opens SELECTED SG MS10 relief valve.		
Critical Task #2 (CT-43): Establish feedwater flow into at least one SG before Bleed and Feed is required. **SAT:_____ UNSAT:_____** **Steps that are bolded and shaded are necessary to complete the critical task.**			
	Critical Task #2 - CRS dispatches operator to open the selected SG BF40 or BF19 valve (120 ft. elev. TGA).		
Simulator Operator: Use the following REMOTES to operate the 22 or 24 SG BF40 or BF19s. **22 BF19: BF02A** **24 BF19: BF04A** **22 BF40: BF06A** **24 BF40: BF08A**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Set Ramp Time = 03:00 mins **Set Desired Value = 100 for Fully Open or see below:** **Notify control room when selected valve is OPEN**.			
Examiner's Note: During scenario validation using MS10s to lower SG pressures to inject with main condensate took considerable time (**approx. 10 mins**). Condensate flow was established when SG pressure is around 600 psi.			
	Critical Task #2 - PO opens the selected SG BF13.		
	PO reports that Release selected for selected BF22		
	Critical Task #2 - PO opens 21 and 22 CN48 (SGFP Bypass valves).		
	Critical Task #2 - PO closes 21 and 22 CN32 (SGFP suction valves).		
Examiner's Note: At this point the crew may wait at Step 18.5 of EOP-FRHS-1 until feedflow is achieved or continue on until the EOP directs you back to beginning of EOP until feed flow is achieved.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: The crew should verify indication of condensate flow AND SG WR level is rising when determining if Condensate Flow is established. During validation it took approx. **6 mins** to see WR rising when condensate flow was established at 5-6 %.			
Examiner's Note: As the crew is waiting for feed flow to be established, you can expect the PZR PORVs to be cycling as the RCS heats up.			
	Critical Task #2 - PO reports that feed flow is established to selected SG by observing SG Wide Range Level rising or CETs are lowering.		
Critical Task #2 (CT-43): Establish feedwater flow into at least one SG before Bleed and Feed is required. **SAT:_____ UNSAT:_____** **Steps that are bolded and shaded are necessary to complete the critical task.**			
	CRS directs PO to maintain selected SG pressure to < 575 psig.		
	Crew reports that Bleed and Feed has NOT been initiated and transitions to procedure in effect (2-EOP-TRIP-1)		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
The scenario may be terminated after the crew has established condensate flow or by direction from Lead Examiner.			

B. 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-AB.CVC-0001, Loss of Charging
G. S2.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality
H. S2.OP-AB.RCP-0001, RCP Abnormality
I. S2.OP-AR.ZZ-0011, 2CC1 Alarm Response Procedure
J. S2.OP-AR.ZZ-0013, 2CC2 Alarm Response Procedure
K. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
L. 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink

ATTACHMENT 1 (NRC-3)
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 93% RCS BORON: 778 MWe 1130

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED): N/A

REACTIVITY PARAMETERS

- Rx Plan: To raise Rx power to 98% in preparation for calorimetric at 10%/hour add 1000 gallons of water along with withdrawing control rods to maintain Tavg on program. Reactor Engineering directs the crew to perform a dilution first. Fuel is conditioned no rod withdrawal limitations apply.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

1. 21 AFW Pump TS.3.7.1.2 action a, 68 hours remaiin
2. 21 CS Pump TS 3.6.2.1, 60 hours remain

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Continue power ascension to 98% at 10%/hour IAW S2.OP-IO.ZZ-0004, Power Operation
- Engineering is monitoring BF19s vibrations during startup
- 2A EDG running in Manual unloaded for 1 hour maintenance run. Field operator and maintenance on station to observe the EDG run. Trouble Alarm is expected for the diesel day tank levels when an diesel engine is running.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power.
No penalty minutes in the last 24 hrs.

PRIMARY:

- 21 AFW Pump C/T for oil bubbler replacement.
- 21 CS Pump C/T for lube.

SECONDARY:

- Blowdown 35K per loop to 23 condenser / flashtank
- Polisher in service

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

None

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: 20-01 NRC Scenario #3 REVIEWER: R. Chan

Initials		Qualitative Attributes
RC	1.	The scenario has clearly stated objectives in the scenario.
RC	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.
RC	3.	The scenario consists mostly of related events.
RC	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
RC	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.
RC	6.	The events are valid with regard to physics and thermodynamics.
RC	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
RC	8.	The simulator modeling is not altered.
RC	9.	All crew competencies can be evaluated.
RC	10.	The scenario has been validated.
NA	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.
RC	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

20-01 NRC Scenario 3

Critical Tasks:

CT-1 (CT-12) - Manually actuate main steamline isolation before a Red path to either subcriticality or the integrity CFST, or transition to LOSC-2, Uncontrolled Depressurization of All Steam Generators.

SAFETY SIGNIFICANCE -- Failure to close the MSIVs under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Additionally, such an omission constitutes a failure by the crew to "demonstrate (the ability to) recognize a failure or an incorrect automatic actuation of an ESF system or component," and to "take one or more actions that would prevent a challenge to plant safety."

In the typical FSAR, the analysis for a large steamline break assumes steamline isolation within a short time frame, on the order of seconds. The analysis typically assumes a steam system piping failure in which a single SG blows down completely. That is, the analysis assumes a fault that can be isolated from all but one SG.

However, in the plant conditions postulated for this critical task, the break is located downstream of the MSIVs. Thus, closure of all MSIVs would terminate all uncontrolled blowdown. In this case, there is no reason for even a single SG to completely depressurize. If the crew allows all MSIVs to remain open, then all SGs depressurize uncontrollably and unnecessarily.

Uncontrolled depressurization of all SGs causes an excessive rate of RCS cooldown, well beyond the conditions typically analyzed in the FSAR. The excessive cooldown rate creates large thermal stresses in the reactor pressure vessel and causes rapid insertion of a large amount of positive reactivity.

Thus, failure to close the MSIVs under the postulated conditions can result in challenges to the following CSFs:

- Integrity
- Subcriticality

Cues:

- [Indication that main steamline isolation is required][6]

AND

- Indication that main steamline isolation has not actuated automatically

– MSIVs indicate open
– Indication of uncontrolled depressurization of all SGs

Measurable Performance Standard:

Manually actuate main steamline isolation before a Red path to either subcriticality or the integrity CFST, or transition to LOSC-2, Uncontrolled Depressurization of All Steam Generators.

- MSIVs undergo fast-closure.This can be accomplished by the Fast Closure pushbuttons on 2CC2 or using the Loops 21-24 MSLI on 2CC1 Safeguards bezels.

Feedback:

- Steam flow indication from all SGs decreases to zero
- All SGs stop depressurizing
- RCS cooldown stops
- MSIVs indicate closed

CT-2 (CT-43) - Establish feed flow to one SG before RCS bleed and feed is required

SAFETY SIGNIFICANCE -- Failure to establish feedwater flow to any SG results in the crew's having to rely upon the lower-priority action of establishing RCS bleed and feed to minimize core uncovery. This constitutes incorrect performance that fails to prevent "degradation of any barrier to fission product release."

The analyses presented in the ERG Background Document for FR-H.1 demonstrate that a complete loss of heat sink occurs when the SG inventories deplete (dry out). Unless some form of SG inventory is restored, the SG dryout deteriorates primary-to-secondary heat transfer, allowing core decay heat to increase the RCS temperature and pressure. The increasing RCS pressure automatically forces the pressurizer PORVs to open, which creates a small-break LOCA and simultaneously degrades the RCS fission-product barrier. As long as the RCS pressure remains high, the flow out the PORVs exceeds the ECCS flow into the RCS, which depletes RCS inventory. Eventually the core starts to uncover, degrading the core cooling CSF. Once the core is uncovered, fuel temperatures increase rapidly until severe fuel damage occurs, unless some form of core cooling is restored. Fuel over-heating constitutes severe degradation of a fission-product barrier (fuel matrix/clad).

Establishing feedwater flow into the SGs offers the most effective recovery action to restore the heat sink. The introduction of feedwater flow immediately restores SG inventory and re-establishes primary-to-secondary heat transfer, decreasing RCS pressure and cooling the core. The RCS pressure decrease then precludes the opening of the PORVs and degradation of the RCS barrier.

Cues:

- Extreme (RED path) challenge to the heat sink CSF

AND

- Indication that RCS pressure remains above the pressure of all SGs

AND

- Indication that RCS temperature is above the temperature for placing the RHR system in service

AND

- Indication and/or annunciation that no AFW flow is available after repeated attempts to establish

AND

- [Indication that RCS bleed and feed is not required][4]

Measurable Performance Standard:

Establish feed flow to one SG before RCS bleed and feed is required.

Feedback:

- Indication of feedwater flow into at least one SG
- Indication of increasing water level in at least one SG

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	**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

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: NRC-4 [IOP-3, AB.PZR-1, AR.ZZ-10, AB.CW-1, AB.SG-1, TRIP-1, SGTR-1]

SCENARIO NUMBER: 20-01 NRC ESG-4

EFFECTIVE DATE: See Approval Dates

EXPECTED DURATION: 70 minutes

REVISION NUMBER: 04

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

New issue for 16-01 ILOT NRC exam.
Rev. 01**:** Incorporated NRC comments from Prep week. Added Tech Spec LCO times. Added clarification that CT#2 is broken down into two parts.
Rev. 02: Modified for 19-01 ILOT NRC exam.
Rev. 03 Incorporated NRC comments from working mtg on 2-14-20. Deleted Loss of Off-site Power to reduce cooldown time in SGTR-1 using steam dumps. Added comments from NRC Prep Week 6-17-20.
Rev. 04 (last used 19-01 NRC) Used for 20-01 NRC exam. Modified to include malfunctions not used on the previous two NC exams which include; 23A CW traveling screen high DP, 21 CFCU failure to start, PZR spray valve 2PS3 fails to close during depressurization.

PREPARED BY:	R. Chan	1-30-22
	Lead Regulatory Exam Author	**Date**
APPROVED BY:	M. Wadusky (signature on file)	2-10-22
	Operations Training Manager	**Date**
APPROVED BY:	W. Hargrave	1-30-22
	Facility Representative	**Date**

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 4

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____ESG-4_____ Op-Test No.: __20-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-243: 2% power, BOL; 21 SGFP in service.

Turnover: The crew is directed to continue power ascension to 10% reactor power IAW S2.OP-IO.ZZ-0003 using control rods, steam dumps, and turbine load control.

Critical Tasks:

1. Isolate feed and stem flow to ruptured SG before transition to SGTR-3
2. Cooldown RCS to target temperature so that transition from SGTR-1 does not occur

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ATC (R) BOP (N) CRS (N)	Continue power ascension to 10% IAW IOP-3 and enter MODE 1.
2	PR0018B	ATC (C) CRS (C,TS)	2PR2 PZR PORV leakage.
3	CW0350E	BOP (C) CRS (C)	High DP across 23A CW Traveling Screen.
4	SG0078C	ATC (C) CRS (C,TS)	23 SG Tube Leak (35 gpm).
5	SG0078C	ALL (M)	23 SG Tube Rupture (650 gpm). **(CT-1 and CT-2)**
6	RP318D1	ALL (I)	21 CFCU fails to start in LOW Speed.
7	PR0019B	ATC (C) CRS (C)	PZR Spray Valve 2PS3 fails to close during depressurization.
		ABs	IOP-3 → AB.PZR-1 → AR.ZZ-10 → AB.CW-1 → AB.SG-1
		EOPs	TRIP-1 → SGTR-1 with depressurization and a failed open spray valve

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

Scenario No.: 4

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	6	2-7
2. Malfunctions after EOP entry (1-2)	2	6,7
3. Abnormal events (2-4)	3	2,3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	1	5 (SGTR-1)
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0	NA
7. Preidentified critical tasks (≥2)	2	5
8. Tech Specs exercised (≥ 2)	2	2,4

I. OBJECTIVES

1. Given the order, perform actions to raise reactor power IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load.
2. Given indication of a radiation monitor system malfunction, DIRECT the response to the malfunction in accordance with approved station procedures.
3. Given the order or indications of a CFCU tripping, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW approved station procedures.
4. Given the order or indications of a CFCU tripping, DIRECT the response to the malfunction IAW approved station procedures.
5. Given the failure of SGFP, perform actions as the nuclear control operator to RESPOND to the failure IAW S2.OP-AB.CN-0001.
6. Given the failure of SGFP, perform actions as the nuclear control operator to DIRECT the response to the malfunction IAW S2.OP-AB.CN-0001
7. Given the failure of affecting a Reactor Coolant Pump, DIRECT the response to the failure IAW S2.OP-AB.RCP-0001.
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 2-EOP-TRIP-1.
9. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with 2-EOP-TRIP-1.
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 steam generator tube rupture, perform actions as the nuclear control operator to RESPOND to the tube rupture in accordance with the approved station procedures.
13. Given the order or indications of a steam generator tube rupture, DIRECT the response to the tube rupture in accordance with the approved station procedures.
14. Given the order or indications of a ECCS pump failing to start, DIRECT the response to the malfunction in accordance with approved station procedures
15. Given the order or indications of a PZR PORV malfunction, DIRECT the response to the malfunction in accordance with approved station procedures.

II. MAJOR EVENTS

1. Power Ascension
2. 2PR2 PZR PORV leakage
3. High DP across 23A CW Traveling Screen
4. 23 SG Tube Leak (35 gpm)
5. 23 SG Tube Rupture (650 gpm)
6. 21 CFCU fails to start in LOW speed
7. PZR Spray Valve 2PS3 fails to close during RCS depressurization

III. SCENARIO SUMMARY

1. The crew will take the watch with the unit stable at 2% reactor power during a plant startup, BOL. 21 SGFP is in service and 22 SGFP is not in service. Steam dumps are in Main Steam Pressure Control, Automatic, set at 1000 psig. The crew will be instructed to raise power to 10% and enter Mode 1.
2. The crew will initiate power ascension to 10%, and enter Mode 1, using Main Steam Dumps and control rods IAW **S2.OP-IO.ZZ-0003**, Hot Standby to Minimum Load and S2.OP-SO.MS-0002, Steam Dump System Operation, Attachments 3 or 4.
3. 2PR2 PZR PORV valve will experience leakage. RCS pressure will lower and spray valves will eventually close. Subsequently, OHA E-28, PZR HTR ON PRESS LO, will actuate to alert the crew of lowering RCS pressure. The crew will assess plant conditions and determine that PZR PORV tailpipe temperatures are elevated indicating a leaking PORV. The CRS will enter S2.OP-AB.PZR-0001 and take actions to isolate and identify that 2PR2 is leaking and close the associated block valve, 2PR7. The CRS will evaluate Tech Specs for a leaking PZR PORV and enter TS 3.4.5 action a. After Tech Specs has been evaluated, Event #3 will be entered..
4. OHA K-1, 21-23 A CW SCRNWSH TRBL, will actuate and indications for high differential pressure across 23A CW pump traveling screen. 23A traveling screen will be running in fast speed. CW operator will report that heavy grassing on the screens. The DP across the traveling screen will continue to rise until exceeding the emergency trip criteria of > 8 feet. The will crew will emergency trip 23A CW and enter S2.OP-AB.CW-0001. After the CW pump is removed from service, Event #4 will be entered.
5. 23 SG will experience a 25-30 gpm tube leak. The crew will receive RMS alarms (2R19C, 2R15, and 2R41D) and enter S2.OP-AB.SG-0001. The crew will transfer to a centrifugal charging pump and determine leak rate. The crew will be able to stabilize PZR level. The CRS will evaluate Tech Spec and enter TS 3.4.7.2.c action a. After the CRS evaluates Tech Spec, Event #5 will be entered.
6. The tube leak on 23 SG will worsen to a 650 gpm tube rupture and the crew will manually trip the reactor and actuate SI. The crew will enter EOP-TRIP-1 and perform the following; (1) isolate feed flow to 23 SG (CT#1), and (2) recognize that 21 CFCU failed to start in LOW speed. The crew will block and reset 2A SEC and manually start 21 CFCU in LOW speed. The CRS will transition to EOP-SGTR-1 and isolate the steam side of 23 SG (completes CT#1

actions), cooldown to target RCS temperature (CT#2), and then depressurize the RCS to stop the primary to secondary leakage. When the crew attempts to stop the depressurization, 2PS3 spray valve will fail to close requiring the crew to stop 21 and 23 RCPs. The scenario can be terminated at this point.

7. The scenario may be terminated when the 21 and 23 RCPs are stopped or by direction from the Lead Examiner.

IV. INITIAL CONDITIONS

____ IC-243

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 SGFP is in service**
____ 9	**IOP-3 open and complete up to step 4.3.18, Power Operation. Attachment 4 is marked up.**
___ 10	**Steam Dumps are in MS Pressure Mode and Auto, and S2.OP-SO.MS-0002 is open and marked up to step 5.4.1**
___ 11	**Rod control in manual.**
___ 12	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:	KCM12AT5 //23A CIRCULATOR-EMERG TRIP <update as needed>
	2	EVENT ACTION: COMMAND: PURPOSE:	QB216PRI //2PS3 PZR SPRAY CONTROL-INCREASE <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	20000
_____ 02	CW0350E 23A CIRC WATER PUMP TRIP -DUE TO FREEZING	N/A	1	00:01:30	RT-2	8.5
_____ 03	SG0078C 23 STEAM GENERATOR TUBE RUPTURE	N/A	N/A	N/A	RT-3	35
_____ 04	RP318D1 21 Fan Coil Low Speed Fails to Start on SEC	N/A	N/A	N/A	N/A	
_____ 05	PR0019B PZR SPRAY VALVE 2PS3 FAILS OPEN	N/A	N/A	N/A	ET-2	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	RP17D RESET MIMS IMPACT - OHA A38	N/A	N/A	N/A	N/A	RESET
_____ 02	RC05A RCS SYSTEM , BORON CONC RESET	N/A	N/A	N/A	N/A	1573

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
_____ 01	OHA-H 08 LO ZLOANN_H08 H08 APT L/O RELAY TRIP	N/A	N/A	N/A	N/A	OFF
_____ 02	OHA-H 15 LO ZLOANN_H15 H15 MPT ph 1 TRBL	N/A	N/A	N/A	N/A	OFF
_____ 03	OHA-H 23 LO ZLOANN_H23 H23 MPT ph 2 TRBL	N/A	N/A	N/A	N/A	OFF
_____ 04	OHA-H 31 LO ZLOANN_H31 H31 MPT ph 3 TRBL	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. CRS please inform me when your crew is ready to assume the shift”.
4. Allow sufficient time for panel walk-downs. When informed by the CRS 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			
Examiner's Note: The crew will be using S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load, to perform the power ascension. Step 4.3.16 provides guidance on raising reactor power using Steam Dumps IAW S2.OP-SO.MS-0002. The crew can use Attachments 3 or 4 of S2.OP-SO.MS-0002 to operate Steam Dumps. The intent is for the crew to enter Mode 1, ≈ 6% Rx power, THEN; proceed to next event.			
Examiner's Note: IF console alarm **RC LOOPS Tavg – Tref DEVIATION** is in at the time the crew takes the watch, the crew will be provided instructions during turnover that verification of Tavg is 541 F once per 30 minutes until alarm is reset in Control Room Narrative Log is being performed by the extra NCO. This alarm will clear during the power ascension into Mode 1.			
	CRS directs power ascension using Main Steam Dumps in MS Pressure Control and control rods.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: The CRS will direct the crew in the order in which to raise Rx power by withdrawing control rods or raising steam dump demand first.			
	PO raises steam dump demand IAW S2.OP-SO.MS-0002, section 5.4 using Attachments 3 or 4.		
	RO withdraws control rods at the specified increments to maintain Tave on program.		
Examiner's Note: Program Tavg at 10% Rx power is about 549 F. During simulator runs, Steam Dump pressure setting was about 982 psig for a Rx Power of 5.4%.			
	RO announces when NIS indicates 5% Reactor Power and RECORDs time of Mode 1 entry in Control Room Narrative Log.		
Proceed on to next event when Reactor Power is 6% or by direction from Lead Examiner.			
2. 2PR2 PZR PORV Seat Leakage:			
Simulator Operator: Insert **RT-1** on direction from Lead Examiner. **PR0018B, PZR PORV 2PR2 Develops Leak** **Value = 20000**			
	RO announces unexpected OHA alarm for PZR HTR		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	ON PRESS LO.		
	CRS places power ascension on hold.		
	RO reports PZR PORV tailpipe temperature is rising or elevated.		
	CRS enters S2.OP-AB.PZR-0001, PZR Pressure Malfunction.		
	PO initiates Attachment 1 CAS		
	RO reports POPs is not in service.		
	RO reports PZR Pressure Control Channel has not failed.		
	RO reports Master Pressure Controller has not failed/		
	RO reports a spray valve has not failed open.		
	RO reports a PORV has not failed.		
	RO reports PORV tailpipe temperature is elevated.		
	CRS directs RO to close 2PR6 and 2PR7		
	RO closes 2PR6 and 2PR7.		
	CRS waits until RCS pressure stabilizes.		
	RO opens 2PR6.		
	RO reports tailpipe temperature is not rising.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO opens 2PR7.		
	RO reports tailpipe temperature is rising.		
	RO closes 2PR7.		
TS evaluation #1:			
	CRS enters: • **TS 3.4.5 action a (1 hour to close PZR PORV Block Valve with power maintained)** • **TS 3.2.5.b, DNB Parameters IF RCS pressue is below 2200 psia [2185 psig] (Restore the parameter to within its limt within 2 hours)**		
Proceed to next event after CRS evaluates Tech Specs or by direction from Lead Examiner.			
3. High DP Across 23A CW Traveling Screen:			
Simulator Operator: Insert **RT-2** on direction from Lead Examiner. **CW0350E, 23A Circ Water Pump Trip Due to Freezing.** **Value = 1 to 8.5** **Ramp = 1:30**			
	PO reports OHA alarm for High DP.		
	PO reports 23A CW Traveling Screen is running in Fast Speed.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports DP across 23A CW Traveling Screen is > 1 feet and rising.		
Role Play: If CW Operator is dispatched to check on traveling screen status, then state the following: 23A CW Traveling Screen is covered with heavy grass and debris. The shear pin is NOT broken.			
	CRS refers to OHA Alarm procedure or S2.OP-AB.CW-0001		
Examiners Note: S2.OP-AB.CW-0001 Attachment 1 step 9 provides guidance on when to stop or Emergency Trip the CW Pump based on screen DP.			
	The CRS directs stopping 23A CW Pump when screen DP exceeds 6 feet AND/OR Emergency Trips CW Pump when travel screen DP exceeds 8 feet IAW OHA ARP procedure.		
	PO Stops OR Emergency Trips 23A CW Pump.		
	CRS enters S2.OP-AB.CW-0001, CW System Abnormality.		
Proceed on to next event after 23A CW Pump is tripped or by direction from Lead Examiner.			
4. 23 SG Tube Leak:			
Simulator Operator: Insert RT-3 on			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
direction from Lead Examiner. **SG0078C, 23 SG Tupe Rupture.** **Value = 35**			
	RO reports OHA alarm A-6 for 2R15 in Alarm.		
	Subsequently, RO reports 2R53C (MS Line Rad Monitor) and later 2R19C (23 SG B/D Rad Monitor) are in Alarm.		
	RO reports PZR Level is lowering.		
	CRS enters S2.OP-AB.SG-0001, SG Tube Leak		
	CRS directs RO to determine RCS leak rate.		
	PO initiates Attachment 1 CAS.		
	RO reports PZR Level is not stable or rising.		
	RO reports a Centrifugal Charging Pump is not running.		
	CRS directs the RO to place a Centrifugal Charging in service IAW step 3.5.		
	RO performs step 3.5 to transfer to a Centrifugal Charging Pump.		
	Following transfer to Centrifugal Charging Pump, RO reports that PZR Level can be maintained stable.		
	Crew determines RCS leak rate around 20-30 gpm.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
TS #2 evaluation:			
	CRS enters: • **TS 3.4.7.2.c (primary-to-secondary leakage) action a (be in Hot Standby within 6 hours)**		
Proceed to next event after report of PZR Level status or by direction from Lead Examiner.			
5. 23 SG Tube Rupture (Major Transient):			
Simulator Operator: MODIFY **RT-3** on direction from Lead Examiner. **SG00078C, 23 SG Tube Rutpure Value = 650**			
Isolation of Feed Flow to 23 SG:			
	RO reports leak rate has worsen.		
	RO reports leak rate exceeds make-up capability.		
	CRS directs the action in Attachment 1 CAS to the RO to Trip the Reactor and actuate Safety Injection.		
	RO trips the reactor, confirms the trip and actuates Safety Injection.		
	CRS enters 2-EOP-TRIP-1, Reactor Trip of Safety Injection.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO continues on with immediate actions of TRIP-1.		
	CRS and RO review immediate actions.		
	PO throttles AFW flow to no less than 22E4 lbm/hr.		
	PO reports that SEC loading is NOT complete for energized ALL Vital Buses.		
6. 21 CFCU fails to start in LOW Speed on SEC signal:			
	PO reports 21 CFCU failed to start.		
	PO blocks 2A SEC.		
	PO resets 2A SEC.		
	RO starts 21 CFCU in LOW Speed.		
5. Cont'd 23 SG Tube Rupture:			
	PO reports that 21 and 22 AFW pumps are running.		
	PO reports 23 SG NR levels are rising.		
Critical Task #1, Part 1 (CT-18): Isolate feed and steam flow to ruptured SG before transition SGTR-3, SGTR with LOCA, occurs. **SAT _____ UNSAT _____**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	Critical Task #1 Part 1 - PO closes 23AF21 and 23AF11 valves.		
	If the ruptured SG is known at this point, the PO may request to close the 23AF21 and 23AF11 to isolate feed flow to the ruptured SG.		
	RO reports that containment pressure has remained less than 15 psig.		
	PO reports that 2RP4 does NOT indicate high steam flow coincident with low steam pressure or low-low Tavg.		
	RO reports 2 CCW pump running.		
	RO reports both CCW HX are in Auto.		
	RO reports 2CC131 is open.		
	PO reports all valve groups per Table E are in safeguards positions.		
	RO reports CAV is in AP Mode and not in Maintenance Mode alignment.		
	RO reports 2 switchgear supply and 1 exhaust fan are running.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports ECCS flow as expected for current RCS pressure.		
	PO maintains total AFW flow greater than 22E4 lbm/hr until at least one SG NR level is >9%, then maintains SG NR level 19-33%.		
	RO reports all RCPs are running for RCS temperature control.		
	RO reports RCS Tcolds are stable or tending to 547 F.		
	RO reports both PZR PORVs are closed.		
	RO reports ONLY 2PR6 PZR PORV block valve is open (Note: 2PR7 closed due to seat lekage earlier).		
	RO reports all RCPs are running for RCP trip criteria.		
	RO reports SI initiated and ECCS flow established.		
	RO reports that RCS pressure is not < 1240 psig (1350 psig).		
	PO reports NO SG pressures are dropping in an uncontrolled manner or completely depressurized.		
	RO reports that NR level in 23 SG is rising in an uncontrolled manner.		
2-EOP-SGTR-1 starts here:			
	CRS transitions to EOP-SGTR-1, Steam Generator Tube Rupture.		

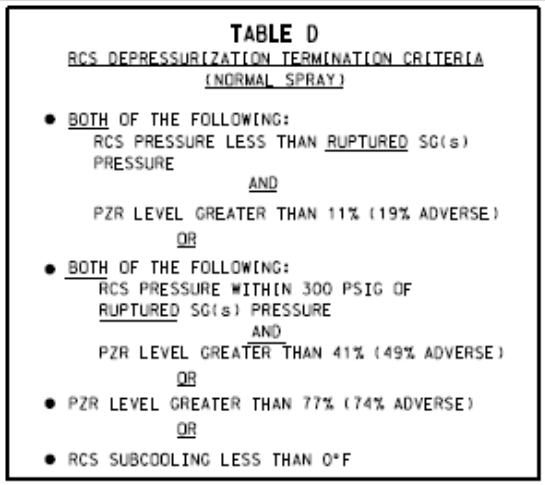
Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports RCP Trip Criteria is NOT met.		
	PO reports NR levels rising in 23 SG.		
	PO sets 23MS10 to 1045 psig.		
	PO reports that 23 SG is ruptured.		
	PO reports that 23 AFW Pump is NOT the only source of feed flow.		
Examiners Note: Steps to stop 23 AFW Pump is only required if 23 AFW Auto Starts. During validation 23 AFW was not required to Auto start.			
	PO lowers 23 AFW pump speed to minimum.		
	PO trips 23 AFW pump		
	CRS dispatches operator to close 23 MS45.		
Simulator Operator: Use **Remote MS06A** to simulate closing 23MS45. Notify CRS when valve is closed.			
	PO reports 23MS18, 23MS7, and 23GB4 are closed.		
Critical Task #1, Part 2 (CT-18): Isolate			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
feed and steam flow to ruptured SG before transition to SGTR-3, SGTR with LOCA, occurs. **SAT _____ UNSAT _____**			
	Critical Task #1 Part 2- PO closes 23MS167 [Critical Task #1 complete]		
	PO reports 23MS167, 23MS18, and 23MS7 are closed.		
	CRS directs WCC to close 2SS333.		
	CRS determines RCS target temperature using Table B (SG press at >1000 psig = 503 F CETs).		
	PO reports steam dumps are available.		
	PO places steam dumps in Manual.		
	PO places steam pressure valve demand to 0%.		
	PO places steam dumps in MS PRESS CONTROL.		
	PO adjusts steam pressure valve demand to cooldown at maximum rate.		
	When Tavg low-low is reached, PO depresses “Bypass Tavg” pushbuttons.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Critical Task #2 (CT-19): Cooldown RCS to target temperature so that transition from EOP-SGTR-1, Steam Generator Tube Rupture, does not occur. **This CT is broken down into two (2) Parts; Part 1 - establishing RCS cooldown and then Part 2 – stops the RCS cooldown by placing the MS PRESS in Auto and maintains RCS temperature.** **SAT_____ UNSAT_____**			
	Critical Task #2 Part 1 - PO dumps steam using steam dumps on intact SGs.		
	CRS continues on in EOP-SGTR-1.		
	RO reports hottest CETs are not less than RCS cooldown target temp.		
	PO maintains AFW flow > 22E4 lbm/hr until one SG NR level is > 9%, then maintain between 19% and 33%.		
	RO reports power is available to both PZR PORV stop valves.		
	RO reports both PZR PORVs are closed.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO resets SI, Phase A, and Phase B isolation.		
	PO resets each SEC and associated control centers.		
	RO opens 21 and 22 CA330s.		
	RO reports RHR suction is aligned to the RWST.		
	RO stops both RHR pumps.		
	RO reports hottest CETs are not less than RCS target temp.		
	Crew **waits** until hottest CETs are less than RCS target cooldown temp.		
	RO reports hottest CETs less than RCS target cooldown temp.		
Examiner's Note: It will take approx. **5 mins** to reach the RCS target temperature.			
Critical Task #2 Part 2 (CT-19): Cooldown RCS to target temperature so that transition from EOP-SGTR-1, Steam Generator Tube Rupture, does not occur. **SAT_____ UNSAT_____**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	Critical Task #2 Part 2 - PO stops the cooldown by placing MS Pressure Control in Auto. [Critical Task #2 complete]		
	CRS directs PO to dump steam to maintain CET temp. less than required.		
	PO reports ruptured SG pressure is stable or rising.		
	RO reports RCS subcooling is greater than 20 F.		
	RO reports normal PZR spray is available		
7. RCS depressurization using PZR Spray Valves:			
	RO reports PZR Spray Valves are available.		
	CRS reviews depressurization termination criteria IAW Table D.		
Examiner's Note: Table D Depressurization Criteria below:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
			
	RO opens BOTH PZR Spray Valves.		
	RO reports RCS pressure is lowering.		
	RO reports when depressurization termination criteria is met IAW Table D.		
PZR Spray Valve 2PS3 fails to close:			
	RO closes both PZR Spray Valves.		
Simulator Operator: Ensure **ET-2** is TRUE. This will insert malfunction to prevent 2PS3 Spray Valve from closing. **ET-2, 2PS3 Spray Valve Open Lamp**			
	RO reports 2PS3 Spray Valve failed to close.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS directs RO to stop 21 and 23 RCPs		
	RO stops 21 and 23 RCPs.		
	RO reports RCS pressure is NOT dropping in uncontrolled manner.		
	CRS goes to step 19 and continues on in SGTR-1		
Examiners Note: If the crew determines that RCS pressure is still lowering, the crew will stop all but one RCP.			
The scenario maybe terminated when the 21 and 23 RCPs are stopped or as directed by the Lead Examiner.			

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-IO.ZZ-0003, Hot Standby to Minimum Load
6. S2.OP-AB.RAD-0001, Radiation System Abnormality
7. S2.OP-SO.MS-0002, Steam Dump System Operation
8. S2.OP-AB.CW-0001, CW System Abnormality
9. S2.OP-AB.PZR-0001, PZR Pressure Malfunction
10. S2.OP-AB.SG-0001, Steam Generator Tube Leak
11. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
12. 2-EOP-SGTR-1, Steam Generator Tube Rupture

ATTACHMENT 1 (NRC-4)
UNIT TWO PLANT STATUS
TODAY

MODE: 2 POWER: 2% RCS BORON: 1584 MWe 0

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

N/A

REACTIVITY PARAMETERS

- Control Bank D at 127 steps.
- Reactor Engineering directs use of control rods and steam dumps to raise power to 10%. No Fuel Conditioning Limits are imposed until 50%.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

None

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load complete up to Section 4.3, step 4.3.18 and S2.OP-SO.MS-0002, Steam Dump System Operation is open at (5.4.1)
- IF RC Loop Tavg – Tref Deviation console alarm is in, then extra NCO will log Tavg > 541 F once per 30 minutes.
- Crew to continue Power ascension to 10% using control rods and steam dumps, and enter Mode 1.
- Reactor Engineering is standing by to support power ascension.
- Mode 1 entry is authorized.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power.

PRIMARY:

SECONDARY:

- On main feedwater using 21 SGFP; 22 SGFP is Out of Service

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: 20-01 NRC Scenario #4 REVIEWER: R. Chan

Initials		Qualitative Attributes
RC	1.	The scenario has clearly stated objectives in the scenario.
RC	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.
RC	3.	The scenario consists mostly of related events.
RC	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
RC	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.
RC	6.	The events are valid with regard to physics and thermodynamics.
RC	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
RC	8.	The simulator modeling is not altered.
RC	9.	All crew competencies can be evaluated.
RC	10.	The scenario has been validated.
NA	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.
RC	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

20-01 NRC Scenario #4

Critical Tasks:

CT-1 (CT-18) - Isolate feed and stem flow to ruptured SG before transition to SGTR-3, SGTR with LOCA – Subcooled Recovery, occurs.

SAFETY SIGNIFICANCE -- Failure to isolate the ruptured SG causes a loss of differential pressure between the ruptured SG and the intact SGs. The fact that the crew allows the differential pressure to dissipate and, as a result, are then forced to transition to a contingency ERG constitutes an incorrect performance that "necessitates the crew taking compensating action that would complicate the event mitigation strategy...."

The analyses presented in the ERG Background Document for E-3 demonstrate that a SGTR violates the RCS fission-product barrier because the SGTR allows radioactive RCS inventory to
leak into the SG. As a result, the SG inventory, radioactivity, and pressure increase. If the primary-to-secondary leakage is not stopped, the SG pressure increases until either the SG PORV or the safety valve(s) opens, releasing radioactivity to the environment. If the leakage continues, the SG inventory increase leads to water release through the PORV or safety valve(s) or to SG overfill, which seriously compromises the SG as a fission-product barrier and complicates mitigation. To stop the primary-to-secondary leakage, the crew must intervene to mitigate excessive inventory increase in the ruptured SG.

To mitigate excessive inventory increase, the crew must take the following actions:

- Identify and isolate the ruptured SG
- Cool down to establish RCS subcooling margin
- Depressurize RCS to restore inventory
- Terminate SI to stop primary-to-secondary leakage

The RCS depressurization decreases the RCS leakage into the SG, which helps to mitigate the excessive increase in SG inventory. The RCS depressurization also helps the ECCS restore RCS inventory, which in turn allows SI termination. SI termination eliminates the remaining cause of leakage from the RCS into the SG, mitigating the increase in SG inventory.

However, the RCS depressurization and SI termination cannot occur until the crew establishes RCS subcooling margin. To establish subcooling margin, the crew must cool down the RCS to a target temperature. But the crew cannot start the RCS cooldown until the ruptured SG is completely isolated. (Isolation means that all steam flow from the SG and all feedwater flow into
the SG must be stopped.)

ATTACHMENT 5

ESG CRITICAL TASKS

Isolating the ruptured SG maintains a differential pressure between the ruptured SG and the intact SGs. The differential pressure (250 psi) ensures that minimum RCS subcooling remains after RCS depressurization.

Without steam isolation, the ruptured SG pressure decreases to less than 250 psi above the intact SG as the cooldown occurs. When the crew cannot maintain the 250 psi differential, the ERGs require a transition to contingency ERG ECA-3.1. This transition unnecessarily delays the sequence of actions leading to RCS depressurization and SI termination.

For the feedwater, isolation must occur after the ruptured SG level exceeds minimum indication,
delaying isolation until after the SG tubes are covered. The feedwater coverage of the tubes places a water barrier between the tubes and the steam in the upper portion of the SG. Failure to maintain the water barrier allows the SG steam to contact the tubes. When the tube temperature decreases during the subsequent RCS cooldown, the tubes condense the hot steam, decreasing the SG pressure. The decreasing SG pressure decreases the differential pressure between the ruptured SG and the intact SGs to less than 250 psi. This forces the crew
to transition to contingency ERG ECA-3.1, which delays RCS depressurization and SI termination.

Any delay in the feedwater isolation allows the ruptured SG level to increase as the feedwater adds additional inventory along with the primary-to-secondary leakage. Too long a delay prevents the crew from depressurizing the RCS and terminating SI before excessive inventory seriously compromises the SG as a fission-product barrier, which complicates mitigation. The delay in feedwater isolation cannot be measured in terms of SG water level. But the delay can be measured in terms of the crew's inability to complete the RCS depressurization or SI termination before excessive SG inventory accumulates.

Thus, when the crew fails to isolate steam and feedwater when it is possible to do so (as in the postulated conditions), it constitutes the following:

- An incorrect action that "necessitates the crew to take compensating actions that would complicate the event mitigation"

AND

- A "significant reduction of safety margin beyond that irreparably introduced by the scenario"

Cues:

- Indication and/or annunciation of SGTR in one SG
  - Increasing SG water level
  - Radiation

AND

ATTACHMENT 5

ESG CRITICAL TASKS

- Indication and/or annunciation of reactor trip

AND

- Indication and/or annunciation of SI

Measurable Performance Standard:
Isolate feed and steam flow to ruptured SG before transition to SGTR-3, SGTR with LOCA – Subcooled Recovery, occurs

- [Main steam isolation valve position lamps indicate closed
- Main steam isolation bypass valve position lamps indicate closed
- PORV setpoint adjusted to ERG Footnote O.03
- Blowdown isolation valve position lamps indicate closed
- Steam isolation valve to TDAFW pump position lamps indicate closed
- AFW valve position lamps and/or indicators indicate closed
- Feedwater isolation valve position lamps indicate closed]$_2$

Feedback:

- Indication of stable or increasing pressure in the ruptured SG
- Indication of decreasing or zero feedwater flow rate in the ruptured SG

CT-2 (CT-19) - Cooldown RCS to target temperature so that transition from SGTR-1, Steam Generator Tube Rutpure, does not occur.

SAFETY SIGNIFICANCE -- Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency ERG. This failure constitutes an incorrect performance that “necessitates the crew taking compensating action that would complicate the event mitigation strategy....”

The analyses presented in the ERG Background Document for E-3 demonstrate that a SGTR violates the RCS fission-product barrier because the SGTR allows radioactive RCS inventory to
leak into the SG. As a result, the SG inventory, radioactivity, and pressure increase. If the primary-to-secondary leakage is not stopped, the SG pressure increases until either the SG PORV or the safety valve(s) open, releasing radioactivity to the environment. If the leakage continues, the SG inventory increase leads to water release through the PORV or safety valve(s) or to SG overfill, which seriously compromises the SG as a fission-product barrier and complicates mitigation. To stop the primary-to-secondary leakage, the crew must intervene to mitigate excessive inventory increase in the ruptured SG.

ATTACHMENT 5

ESG CRITICAL TASKS

To mitigate excessive inventory increase, the crew must take the following actions:

- Identify and isolate the ruptured SG
- Cool down to establish RCS subcooling margin
- Depressurize RCS to restore inventory
- Terminate SI to stop primary-to-secondary leakage

The RCS depressurization decreases the RCS leakage into the SG, which helps to mitigate the excessive increase in SG inventory. The RCS depressurization also helps the ECCS restore RCS inventory, which in turn allows SI termination. SI termination eliminates the remaining cause of leakage from the RCS into the SG, mitigating the increase in SG inventory.

However, the RCS depressurization and SI termination cannot occur until the crew establishes RCS subcooling margin. To establish subcooling margin, the crew must cool down the RCS to a target temperature. Terminating the RCS cooldown before reaching the target temperature prevents achieving the minimum RCS subcooling. Failure to achieve the required RCS subcooling results in a condition that forces the crew to transition to contingency ERG ECA-3.1, thereby delaying the RCS depressurization and SI termination. Such a delay allows the excessive inventory increase of the ruptured SG to continue until the SG overpressure components release water or until SG overfill occurs.

In addition to achieving the minimum target temperature, the crew must maintain that temperature to avoid a similar delay.

Terminating the cooldown too late challenges either the subcriticality CSF or the integrity CSF. Because the crew is directed to cool down at the maximum rate, late termination of cooldown could force the RCS temperature low enough to challenge the integrity CSF. The crew must then transition to one of the integrity FRGs. The transition also delays RCS depressurization and SI termination.

For plants without the BIT (BAT for LP plants) or with reduced BIT (BAT) boron concentration, late termination of cooldown could force the RCS temperature low enough to challenge the subcriticality CSF. Also, the crew's transition delays RCS depressurization and SI termination. In addition to avoiding challenges to the CSFs during the cooldown, the crew must maintain the RCS temperature high enough to avoid similar challenges.

Thus, when the crew fails to establish and maintain the correct RCS temperature when it is possible to do so (as in the postulated conditions) without transition from E-3, it constitutes the following:

- An incorrect action that "necessitates the crew to take compensating actions that would complicates the event mitigation"

AND

- A "significant reduction of safety margin beyond that irreparably introduced by the

ATTACHMENT 5

ESG CRITICAL TASKS

scenario

Cues:

- Indication and/or annunciation of SGTR in one SG
  - Increasing SG water level
  - Radiation

AND

- Indication and/or annunciation of reactor trip

AND

- Indication and/or annunciation of SI

AND

- Indication of ruptured SG pressure [greater than minimum required pressure][4]

Measurable Performance Standard:

Cooldown RCS to target temperature so that transition from SGTR-1 does not occur.

- Steam dump valve position lamps and/or indicators indicate closed
- SG PORV valve position lamps and/or indicators indicate closed

Indications of the RCS temperature is in either of the following conditions:

- Too high to maintain [minimum required subcooling]
- Below [the RCS temperature that causes an extreme (RED path) or a severe (PURPLE path) challenge to the subcriticality and/or the integrity CSF

Feedback:

- Indication of steam flow rate greater than zero
- Indication of RCS temperature decreasing

OR

- Indication of RCS temperature less than target temperature

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
Y	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
Y	Cooldown the RCS and depressurize the system
Y	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