OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin – Conduct of Operations

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

TASK NUMBER: N1150880502

JPM NUMBER: 17-01 NRC RO-A1

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

IMPORTANCE FACTOR: 3.9 (RO) ____ (SRO)

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

EVALUATION SETTING/METHOD: Classroom

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

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 8 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

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

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

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

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

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

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

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 17-01 NRC RO-A1

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

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Admin – Conduct of Operations

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

TASK NUMBER: N1150880502

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS: None

NAME: _____

DATE: _____

SYSTEM: Generic Admin – Conduct of Operations

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

TASK NUMBER: N1150880502

INITIAL CONDITIONS:

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

INITIATING CUE:

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

Successful Completion Criteria:

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

Task Standard for Successful Completion:

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

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

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

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

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

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

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

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

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

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

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

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

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

R 4. Initial setup conditions are identified.

R 5. Initiating and terminating Cues are properly identified.

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

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

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

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

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

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

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

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

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

INITIAL CONDITIONS:

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

INITIATING CUE:

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

MAXIMUM VENT TIME DETERMINATION

1. Record the following data:

   1.1 Containment temperature **140 °F**

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

   1.3 RCS pressure **1200 psig**

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

   2.1 Calculate containment absolute temperature, Tabs

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

   2.2 Calculate containment air volume (V) at STP:

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

3. Determine maximum hydrogen vent volume

   3.1 Record containment hydrogen concentration

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

   3.2 Record containment air volume at STP

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

   3.3 Calculate maximum vent volume (M)

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

4. Determine maximum vent time

   4.1 Record RCS pressure

   (from Step 1.3) **1200 psig**

   4.2 Record calculated maximum vent volume

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

   4.3 Record hydrogen vent flow rate

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

   4.4 Calculate maximum vent time (Tv)

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

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