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: _____

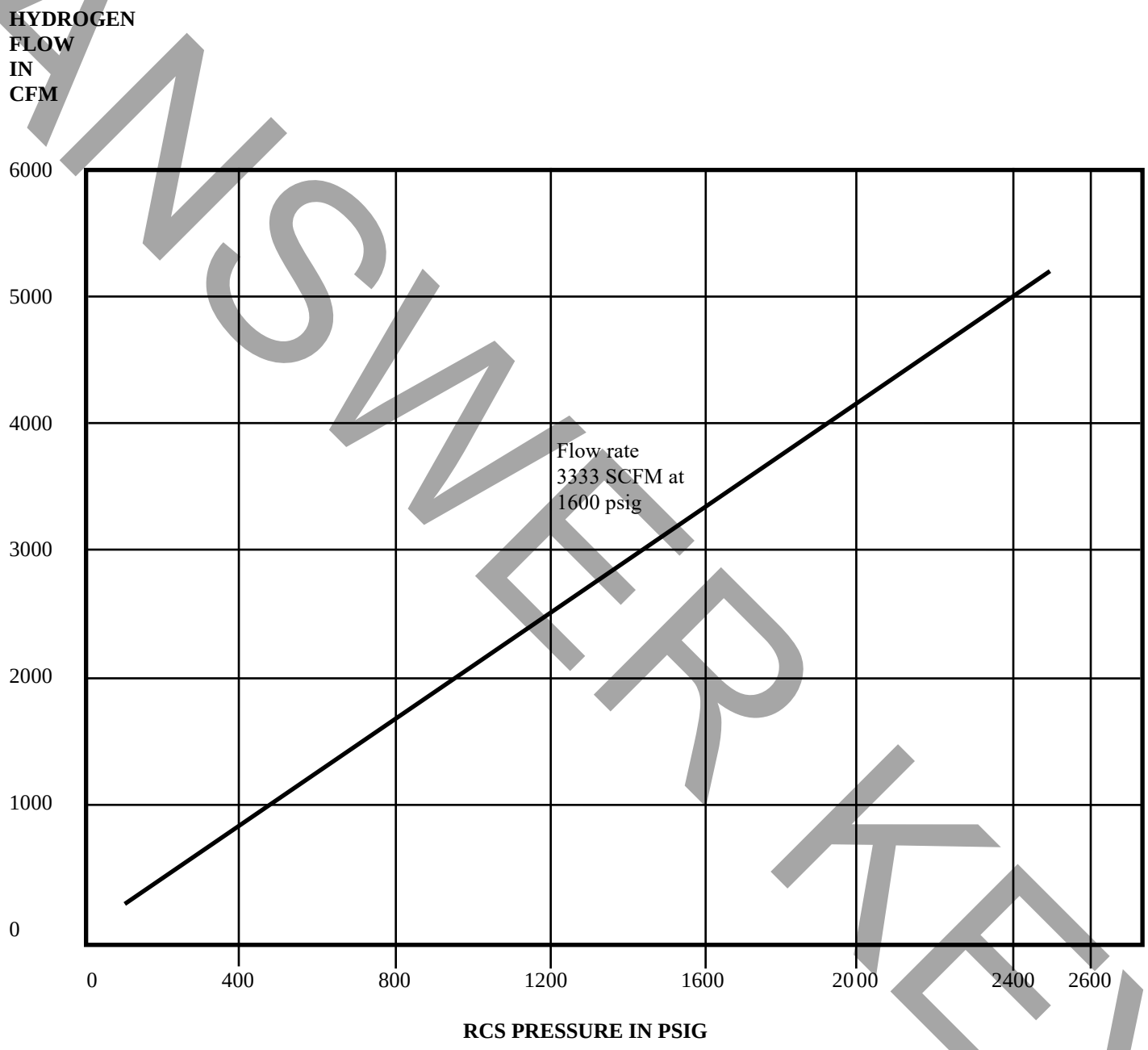
INITIAL CONDITIONS:

- 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