PSEG Nuclear LLC

Job Performance Measure

DETERMINE MINIMUM ECCS INJECTION FLOW

JPM Number: 21-01 NRC SRO-A1.a

Revision Number: 01

Date: 01/18/2023

Developed By:	**R. Chan** **Instructor**	**Date:**	1-18-23
Validated By:	**E. Gallagher** **SME or Instructor**	**Date:**	1-18-23
Reviewed By:	**M. Winkelspecht** **Operations Representative**	**Date:**	1/19/23
Approved By:	**M. Wadusky** **Training Department (Print/Sign)**	**Date:**	1/19/23

REVISION RECORD (Summary)

Revision Number	Date	Reason
00	7/26/22	Modified JPM conditions in stem from NRC 17-01 JPM that results in none of the ECCS pumps can be stopped. Converted to new template.
01	1/18/23	Revised JPM to add Figure 1 from EOP-LOCA-5 as a student handout.

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:
RC	Procedure(s) 2-EOP-LOCA-5 Sheet 2 Rev. 41 Date Checked: 8/18/22
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.
N/A	11. When JPM is revalidated, SME or instructor sign and date JPM cover page

R. Chan	8/18/22
SME/Instructor	Date
SME/Instructor	Date
SME/Instructor	Date

SIMULATOR SETUP INSTUCTIONS

1. None, this is an Admin JPM.

SPECIAL INSTRUCTIONS

1. None.

INITIAL CONDITIONS

- At Time 0500, Salem Unit 2 was manually tripped and Safety Injection automatically actuated as a result of a LOCA
- At Time 0600, the RWST Low Level Alarm actuates and the crew transitions to 2-EOP-LOCA-3.
- The crew is unable to transfer to Cold Leg Recirculation and transitions to 2-EOP-LOCA-5, Loss of Emergency Recirculation, due to NO recirculation capability.
- ECCS has been reduced to one train with the following ECCS Pump flow rates:
    - 21 SI Pump – 160 gpm
    - 22 Charging Pump – 220 gpm
    - BOTH RHR Pumps were stopped

INITIATING CUE

You are the CRS at Step 16.1 of 2-EOP-LOCA-5.

- DETERMINE the following:
    1. At Time 0640 hours, what is the MINIMUM SI flow required from Figure 1?
    2. Which ECCS Pumps can be stopped , if any, to reduce injection flow as close as possible to minimum flow determined from Item 1 (assume that ECCS Pump flows remain stable).

TASK STANDARD:

The task is satisfactorily met when the applicant has determined that the minimum flow per Figure 1 is 290 gpm (320 – 280 gpm acceptable band), and NONE of the running ECCS Pumps can be stopped.

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Information for Evaluators Use:

UNSAT requires written comments on the respective step.

(*) **Denotes critical steps**

If Time Critical, estimated time is the Time Critical time.

The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The time clock starts when the candidate acknowledges the initiating cue.

ANSWER KEY (optional):

You are the CRS at Step 16.1 of 2-EOP-LOCA-5.

- DETERMINE the following:
  1. At Time 0640 hours, what is the MINIMUM SI flow required from Figure 1?

     290 gpm (320 – 280 gpm acceptable band)

  2. Which ECCS Pumps can be stopped , if any, to reduce injection flow as close as possible to minimum flow determined from Item 1 (assume that ECCS Pump flows remain stable).

     NONE of the ECCS Pumps can be stopped because neither an SI nor a Charging Pump alone can supply the minimum required flow injection of 290 gpm. Therefore, 21 SI and 22 Charging are required to remain in service.

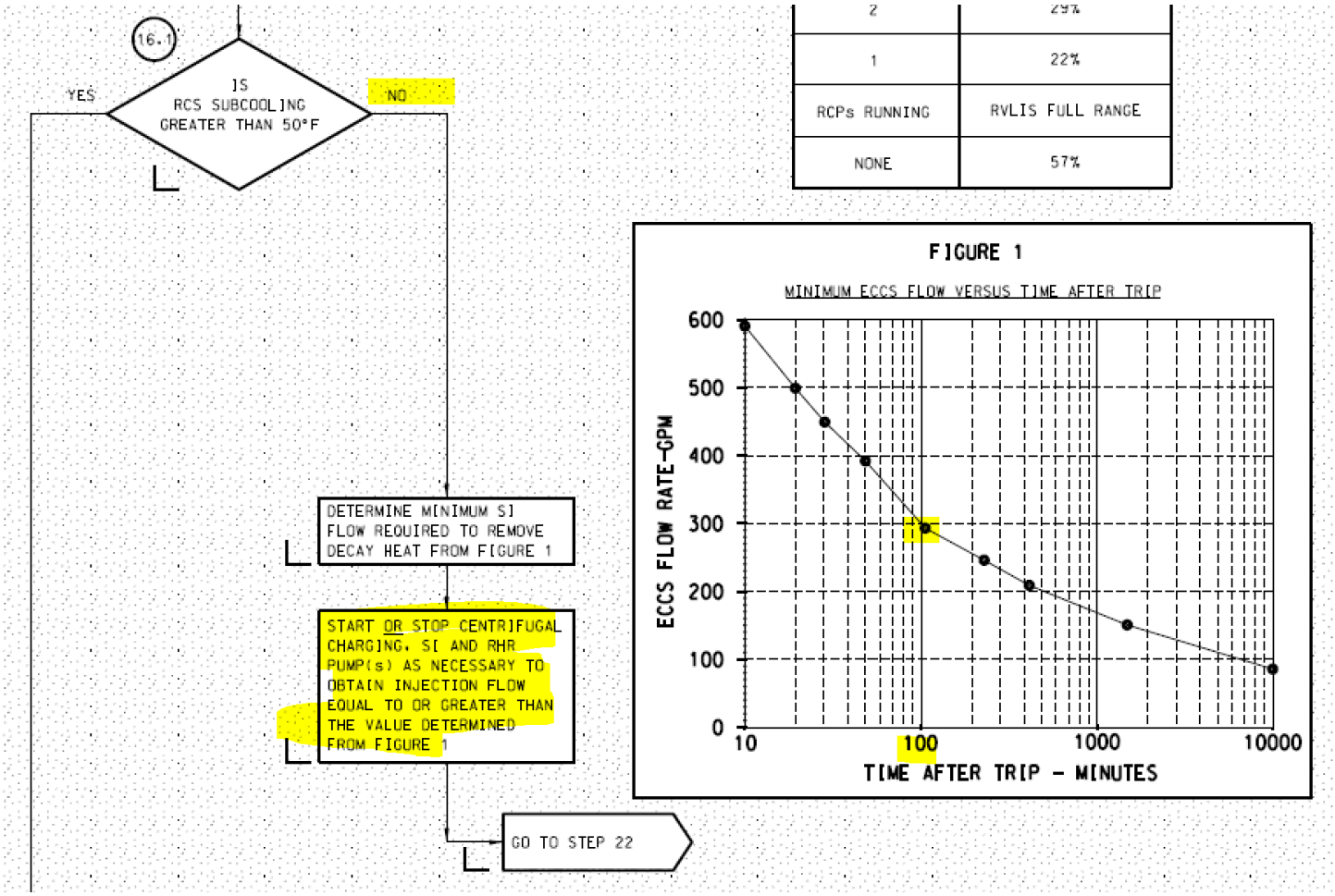
     Conditions from the stem:

     ECCS has been reduce to one train with the following ECCS Pump flow rates:

     - 21 SI Pump – 160 gpm
     - 22 Charging Pump – 220 gpm
     - BOTH RHR Pumps were stopped

ANSWER KEY (additional info)

From 2-EOP-LOCA-5, sheet 2 Rev. 41:



2	29%
1	22%
RCPs RUNNING	RVLIS FULL RANGE
NONE	57%

RECORD JPM Start Time:_____

STEP	CRITICAL	ELEMENT	STANDARD	GRADE (S/U)
N/A		**RECORD** the JPM Start Time when the operator acknowledges READY TO START JPM.		N/A
Cue: Provide candidate copy of 2-EOP-LOCA-5 sheet 2 **(D size sheet or greater**) Examiners Note: N/A Comments: N/A				
1.0	*	At Time 0640 hours, what is the MINIMUM SI flow required from Figure 1?	Determines that 100 minutes has elapsed since the Reactor Trip and using Figure 1 determines that 290 gpm (320-280 gpm) is the minimum ECCS flow injection.	
Cue: N/A **Examiners Note**: Figure 1 may be hard to read and readability errors will come into play. Lead Examiner will need to evaluate the applicants response to this answer to determine if the flow rate is reasonable based on the size of the figure. Comments:				
2.0	*	Which ECCS Pumps can be stopped ,if any, to reduce injection flow as close as possible to minimum flow determined from Item 1 (assume that ECCS Pump flows remain stable)	Determines that NONE of the ECCS Pumps can be stopped because neither an SI nor a Charging Pump alone can supply the minimum required flow injection of 290 gpm. Therefore, 21 SI and 22 Charging are required to remain in service	
Cue: N/A Examiners Note: N/A Comments:				

STEP	CRITICAL	ELEMENT	STANDARD	GRADE (S/U)
Terminating Cue		**JPM COMPLETE when applicant submits the worksheet.**		N/A

RECORD JPM Stop Time: _____

Operator's Name: _____ **Job Title:** RO _____ SRO X

Facility: Salem **JPM No.:** 21-01 NRC SRO-A1.a **Revision No.:** 01

Task Title: Determine Minimum ECCS Injection Flow

Task No.: N1150680502 **Source:**

Bank _____ New _____ Mod X

System: Conduct of Operations (Generic)

K/A Number / Description: G2.1.7 Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation

K/A Rating RO 4.4 SRO 4.7

Task Applicability: SRO Only X RO/SRO _____ AO/RO/SRO _____ Other _____

Time-Critical: Yes _____ No X **Alternate Path:** Yes _____ No X

Estimated Time to Complete: **5** Minutes **Actual Time Used:** Minutes

Method of Testing: Simulated Performance _____ Actual Performance X

Location: Classroom X Simulator _____ In-Plant _____ RCA _____

Required Materials: None

Reference(s): 2-EOP-LOCA-5

EVALUATION SUMMARY:

Were all the Critical Elements (steps) performed satisfactorily? Yes ____ No ____

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: Satisfactory _____ Unsatisfactory _____

Comments:

Evaluator's Name: _____

Evaluator's Signature: _____ **Date:** _____

STUDENT HANDOUT/WORKSHEET

Operator's Name: _____

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RECORD YOUR ANSWERS ON THIS WORKSHEET

STUDENT HANDOUT - 2-EOP-LOCA-5, Figure 1

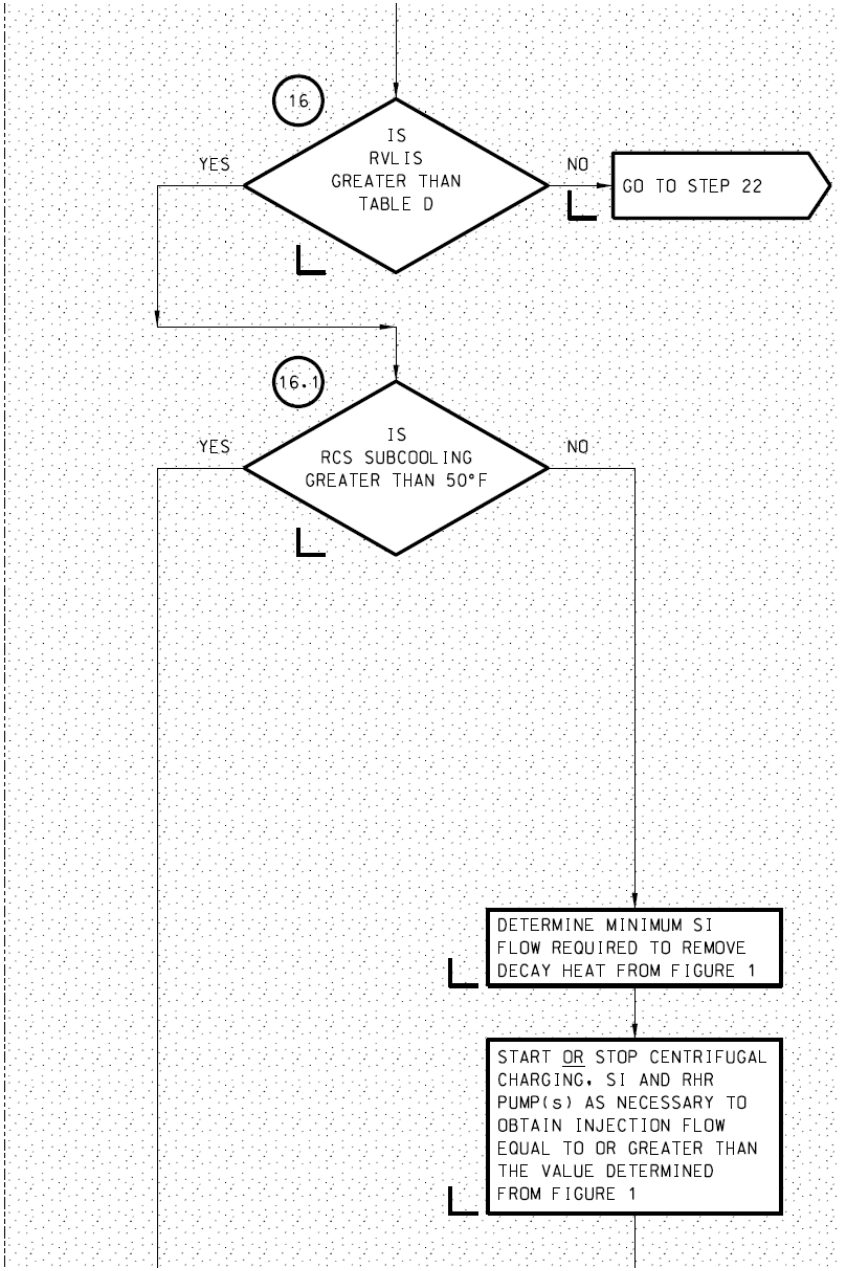

TABLE D

MINIMUM RCS INVENTORY

RCPs RUNNING	RVLIS DYNAMIC RANGE
4	60%
3	41%
2	29%
1	22%
RCPs RUNNING	RVLIS FULL RANGE
NONE	57%

FIGURE 1

MINIMUM ECCS FLOW VERSUS TIME AFTER TRIP