

Exelon Nuclear

Job Performance Measure

Place Shutdown Cooling In Operation with RHR system leak

JPM Number: 2014 ILT NRC JPM e

Revision Number: 00

Date: 10 / 14 / 2013

Developed By: _____
Instructor Date

Validated By: _____
SME or Instructor Date

Reviewed By: _____
Operations Representative Date

Approved By: _____
Training Department Date

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 9 and 13 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, simulator, or other)
- _____ 4. Initial setup conditions are identified.
- _____ 5. Initiating cue (and terminating cue if required) 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. If an alternate path is used, the task standard contains criteria for successful completion.
- _____ 9. Verify the procedure(s) referenced by this JPM reflects the current revision:
 Procedure QCOP 1000-05 Rev: 49
 Procedure _____ Rev: _____
 Procedure _____ Rev: _____
- _____ 10. Verify cues both verbal and visual are free of conflict.
- _____ 11. Verify performance time is accurate
- _____ 12. If the JPM cannot be performed as written with proper responses, then revise the JPM.
- _____ 13. When JPM is initially validated, sign and date JPM cover page. Subsequent validations, sign and date below:

SME / Instructor	Date
SME / Instructor	Date
SME / Instructor	Date

Revision Record (Summary)

Revision 00, Created for the ILT 12-1 NRC exam. The setup creates a flowpath from the 1A RHR pump to the torus [masked by overrides], initiated at RHR pump start. In addition, a torus leak is initiated to mask the torus level rise and give indications that the RHR piping is leaking into the Reactor Building basement.

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 6 (ready for shutdown cooling)

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Place the 1A RHRSW pump online to the 1A RHR heat exchanger
3. Run the following commands (contained in caep file "E caep.cae")

Fail group 2 to work (4 commands)|00:00:00|01

imf rp08A|00:00:02|02

imf rp08B|00:00:04|03

imf rp08C|00:00:06|04

imf rp08D|00:00:08|05

Rack out 1-1001-34A breaker|00:00:00|06

irf rh23ar open|00:00:10|07

override lights for 1-1001-34A|00:00:00|08

ior lohs1100134A1 on|00:00:12|09

Rack out 1-1001-36A breaker|00:00:00|10

irf rh24ar open|00:00:14|11

override lights for 1-1001-36A|00:00:00|12

ior lohs1100136A1 on|00:00:16|13

open the 1-1001-36A|00:00:00|14

irf rh34ar 100|00:00:18|15

override the A RHR containment flow to zero|00:00:00|16

ior aofi1104011a 0|00:00:20|17

set trigger 1 true when RHR pump A is taken to normal-after-start|00:00:00|18

trgset 1 "zdihs110021A(4)"|00:00:22|19

open 1-1001-34A 10% when trigger 1 is true|00:00:00|20

trg 1 "irf rh33ar 10"|00:00:24|21

cause a torus leak when trigger 1 is true|00:00:00|22

imf pc07 (1) 1.6|00:00:26|23

set trigger 2 true when RHR pump A is taken to trip or PTL or tripped light|00:00:00|24

trgset 2 "zdihs110021A(1) .or. zdihs110021A(2) .or. zlohs110021a(2)"|00:00:28|25

delete the torus leak on trigger 2|00:00:00|26

trg 2 "dmf pc07"|00:00:30|27

Override the Torus low level alarm (annunciator 901-3 A-14) off|00:00:00|28

imf ser0202 off|00:00:32|29

Increase 1-1001-34A open amount by 2% if needed|00:00:00|30

irf rh33ar 12|10:00:00|31

Rack out 1-1001-18A when directed|00:00:00|32

irf rh17ar open|10:00:00|33

When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.

4. This completes the setup for this JPM.



JPM E QCOP
1000-05, Rev 049, SI E caep.cae



INITIAL CONDITIONS

- Unit 1 is in hot standby, ready for shutdown cooling.
- Reactor water temperature has been steady for the last hour.
- One RHRSW pump is running on loop A.
- RHR Loop A is in a standby lineup per QCOP 1000-02.
- EOs are standing by in the Reactor Building.
- Pre-start checks are complete the 1A RHR pump.
- A slow cooldown is NOT required.

INITIATING CUE

Start Shutdown cooling on Unit 1 using the 1A RHR pump.

Provide student with QCOP 1000-05

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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Information For Evaluator's Use:

Prepare a copy of QCOP 1000-05 completed through step F.1.b

UNSAT requires written comments on respective step.

- * Denotes critical steps.
- Brackets the critical portion of the critical steps

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

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 timeclock starts when the candidate acknowledges the initiating cue.
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JPM Start Time: _____

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*F.1.c	• Close MO 1-1001-19A, A RHR LOOP XTIE TO B RHR LOOP SV. •	Places keylock switch for the 1-1001-19A to close and waits for green light to be lit and red light extinguished.	—	—	—
NOTE: The student should evaluate step F.1.d as Not Applicable					
CUE	If the candidate directs closing 1-1001-141A & 141B per steps F.1.e.(3), report that the handwheel is spinning freely on the 1-1001-141A and you are unable to close it. [This is to prompt the student to close the MO 1-1001-18A. The simulator does not have the 1-1001-141A & 141B modeled.]				
*F.1.e (1)	• Close MO 1-1001-18A, RHR LOOP MIN FLOW VLV. •	Places control switch for 1-1001-18A to close and releases. Waits for green light to be lit and red light extinguished.	—	—	—
F.1.e. (1).(a)	Verify closed MO 1-1001-18A.	Requests another NSO to verify 1-1001-18A RHR LOOP MIN FLOW VLV is shut	—	—	—
CUE	As another NSO, agree with the candidate regardless of valve indication.				
*F.1.e (2)	• Open breaker for MO 1-1001-18A, on MCC 18-1A-1. •	Directs EO to open the breaker for the 1-1001-18A RHR LOOP MIN FLOW VLV at MCC 18-1A-1	—	—	—
NOTE: Direct the Sim Op to open the breaker for the MO 1-1001-18A using caep file command irf rh17ar open . Verify the MO 1-1001-18A lights are extinguished prior to giving the cue.					
CUE	As EO, report that the MO 1-1001-18A RHR LOOP MIN FLOW VLV breaker at MCC 18-1A-1 is open.				
*F.1.f	• Close MO 1-1001-7A, A RHR PMP TORUS SUCT VLV. •	Places keylock switch for 1-1001-7A to close and waits for green light to be lit and red light extinguished.	—	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*F.1.g	• Close MO 1-1001-7B, B RHR PMP TORUS SUCT VLV. •	Places keylock switch for 1-1001-7B to close and waits for green light to be lit and red light extinguished.	—	—	—
*F.1.h	• Open MO 1-1001-43A, RHR PUMP SDC SUCT VLV. •	Places keylock switch for 1-1001-43A to open and waits for red light to be lit and green light extinguished.	—	—	—
F.1.i.(1)	Reset Group 2 isolation: ISOL VLV RESET switch at Panel 901-5.	Places ISOL VLV RESET to INBD momentarily, then to OTBD momentarily then releases.	—	—	—
F.1.i.(2)	Reset Group 2 isolation: RESET FOR GRP 2 ISOL VLV 1-1001-29 pushbutton at Panel 901(2)-3.	Pushes RESET FOR GRP 2 ISOL VLV 1-1001-29 pushbutton for A loop Pushes RESET FOR GRP 2 ISOL VLV 1-1001-29 pushbutton for B loop	—	—	—
*F.1.j	• Open MO 1-1001-47, SDC HDR DOWNSTREAM SV. •	Places control switch for 1-1001-47 to open and releases. Waits for red light lit and green light extinguished.	—	—	—
*F.1.k	• Open MO 1-1001-50, SDC HDR UPSTREAM SV. •	Places control switch for 1-1001-50 to open and releases. Waits for red light lit and green light extinguished.	—	—	—
F.1.l	Verify open MO 1-1001-16A, A RHR HX BYP VLV.	Verifies red light lit and green light extinguished for 1-1001-16A.	—	—	—
*F.1.m	• Close MO 1-1001-28A, A LPCI LOOP UPSTREAM SV. •	Places control switch for 1-1001-28A to close and holds until the green light is lit and red light is extinguished.	—	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*F.1.n	• Open MO 1-1001-29A, A LPCI LOOP DOWNSTREAM SV. •	Places control switch for 1-1001-29A to open and releases. Waits until the red light is lit and green light is extinguished.	—	—	—
NOTE: The student should evaluate steps F.1.o and F.1.p as Not Applicable					
NOTE: In preparation for starting the 1A RHR pump, the candidate will make a plant announcement. Ensure the student does not use the PA system to prevent interacting with other candidates.					
	In preparation for starting the 1A RHR pump, makes a plant announcement	Makes a plant announcement of the impending start of the 1A RHR pump.	—	—	—
	Directs EO to leave the 1A RHR pump area (safety concern)	Directs EO to leave the 1A RHR pump area.	—	—	—
CUE	As EO, acknowledge the direction to leave the area.				
*F.1.q	• Initiate shutdown cooling operation as follows: (1) Throttle open MO 1-1001-28A for approximately 2 seconds. (2) Start 1A RHR Pump. •	Places control switch for 1-1001-28A to open for approximately 2 seconds and releases. Without delay, places control switch for 1A RHR pump to start and releases.	—	—	—
NOTE: Alternate path starts here. Starting the 1A RHR pump causes an unexplained loss in Reactor Water Level and the candidate may immediately perform step E.2. The remaining steps in F.1 may not be completed. The Group 2 isolation is faulted, making manual isolation a critical step. In the following steps, IF asked as EO to investigate water in the Reactor Building area, THEN report that there is a large amount of water coming from somewhere. Do NOT prompt the student as to the source.					
NOTE: If Reactor Water Level is dropping inadequately (perhaps due to other JPMs), increase the leak size an additional amount by opening the 1-1001-34A from 10% to 12% using irf rh33ar 12 . As necessary, throttle the 34A by modifying the percent open (12 in the command above).					

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
F.1.r	Throttle open MO 1-1001-28A and maintain > 2500 gpm flow.	Throttles 1-1001-28A open as necessary to achieve >2500 gpm flow	—	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
F.1.s	<p>Monitor Reactor water temperature and maintain cooldown rate < 100°F per hour while maintaining > 2500 gpm flow:</p> <p>(1) To increase cooldown rate, perform any of the following:</p> <p>(a) Throttle closed MO 1-1001-16A.</p> <p>(b) Throttle open MO 1-1001-28A.</p> <p>(2) To decrease cooldown rate, perform any of the following:</p> <p>(a) Throttle open MO 1-1001-16A.</p> <p>(b) Throttle closed MO 1-1001-28A.</p> <p>(c) IF cooldown rate is excessive OR Reactor vessel temperature can NOT be maintained, THEN:</p> <ul style="list-style-type: none"> ▫ Unlock 1-1001-17A. ▫ Throttle 1-1001-17A (approximately 28.5 turns closed initially or as directed by US). ▫ Throttle MO 1-1001-16A MO 1-1001-28A as necessary to maintain Reactor water cooldown rate < 100°F/hour. ▫ Verify Equipment Status Tag placed on MO 1-1001-16A control switch stating 1-1001-17A is throttled. 	<p>To throttle the 1-1001-16A, places control switch to desired position and returns to center position. When desired position is reached, pulls out on handle to stop valve movement.</p> <p>To throttle the 1-1001-28A, places control switch in desired position and holds until desired position is reached and releases.</p> <p>To throttle the 1-1001-17A, directs the EO to unlock and reposition the 1-1001-17A</p>	—	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
CUE	As EO, if directed to unlock and open the 1-1001-17A, wait two minutes and report the 1-1001-17A is unlocked and throttled (include number of turns closed as directed).				
F.1.t	Monitor Reactor water level and maintain level > +20 inches.	Identifies that Reactor water level is NOT being maintained and executes step E.2	—	—	—
NOTE: In the following steps, it is not expected for the student to wait until valve movement completes before moving to the next valve. If the 1A RHR pump is still running, it will trip upon closure of either the -47 or -50 valves in the steps below.					
*E.2	IF an unexplained loss of inventory should occur, THEN : •a. Close MO 1-1001-47, SDC SUCT HDR DOWNSTREAM SV, if energized. •	Places control switch for 1-1001-47 to close and releases.	—	—	—
*E.2	IF an unexplained loss of inventory should occur, THEN : •b. Close MO 1-1001-50, SDC HDR UPSTREAM SV, if energized. •	Places control switch for 1-1001-50 to close and releases.	—	—	—
*E.2	IF an unexplained loss of inventory should occur, THEN : •c. Close MO 1-1001-29A, LPCI LOOP DOWNSTREAM SV. •	Places control switch for 1-1001-29A to close and releases.	—	—	—
	Reports to the Unit Supervisor of the unexplained loss of inventory and actions taken to isolate the Reactor Vessel	Reports to the Unit Supervisor of the unexplained loss of inventory and actions taken to isolate the Reactor Vessel	—	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
	If Group 2 isolation signal for Reactor Water Level was reached (approximately 6.6"), reports to the Unit Supervisor of the failed Group 2 isolation	Reports to the failure of Group 2 to actuate.	—	—	—
CUE	As Unit Supervisor, acknowledge the report(s). Inform the candidate you will have the system(s) inspected prior to reinitiating shutdown cooling.				

The candidate will inform you the task is complete.

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title:** ☐ EO ☐ RO ☐ SRO ☐ FS
☐ STA/IA ☐ SRO Cert

JPM Title: Place Shutdown Cooling In Operation with RHR system leak

JPM Number: 2014 ILT NRC JPM e Revision Number: 00

Task Number and Title:

SR-1000-P14 Given a shutdown reactor plant with RHR/SDC in service when an inadvertent drain down to the torus or drywell occurs, isolate RHR/SDC to stop the drain down in accordance with QCOP 1000-05.

K/A Number and Importance: **K/A** 205000 A2.09

Rating: 3.6/3.8

Ability to (a) predict the impacts of the following on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
 Reactor low water level

Suggested Testing Environment: Simulator

Alternate Path: ☒ Yes ☐ No SRO Only: ☐ Yes ☒ No Time Critical: ☐ Yes ☒ No

Reference(s): QCOP 1000-05, SHUTDOWN COOLING OPERATION, Rev 49

Actual Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☒ Perform

Estimated Time to Complete: 25 minutes

Actual Time Used: _____ minutes

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

Evaluator's Name: _____ (Print)

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

[If this page is an odd numbered page, a blank page is automatically generated after this page to keep the student cue sheet separate from this page]

INITIAL CONDITIONS

- Unit 1 is in hot standby, ready for shutdown cooling.
- Reactor water temperature has been steady for the last hour.
- One RHRSW pump is running on loop A.
- RHR Loop A is in a standby lineup per QCOP 1000-02.
- EOs are standing by in the Reactor Building.
- Pre-start checks are complete the 1A RHR pump.
- A slow cooldown is NOT required.

INITIATING CUE

Start Shutdown cooling on Unit 1 using the 1A RHR pump.