

NRC REGION III
INITIAL LICENSE EXAM
JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 4

**TITLE: PERFORM OFF-SITE DOSE
CALCULATION "NORMAL METHOD"**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Calculate Off-Site Dose

Alternate Path: N/A

Facility JPM #: NEW

K/A: 2.4.44 Importance: SRO: 4.4

K/A Statement: Knowledge of emergency plan protective action recommendations

Task Standard: Perform a manual stack gas release rate calculation correctly

Preferred Evaluation Location: Simulator In Plant

Preferred Evaluation Method: Perform Simulate

References: EI-1, Emergency Classification And Actions
EI-6.0, Offsite Dose Calculation And Recommendations For Protective Actions
EI-6.1, Release Rate Determination From Stack Gas Monitors

Validation Time: 25 minutes Time Critical: NO

Candidate: _____

Time Start: _____ Time Finish: _____

Performance Time: _____ minutes

Performance Rating: SAT _____ UNSAT _____

Comments:

Examiner: _____
Signature

Date: _____

EXAMINER COPY ONLY

Tools/Equipment/Procedures Needed:

EI-6.1, Attachments 1, Stack Gas Monitor Conversion Factor, RIA-2326;
Attachment 2, Stack Gas Monitor Conversion Factor, RIA-2327; and
Attachment 3, Stack Release Rate Worksheet, Rev. 7

Also see **Simulator Operator Instructions** (last page of this document).

READ TO CANDIDATE

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- A plant trip occurred 7 hour ago
- A radioactive release is currently in progress via the plant stack.
- RGEM is operable and RIA-2326, normal range noble gas stack monitor, has been in "high" alarm
- No indications of fuel failure exist
- The IBM PC Automated Dose Assessment Program "Offsite" is not available
- The PPC is not available
- RMC has verified stack activity is consistent with the Radiation Monitor reading
- There is currently a blizzard outside
- A Site Area Emergency has been declared
- The SED will review EI-6.13 to determine any additional requirements, and assign other personnel to complete and process EI-3 notification forms

INITIATING CUES:

- The SED has directed you to determine the Stack Release Rate per Section 6.2.1 of EI-6.0 and turn in Stack Release Rate Worksheet , Attachment 3 of EI-6.1 to SED

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
n/a	EI-6.0, Offsite Dose Calculation and Recommendations For Protective Actions, Section 6.2, "Normal Method" Dose Assessment located.	Operator obtains EI-6.0, Section 6.2	S U
Comment:			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
6.2.1d.1.b	If the Offsite program is not functional, the manual release rate calculation procedure EI-6.1, Release Rate Determination from Stack Gas Monitors, shall be used	Operator obtains EI-6.1, Release Determination From Stack Gas Monitors.	S U
Comment:			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
4.0b	Data and results from this procedure should be recorded on Attachment 3, Stack Release Rate Worksheet	Operator obtains EI-6.1 Att. 3	S U
Comment: <i>Evaluator provides candidate with a Working Copy (Attachments 1, 2, and 3 of EI-6.1)</i>			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
5.1a	Determine the Time Since Reactor Shutdown (in hours) and record on the Stack Gas Release Worksheet	<u>7</u> hours entered on #1. Time Since Reactor Shutdown, EI-6.1, Att. 3	S U
<p>Comment:</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
5.1b	IF unavailable, THEN obtain reading for RIA-2327 from chart recorder RR-2327... Record reading on Att. 3. Circle appropriate units and mark which monitor was used ...	<u>9.9</u> mr/hr entered on Att. 3, #2. Current stack gas monitor reading <u>AND</u> CPM circled <u>AND</u> (X) RIA-2327	S U
<p>Comment:</p> <p>NOTE: RIA-2327 (RR-2327) must be used. This is based on note in Section 6.2.1 of EI-06 which states if RIA-2326 is in High Alarm, all flow is routed through RIA-2327.</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
5.1c	Obtain the background reading from the same recorder used above. The default value for background are 0.5 mr/hr for RIA-2327, Record background on Att. 3 ... Circle the appropriate units.	<u>0.5</u> mr/hr entered on Att. 3, #3. Stack monitor background reading <u>AND</u> CPM circled	S U
<p>Comment:</p> <p>EVALUATOR CUE: Inform operator to use the default value (0.5 mr/hr) as the background reading, after they have read the step.</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 7	STANDARD	Grade
5.1d	Obtain a net stack reading by subtracting stack monitor background from current stack monitor reading Record background on Att. 3 ... Circle the appropriate units.	<u>9.4</u> mr/hr entered on #4. Net stack reading <u>AND</u> mr/hr circled	S U
<p>Comment:</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 8	STANDARD	Grade
5.2f&g	IF the stack gas flow rate indication is not available from the PPC , THEN use 82,000 ft ³ /min as a default value Record the Stack Gas Flow on Att.3	<u>82,000</u> ft ³ /min entered on #5. Stack gas flow rate	S U
<p>Comment:</p> <p>Note: PPC not available for stack gas flow rate.</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 9	STANDARD	Grade
5.2h	IF performing the manual release rate determination, THEN convert flow rate to m ³ /s by multiplying stack gas flow rate by 4.27 E-4(units). Record the result on Att. 3	<u>38.704</u> m ³ /s entered on #6. Stack gas flow rate	S U
<p>Comment:</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 10	STANDARD	Grade
5.3a.2	<p>IF the Time Since Reactor Shutdown is >6 hours, THEN obtain factor from Attachment 1 or 2, as appropriate, using the Time Since Reactor Shutdown as the Decay Time.</p> <p>Record conversion factor on Att.3, circle the appropriate units</p>	<p><u>0.04</u> Ci/m³/mr/hr on #7. Conversion factor AND Ci/m³/mr/hr circled</p>	<p>S U</p>
<p>Comment:</p> <p>Note: Attachment 2, STACK GAS MONITOR CONVERSION FACTOR, RIA-2327 Figure 2, is used, all readings on Att. 3, have come from RIA-2327</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 11	STANDARD	Grade
5.3b	<p>Calculate the noble gas release tare (QN) as follows:</p> <p>QN (Ci/s) = Net stack gas monitor reading (mr/hr) x stack gas flow rate (m³/s) x conversion factor</p> <p>Record the results on Att. 3</p>	<p><u>14 to 16</u> Ci/s entered on #8. QN, Noble Gas release rate</p>	<p>S U</p>
<p>Comment:</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 12	STANDARD	Grade
5.3c	Calculate the Iodine release rate (QI) as follows: $QI = QN \times (1.0 \text{ E-}3)$ Record results on Att. 3	<u>0.014 to 0.016</u> Ci/s entered on #9. QI, Iodine release rate	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 13	STANDARD	Grade
n/a	Date, Time, and Sign Att. 3 of EI-6.1 Completed form given to SED	EI 6.1, Att. 3, signed, dated with time and turned over to the SED	S U
Comment: CRITICAL STEP			

END OF TASK

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER TO UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- A plant trip occurred 7 hour ago
- A radioactive release is currently in progress via the plant stack
- RGEM is operable and RIA-2326, normal range noble gas stack monitor, has been in "high" alarm
- No indications of fuel failure exist
- The IBM PC Automated Dose Assessment Program "Offsite" is not available
- The PPC is not available
- RMC has verified stack activity is consistent with the Radiation Monitor reading
- There is currently a blizzard outside
- A Site Area Emergency has been declared
- The SED will review EI-6.13 to determine any additional requirements, and assign other personnel to complete and process EI-3 notification forms

INITIATING CUES:

- The SED has directed you to determine the Stack Release Rate per Section 6.2.1 of EI-6.0 and turn in Stack Release Rate Worksheet , Attachment 3 of EI-6.1 to SED

SIMULATOR OPERATOR INSTRUCTIONS

USE IC-79

PPC monitors turned off (PPC not available)

STACK RELEASE RATE WORKSHEET

1. Time Since Reactor Shutdown = 7 hours
2. Current stack gas monitor reading = $\frac{10}{\text{(circle units)}}$ cpm or RIA-2326 ()
mrem/hr RIA-2327 (X)
3. Stack monitor background reading = $\frac{0.5}{\text{(circle units)}}$ cpm or mrem/hr
4. Net stack reading = $\frac{9.5}{\text{(circle units)}}$ cpm or mrem/hr
5. Stack gas flow rate = 82000 ft³/min
6. Stack gas flow rate
(#5) ft³/min x 4.72 E-4 $\frac{\text{m}^3/\text{sec}}{\text{ft}^3/\text{min}}$ = 38.704 m³/s
7. Conversion factor = $\frac{0.04}{\text{(circle units)}}$ $\frac{\text{Ci/m}^3}{\text{cpm}}$ or $\frac{\text{Ci/m}^3}{\text{mrem/hr}}$

8.	QN, Noble Gas release rate = (#4) x (#6) x (#7)	= <u>14 to 16</u>	Ci/s
----	---	-------------------	------

9.	QI, Iodine release rate = (#8) x (1.0 E-3)	= <u>0.014 to 0.016</u>	Ci/s
----	--	-------------------------	------

Date: TODAY Time: NOW Completed By: Joe Operator

ANSWER KEY ANSWER KEY ANSWER KEY ANSWER KEY