

2010 PALISADES NUCLEAR PLANT

INITIAL EXAMINATION

AS-ADMINISTERED EXAM FILES

ADMINISTRATIVE JPMs

NRC REGION III
INITIAL LICENSE EXAM
JOB PERFORMANCE MEASURE

JPM: RO ADMIN 1a

**TITLE: DETERMINE QUADRANT POWER TILT
PER PO-3**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Determine Quadrant Power Tilt per PO-3

Alternate Path: N/A

Facility JPM #: PL-OPS-ENG-014J

K/A: G2.1.7 Importance: RO: 4.4 SRO: 4.7

K/A Statement: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Task Standard: Four NI Power readings recorded within $\pm 1\%$ of key and Quadrant Power Tilt calculated correctly per PO-3

Preferred Evaluation Location: Simulator ☒ In Plant ☐

Preferred Evaluation Method: Perform ☒ Simulate ☐

References: PO-3, "Alternate Incore and Excore Applications"

Validation Time: 12 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:

PO-3, "Alternate Incore and Excore Applications," Attachment 2

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:

- Plant was at full power.
- Incors #9 and #35 are inoperable.
- Control Rod #11 has dropped into the core.

INITIATING CUES:

During performance of PO-3, Alternate Incore and Excore Applications, the Control Room Supervisor directs you to calculate Excore Quadrant Power Tilt utilizing Power Range NI Channels on Panel C-06.

EVALUATOR CUE: Provide candidate with a working copy of PO-3, Attachment 2.

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
5.2.1	Obtain lower and upper excore readings as required. (S_{AL} , S_{BL} , S_{CL} , S_{DL} and S_{AU} , S_{BU} , S_{CU} , S_{DU}).	Lower and upper excore readings from the Upper and Lower NI Detector meters on EC-06 are entered on PO-3, Attachment 2, within $\pm 1\%$ of the answer key.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
5.2.1	Calculate the sum from the Lower + Upper excore readings (S_A , S_B , S_C , S_D)	Lower + Upper excore readings (S_A , S_B , S_C , S_D) summed and entered on PO-3, Attachment #2, within $\pm 1\%$ of the answer key.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
5.2.1	1. Calculate the sum of all excore readings divided by 4: ($S = \Sigma \text{all detectors}/4$).	Sum of all excores reading divided by 4 calculated and entered on PO-3, Attachment 2.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
5.2.1	Calculate the Quadrant Tilt.	Using the formula $T_{EX} = [(S_X - S)/S]$, calculate the tilt for each Quadrant.	S U
Comment: EVALUATOR NOTE: <i>Acceptance criteria are all four Quadrant Tilts should add up to approximately zero (0).</i> CRITICAL STEP			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
5.2.1	Have calculations verified.	Have another qualified individual verify the calculations.	S U
Comment: EVALUATOR CUE: <i>State that another Operator will verify the calculation.</i>			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
n/a	Notify the CRS that Excore Quadrant Power Tilt has been completed per PO-3, Attachment 2.	Operator notifies CRS of completion of PO-3, Attachment 2, Excore Quadrant Power Tilt.	S U
Comment:			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

SIMULATOR SET UP:

Simulator Setup Instructions:

- Full power IC
- Drop Control Rod #11 fully into the core with RD-11 (Final Value = 2) on PIDRD02
- When plant has stabilized, freeze the Simulator and SNAP
- Use PO-3, Attachment 2 and record/calculate from the Upper and Lower NI Detector meters on EC-06 and use as answer key.

Excore	Lower Reading (%) $S_{AL}, S_{BL}, S_{CL}, S_{DL}$	Upper Reading (%) $S_{AU}, S_{BU}, S_{CU}, S_{DU}$	Lower + Upper S_A, S_B, S_C, S_D	$S = (\Sigma \text{ All Detectors})/4$ $= (S_A + S_B + S_C + S_D)/4$	Excore Quadrant Tilt $T_{EA}, T_{EB}, T_{EC}, T_{ED}$	
5 (CH A)	$S_{AL} =$ [NI-005 Lower (A)] 51	$S_{AU} =$ [NI-005 Upper (B)] 50	$S_A = S_{AL} + S_{AU}$ 101	96	$T_{EA} = [(S_A - S)/S] \times 100\%$ 5.2	QUAD 1
6 (CH B)	$S_{BL} =$ [NI-0065 Lower (A)] 41	$S_{BU} =$ [NI-006 Upper (B)] 40	$S_B = S_{BL} + S_{BU}$ 81		$T_{EB} = [(S_B - S)/S] \times 100\%$ -15.6	QUAD 3
7 (CH C)	$S_{CL} =$ [NI-007 Lower (A)] 51	$S_{CU} =$ [NI-007 Upper (B)] 50	$S_C = S_{CL} + S_{CU}$ 101		$T_{EC} = [(S_C - S)/S] \times 100\%$ 5.2	QUAD 4
8 (CH D)	$S_{DL} =$ [NI-008 Lower (A)] 52	$S_{DU} =$ [NI-008 Upper (B)] 49	$S_D = S_{DL} + S_{DU}$ 101		$T_{ED} = [(S_D - S)/S] \times 100\%$ 5.2	QUAD 2

NOTE: The four QPTs should sum to approximately zero.

Comments: _____

Performed By: Pat Person Date: Today Time: Now

Calculations Verified By: _____ Date: _____

After calculations are verified, forward to NSSS and Reactor Engineering Supervisor or designee for final review.

Reactor Engineering Supervisor or designee: _____ Date: _____

ANSWER KEY ANSWER KEY ANSWER KEY ANSWER KEY ANSWER KEY ANSWER KEY

CANDIDATE CUE SHEET

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

INITIAL CONDITIONS:

- Plant was at full power.
- Incores #9 and #35 are inoperable.
- Control Rod #11 has dropped into the core.

INITIATING CUES:

During performance of PO-3, Alternate Incore and Excore Applications, the Control Room Supervisor directs you to calculate Excore Quadrant Power Tilt utilizing Power Range NI Channels on Panel C-06.

NRC REGION III
INITIAL LICENSE EXAM
JOB PERFORMANCE MEASURE

JPM: RO ADMIN 1b

TITLE: RESET UFM CORRECTION FACTORS

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Reset UFM Correction Factors

Alternate Path: N/A

Facility JPM #: PL-OPS-PPC-001J

K/A: 2.1.19 Importance: SRO: 3.0 RO:3.0

K/A Statement: Ability to use plant computer to obtain and evaluate parametric information on system or component status.

Task Standard: UFM correction factors set to 1.000 and UFM is not enabled on PPC Page 521.

Preferred Evaluation Location: Simulator ☒ In Plant ☐

Preferred Evaluation Method: Perform ☒ Simulate ☐

References: DWO-1, "Operator's Daily/Weekly Items MODES 1, 2, 3, and 4"

Validation Time: 10 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:

DWO-1, "Operator's Daily/Weekly Items MODES 1, 2, 3, and 4"
DWO-1 Attachment 12
GOP-8, "Power Reduction and Plant Shutdown to MODE 2 or MODE 3 \geq 525°F"
Tech Data Book

Also see **Simulator Operator Instructions** (later 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:

The Plant is at 86% power following a power reduction from full power.

INITIATING CUES:

The Control Room Supervisor directs you to ensure UFM CAL ENABLED on PPC Page 521 is NOT ENABLED per DWO-1, Section 5.2.3.

Evaluator Cue: Provide candidate with a working copy of DWO-1 section 5.2.3.

Proc.Step	TASK ELEMENT 1	STANDARD	Grade
5.2.3.a	OBTAIN PPC Page 521 "UFM PLANT CALORIMETRIC	Page 521 of PPC is displayed	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 2	STANDARD	Grade
5.2.3.b	DETERMINE if UFM CAL ENABLED on PPC Page 521 is correct. Refer to Technical Data Book Figure 14.1.	PPC Page 521 UFM CAL ENABLED noted to be "YES".	S U
Comment:			

Proc.Step	TASK ELEMENT 3	STANDARD	Grade
5.2.3.c	IF UFM CAL ENABLED will be changed from NOT ENABLED to ENABLED, THEN PERFORM the following:	Determines step is N/A.	S U
Comment:			

Proc.Step	TASK ELEMENT 4	STANDARD	Grade
5.2.3.d.1	IF UFM CAL ENABLED will be changed from ENABLED to NOT ENABLED, THEN PERFORM the following: 1. UPDATE Technical Data Book Figure 14.1 indicating UFM CAL ENABLED status.	Updates Tech Data Book Figure 14.1 for UFM status to Not Enabled.	S U
Comment:			

Proc.Step	TASK ELEMENT 5	STANDARD	Grade
5.2.3.d.2	IF UFM CAL ENABLED will be changed from ENABLED to NOT ENABLED, THEN PERFORM the following: 2. ENSURE HB_PWR_STEADY is lowered to the 100% thermal power limit allowed by Attachment 12, "100% Thermal Power Limit."	Refers to Attachment 12 and determines power is < 2530 MWt.	S U
Comment: Evaluator Cue: Provide candidate with a working copy of DWO-1 Attachment 12.			

Proc.Step	TASK ELEMENT 6	STANDARD	Grade
5.2.3.d.3	IF UFM CAL ENABLED will be changed from ENABLED to NOT ENABLED, THEN PERFORM the following: 3. SELECT UFM CAL ENABLED.	UFM CAL ENABLED field is selected.	S U
Comment:			

Proc.Step	TASK ELEMENT 7	STANDARD	Grade
5.2.3.d.4	IF UFM CAL ENABLED will be changed from ENABLED to NOT ENABLED, THEN PERFORM the following: 4. ENTER N for no.	'N' is entered.	S U
Comment:			

Proc.Step	TASK ELEMENT 8	STANDARD	Grade
5.2.3.d.5	IF UFM CAL ENABLED will be changed from ENABLED to NOT ENABLED, THEN PERFORM the following: 5. PRESS UPDATE hardkey.	UPDATE hardkey is pressed.	S U
Comment:			

Proc.Step	TASK ELEMENT 9	STANDARD	Grade
5.2.3.d.5	IF UFM CAL ENABLED will be changed from ENABLED to NOT ENABLED, THEN PERFORM the following: 6. ENSURE UFM Correction Factors set to 1.0000. Refer to Step 5.2.3f.	Operator goes to 5.2.3.f.	S U
Comment:			

Proc.Step	TASK ELEMENT 10	STANDARD	Grade
5.2.3.f.1	ENSURE Technical Data Book Figure 14.1 is updated.	Enters "1.0000" for UFM correction factors in Tech Data Book Figure 14.1.	S U
Comment:			

Proc.Step	TASK ELEMENT 11	STANDARD	Grade
5.2.3.f.2	ENSURE HB_PWR_STEADY is acceptable for the new Total UFM Correction Factor Worth in Technical Data Book Figure 14.1.	Operator verifies HB_PWR_STEADY is lowered to a value less than the 'Maximum UFM Corrected Power for Resetting Correction Factors to 1.0' found in Tech Data Book Figure 14.1.	S U
Comment:			

Proc.Step	TASK ELEMENT 12	STANDARD	Grade
5.2.3.f.3	Select data.	On PPC page 521, data is selected for first UFM Correction Factor.	S U
Comment:			
CRITICAL STEP			

Proc.Step	TASK ELEMENT 13	STANDARD	Grade
5.2.3.f.4	Enter new value.	1.0000 is entered.	S U
Comment:			
CRITICAL STEP			

Proc.Step	TASK ELEMENT 14	STANDARD	Grade
5.2.3.f.5	Press UPDATE hardkey.	UPDATE hardkey is pressed.	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 15	STANDARD	Grade
5.2.3.f.3	Select data.	On PPC page 521, data is selected for second UFM Correction Factor.	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 16	STANDARD	Grade
5.2.3.f.4	Enter '1.0000'.	1.0000 is entered.	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 17	STANDARD	Grade
5.2.3.f.5	Press UPDATE hardkey.	UPDATE hardkey is pressed.	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 18	STANDARD	Grade
5.2.3.d.7 5.2.3.f.6	Wait approximately 30 minutes for Heat Balance power to adjust to the change in the UFM Correction Factors.	Operator waits approximately 30 minutes for Heat Balance power to adjust to the change in the UFM Correction Factors.	S U
Comment: EVALUATOR CUE: Another person will perform the Heat Balance.			

Proc.Step	TASK ELEMENT 19	STANDARD	Grade
5.2.3.d.8 5.2.3.f.7	Perform a heat balance as soon as plant conditions allow.	Informs CRS that a heat balance is to be performed as soon as plant conditions allow.	S U
Comment: EVALUATOR CUE: Another Operator will perform a Heat Balance.			

Proc.Step	TASK ELEMENT 20	STANDARD	Grade
---	Inform CRS that the UFM Correction Factors are reset to 1.0000 per DWO-1.	Operator informs the CRS that the UFM Correction Factors are reset to 1.0000 per DWO-1.	S U
Comment: EVALUATOR CUE: Repeat back notification.			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

- IC-16, 86% power.
- Ensure UFM Correction Factors are 0.9890 and 0.9690 on PPC page 521 and Tech Data Book figure 14.1 is updated.
- Ensure UFM CAL ENABLED (= YES)

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The Plant is at 86% power following a power reduction from full power.

INITIATING CUES:

The Control Room Supervisor directs you to ensure UFM CAL ENABLED on PPC Page 521 is NOT ENABLED per DWO-1, Section 5.2.3.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: RO ADMIN 2

TITLE: PERFORM DWO-1 ACOUSTIC MONITOR
7-DAY CHECK

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Perform Operators Daily/Weekly/Bi-Weekly items in all MODES

Alternate Path: N/A

Facility JPM #: NEW

K/A: 2.2.12 Importance: RO: 3.7 SRO: 4.1

K/A Statement: Knowledge of surveillance procedures

Task Standard: Identification of one out-of-spec reading during the performance of
DWO-1 for Acoustic Monitors.

Preferred Evaluation Location: Simulator ☒ In Plant ☐

Preferred Evaluation Method: Perform ☒ Simulate ☐

References: DWO-1, "Operator's Daily/Weekly Items Modes 1, 2, 3, and 4"

Validation Time: 15 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:**

- DWO-1, "Operator's Daily/Weekly Items Modes 1, 2, 3, and 4," Section 6.1 and Attachment 1, Daily/Weekly Surveillance Data Sheet
- Red ink pen

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:

- The Plant is at full power.
- It is Wednesday, 1900 hours.

INITIATING CUES:

You have been directed to take the readings of DWO-1, Item 6.1. ALL remaining readings have already been taken by another NCO.

EVALUATOR CUE: Provide candidate with page 3 of DWO-1, attachment 1 and section 6.1.

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
6.1.1	PUSH "read preamp bias" button (should read between 52.5 and 67.5) AND ENTER reading on Attachment 1, "Daily/Weekly Surveillance Data Sheet."	<ul style="list-style-type: none"> Pushes "read preamp bias" button for one of the five (5) monitors CHECKS reading between 52.5 and 67.5 RECORDS reading in "Wednesday Reading" column for applicable monitor Repeats above three steps for each monitor DETERMINES FI-1043B reading is less than 52.5 CIRCLES in RED FI-1043B reading* NOTIFY CRS of the out of spec reading * 	S U

Comment:

EVALUATOR CUE: If notified as the CRS of the out of spec reading: Acknowledge. If asked if the surveillance should continue: RESPOND to continue with the surveillance.

*** NOTE: Not part of the critical step**

CRITICAL STEP

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
6.1.2	PUSH "high alarm test" pushbutton - high alarm on C-13 should annunciate.	<ul style="list-style-type: none"> Pushes "high alarm test" pushbutton for one of the five (5) monitors CHECKS that high alarm on C-13 annunciates Repeats above two steps for each monitor 	S U

Comment:

CRITICAL STEP

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
6.1.3	TURN Channel 1 gain switch to highest point - some noise should be present after switch is at highest point.	▪ Turns Channel 1 gain switch clockwise until noise is heard.	S U
Comment: NOTE: Channel 1 gain switch is switch on LEFT side of panel. CRITICAL STEP			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
6.1.4	RETURN switch to zero.	▪ Turns Channel 1 gain switch counterclockwise to zero position	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
6.1.5	IF the pre-amp bias for any of the acoustic monitors is found out of tolerance, THEN INITIATE a work request. The instrument is operable provided the other two checks (alarm operates, audible noise) passed satisfactorily.	▪ INITIALS RECD BY in Wednesday column for Item 6.1 ▪ RECORDS a note at bottom of page that preamp bias for FI-1043B indicated zero ▪ Informs CRS that Work Request initiation is required for preamp bias issue on FI-0143B.	S U
Comment: EVALUATOR CUE: If notified as the CRS of the out of spec reading and need for a Work Request: Acknowledge.			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
n/a	▪ Return completed DWO-1 to CRS ▪ Inform CRS of out of spec readings (if not already done)	▪ Completed DWO-1 RETURNED to the CRS ▪ CRS INFORMED of the out of spec readings (if not already done)	S U
Comment:			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

- Reset to any full power IC.
- Insert the following or use CAE file
 - Override for FI-1043B Controller Output to 0.011597
- Ensure copies of DWO-1, Section 6.1 and Attachment 1, page 3 of 4 are available
- Ensure Simulator clipboard copy of SHO-1, Attachment 1 is the current revision
- Ensure Channel #1 is selected on Audio Channels Switch (Panel C-11A rear, top right-hand corner of Acoustic Panel.)

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- The Plant is at full power.
- It is Wednesday, 1900 hours.

INITIATING CUES:

You have been directed to take the readings of DWO-1, Item 6.1. All remaining readings have already been taken by another NCO.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: RO ADMIN 3

**TITLE: DETERMINE EXPECTED DOSE FOR
EQUIPMENT INSPECTION**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Determine Expected Dose for Equipment Inspection

Alternate Path: N/A

Facility JPM #: PL-OPS-ADM-002J

K/A: 2.3.4 Importance: SRO: 3.7 RO: 3.2

K/A Statement: Knowledge of radiation exposure limits under normal or emergency conditions.

Task Standard: Expected dose is calculated to be 4.5 mR (allow 4 to 5 mR).

Preferred Evaluation Location: ANY ☒_X_Preferred Evaluation Method: Perform ☒_X_ Simulate _____

References: Health Physics Procedure 2.14, "Radiological Surveys"

Validation Time: 20 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:

Current "Radiological Area Status Sheet" for East Safeguards

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:

The Plant is in a refueling outage. Work is in progress on P-67A Low Pressure Safety Injection Pump. A report has been received in the Control Room that scaffold erecting activities may have damaged the seal cooler and seal injection lines for P-67A.

INITIATING CUES:

You have been assigned the task of inspecting P-67A seal cooler and seal injection lines for damage. This will require close inspection (within 1-2 feet of pump skid area next to the seal cooler), but you are NOT to cross any contamination boundary. The inspection is expected to require 15 minutes to complete.

Determine the maximum expected radiation dose you will receive for this task. Do not include dose received during transit time.

Proc.Step	TASK ELEMENT 1	STANDARD	Grade
---	Obtains correct survey map for P-67A.	Obtains "Radiological Area Status Sheet" for East Engineering Safeguards.	S U

Comment:

EVALUATOR CUE: Provide candidate with attached Radiological Area Status Sheet and picture of P-67A skid.

Proc.Step	TASK ELEMENT 2	STANDARD	Grade
---	Determine dose rate near the component.	Dose rate determined to be 18 mRem/hr.	S U

Comment:

EVALUATOR NOTE: Candidate should select 18 mR/hr dose rate reading from Status Sheet since this is the general area where seal cooler is located and they were instructed not to cross any contamination areas.

CRITICAL STEP

Proc.Step	TASK ELEMENT 3	STANDARD	Grade
---	Calculates expected dose.	Expected dose calculated to be 4.5 mRem.	S U

Comment:

EVALUATOR NOTE: $18 \text{ mRem/hr} \times 0.25 \text{ hr} = 4.5 \text{ mR}$ (allow 4-5 mR)

CRITICAL STEP

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

Simulator NOT required for this JPM.

Radiological Survey Sheet

Room ID 4	RWP# 2010 010	Item Description Aux Bldg 570' East Engineered Safeguards	Date/Time 8/16/10 2330
<input type="checkbox"/> Smear	<input checked="" type="checkbox"/> Gamma	Status Sheet/RWP Updated Yes	Meter Type/Serial No. XYZ1/1234AA
<input type="checkbox"/> Masslinn	<input type="checkbox"/> Beta	Meter Type/Serial No. N/A	Meter Type/Serial No. N/A
<input type="checkbox"/> Frisk	<input type="checkbox"/> Neutron	Surveyed/Recorded by J Technician	Reviewed by J Supervisor
		Date 8/16/10	

Note: All Dose Rates in mRem/hr unless otherwise noted

Comments: _____

Smears
dpm/100 cm²

1	16K
2	N/A
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

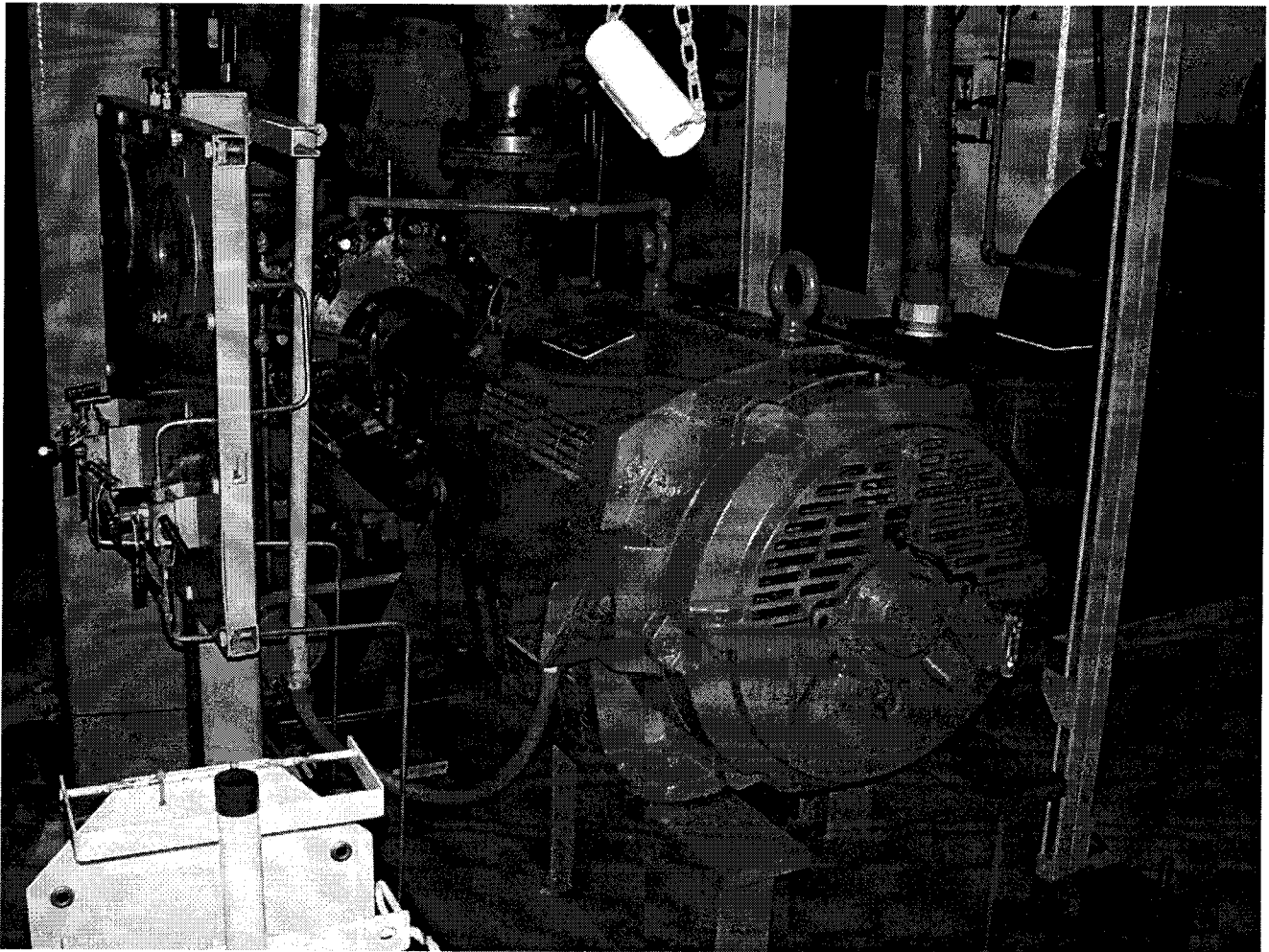
Masslinn Wipe
dpm/Masslinn

1	N/A
2	
3	
4	
5	
6	
7	
8	

Alpha Smear
dpm/100 cm²

○	N/A
○	N/A

The diagram is a floor plan of Room 4. It shows the layout of various pieces of equipment and survey points. Equipment labeled includes P-75A, P-75B, P-60A, P-60B, T-60, P-54A, P-66A, P-67A, C-6A, and a SUMP. Survey points are indicated by numbers: 1 (near P-67A), 2 (near P-54A), 5 (multiple locations), 8 (near P-67A), 10 (near P-66A), 18 (near P-67A), and CA (near P-67A). A grid of 'x' marks is shown near P-67A.



CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The Plant is in a refueling outage. Work is in progress on P-67A Low Pressure Safety Injection Pump. A report has been received in the Control Room that scaffold erecting activities may have damaged the seal cooler and seal injection lines for P-67A.

INITIATING CUES:

You have been assigned the task of inspecting P-67A seal cooler and seal injection lines for damage. This will require close inspection (within 1-2 feet of pump skid area next to the seal cooler), but you are NOT to cross any contamination boundary. The inspection is expected to require 15 minutes to complete.

Determine the maximum expected radiation dose you will receive for this task. Do not include dose received during transit time.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 1a

**TITLE: DETERMINE COMPENSATION FOR A
WITHDRAWN, INOPERABLE CONTROL ROD**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Determine Compensation for a Withdrawn, Inoperable Control Rod

Alternate Path: N/A

Facility JPM #: PL-OPS-ENG-011J

K/A: 2.1.25 Importance: RO:3.9 SRO: 4.2

K/A Statement: Ability to interpret reference materials, such as graphs, curves, tables, etc.

Task Standard: EM-04-08, Attachment 1 properly completed per key.

Preferred Evaluation Location: ANY ☒ X ☐

Preferred Evaluation Method: Perform ☒ X ☐ Simulate ☐

References: EM-04-08, "Shutdown Margin Requirements"

Validation Time: ☐ 20 ☐ 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:**

EM-04-08, "Shutdown Margin Requirements"
Technical Data Book
Calculator

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:

- Rod #6 is inoperable and fully withdrawn.
- It is believed that the rod is untrippable.
- Burnup is 7,000 MWD/MTU.
- Rx power is 100%.
- PCS Boron is 865 ppm.
- All rods out, equilibrium Xenon.

INITIATING CUES:

The Control Room Supervisor directs you to determine the compensation for shutdown margin required for control rod #6 utilizing EM-04-08.

[Provide a calculator to the examinee for this JPM.]

EVALUATOR CUE: Provide candidate a working copy of EM-04-08 Attachment 1.

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
1	Record inoperable control rod identification.	'A', '6' and 'untripable' recorded.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
2	Record worth of inoperable control rod.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: EVALUATOR CUE: Reactor Engineering is not available. CRITICAL STEP			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
3	Record source of inoperable control rod worth data.	'Tech Data Book' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
4.A	Record current cycle burnup.	Record current cycle burnup = 7000.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
4.B	Record current power level.	'100' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
4.C	Control rod worth inserted into core.	'0' and 'Gp 4 @ 131/132" entered.	S U
Comment:			
CRITICAL STEP			

Proc. Step	TASK ELEMENT 7	STANDARD	Grade
4.D	Record PCS Boron concentration.	'865' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 8	STANDARD	Grade
5.E	Determine and record worth of control rods at current power level.	'7.05 (7.04 to 7.06)' entered.	S U
Comment:			
EVALUATOR NOTE: This will need to be obtained by interpolation of the graph.			
CRITICAL STEP			

Proc. Step	TASK ELEMENT 9	STANDARD	Grade
5.F	Determine and record max worth of stuck rod at current power.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 10	STANDARD	Grade
5.G	Determine and record PCS boron concentration at 100% at 7000 MWD/MTU.	'865 (860 to 870)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 11	STANDARD	Grade
5.H	Determine and record power defect for 100% power.	'1.53 (1.51 to 1.55)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 12	STANDARD	Grade
5.I	Determine and record power defect at current power level.	'1.53 (1.51 to 1.55)' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 13	STANDARD	Grade
5.J	Determine and record required SDM.	'2.0' already entered.	S U
Comment: 			

Proc. Step	TASK ELEMENT 14	STANDARD	Grade
6.K	Calculate Net amount of shutdown margin.	'1.82 (1.80 to 1.84)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 15	STANDARD	Grade
6.L	Enter worth of untrippable rod.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 16	STANDARD	Grade
6.M	Determine excess shutdown margin with the inoperable rod.	'0.65 (0.645 to 0.655)' entered. Determines Step 7 substeps are 'N/A'.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 17	STANDARD	Grade
7.N-Q	IF Shutdown margin is negative, THEN...	Determines Step 7 substeps are 'N/A'.	S U
Comment: 			

Proc. Step	TASK ELEMENT 18	STANDARD	Grade
8.R	Determine and record PPC PDIL for current power level.	'Group 4 at 101" (100 to 105)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 19	STANDARD	Grade
8.S	Determine and record control rod position corresponding to excess shutdown margin.	'Group 4 at 20" (18 to 22)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 20	STANDARD	Grade
8.T	Determine and record PDIL for inoperable control rod condition.	'Group 4 at 101" (100 to 105)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 21	STANDARD	Grade
8.U	Determine if Caution Tagging Control Room joy-stick on Panel C-02 is NOT required.	Determines Caution Tagging Control Room joy-stick on Panel C-02 is NOT required.	S U
Comment:			

Proc. Step	TASK ELEMENT 22	STANDARD	Grade
9	Sign and date Step 9.	Operator signs and dates.	S U
Comment:			

Proc. Step	TASK ELEMENT 23	STANDARD	Grade
N/A	Report results to Control Room Supervisor.	CRS notified.	S U
Comment: EVALUATOR CUE: End JPM Note: Attach completed EM-04-08, Attachment 1 to this JPM.			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

NONE

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

1. **UNTRIPPABLE OR DROPPED CONTROL ROD IDENTIFICATION:**

GROUP A NUMBER 6

CONDITION untripable (*Untripable or Dropped*)

2. **WORTH OF UNTRIPPABLE OR DROPPED CONTROL ROD** 1.17 % Δ p
(TDB Figure 1.1 or Reactor Engineering)

3. **SOURCE OF UNTRIPPABLE OR DROPPED CONTROL ROD WORTH DATA:**

 Tech Data Book

4. **REFERENCE DATA**

A. CURRENT CYCLE BURNUP 7000 MWd/MTU
(TDB Fig 1.10)

B. CURRENT REACTOR POWER LEVEL 100 %
(Percent of Rated Power)

C. CONTROL ROD WORTH INSERTED INTO CORE 0 % Δ p
(TDB Fig 1.3)

GROUP 4 INCHES 132 (or 131)

*This Control Rod worth does not include
the worth of a dropped Control Rod.*

D. PCS BORON CONCENTRATION 865 ppm
(Chemistry Log or Reactor Logbook)

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

Proc No EM-04-08
Attachment 1
Revision 30
Page 2 of 4

5. **GENERAL DATA**

E.	WORTH OF ALL CONTROL RODS AT A (TDB Fig 1.1)	<u>7.05</u>	%Δp
F.	MAXIMUM WORTH OF STUCK CONTROL ROD AT A (TDB Fig 1.1)	<u>1.17</u>	%Δp
G.	PCS BORON AT 100% POWER AT A (TDB Fig 6.1, Reactor Log)	<u>865</u>	ppm
H.	POWER DEFECT AT 100% POWER (TDB Fig 3.2 and G)	<u>1.53</u>	%Δp
I.	POWER DEFECT AT POWER B		
	$\frac{H \times B}{100} = \frac{(1.53) \times (100)}{100} =$	<u>1.53</u>	%Δp
J.	REQUIRED SHUTDOWN MARGIN (4 PCPs Operating)	<u>2.0</u>	%Δp

6. **CALCULATION**

K. NET AMOUNT OF SHUTDOWN MARGIN

$$\begin{aligned} & \frac{(E - C - F)}{1.1} - I - J \\ &= \frac{[(7.05) - (0) - 1.17]}{1.1} - (1.53) - (2.0) = \end{aligned} \quad \begin{array}{r} \underline{1.82} \\ \text{\%}\Delta p \end{array}$$

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

L. WORTH OF UNTRIPPABLE OR DROPPED CONTROL ROD
Step 2 1.17 %Δp

M. EXCESS SHUTDOWN MARGIN WITH ONE UNTRIPPABLE OR DROPPED CONTROL ROD

$$K - L = (1.82) - (1.17) = \underline{0.65} \quad \% \Delta p$$

7. **IF** excess Shutdown Margin (**M**) is **NEGATIVE**, **THEN** borate the PCS to reduce reactor power until **M** is **POSITIVE** performing Steps **N** through **Q** to calculate the maximum reduced reactor power level.

N. POWER DEFECT AT REDUCED POWER

$$I + M = (\quad) + (\quad) = \underline{N/A} \quad \% \Delta p$$

O. MAXIMUM REDUCED POWER LEVEL

$$\frac{N \times B}{I} = \frac{(\quad) \times (\quad)}{(\quad)} = \underline{N/A} \quad \%$$

P. Caution Tag the Control Rod joy-stick on panel C-02 that the new PDIL is Control Rod position at C.

N/A

Q. **IF** power reduction is required, **THEN** after power reduction re-perform Attachment 1 to verify Shutdown Margin requirements are satisfied.

N/A

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

Proc No EM-04-08
Attachment 1
Revision 30
Page 4 of 4

8. **IF M is POSITIVE, THEN** sufficient Shutdown Margin is available and no power reduction is necessary to ensure required Shutdown Margin. Perform Steps **R** through **U** to determine maximum allowable Control Rod insertion limit corresponding to excess Shutdown Margin available (**M**).

R.	PPC PDIL FOR CURRENT POWER LEVEL (TDB Fig 1.9)	Group	<u>4</u>
		Inches	<u>101</u>
S.	CONTROL ROD POSITION CORRESPONDING TO EXCESS SHUTDOWN MARGIN IN M (TDB Fig 1.3 or 5.1 and M)	Group	<u>4</u>
		Inches	<u>20</u>
T.	PDIL FOR UNTRIPPABLE OR DROPPED CONTROL ROD CONDITION (R or S , whichever is farthest withdrawn)	Group	<u>4</u>
		Inches	<u>101</u>
U.	<u>IF</u> the Control Rod position in S is farther withdrawn than the Control Rod position in R , <u>THEN</u> Caution Tag the Control Rod joy-stick on panel C-02, identifying that the new PPC PDIL as the Control Rod position in S .		N/A

9. **REVIEWS**

(Operators' Name)	/	(Today)
Performed By		Date
/		
Reviewed By		Date

Forward Completed Form to Reactor Engineering Supervisor

	/	
Reactor Engineering Supervisor		Date

CANDIDATE CUE SHEET

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

INITIAL CONDITIONS:

- Rod #6 is inoperable and fully withdrawn.
- It is believed that the rod is untrippable.
- Burnup is 7,000 MWD/MTU.
- Rx power is 100%.
- PCS Boron is 865 ppm.
- All rods out, equilibrium Xenon.

INITIATING CUES:

The Control Room Supervisor directs you to determine the compensation for shutdown margin required for control rod #6 utilizing EM-04-08.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 1a

**TITLE: DETERMINE COMPENSATION FOR A
WITHDRAWN, INOPERABLE CONTROL ROD**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Determine Compensation for a Withdrawn, Inoperable Control Rod

Alternate Path: N/A

Facility JPM #: PL-OPS-ENG-011J

K/A: 2.1.25 Importance: RO:3.9 SRO: 4.2

K/A Statement: Ability to interpret reference materials, such as graphs, curves, tables, etc.

Task Standard: EM-04-08, Attachment 1 properly completed per key.

Preferred Evaluation Location: ANY ☒X___

Preferred Evaluation Method: Perform ☒X___ Simulate _____

References: EM-04-08, "Shutdown Margin Requirements"

Validation Time: 20 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:**

EM-04-08, "Shutdown Margin Requirements"
Technical Data Book
Calculator

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:

- Rod #6 is inoperable and fully withdrawn.
- It is believed that the rod is untrippable.
- Burnup is 7,000 MWD/MTU.
- Rx power is 100%.
- PCS Boron is 865 ppm.
- All rods out, equilibrium Xenon.

INITIATING CUES:

The Control Room Supervisor directs you to determine the compensation for shutdown margin required for control rod #6 utilizing EM-04-08.

[Provide a calculator to the examinee for this JPM.]

EVALUATOR CUE: Provide candidate a working copy of EM-04-08 Attachment 1.

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
1	Record inoperable control rod identification.	'A', '6' and 'untrippable' recorded.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
2	Record worth of inoperable control rod.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: EVALUATOR CUE: Reactor Engineering is not available. CRITICAL STEP			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
3	Record source of inoperable control rod worth data.	'Tech Data Book' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
4.A	Record current cycle burnup.	Record current cycle burnup = 7000.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
4.B	Record current power level.	'100' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
4.C	Control rod worth inserted into core.	'0' and 'Gp 4 @ 131/132" entered.	S U
Comment:			
CRITICAL STEP			

Proc. Step	TASK ELEMENT 7	STANDARD	Grade
4.D	Record PCS Boron concentration.	'865' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 8	STANDARD	Grade
5.E	Determine and record worth of control rods at current power level.	'7.05 (7.04 to 7.06)' entered.	S U
Comment:			
EVALUATOR NOTE: This will need to be obtained by interpolation of the graph.			
CRITICAL STEP			

Proc. Step	TASK ELEMENT 9	STANDARD	Grade
5.F	Determine and record max worth of stuck rod at current power.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 10	STANDARD	Grade
5.G	Determine and record PCS boron concentration at 100% at 7000 MWD/MTU.	'865 (860 to 870)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 11	STANDARD	Grade
5.H	Determine and record power defect for 100% power.	'1.53 (1.51 to 1.55)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 12	STANDARD	Grade
5.I	Determine and record power defect at current power level.	'1.53 (1.51 to 1.55)' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 13	STANDARD	Grade
5.J	Determine and record required SDM.	'2.0' already entered.	S U
Comment: 			

Proc. Step	TASK ELEMENT 14	STANDARD	Grade
6.K	Calculate Net amount of shutdown margin.	'1.82 (1.80 to 1.84)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 15	STANDARD	Grade
6.L	Enter worth of untrippable rod.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 16	STANDARD	Grade
6.M	Determine excess shutdown margin with the inoperable rod.	'0.65 (0.645 to 0.655)' entered. Determines Step 7 substeps are 'N/A'.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 17	STANDARD	Grade
7.N-Q	IF Shutdown margin is negative, THEN...	Determines Step 7 substeps are 'N/A'.	S U
Comment: 			

Proc. Step	TASK ELEMENT 18	STANDARD	Grade
8.R	Determine and record PPC PDIL for current power level.	'Group 4 at 101" (100 to 105)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 19	STANDARD	Grade
8.S	Determine and record control rod position corresponding to excess shutdown margin.	'Group 4 at 20" (18 to 22)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 20	STANDARD	Grade
8.T	Determine and record PDIL for inoperable control rod condition.	'Group 4 at 101" (100 to 105)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 21	STANDARD	Grade
8.U	Determine if Caution Tagging Control Room joy-stick on Panel C-02 is NOT required.	Determines Caution Tagging Control Room joy-stick on Panel C-02 is NOT required.	S U
Comment:			

Proc. Step	TASK ELEMENT 22	STANDARD	Grade
9	Sign and date Step 9.	Operator signs and dates.	S U
Comment:			

Proc. Step	TASK ELEMENT 23	STANDARD	Grade
N/A	Report results to Control Room Supervisor.	CRS notified.	S U
Comment: EVALUATOR CUE: End JPM Note: Attach completed EM-04-08, Attachment 1 to this JPM.			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

NONE

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

1. **UNTRIPPABLE OR DROPPED CONTROL ROD IDENTIFICATION:**

GROUP A NUMBER 6

CONDITION untrippable (*Untrippable or Dropped*)

2. **WORTH OF UNTRIPPABLE OR DROPPED CONTROL ROD** 1.17 % Δ p
(TDB Figure 1.1 or Reactor Engineering)

3. **SOURCE OF UNTRIPPABLE OR DROPPED CONTROL ROD WORTH DATA:**

 Tech Data Book

4. **REFERENCE DATA**

A. CURRENT CYCLE BURNUP 7000 MWd/MTU
(TDB Fig 1.10)

B. CURRENT REACTOR POWER LEVEL 100 %
(Percent of Rated Power)

C. CONTROL ROD WORTH INSERTED INTO CORE 0 % Δ p
(TDB Fig 1.3)

GROUP 4 INCHES 132 (or 131)

*This Control Rod worth does not include
the worth of a dropped Control Rod.*

D. PCS BORON CONCENTRATION 865 ppm
(Chemistry Log or Reactor Logbook)

UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION

Proc No EM-04-08
Attachment 1
Revision 30
Page 2 of 4

5. **GENERAL DATA**

E.	WORTH OF ALL CONTROL RODS AT A (TDB Fig 1.1)	<u>7.05</u>	%Δp
F.	MAXIMUM WORTH OF STUCK CONTROL ROD AT A (TDB Fig 1.1)	<u>1.17</u>	%Δp
G.	PCS BORON AT 100% POWER AT A (TDB Fig 6.1, Reactor Log)	<u>865</u>	ppm
H.	POWER DEFECT AT 100% POWER (TDB Fig 3.2 and G)	<u>1.53</u>	%Δp
I.	POWER DEFECT AT POWER B		
	$\frac{H \times B}{100} = \frac{(1.53) \times (100)}{100} =$	<u>1.53</u>	%Δp
J.	REQUIRED SHUTDOWN MARGIN (4 PCPs Operating)	<u>2.0</u>	%Δp

6. **CALCULATION**

K. NET AMOUNT OF SHUTDOWN MARGIN

$$\frac{(E - C - F)}{1.1} - I - J$$
$$= \frac{[(7.05) - (0) - 1.17]}{1.1} - (1.53) - (2.0) =$$

1.82 %Δp

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

L. WORTH OF UNTRIPPABLE OR DROPPED CONTROL ROD 1.17 %Δp
Step 2

M. EXCESS SHUTDOWN MARGIN WITH ONE UNTRIPPABLE OR DROPPED CONTROL ROD

$$K - L = (1.82) - (1.17) = \underline{0.65} \quad \% \Delta p$$

7. **IF** excess Shutdown Margin (**M**) is **NEGATIVE**, **THEN** borate the PCS to reduce reactor power until **M** is **POSITIVE** performing Steps **N** through **Q** to calculate the maximum reduced reactor power level.

N. POWER DEFECT AT REDUCED POWER

$$I + M = (\quad) + (\quad) = \underline{N/A} \quad \% \Delta p$$

O. MAXIMUM REDUCED POWER LEVEL

$$\frac{N \times B}{I} = \frac{(\quad) \times (\quad)}{(\quad)} = \underline{N/A} \quad \%$$

P. Caution Tag the Control Rod joy-stick on panel C-02 that the new PDIL is Control Rod position at **C**.

N/A

Q. **IF** power reduction is required, **THEN** after power reduction re-perform Attachment 1 to verify Shutdown Margin requirements are satisfied.

N/A

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

Proc No EM-04-08
Attachment 1
Revision 30
Page 4 of 4

8. **IF M is POSITIVE, THEN** sufficient Shutdown Margin is available and no power reduction is necessary to ensure required Shutdown Margin. Perform Steps **R** through **U** to determine maximum allowable Control Rod insertion limit corresponding to excess Shutdown Margin available (**M**).

R.	PPC PDIL FOR CURRENT POWER LEVEL (TDB Fig 1.9)	Group	<u>4</u>
		Inches	<u>101</u>
S.	CONTROL ROD POSITION CORRESPONDING TO EXCESS SHUTDOWN MARGIN IN M (TDB Fig 1.3 or 5.1 and M)	Group	<u>4</u>
		Inches	<u>20</u>
T.	PDIL FOR UNTRIPPABLE OR DROPPED CONTROL ROD CONDITION (R or S , whichever is farthest withdrawn)	Group	<u>4</u>
		Inches	<u>101</u>
U.	<u>IF</u> the Control Rod position in S is farther withdrawn than the Control Rod position in R , <u>THEN</u> Caution Tag the Control Rod joy-stick on panel C-02, identifying that the new PPC PDIL as the Control Rod position in S .		N/A

9. **REVIEWS**

(Operators' Name)	/	(Today)
Performed By		Date
/		
Reviewed By		Date

Forward Completed Form to Reactor Engineering Supervisor

	/	
Reactor Engineering Supervisor		Date

CANDIDATE CUE SHEET

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

INITIAL CONDITIONS:

- Rod #6 is inoperable and fully withdrawn.
- It is believed that the rod is untrippable.
- Burnup is 7,000 MWD/MTU.
- Rx power is 100%.
- PCS Boron is 865 ppm.
- All rods out, equilibrium Xenon.

INITIATING CUES:

The Control Room Supervisor directs you to determine the compensation for shutdown margin required for control rod #6 utilizing EM-04-08.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 1a

**TITLE: DETERMINE COMPENSATION FOR A
WITHDRAWN, INOPERABLE CONTROL ROD**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Determine Compensation for a Withdrawn, Inoperable Control Rod

Alternate Path: N/A

Facility JPM #: PL-OPS-ENG-011J

K/A: 2.1.25 Importance: RO:3.9 SRO: 4.2

K/A Statement: Ability to interpret reference materials, such as graphs, curves, tables, etc.

Task Standard: EM-04-08, Attachment 1 properly completed per key.

Preferred Evaluation Location: ANY ☒X

Preferred Evaluation Method: Perform ☒X Simulate ☐

References: EM-04-08, "Shutdown Margin Requirements"

Validation Time: 20 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:**

EM-04-08, "Shutdown Margin Requirements"
Technical Data Book
Calculator

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:

- Rod #6 is inoperable and fully withdrawn.
- It is believed that the rod is untrippable.
- Burnup is 7,000 MWD/MTU.
- Rx power is 100%.
- PCS Boron is 865 ppm.
- All rods out, equilibrium Xenon.

INITIATING CUES:

The Control Room Supervisor directs you to determine the compensation for shutdown margin required for control rod #6 utilizing EM-04-08.

[Provide a calculator to the examinee for this JPM.]

EVALUATOR CUE: Provide candidate a working copy of EM-04-08 Attachment 1.

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
1	Record inoperable control rod identification.	'A', '6' and 'untrippable' recorded.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
2	Record worth of inoperable control rod.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: EVALUATOR CUE: Reactor Engineering is not available. CRITICAL STEP			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
3	Record source of inoperable control rod worth data.	'Tech Data Book' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
4.A	Record current cycle burnup.	Record current cycle burnup = 7000.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
4.B	Record current power level.	'100' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
4.C	Control rod worth inserted into core.	'0' and 'Gp 4 @ 131/132" entered.	S U
Comment:			
CRITICAL STEP			

Proc. Step	TASK ELEMENT 7	STANDARD	Grade
4.D	Record PCS Boron concentration.	'865' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 8	STANDARD	Grade
5.E	Determine and record worth of control rods at current power level.	'7.05 (7.04 to 7.06)' entered.	S U
Comment:			
EVALUATOR NOTE: This will need to be obtained by interpolation of the graph.			
CRITICAL STEP			

Proc. Step	TASK ELEMENT 9	STANDARD	Grade
5.F	Determine and record max worth of stuck rod at current power.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 10	STANDARD	Grade
5.G	Determine and record PCS boron concentration at 100% at 7000 MWD/MTU.	'865 (860 to 870)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 11	STANDARD	Grade
5.H	Determine and record power defect for 100% power.	'1.53 (1.51 to 1.55)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 12	STANDARD	Grade
5.I	Determine and record power defect at current power level.	'1.53 (1.51 to 1.55)' entered.	S U
Comment:			

Proc. Step	TASK ELEMENT 13	STANDARD	Grade
5.J	Determine and record required SDM.	'2.0' already entered.	S U
Comment: 			

Proc. Step	TASK ELEMENT 14	STANDARD	Grade
6.K	Calculate Net amount of shutdown margin.	'1.82 (1.80 to 1.84)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 15	STANDARD	Grade
6.L	Enter worth of untrippable rod.	'1.17 (1.16 to 1.18)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 16	STANDARD	Grade
6.M	Determine excess shutdown margin with the inoperable rod.	'0.65 (0.645 to 0.655)' entered. Determines Step 7 substeps are 'N/A'.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 17	STANDARD	Grade
7.N-Q	IF Shutdown margin is negative, THEN...	Determines Step 7 substeps are 'N/A'.	S U
Comment: 			

Proc. Step	TASK ELEMENT 18	STANDARD	Grade
8.R	Determine and record PPC PDIL for current power level.	'Group 4 at 101" (100 to 105)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 19	STANDARD	Grade
8.S	Determine and record control rod position corresponding to excess shutdown margin.	'Group 4 at 20" (18 to 22)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 20	STANDARD	Grade
8.T	Determine and record PDIL for inoperable control rod condition.	'Group 4 at 101" (100 to 105)' entered.	S U
Comment: CRITICAL STEP			

Proc. Step	TASK ELEMENT 21	STANDARD	Grade
8.U	Determine if Caution Tagging Control Room joy-stick on Panel C-02 is NOT required.	Determines Caution Tagging Control Room joy-stick on Panel C-02 is NOT required.	S U
Comment:			

Proc. Step	TASK ELEMENT 22	STANDARD	Grade
9	Sign and date Step 9.	Operator signs and dates.	S U
Comment:			

Proc. Step	TASK ELEMENT 23	STANDARD	Grade
N/A	Report results to Control Room Supervisor.	CRS notified.	S U
Comment: EVALUATOR CUE: End JPM Note: Attach completed EM-04-08, Attachment 1 to this JPM.			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

NONE

UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION

1. **UNTRIPPABLE OR DROPPED CONTROL ROD IDENTIFICATION:**

GROUP A NUMBER 6

CONDITION untrippable (*Untrippable or Dropped*)

2. **WORTH OF UNTRIPPABLE OR DROPPED CONTROL ROD** 1.17 % Δ p
(TDB Figure 1.1 or Reactor Engineering)

3. **SOURCE OF UNTRIPPABLE OR DROPPED CONTROL ROD WORTH DATA:**

 Tech Data Book

4. **REFERENCE DATA**

A. CURRENT CYCLE BURNUP 7000 MWd/MTU
(TDB Fig 1.10)

B. CURRENT REACTOR POWER LEVEL 100 %
(Percent of Rated Power)

C. CONTROL ROD WORTH INSERTED INTO CORE 0 % Δ p
(TDB Fig 1.3)

GROUP 4 INCHES 132 (or 131)

*This Control Rod worth does not include
the worth of a dropped Control Rod.*

D. PCS BORON CONCENTRATION 865 ppm
(Chemistry Log or Reactor Logbook)

UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION

Proc No EM-04-08
Attachment 1
Revision 30
Page 2 of 4

5. **GENERAL DATA**

E.	WORTH OF ALL CONTROL RODS AT A (TDB Fig 1.1)	<u>7.05</u>	%Δp
F.	MAXIMUM WORTH OF STUCK CONTROL ROD AT A (TDB Fig 1.1)	<u>1.17</u>	%Δp
G.	PCS BORON AT 100% POWER AT A (TDB Fig 6.1, Reactor Log)	<u>865</u>	ppm
H.	POWER DEFECT AT 100% POWER (TDB Fig 3.2 and G)	<u>1.53</u>	%Δp
I.	POWER DEFECT AT POWER B		
	$\frac{H \times B}{100} = \frac{(1.53) \times (100)}{100} =$	<u>1.53</u>	%Δp
J.	REQUIRED SHUTDOWN MARGIN (4 PCPs Operating)	<u>2.0</u>	%Δp

6. **CALCULATION**

K. NET AMOUNT OF SHUTDOWN MARGIN

$$\frac{(E - C - F)}{1.1} - I - J$$
$$= \frac{[(7.05) - (0) - 1.17]}{1.1} - (1.53) - (2.0) =$$

1.82 %Δp

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

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L. WORTH OF UNTRIPPABLE OR DROPPED CONTROL ROD 1.17 %Δp
Step 2

M. EXCESS SHUTDOWN MARGIN WITH ONE UNTRIPPABLE OR DROPPED CONTROL ROD

$$K - L = (1.82) - (1.17) = \underline{0.65} \quad \% \Delta p$$

7. **IF** excess Shutdown Margin (**M**) is **NEGATIVE**, **THEN** borate the PCS to reduce reactor power until **M** is **POSITIVE** performing Steps **N** through **Q** to calculate the maximum reduced reactor power level.

N. POWER DEFECT AT REDUCED POWER

$$I + M = (\quad) + (\quad) = \underline{N/A} \quad \% \Delta p$$

O. MAXIMUM REDUCED POWER LEVEL

$$\frac{N \times B}{I} = \frac{(\quad) \times (\quad)}{(\quad)} = \underline{N/A} \quad \%$$

P. Caution Tag the Control Rod joy-stick on panel C-02 that the new PDIL is Control Rod position at C.

N/A

Q. **IF** power reduction is required, **THEN** after power reduction re-perform Attachment 1 to verify Shutdown Margin requirements are satisfied.

N/A

**UNTRIPPABLE OR DROPPED CONTROL ROD
SHUTDOWN MARGIN CALCULATION**

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8. **IF M is POSITIVE, THEN** sufficient Shutdown Margin is available and no power reduction is necessary to ensure required Shutdown Margin. Perform Steps **R** through **U** to determine maximum allowable Control Rod insertion limit corresponding to excess Shutdown Margin available (**M**).

R.	PPC PDIL FOR CURRENT POWER LEVEL (TDB Fig 1.9)	Group	<u>4</u>
		Inches	<u>101</u>
S.	CONTROL ROD POSITION CORRESPONDING TO EXCESS SHUTDOWN MARGIN IN M (TDB Fig 1.3 or 5.1 and M)	Group	<u>4</u>
		Inches	<u>20</u>
T.	PDIL FOR UNTRIPPABLE OR DROPPED CONTROL ROD CONDITION (R or S , whichever is farthest withdrawn)	Group	<u>4</u>
		Inches	<u>101</u>
U.	<u>IF</u> the Control Rod position in S is farther withdrawn than the Control Rod position in R , <u>THEN</u> Caution Tag the Control Rod joy-stick on panel C-02, identifying that the new PPC PDIL as the Control Rod position in S .		N/A

9. **REVIEWS**

(Operators' Name)	/	(Today)
Performed By		Date
/		
Reviewed By		Date

Forward Completed Form to Reactor Engineering Supervisor

	/	
Reactor Engineering Supervisor		Date

CANDIDATE CUE SHEET

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

INITIAL CONDITIONS:

- Rod #6 is inoperable and fully withdrawn.
- It is believed that the rod is untrippable.
- Burnup is 7,000 MWD/MTU.
- Rx power is 100%.
- PCS Boron is 865 ppm.
- All rods out, equilibrium Xenon.

INITIATING CUES:

The Control Room Supervisor directs you to determine the compensation for shutdown margin required for control rod #6 utilizing EM-04-08.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 1b

**TITLE: CALCULATE BLEND RATIO FOR MAKEUP
TO SIRWT**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Perform Safety Injection Refueling Water Tank Operations

Alternate Path: N/A

Facility JPM #: PL-OPS-ENG-019J

K/A: 2.1.34 Importance: RO: 2.3 SRO: 2.9

K/A Statement: Ability to maintain primary and secondary plant chemistry within allowable limits.

Task Standard: Correct volume of Boric Acid and Primary Makeup Water Calculated for addition to SIRWT

Preferred Evaluation Location: Any ☒_X_

Preferred Evaluation Method: Perform ☒_X_ Simulate ☐_____

References: SOP-2A, "Chemical and Volume Control System"
Technical Data Book, figure 8.2

Validation Time: ☐_12_ 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:**

- SOP-2A, "Chemical and Volume Control System"
- Calculator
- Pencil and paper

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:

- Safety Injection Refueling Water Storage Tank boron concentration = 2149ppm
- Safety Injection Refueling Water Storage Tank level = 96%
- Boric Acid Storage Tank T-53A boron concentration = 12,524ppm

INITIATING CUES:

The Control Room Supervisor directs you to perform SOP-2A section 7.6.1.a to calculate the volumes of Boric Acid and Primary Makeup water needed to raise SIRWT level by 3000 gallons while maintaining current SIRWT boron concentration.

EVALUATOR CUE: Provide candidate a working copy of SOP-2A Section 7.6.1

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
7.6.1.a Caution	<p>During makeup operations to the SIRWT:</p> <p>1. Makeup to the volume control tank is not available.</p> <p>2. Opening CV-2155, Boric Acid Blender Outlet Control Valve, will inject the blended batch intended for the SIRWT into the PCS.</p> <p>3. Additions that exceed 2500 ppm may result in exceeding boron concentration limits of Technical Specifications LCO 3.5.4. SITs may also be affected during fill and drain operations</p>	Operator reviews caution	S U
Comment:			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
7.6.1.a.1	<p>To determine the amount of boric acid and primary makeup water to be transferred to SIRW tank, REFER TO the following formulas:</p> <p>SIRW Tank Volume = (% meter reading x 2797) + 18,646</p> <p>Where: SIRW Tank Volume = SIRW total gallons % meter reading = LIA-0332A or LIA-0331.</p>	<p>Operator calculates the following:</p> <p>Amount of volume to add = 3000 gallons (give in initial conditions)</p>	S U
Comment:			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
7.6.1.a.2	Blend Ratio = (BAST ppm/SIRW ppm) - 1 Where: Blend Ratio = gallons of PMW per 1 gallon of concentrated Boric Acid BAST ppm = 12,524 SIRWT ppm = 2149	Operator calculates the following: $(12,524/2149) - 1 = 4.83$ (allow 4.80 - 4.85)	S U
Comment: EVALUATOR NOTE: Allow 4.80 to 4.86 CRITICAL STEP			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
7.6.1.a.3	Gallons of concentrated boric acid to add = Total Volume Makeup to SIRW/(Blend Ratio + 1) Where: Total Volume Makeup to SIRWT = Desired SIRWT level in gallons minus current level in gallons Blend Ratio = gallons of PMW per 1 gallon of concentrated Boric Acid	Operator calculates the following: $3000/(4.83 + 1) = 514.6$ gal of boric acid	S U
Comment: EVALUATOR NOTE: Allow 511.9 – 517.2 CRITICAL STEP			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
7.6.1.a.4	<p>Gallons of PMW to add = Total volume makeup to SIRWT - Gallons of Boric Acid to add</p> <p>Where:</p> <p>Total Volume Makeup to SIRWT = Desired SIRWT level in gallons minus current level in gallons</p> <p>Gallons of Boric Acid to Add = Item 3. above</p>	<p>Operator calculates the following:</p> <p>$3000 - 514.6 = 2485.4$ gal of PMW</p>	S U
<p>Comment:</p> <p>EVALUATOR NOTE: Allow 2483 – 2488</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
n/a	Operator informs Control Room Supervisor of the volume of boric acid and primary makeup water to add.	<p>CRS informed of the following volumes:</p> <p>Primary Makeup Water: 2485.4 gal</p> <p>Concentrated Boric Acid: 514.6 gal</p>	S U
<p>Comment:</p> <p>EVALUATOR NOTE: Allow 2483 – 2488 gal for Primary Makeup Water and 511.9 – 517.2 gal for Boric Acid</p> <p>EVALUATOR CUE: Role play as CRS</p>			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

- NONE

CANDIDATE CUE SHEET

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

INITIAL CONDITIONS:

- Safety Injection Refueling Water Storage Tank boron concentration = 2149ppm
- Safety Injection Refueling Water Storage Tank level = 96%
- Boric Acid Storage Tank T-53A boron concentration = 12,524ppm

INITIATING CUES:

The Control Room Supervisor directs you to perform SOP-2A section 7.6.1.a to calculate the volumes of Boric Acid and Primary Makeup water needed to raise SIRWT level by 3000 gallons while maintaining current SIRWT boron concentration.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 2

TITLE: APPROVE A HEAVY LOAD MOVEMENT

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Approve a heavy load movement

Alternate Path: N/A

Facility JPM #: PL-OPS-ADM-001J

K/A: 2.2.14 Importance: SRO: 4.3

K/A Statement: Knowledge of the process for controlling equipment configuration or status

Task Standard: Approve a heavy load movement, ensuring all prerequisites and operational requirements are met.

Preferred Evaluation Location: ANY ☒X

Preferred Evaluation Method: Perform ☒X Simulate ☐

References: FHS-M-23, "Movement of Heavy Loads in The Spent Fuel Pool Area"
Administrative Procedure AP 4.02, "Control Of Equipment"

Validation Time: 20 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:

FHS-M-23, "Movement of Heavy Loads in The Spent Fuel Pool Area,"
Attachment 1, Heavy Load Data Sheet, with applicable sections completed by
Heavy Load Person In Charge (HL PIC)

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:

- The Plant is in Mode 1
- A refueling outage was completed 95 days ago, with all spent fuel from the core stored in the south end of the Spent Fuel Pool
- You are an on-shift SRO
- It is Tuesday, 'Night' shift, 1930 hours
- V-10, Radwaste Area Supply Fan; V-14A and V-14B Radwaste Area Exhaust Fan are in service
- Both Control Room HVAC trains for filtration and cooling are operable, with the left train in service, normal operation
- VF-66, Fuel Pool Area Refueling Charcoal Filter, is bypassed (not in service)
- V-7, Fuel Handling Area Supply Fan; V-8A and V-8B, Radwaste Area Exhaust Fans are in service
- Mechanical Maintenance has requested to move the MSB Shielding Lid from the Cask Washdown Pit onto the loaded fuel cask, in the Spent Fuel Pool
- This evolution is expected to begin immediately after authorization and to be completed by 2300 hours
- No other load movements are planned or in progress
- No fuel movement in the SFP is planned or in progress
- All spent fuel in the north tilt pit and has decayed for greater than one year

INITIATING CUES:

The Shift Manager directs you to approve the requested load movement, ensuring all Operational prerequisites and requirements are met prior to the approval.

EVALUATOR CUE Provide candidate the completed FHS-M-23, Att. 1 Working Copy.

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
Att. 6	Is the load a heavy load (>1300 lbs)?	SRO determines: <u>YES</u> , Object is a heavy load (MSB Shield Lid weighs 6457 lbs from Att. 2)	S U
Comment: EVALUATOR CUE: Provide candidate with a working copy of FHS-M-23. CRITICAL STEP			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
Att. 6	Is the load movement within Load Path 3 only?	<u>NO</u> Heavy Load path #4 determined for movement of DFS components between cask wash-down pit and cask loading floor area, Att.3	S U
Comment: EVALUATOR CUE: If asked by SRO what load move will be taking place, Reply: the MSB Shielding Lid is being moved from the Cask Wash-down area to the loaded fuel cask in the Spent Fuel Pool. Evaluator Note: Candidate determines FHS-M-23 Attachment 1 working copy Block 7 "HL Path(s) Authorized For Use" is wrong and changes to reflect Load Path 4 (may be done at anytime prior to end of JPM). CRITICAL STEP			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
Att. 6	Will loads be moved over Load Path 1?	<u>NO</u>	S U
Comment: EVALUATOR CUE: If asked by SRO what load move will be taking place, Reply: the MSB Shielding Lid is being moved from the Cask Wash-down area to the loaded fuel cask in the Spent Fuel Pool. CRITICAL STEP			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
Att. 6	Will loads be moved over Load Path 4 (Main Fuel Pool)?	<u>YES</u>	S U
<p>Comment:</p> <p>Evaluator Note: Candidate determines FHS-M-23 Attachment 1 working copy Block 7 "HL Path(s) Authorized For Use" is wrong and changes to reflect Load Path 4 (may be done at anytime prior to end of JPM).</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
Att. 6	Has fuel decayed ≥ 30 days?	<u>YES</u> (given in the initial conditions)	S U
<p>Comment:</p>			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
Att. 6	V-10, V-14A and V-14B inservice OR V-10 off and either V-14A OR V-14B inservice	V-10, V-14A and V-14B verified in-service	S U
<p>Comment:</p>			

Proc. Step	TASK ELEMENT 7	STANDARD	Grade
Att. 6	Both CRHVAC filtration operable (refer to TS 3.7.10 if one train inoperable)	Both CRHVAC filtration trains verified operable	S U
Comment: EVALUATOR CUE: If asked by SRO if both CRHVAC Filtration trains are operable, RESPOND: they are not on the LCO or LCO Annex sheet for being inoperable or degraded.			

Proc. Step	TASK ELEMENT 8	STANDARD	Grade
Att. 6	Both CRHVAC cooling operable (refer to TS 3.7.11 if one train inoperable)	Both CRHVAC cooling trains verified operable	S U
Comment: EVALUATOR CUE: If asked by SRO if both CRHVAC cooling trains are operable, RESPOND: they are not on the LCO or LCO Annex sheet, for being inoperable or degraded.			

Proc. Step	TASK ELEMENT 9	STANDARD	Grade
Att. 6	Has fuel decayed ≥ 90 days?	<u>YES</u> (given in the initial conditions)	S U
Comment:			

Proc. Step	TASK ELEMENT 10	STANDARD	Grade
Att. 6	VF-66 maybe bypassed OR out of service At least one V-8 shall be inservice	One V-8 fan verified inservice	S U
Comment:			

Proc. Step	TASK ELEMENT 11	STANDARD	Grade
Att. 6	Will loads be moved over Load Path 2?	<u>NO</u>	S U
Comment: Evaluator Note: Candidate determines FHS-M-23 Attachment 1 working copy Block 7 "HL Path(s) Authorized For Use" is wrong and changes to reflect Load Path 4 (may be done at anytime prior to end of JPM). CRITICAL STEP			

Proc. Step	TASK ELEMENT 12	STANDARD	Grade
Att. 6	Will loads be moved over Load Path 3?	<u>NO</u>	S U
Comment:			

Proc. Step	TASK ELEMENT 13	STANDARD	Grade
Att. 6	Will non-heavy loads be moved under this procedure?	<u>NO</u> (given in initial conditions)	S U
Comment:			

Proc. Step	TASK ELEMENT 14	STANDARD	Grade
Att. 6	Will load be moved in an alternate path?	<u>NO</u> (Path 4 is the only path for this evolution)	S U
Comment:			

Proc. Step	TASK ELEMENT 15	STANDARD	Grade
5.1.1a	On-Shift, Duty SRO <u>shall</u> : Review and understand Sections 1.0 through 4.0 of procedure.	SRO references Section 1.0 through 4.0, and ensures: No fuel movements in SFP Area (given in initial conditions)	S U
Comment:			

Proc. Step	TASK ELEMENT 16	STANDARD	Grade
5.1.1b	On-Shift, Duty SRO <u>shall</u> : ENSURE plant systems and conditions are met.	SRO verifies plant systems and conditions are met (has effectively completed this step by ensuring Att. 6 complete)	S U
Comment:			

Proc. Step	TASK ELEMENT 17	STANDARD	Grade
5.1.1c	On-Shift, Duty SRO shall: Complete Attachment 1 to document permission to commence heavy load movement for approved Load Paths during specified time period.	SRO enters on FHS-M-23, Att. 1: <u>Signs, Dates and Times</u> , in box (8) <u>Today/1930</u> for Start in box (9) <u>Today/2300 OR 0700 tomorrow/ Signed</u> for Stop in box(9)	S U
<p>Comment:</p> <p>Evaluator Note: Candidate determines FHS-M-23 Attachment 1 working copy Block 7 "HL Path(s) Authorized For Use" is wrong and changes to reflect Load Path 4 (may be done at anytime prior to end of JPM).</p> <p>Evaluator Note: one-week duration limit found in Section 3.1.3d</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 18	STANDARD	Grade
5.1.1.d	On-Shift, Duty SRO <u>shall</u> : DOCUMENT authorization of heavy loads movements in the Operations log.	SRO makes log entry.	S U
Comment:			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

- N/A

(1) Date: <u>TODAY</u>	(2) Work Order No: <u>5199999</u>		(3) Authorization Period: <input checked="" type="checkbox"/> Shift <input type="checkbox"/> Daily <input type="checkbox"/> Week	
(4) Procedure used in conjunction w/FHS-M-23: <u>NONE</u>	(5) Special precautions to be taken: <u>Measure girder temperature for single failure power lift</u>			
(6) General Description of HL(s) Allowed To Be Moved (Can attach schedule to satisfy)	(7) HL Path(s) Authorized For Use	(8) Approved By: On-Shift, Duty SRO (Name / Date / Time)	(9) HL Duration Approved Start: (Date / Time) Stop: (Date / Time)	
MSB Shielding Lid	4	J Operator/ <u>TODAY</u> / <u>NOW</u>	START: <u>TODAY</u> <u>1930</u>	
			STOP: <u>TODAY (OR</u> <u>2300 (OR</u>	
			<u>Tomorrow)</u> <u>0700)</u>	
(10) CALIBRATED EQUIPMENT (If Required)				
Equipment Description	Range / Accuracy	Serial Number	Calibration Date	Calibration Due Date
FLUKE Model 8660	0-200°F/ ± .02°F	CMS234567	06/01/2010	06/01/2011
(11) HL PIC Name / Date / Time (Print)	(12) Crane Inspection Complete (✓)	(13) Crane Operator Name / Date / Time (Print)	(14) Signal Person Name / Date / Time (Print)	(15) On-Shift, Duty SRO Contacted -- Name (Print)
J JOHNSON/ TODAY/ NOW	X			
ANSWER KEY	ANSWER KEY	ANSWER KEY	ANSWER KEY	ANSWER KEY

HEAVY LOAD DATA SHEET

Instructions for completion of Attachment 1:

1. **ENTER** today's date.
2. **ENTER** Work Order number that controls movement of heavy loads.

NOTE: Heavy Load Person-in-Charge will contact the Work Control Center or Control Room each shift to ensure that plant conditions have not changed.

3. **CHECK** time period where authorization from an On-Shift Duty SRO will be required (Shift, Daily, or Week).
4. **ENTER** any procedure used in conjunction with FHS-M-23.
5. **ENTER** any special precautions or temperature measurements for bridge girder (See Step 3.4.1h).
6. **ATTACH** schedule information to Attachment 1 or list general description of heavy loads to be moved.
7. **LIST** heavy load paths authorized for use.

NOTE: This information is only required to approve the beginning of heavy load movements for an extended load move campaign. All subsequent authorizations can be handled over the phone (See Section 3.1).

8. On-Shift, Duty SRO **PRINT** name, date, and time (SRO authorization required before starting heavy load movements. SRO authorization confirms plant/system/component conditions are met. SRO signature not required for Load Path No 3 or non-heavy loads covered under this procedure).
9. **LIST** START date and time. **LIST** STOP date and time (this can not exceed time period authorized in Step No 3).
10. Enter calibrated equipment information.

NOTE: Multiple Page 3 of this attachment may be used for an extended moving campaign.

11. Heavy Load Person-in-Charge (HL PIC) **PRINT** name, date, and time (HL PIC signoff confirms proper load path, weight, & rigging requirements are understood and will be met. Each time HL PIC changes, new information shall be entered).
12. Crane Inspection requires Crane Operator to **ENSURE** daily crane inspection is completed. **PLACE** a check (☐) in the box next to the Crane Operator that performed the inspection.
13. Crane Operator **PRINT** name, date, and time (Crane Operator signoff confirms understanding of heavy load requirements AND that all heavy load prerequisites, precautions & limitation, and equipment/plant safety or limits are met. Each time Crane Operator changes, new information shall be entered).
14. Signal Person **PRINT** name, date, and time (Signal Person signoff confirms understanding of heavy load requirements AND that all heavy load prerequisites, precautions & limitation, and equipment/plant safety or limits are met. Each time Signal Person changes, new information shall be entered).
15. Heavy Load Person-in-Charge will **DOCUMENT** On-Shift, Duty SRO that was contacted by printing name.
16. Page 3 duplicates the information recorded in Items 11 through 15.
17. **DESCRIBE** Alternate Load Path (assistance may be required from Engineering to best determine how to best fulfill Step 5.1.4i). **CIRCLE** YES or NO for Attachment.
18. IF alternate load path is required, THEN **OBTAIN** Reactor Engineer approval. [CMT891009645, CMT922001477]
19. IF alternate load path is required, THEN **OBTAIN** On-Shift Duty SRO approval. [CMT891009645]
20. **PROVIDE** a sketch in the space provided (when adequate space is not available, an Attachment can be attached -- See Item 17).

HEAVY LOAD DATA SHEET

(1) Date: <u>TODAY</u>		(2) Work Order No: <u>5199999</u>		(3) Authorization Period: <input checked="" type="checkbox"/> Shift <input type="checkbox"/> Daily <input type="checkbox"/> Week	
(4) Procedure used in conjunction w/FHS-M-23: <u>NONE</u>		(5) Special precautions to be taken: <u>Measure girder temperature for single failure power lift</u>			
(6) General Description of HL(s) Allowed To Be Moved (Can attach schedule to satisfy)		(7) HL Path(s) Authorized For Use	(8) Approved By: On-Shift, Duty SRO (Name / Date / Time)	(9) HL Duration Approved Start: (Date / Time) Stop: (Date / Time)	
MSB Shielding Lid		2	/ /	START: /	
				STOP: /	
(10) CALIBRATED EQUIPMENT (If Required)					
Equipment Description	Range / Accuracy	Serial Number	Calibration Date	Calibration Due Date	
FLUKE Model 8660	0-200°F / ± .02°F	CMS234567	06/01/2010	06/01/2011	
(11) HL PIC Name / Date / Time (Print)	(12) Crane Inspection Complete (√)	(13) Crane Operator Name / Date / Time (Print)	(14) Signal Person Name / Date / Time (Print)	(15) On-Shift, Duty SRO Contacted -- Name (Print)	
J JOHNSON/ TODAY/ NOW	X				

[illegible]

HEAVY LOAD DATA SHEET

Proc No FHS-M-23
Attachment 1
Revision 29
Page 4 of 4

(17) Alternate Load Path (if used), Description:	
Attachment (YES / NO)	
(18) Approved By: _____ / _____ Reactor Engineer Date	(19) Approved By: _____ / _____ On-Shift, Duty SRO Date
(20) Attach sketch, if necessary.	

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- The Plant is in Mode 1
- A refueling outage was completed 95 days ago, with all spent fuel from the core stored in the south end of the Spent Fuel Pool
- You are an on-shift SRO
- It is Tuesday, 'Night' shift, 1930 hours
- V-10, Radwaste Area Supply Fan; V-14A and V-14B Radwaste Area Exhaust Fan are in service
- Both Control Room HVAC trains for filtration and cooling are operable, with the left train in service, normal operation
- VF-66, Fuel Pool Area Refueling Charcoal Filter, is bypassed (not in service)
- V-7, Fuel Handling Area Supply Fan; V-8A and V-8B, Radwaste Area Exhaust Fans are in service
- Mechanical Maintenance has requested to move the MSB Shielding Lid from the Cask Washdown Pit onto the loaded fuel cask, in the Spent Fuel Pool
- This evolution is expected to begin immediately after authorization and to be completed by 2300 hours
- No other load movements are planned or in progress
- No fuel movement in the SFP is planned or in progress
- All spent fuel in the north tilt pit and has decayed for greater than one year

INITIATING CUES:

The Shift Manager directs you to approve the requested load movement, ensuring all Operational prerequisites and requirements are met prior to the approval

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 3

**TITLE: DETERMINE INCREASED MONITORING
ACTIONS PER ONP-23.2, STEAM GENERATOR TUBE
LEAK PROCEDURE**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Respond to Steam Generator Tube leakage in accordance with ONP-23.2

Alternate Path: N/A

Facility JPM #: NEW

K/A: 2.3.11 Importance: RO:3.8 SRO: 4.3

K/A Statement: Ability to control radiation releases.

Task Standard: Determines RIA-0631 count rate of $8.5\text{E}+03$ cpm (allow $8.0\text{E}+03$ to $9.0\text{E}+03$ cpm)

Preferred Evaluation Location: Simulator ☒ In Plant ☐

Preferred Evaluation Method: Perform ☒ Simulate ☐

References: ONP-23.2, "Steam Generator Tube Leak"

Validation Time: 20 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:

ONP-23.2, "Steam Generator Tube Leak"

Also see **Simulator Operator Instructions** (later 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:

- The Plant is at full power.
- A Steam Generator Tube Leak is in progress on the 'A' Steam Generator.
- ONP-23.2, Steam Generator Tube Leak Procedure has been entered.
- Current estimated primary to secondary leakage is 0.01 gpm and stable.
- PCS Gas Total Isotope = 0.5 $\mu\text{Ci/cc}$
- Offgas flowrate = 4 cfm (taken within last 30 minutes).

INITIATING CUES:

During implementation of ONP-23.2, the Control Room Supervisor directs you to determine the new setpoint for RIA-0631, Condenser Offgas Monitor, per ONP-23.2, Attachment 2 Step 3a.

EVALUATOR CUE: Provide candidate a working copy of ONP-23.2.

Proc.Step	TASK ELEMENT 1	STANDARD	Grade
Att 2 step 3.a	ESTIMATE the count rate indication on RIA-0631, Condenser Off Gas Monitor, which would result in a 0.02 gpm primary to secondary leakrate. Refer to Attachment 1, "Estimation of Primary to Secondary Leakrate."	Refer to ONP-23.2 Attachment 1 page 2 of 3.	S U
Comment:			

Proc.Step	TASK ELEMENT 2	STANDARD	Grade
Pg 2 Step 1	OBTAIN Condenser Off Gas flow rate (preferred) OR USE last known reading if taken within 24 hours.	Determines Off Gas flow rate = 4 cfm from initiating cue	S U
Comment:			

Proc.Step	TASK ELEMENT 3	STANDARD	Grade
Pg 2 Step 2	OBTAIN "PCS Gas Total Isotope" from Chemistry using last known analysis.	Determines PCS Gas Total Isotope = 0.5 μ Ci/cc from initiating cue.	S U
Comment:			

Proc.Step	TASK ELEMENT 4	STANDARD	Grade
Pg 2 Step 3	DETERMINE maximum Primary to Secondary Leakrate based on current Action Level.	Determines 0.02 gpm (from Attachment 2 Step 3a.)	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 5	STANDARD	Grade
Pg 2 Step 4	CALCULATE uncorrected leakrate using the following equation: $\text{Uncorrected Leakrate } (\mu\text{Ci-gal/min-kg}) = \text{Primary to Secondary Leakrate (gal/min)} \times \text{PCS Gas Total Isotope } (\mu\text{Ci/cc}) \times 1000 \text{ (cc/kg)}$	Calculates uncorrected leakrate using formula: $0.02 \text{ gpm} \times 0.5 \mu\text{Ci/cc} \times 1000 = 10.0 \mu\text{Ci-gal/min-kg}$	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 6	STANDARD	Grade
Pgs 2&3 Step 5	ESTIMATE RIA-0631 count rate using the "Uncorrected Leakrate Graph" on page 3.	<ul style="list-style-type: none"> Determines 8.5E+03 cpm using Attachment 1 pg 3 graph with 4 scfm Off Gas flowrate line and 2.0E+00 Uncorrected Leak Rate line. SIGNS "Completed By" on Attachment 1 pg 2.* Informs CRS of results and that "Reviewed By" signature is still required.* 	S U
Comment: EVALUATOR NOTE: allow 8.0E+03 to 9.0E+03 cpm EVALUATOR CUE: If notified as the CRS of reading and need for Review signature: Acknowledge. If asked if Attachment 2 steps should be completed: RESPOND that another operator will complete Attachment 2 steps. * NOTE: Not part of the critical step CRITICAL STEP			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

- No Simulator setup required.
- It is preferred that this JPM be done separately from the simulator. If, by chance, candidate IS in the simulator while doing this JPM, THEN ensure the IC is an at-power IC.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- The Plant is at full power.
- A Steam Generator Tube Leak is in progress on the 'A' Steam Generator.
- ONP-23.2, Steam Generator Tube Leak Procedure has been entered.
- Current estimated primary to secondary leakage is 0.01 gpm and stable.
- PCS Gas Total Isotope = 0.5 $\mu\text{Ci/cc}$
- Offgas flowrate = 4 cfm (taken within last 30 minutes).

INITIATING CUES:

During implementation of ONP-23.2, the Control Room Supervisor directs you to determine the new setpoint for RIA-0631, Condenser Offgas Monitor, per ONP-23.2, Attachment 2 Step 3a.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 3

**TITLE: DETERMINE INCREASED MONITORING
ACTIONS PER ONP-23.2, STEAM GENERATOR TUBE
LEAK PROCEDURE**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Respond to Steam Generator Tube leakage in accordance with ONP-23.2

Alternate Path: N/A

Facility JPM #: NEW

K/A: 2.3.11 Importance: RO:3.8 SRO: 4.3

K/A Statement: Ability to control radiation releases.

Task Standard: Determines RIA-0631 count rate of $8.5\text{E}+03$ cpm (allow $8.0\text{E}+03$ to $9.0\text{E}+03$ cpm)Preferred Evaluation Location: Simulator ☒ In Plant ☐Preferred Evaluation Method: Perform ☒ Simulate ☐

References: ONP-23.2, "Steam Generator Tube Leak"

Validation Time: 20 minutes Time Critical: NOCandidate: Time Start: Time Finish: Performance Time: minutesPerformance Rating: SAT UNSAT

Comments:

Examiner:
SignatureDate:

EXAMINER COPY ONLY

Tools/Equipment/Procedures Needed:

ONP-23.2, "Steam Generator Tube Leak"

Also see **Simulator Operator Instructions** (later 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:

- The Plant is at full power.
- A Steam Generator Tube Leak is in progress on the 'A' Steam Generator.
- ONP-23.2, Steam Generator Tube Leak Procedure has been entered.
- Current estimated primary to secondary leakage is 0.01 gpm and stable.
- PCS Gas Total Isotope = 0.5 $\mu\text{Ci/cc}$
- Offgas flowrate = 4 cfm (taken within last 30 minutes).

INITIATING CUES:

During implementation of ONP-23.2, the Control Room Supervisor directs you to determine the new setpoint for RIA-0631, Condenser Offgas Monitor, per ONP-23.2, Attachment 2 Step 3a.

EVALUATOR CUE: Provide candidate a working copy of ONP-23.2.

Proc.Step	TASK ELEMENT 1	STANDARD	Grade
Att 2 step 3.a	ESTIMATE the count rate indication on RIA-0631, Condenser Off Gas Monitor, which would result in a 0.02 gpm primary to secondary leakrate. Refer to Attachment 1, "Estimation of Primary to Secondary Leakrate."	Refer to ONP-23.2 Attachment 1 page 2 of 3.	S U
Comment:			

Proc.Step	TASK ELEMENT 2	STANDARD	Grade
Pg 2 Step 1	OBTAIN Condenser Off Gas flow rate (preferred) OR USE last known reading if taken within 24 hours.	Determines Off Gas flow rate = 4 cfm from initiating cue	S U
Comment:			

Proc.Step	TASK ELEMENT 3	STANDARD	Grade
Pg 2 Step 2	OBTAIN "PCS Gas Total Isotope" from Chemistry using last known analysis.	Determines PCS Gas Total Isotope = 0.5 μ Ci/cc from initiating cue.	S U
Comment:			

Proc.Step	TASK ELEMENT 4	STANDARD	Grade
Pg 2 Step 3	DETERMINE maximum Primary to Secondary Leakrate based on current Action Level.	Determines 0.02 gpm (from Attachment 2 Step 3a.)	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 5	STANDARD	Grade
Pg 2 Step 4	CALCULATE uncorrected leakrate using the following equation: Uncorrected Leakrate ($\mu\text{Ci-gal/min-kg}$) = Primary to Secondary Leakrate (gal/min) X PCS Gas Total Isotope ($\mu\text{Ci/cc}$) X 1000 (cc/kg)	Calculates uncorrected leakrate using formula: 0.02 gpm X 0.5 $\mu\text{Ci/cc}$ X 1000 = 10.0 $\mu\text{Ci-gal/min-kg}$	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 6	STANDARD	Grade
Pgs 2&3 Step 5	ESTIMATE RIA-0631 count rate using the "Uncorrected Leakrate Graph" on page 3.	<ul style="list-style-type: none"> Determines 8.5E+03 cpm using Attachment 1 pg 3 graph with 4 scfm Off Gas flowrate line and 2.0E+00 Uncorrected Leak Rate line. SIGNS "Completed By" on Attachment 1 pg 2.* Informs CRS of results and that "Reviewed By" signature is still required.* 	S U
Comment: EVALUATOR NOTE: allow 8.0E+03 to 9.0E+03 cpm EVALUATOR CUE: If notified as the CRS of reading and need for Review signature: Acknowledge. If asked if Attachment 2 steps should be completed: RESPOND that another operator will complete Attachment 2 steps. * NOTE: Not part of the critical step CRITICAL STEP			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

- No Simulator setup required.
- It is preferred that this JPM be done separately from the simulator. If, by chance, candidate IS in the simulator while doing this JPM, THEN ensure the IC is an at-power IC.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- The Plant is at full power.
- A Steam Generator Tube Leak is in progress on the 'A' Steam Generator.
- ONP-23.2, Steam Generator Tube Leak Procedure has been entered.
- Current estimated primary to secondary leakage is 0.01 gpm and stable.
- PCS Gas Total Isotope = 0.5 $\mu\text{Ci/cc}$
- Offgas flowrate = 4 cfm (taken within last 30 minutes).

INITIATING CUES:

During implementation of ONP-23.2, the Control Room Supervisor directs you to determine the new setpoint for RIA-0631, Condenser Offgas Monitor, per ONP-23.2, Attachment 2 Step 3a.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 3

**TITLE: DETERMINE INCREASED MONITORING
ACTIONS PER ONP-23.2, STEAM GENERATOR TUBE
LEAK PROCEDURE**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Respond to Steam Generator Tube leakage in accordance with ONP-23.2

Alternate Path: N/A

Facility JPM #: NEW

K/A: 2.3.11 Importance: RO:3.8 SRO: 4.3

K/A Statement: Ability to control radiation releases.

Task Standard: Determines RIA-0631 count rate of $8.5\text{E}+03$ cpm (allow $8.0\text{E}+03$ to $9.0\text{E}+03$ cpm)Preferred Evaluation Location: Simulator ☒ In Plant ☐Preferred Evaluation Method: Perform ☒ Simulate ☐

References: ONP-23.2, "Steam Generator Tube Leak"

Validation Time: 20 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:

ONP-23.2, "Steam Generator Tube Leak"

Also see **Simulator Operator Instructions** (later 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:

- The Plant is at full power.
- A Steam Generator Tube Leak is in progress on the 'A' Steam Generator.
- ONP-23.2, Steam Generator Tube Leak Procedure has been entered.
- Current estimated primary to secondary leakage is 0.01 gpm and stable.
- PCS Gas Total Isotope = 0.5 $\mu\text{Ci/cc}$
- Offgas flowrate = 4 cfm (taken within last 30 minutes).

INITIATING CUES:

During implementation of ONP-23.2, the Control Room Supervisor directs you to determine the new setpoint for RIA-0631, Condenser Offgas Monitor, per ONP-23.2, Attachment 2 Step 3a.

EVALUATOR CUE: Provide candidate a working copy of ONP-23.2.

Proc.Step	TASK ELEMENT 1	STANDARD	Grade
Att 2 step 3.a	ESTIMATE the count rate indication on RIA-0631, Condenser Off Gas Monitor, which would result in a 0.02 gpm primary to secondary leakrate. Refer to Attachment 1, "Estimation of Primary to Secondary Leakrate."	Refer to ONP-23.2 Attachment 1 page 2 of 3.	S U
Comment:			

Proc.Step	TASK ELEMENT 2	STANDARD	Grade
Pg 2 Step 1	OBTAIN Condenser Off Gas flow rate (preferred) OR USE last known reading if taken within 24 hours.	Determines Off Gas flow rate = 4 cfm from initiating cue	S U
Comment:			

Proc.Step	TASK ELEMENT 3	STANDARD	Grade
Pg 2 Step 2	OBTAIN "PCS Gas Total Isotope" from Chemistry using last known analysis.	Determines PCS Gas Total Isotope = 0.5 μ Ci/cc from initiating cue.	S U
Comment:			

Proc.Step	TASK ELEMENT 4	STANDARD	Grade
Pg 2 Step 3	DETERMINE maximum Primary to Secondary Leakrate based on current Action Level.	Determines 0.02 gpm (from Attachment 2 Step 3a.)	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 5	STANDARD	Grade
Pg 2 Step 4	CALCULATE uncorrected leakrate using the following equation: $\text{Uncorrected Leakrate } (\mu\text{Ci-gal/min-kg}) = \text{Primary to Secondary Leakrate (gal/min)} \times \text{PCS Gas Total Isotope } (\mu\text{Ci/cc}) \times 1000 \text{ (cc/kg)}$	Calculates uncorrected leakrate using formula: $0.02 \text{ gpm} \times 0.5 \mu\text{Ci/cc} \times 1000 = 10.0 \mu\text{Ci-gal/min-kg}$	S U
Comment: CRITICAL STEP			

Proc.Step	TASK ELEMENT 6	STANDARD	Grade
Pgs 2&3 Step 5	ESTIMATE RIA-0631 count rate using the "Uncorrected Leakrate Graph" on page 3.	<ul style="list-style-type: none"> Determines 8.5E+03 cpm using Attachment 1 pg 3 graph with 4 scfm Off Gas flowrate line and 2.0E+00 Uncorrected Leak Rate line. SIGNS "Completed By" on Attachment 1 pg 2.* Informs CRS of results and that "Reviewed By" signature is still required.* 	S U
Comment: EVALUATOR NOTE: allow 8.0E+03 to 9.0E+03 cpm EVALUATOR CUE: If notified as the CRS of reading and need for Review signature: Acknowledge. If asked if Attachment 2 steps should be completed: RESPOND that another operator will complete Attachment 2 steps. * NOTE: Not part of the critical step CRITICAL STEP			

END OF TASK

SIMULATOR OPERATOR INSTRUCTIONS

- No Simulator setup required.
- It is preferred that this JPM be done separately from the simulator. If, by chance, candidate IS in the simulator while doing this JPM, THEN ensure the IC is an at-power IC.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- The Plant is at full power.
- A Steam Generator Tube Leak is in progress on the 'A' Steam Generator.
- ONP-23.2, Steam Generator Tube Leak Procedure has been entered.
- Current estimated primary to secondary leakage is 0.01 gpm and stable.
- PCS Gas Total Isotope = 0.5 $\mu\text{Ci/cc}$
- Offgas flowrate = 4 cfm (taken within last 30 minutes).

INITIATING CUES:

During implementation of ONP-23.2, the Control Room Supervisor directs you to determine the new setpoint for RIA-0631, Condenser Offgas Monitor, per ONP-23.2, Attachment 2 Step 3a.

NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: SRO ADMIN 4

TITLE: CLASSIFY EVENT AND DETERMINE PAR

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Classify an Event and Determine PARs - Protective Action Recommendations

Alternate Path: N/A

Facility JPM #: NEW

K/A: 2.4.41, 2.4.44 Importance: RO:4.1, 4.0 SRO: 4.1, 4.4

K/A Statement: (2.4.41) Knowledge of the emergency action level thresholds and
classifications.
(2.4.44) Knowledge of emergency plan protective action
recommendations.Task Standard: Event classified as a General Emergency within 15 minutes and PAR is
evacuation of Areas 1 and 3, within 15 minutes from declaration of GE.Preferred Evaluation Location: Any ☒ X ☐Preferred Evaluation Method: Perform ☒ X ☐ Simulate ☐References: EI-1, "Emergency Classifications and Actions"
EI-3, "Communications and Notifications"
EI-6.13, "Protective Action Recommendations for Offsite Populations"Validation Time: 20 minutes Time Critical: YES - see task standardCandidate: Time Start: Time Finish: Performance Time: minutesPerformance Rating: SAT UNSAT

Comments:

Examiner:
SignatureDate:

EXAMINER COPY ONLY**Tools/Equipment/Procedures Needed:**

- El-1, "Emergency Classifications and Actions," Attachment 1
- El-3, "Communications and Notifications"
- El-6.13, "Protective Action Recommendations for Offsite Populations," Attachment 1

Also see **Simulator Operator Instructions** (later 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:

- The Reactor tripped 10 minutes ago.
- A Steam Generator Tube Rupture Event is in progress on the 'A' Steam Generator.
- Pressurizer level is off-scale LOW.
- PCS pressure is 1000 psia.
- CETs indicate 500°F.
- SIRWT level is 92% and lowering slowly.
- A release IS occurring through a stuck open code safety valve on the 'A' Steam Generator.
- Reactor Vessel Level Monitoring System (RVLMS) indicates ALL red lights
- Failed fuel analysis is in progress with no results to report yet.
- The weather is clear with no precipitation.

INITIATING CUES:

During activation of the Site Emergency Plan, you are the Shift Manager (acting as the Emergency Plant Manager). You are to classify the event given the above information and complete the Event Notification Form. No previous event declaration has been made.

This JPM is Time Critical.

EVALUATOR: Candidate may use placard of site emergency plan classifications or use paper copy from EI-1, attachment 1.

Proc.Step	TASK ELEMENT 1	STANDARD	Grade
EI-1 Att 1	Refers to "Fission Product Barriers" section (lower right-hand corner)	Refers to lower right-hand corner of EI-1, Attachment 1, "Hot Conditions (PCS > 200 degrees F)".	S U
Comment:			

Proc.Step	TASK ELEMENT 2	STANDARD	Grade
EI-1 Att 1	Determines status of fission product barriers.	<ul style="list-style-type: none"> ___ Refers to Table F1 ___ Determines a POTENTIAL LOSS of Fuel Cladding (based on RVLMS < 614 ft elevation readings (item 4) ___ Determines a LOSS of PCS Barrier (based on S/G leak rate causing SI actuation) (item 3). ___ Determines a LOSS of Containment Barrier (based on affected S/G faulted outside Containment) (item 4). 	S U
Comment:			

Proc.Step	TASK ELEMENT 3	STANDARD	Grade
EI-1 Att 1	Declares Emergency Classification.	Declares a GENERAL EMERGENCY per FG1 based on status of fission product barriers (loss of TWO and potential loss of THIRD).	S U
Comment:			
CRITICAL STEP - must be performed within 15 minutes of start of JPM.			

Proc.Step	TASK ELEMENT 4	STANDARD	Grade
EI-1 Att 2	Prepares Emergency Actions/Notifications form.	Obtains EI-1, Attachment 2 and fills out.	S U
Comment: EVALUATOR NOTE: <i>This Task Element may be performed at any time during the JPM. Filling out this form is NOT required for this JPM.</i> EVALUATOR NOTE: <i>It is NOT the intent of this JPM to have candidate actually make the notifications.</i>			

Proc.Step	TASK ELEMENT 5	STANDARD	Grade
EI-3 Att 1	Prepares Event Notification Form.	Obtains EI-3, Attachment 1 and fills out per attached KEY.	S U
Comment: EVALUATOR CUE: <i>When candidate asks for Meteorological Data, hand them attachment 1 of EI-6.7, "Plant Site Meteorological System Worksheet," which has been previously completed (attached).</i> EVALUATOR CUE: <i>If JPM is not conducted in the Simulator, hand them a blank Event Notification form to fill out (attached).</i> EVALUATOR NOTE: <i>KEY is attached to this JPM.</i> EVALUATOR NOTE: <i>EI-3, Attachment 2, "Palisades Event Technical Data Sheet" is NOT required during this JPM.</i> EVALUATOR NOTE: <i>If JPM is conducted in the Simulator, then Candidate may use computer on Control Room island area to prepare this form.</i>			

Proc.Step	TASK ELEMENT 6	STANDARD	Grade
EI-6.13 Att 1	Determines Protective Action Recommendations (PARs).	Obtains EI-6.13 and corresponding Attachment 1 and determines: — Evacuate Areas 1 and 3 (minimum GE recommendation on bottom of Pg 1 of Attachment 1)	S U
Comment: EVALUATOR NOTE: <i>Provide candidate with a working copy of EI-6.13.</i> CRITICAL STEP			

Proc.Step	TASK ELEMENT 7	STANDARD	Grade
EI-11	Candidate may determine status of Core Damage per EI-11.	Candidate refers to EI-11: determines there is not enough info provided in initiating cue to determine amount of core damage.	S U

Comment:

EVALUATOR NOTE: *If candidate attempts to perform this step, provide them with a working copy of EI-11, attachment 2.*

Proc.Step	TASK ELEMENT 8	STANDARD	Grade
EI-3 Att 1	Completes filling out Palisades Event Notification Form.	Palisades Event Notification Form completely filled per attached KEY AND form is approved (Candidate initials, date, and time entered at bottom of form) *	S U

Comment:

EVALUATOR CUE: *If JPM is not conducted in the Simulator, hand them a blank Event Notification form to fill out (attached) if not done already.*

EVALUATOR NOTE: *If JPM is conducted in the Simulator, then Candidate may use computer on back-bar of Control Room island area to complete and print this form.*

* The following are the critical parts of this step:

- General Emergency is checked in "current classification" section
- Date and time filled in "current classification" section
- FG1 filled in "reason for classification" section AND Fission Product Barrier Degradation checked in "reason for classification" section
- "Yes" checked in Radiological Release in Progress
- Areas 1 and 3 checked for Evacuation of Areas

CRITICAL STEP - must be performed within 15 minutes of declaration of General Emergency.

END OF TASK

PALISADES EVENT NOTIFICATION FORM

<input type="checkbox"/> Actual Event	<input checked="" type="checkbox"/> Drill
Plant Contact Information	
Nuclear Power Plant: _____	<div style="border: 2px solid black; padding: 20px; font-size: 48pt; margin: 0 auto;">1</div> Plant Message Number
Plant Communicator: _____ Time of Communication: V.B. _____	
S.O.M. _____	
NRC _____	
Calling From:	<input type="checkbox"/> Control Room <input type="checkbox"/> TSC <input type="checkbox"/> EOF <input type="checkbox"/> Other _____
Call Back Telephone Number: _____	
Current Classification	
<input type="checkbox"/> Unusual Event <input type="checkbox"/> Alert <input type="checkbox"/> Site Area Emergency <input checked="" type="checkbox"/> General Emergency <input type="checkbox"/> Termination	
This Classification was declared as of: Date: <u>Today</u> Time: <u>Within 15 minutes from start of JPM</u>	
Reason for Classification	
<input type="checkbox"/> Abnormal Rad Levels / Radiological Effluent	<input type="checkbox"/> System Malfunctions
<input type="checkbox"/> Hazards and Other Conditions Affecting Plant Safety	<input type="checkbox"/> Cold Shutdown / Refueling System Malfunction
	<input type="checkbox"/> Independent Spent Fuel Storage Installation Events
	<input checked="" type="checkbox"/> Fission Product Barrier Degradation
IC Number: <u>FG1</u>	
Radiological Release in Progress Due to Event	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Protective Action Recommendations	
<input type="checkbox"/> None	
Evacuation of Areas(s):	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
In-Place Shelter of Area(s)	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
PAR based on:	
<input type="checkbox"/> Dose Calculation (Palisades Event Technical Data Sheet required) <input checked="" type="checkbox"/> Plant Status <input type="checkbox"/> Security Event	
<input type="checkbox"/> Other _____	
Meteorological Data	
Wind Direction (degrees): From <u>305</u> To <u>125</u>	Wind Speed (MPH): <u>1</u>
Stability Class: <u>G</u>	Precipitation: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Emergency Director Approval: _____ Date: _____ Time: _____

ANSWER KEY

SIMULATOR OPERATOR INSTRUCTIONS

- No Simulator setup required.
- It is preferred that this JPM be done separately from the simulator. If, by chance, candidate IS in the simulator while doing this JPM, THEN ensure the IC does NOT have a release in progress.

ENSURE ALL DATA IS CLEARED FROM EP NOTIFICATION COMPUTER ON BACK-BAR OF CRS ISLAND PRIOR TO NEXT USE OF THIS JPM.

PLANT SITE METEOROLOGICAL SYSTEM WORKSHEET

1.	WS, Wind Speed = <u>1.0</u> mph	(X) 10 meters () 60 meters, *corrected (see Step 5.1.3 or 5.2.6)
	*Multiply by 0.77	

2.	WD, Wind Direction = <u>305</u> ° from	(X) 10 meters () 60 meters (see Step 5.1.3 or 5.2.6)
		(see Step 5.1.4 or 5.2.7)

3.	Stability Class = <u>G</u>	
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Date: TODAY Time: NOW Completed By: JOE OPERATOR

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- The Reactor tripped 10 minutes ago.
- A Steam Generator Tube Rupture Event is in progress on the 'A' Steam Generator.
- Pressurizer level is off-scale LOW.
- PCS pressure is 1000 psia.
- CETs indicate 500°F.
- SIRWT level is 92% and lowering slowly.
- A release IS occurring through a stuck open code safety valve on the 'A' Steam Generator.
- Reactor Vessel Level Monitoring System (RVLMS) indicates ALL red lights
- Failed fuel analysis is in progress with no results to report yet.
- The weather is clear with no precipitation.

INITIATING CUES:

During activation of the Site Emergency Plan, you are the Shift Manager (acting as the Emergency Plant Manager). You are to classify the event given the above information and complete the Event Notification Form. No previous event declaration has been made.

This JPM is Time Critical.