

U.S. Nuclear Regulatory Commission  
Surry Power Station

SR14301

**Administrative** Job Performance Measure G2.1.7

Applicant\_\_\_\_\_

Start Time\_\_\_\_\_

Examiner\_\_\_\_\_

Date \_\_\_\_\_

Stop Time\_\_\_\_\_

**Title****Perform a Quadrant Power Tilt Calculation.****K/A: G.2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.****Applicability****Estimated Time****Actual Time**

RO/SRO(D)/SRO(U)

15 Minutes

**Conditions**

- Task is to be PERFORMED in the classroom.

**Standards**

- Correctly calculates Quadrant Power Tilt for given core conditions on the Calculation of Excore Quadrant Power Tilt Ratios, Attachment 6 of 0-AP-1.00, Rod Control Malfunction.

**Initiating Cues**

- A dropped rod has occurred on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00. Rod Control System Malfunction.
- When you have determined the Quadrant Power Tilt, inform the examiner.

**Terminating Cues**

- Applicant has completed the QPTR Calculation.

**Tools and Equipment**

- Calculator
- NIS Setpoints and Power Range Currents Data Sheet

**Safety Considerations**

- None

**Initial Conditions:**

- Unit 1 operating at 100% power.
  - Control Rod D-10, Control Bank B, Group 1 dropped and is currently indicating 0 steps.

**Initiating Cues**

- Control Rod D-10, Control Bank B, has dropped on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00, Rod Control System Malfunction, Step 15.
- The Shift Manager directs you to perform the Quadrant Power Tilt Calculation in accordance with Attachment 6, Calculation of Excore Quadrant Power Tilt Ratios.
- You are to perform these calculations to 4 significant digits.
- You are provided a copy of the Power Range Currents from the NIS Data Book providing Normalized Values.
- When you have determined the Quadrant Power Tilt, inform the examiner.

**Notes**

Actual detector currents taken from the Power Range NIs:

N-41 Upper Detector Current	120.5
N-41 Lower Detector Current	124.2
N-42 Upper Detector Current	96.5
N-42 Lower Detector Current	94.23
N-43 Upper Detector Current	114.7
N-43 Lower Detector Current	115.5
N-44 Upper Detector Current	119.1
N-44 Lower Detector Current	121.8

**PERFORMANCE CHECKLIST****Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (\*).
- At the completion of the JPM **all SRO Candidates** will have a Follow-Up question.
- **START TIME:** \_\_\_\_\_

<p>STEP 1: Acknowledges NOTE prior to Step 1 of Att. 6.</p> <p>Calculations for QPTR should be carried out to four places to the right of the decimal place to provide accuracy and consistency of results.</p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 2: <b>[Step 1, Att. 6]</b></p> <p>a) Record Reactor Power, Date, and Time in appropriate blocks.</p> <p>b) Initials Step 1.</p> <p><b>STANDARD:</b></p> <p>Records 100% for Reactor Power block, Current Date in Date block, Time in Time block.</p> <p><b>EVALUATOR'S NOTE:</b></p> <p><b>If Asked:</b> Current Reactor Power is 100%.</p> <p><b>If Asked:</b> Use today's date.</p> <p><b>If Asked:</b> Use current time.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 3: <b>[Step 2, Att. 6]</b></p> <p>a) Transcribes information from data sheets onto 0-AP-1.00, Attachment 6, Calculation of Excore Quadrant Power Tilt Ratios, Step 2 Table.</p> <p><b>STANDARD:</b></p> <p>Places PR NI currents and Normalized Currents in appropriate location on Calculation of Excore Quadrant Power Tilt Ratios.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

<p>STEP 4: <b>[STEP 3, Att. 6]</b> a) Performs calculations to obtain normalized values for Upper Detectors.</p> <p><b>STANDARD:</b> a) Divides Upper Detector current by Normalized currents for each detector.</p> <p><b>EVALUATOR' S NOTE:</b> (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 5: <b>[STEP 3, Att. 6]</b> a) Performs calculations to obtain Sum of normalized values for Upper Detectors.</p> <p><b>STANDARD:</b> a) Adds Upper Detector Normalized currents for all Upper detectors</p> <p><b>EVALUATOR' S NOTE:</b> (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 6: <b>[STEP 3, Att. 6]</b> a) Performs calculations to obtain normalized values for Lower Detectors.</p> <p><b>STANDARD:</b> a) Divides Lower Detector current by Normalized currents for each detector.</p> <p><b>EVALUATOR' S NOTE:</b> (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>



<p>STEP 7: <b>[Step 3, Att. 6]</b>  a) Performs calculations to obtain Sum of normalized values for Lower Detectors.</p> <p><b>STANDARD:</b>  a) Adds Lower Detector Normalized currents for all Lower Detectors.  b) Initials Step 3 of Attachment 6.</p> <p><b>EVALUATOR' S NOTE:</b>  (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 8: <b>[Step 4, Att. 6]</b>  a) Records the Number of Detectors in use.  b) Initials Step 4.</p> <p><b>STANDARD:</b>  a) Records the Number of Detectors in Step 4;  b) Initials Step 4.</p> <p><b>EVALUATOR' S NOTE:</b>  (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)  <b>If Asked:</b> All 4 Detectors are used.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 9: <b>[Step 5, Att. 6]</b>  a) Calculates the average upper and lower detector current values.</p> <p><b>STANDARD:</b>  a) Transcribes Upper and Lower detector Sum of Normalized Values from Step 3 of Attachment 6.  b) Divides each Sum by the number of Detectors in use.  c) Initials Step 5.</p> <p><b>EVALUATOR' S NOTE:</b>  (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

<p>STEP 10: <b>[Step 6, Att. 6]</b>  a) From Step 3, Record the following values.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>* a) Records the Maximum Normalized Upper Detector Current from Step 3 (N41 value of 1.0143.)</li> <li>* b) Records the Maximum Normalized Lower Detector Current From Step 3 (N41 value of 1.0393.)</li> <li>c) Initials Step 6 of Attachment 6.</li> </ul> <p><b>EVALUATOR' S NOTE:</b>  (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 11: <b>[Step 7, Att. 6]</b>  a) Calculates the maximum upper and lower Excore Quadrant Power Tilt Ratios.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>a) Divides Maximum Upper channel current by the Average Upper Detector currents to determine the Upper Excore Quadrant Power Tilt Ratio.</li> <li>b) Divides Maximum Lower channel current by the Average Lower Detector current to determine the Lower Excore Quadrant Power Tilt Ratio.</li> <li>c) Initials Step 7 of Attachment 6.</li> </ul> <p><b>EVALUATOR' S NOTE:</b>  (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 12: <b>[Step 8, Att. 6]</b>  a) Calculates Tilt %.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>a) Calculates Tilt % for Upper channels.</li> <li>b) Caculates % Tilt for Lower channels.</li> <li>c) Initials Step 8 of Attachment 6.</li> </ul> <p><b>EVALUATOR' S NOTE:</b>  (See attached Calculation of Excore Quadrant Power Tilt Ratios for calculations.)</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>



NUMBER 0-AP-1.00	ATTACHMENT TITLE  CALCULATION OF EXCORE QUADRANT POWER TILT RATIOS	ATTACHMENT 6
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NOTE: Calculations for QPTR should be carried out to four places to the right of the decimal place to provide for accuracy and consistency of results.

1. \_\_\_\_ Record the following data:

Reactor Power 100% % Date Today Time Now

2. \_\_\_\_ Record the following Excore Detector Data:

Actual Excore Detector Readings				Expected Excore Detector Readings at 100% Power			
Upper		Lower		Upper		Lower	
N41U	120.5	N41L	124.2	N41U <sub>100</sub>	118.8	N41L <sub>100</sub>	119.5
N42U	96.5	N42L	94.2	N42U <sub>100</sub>	118.5	N42L <sub>100</sub>	119.3
N43U	114.7	N43L	115.5	N43U <sub>100</sub>	119.1	N43L <sub>100</sub>	119.5
N44U	119.1	N44L	121.8	N44U <sub>100</sub>	119.1	N44L <sub>100</sub>	119.5

3. \_\_\_\_ Normalize the Actual Excore Detector Readings to the expected Excore Detector readings at 100% power, and sum the normalized values for both the upper and lower detectors.

Upper Detector Fraction	Upper Detector Fraction Values	Normalized Value ( I <sub>U</sub> )	Lower Detector Fraction	Lower Detector Fraction Values	Normalized Value ( I <sub>L</sub> )
$\frac{N41U}{N41U_{100}}$	$\frac{120.5}{118.8}$	1.0143	$\frac{N41L}{N41L_{100}}$	$\frac{124.2}{119.5}$	1.0393
$\frac{N42U}{N42U_{100}}$	$\frac{96.5}{118.5}$	0.8143	$\frac{N42L}{N42L_{100}}$	$\frac{94.2}{119.3}$	0.7896
$\frac{N43U}{N43U_{100}}$	$\frac{114.7}{119.1}$	0.9631	$\frac{N43L}{N43L_{100}}$	$\frac{115.5}{119.5}$	0.9665
$\frac{N44U}{N44U_{100}}$	$\frac{119.1}{119.1}$	1.0000	$\frac{N44L}{N44L_{100}}$	$\frac{121.8}{119.5}$	1.0192
Sum of Normalized Values = $\Sigma I_U =$		3.7917	Sum of Normalized Values = $\Sigma I_L =$		3.8147

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4. \_\_\_\_ Record N = the No. of Detectors in use = 4

5. \_\_\_\_ Calculate the average upper and lower detector current values.

$$\text{Average } I_U = \frac{\sum I_U}{N} = \frac{3.7917}{4} = 0.9479$$

$$\text{Average } I_L = \frac{\sum I_L}{N} = \frac{3.7955}{4} = 0.9537$$

6. \_\_\_\_ From Step 3, record the following values.

$$\text{Maximum Normalized Upper Detector Current} = I_{Umax} = 1.0143$$

$$\text{Maximum Normalized Lower Detector Current} = I_{Lmax} = 1.0393$$

7. \_\_\_\_ Calculate the maximum upper and lower Excore Quadrant Power Tilt Ratios.

$$\square \text{ a. Upper Excore Quadrant Power Tilt Ratio} = \frac{I_{Umax}}{\text{Average } I_U} = 1.0700$$

$$\square \text{ b. Lower Excore Quadrant Power Tilt Ratio} = \frac{I_{Lmax}}{\text{Average } I_L} = 1.0898$$

8. \_\_\_\_ Calculate tilt%:

$$\square \text{ a. Subtract 1 from Step 7.a and multiply by 100 for Upper Tilt \%} = 7.00\%$$

$$\square \text{ b. Subtract 1 from Step 7.b and multiply by 100 for Lower Tilt \%} = 8.98\%$$

9. \_\_\_\_ Notify Unit Supervisor.

10. \_\_\_\_ IF additional Quadrant Power Tilt Ratio Calculations are required, THEN 0-NPT-RX-011, Quadrant Power Tilt Ratio Calculations and Corrective Actions, Attachment 2, should be used.

Completed by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

**Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)**

**Task**

- Task is to be performed in the classroom.
- Perform a Quadrant Power Tilt calculation.

**Directions**

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

**Initial Conditions:**

- Unit 1 operating at 100% power.
  - Control Rod D-10, Control Bank B, Group 1 dropped and is currently indicating 0 steps.

**Initiating Cues**

- Control Rod D-10, Control Bank B, has dropped on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00, Rod Control System Malfunction, Step 15.
- The Shift Manager directs you to perform a Quadrant Power Tilt Calculation in accordance with Attachment 6, Calculation of Excore Quadrant Power Tilt Ratios.
- You are provided a copy of the Power Range Currents from the NIS Data Book providing Normalized Values.
- When you have determined the Quadrant Power Tilt, inform the examiner.

Actual detector currents taken from the Power Range NIs:

N-41 Upper Detector Current	120.5
N-41 Lower Detector Current	124.2
N-42 Upper Detector Current	96.5
N-42 Lower Detector Current	94.23
N-43 Upper Detector Current	114.7
N-43 Lower Detector Current	115.5
N-44 Upper Detector Current	119.1
N-44 Lower Detector Current	121.8

**SRO ONLY ANSWER KEY****NOT FOR TRAINEE**

## QPTR FOLLOW-UP Question

With the calculated Quadrant Power Tilt, what are the Tech Spec actions (if any)?

ANSWER: TS 3.12.B.6 requires:

- 3.12.B.6.a Within 2 hours either hot channel factors shall be determined and power level adjusted to meet the requirement OR
- 3.12.B.6.b Power level to be reduced from Rated Power 2% for each percent of Quadrant Power Tilt. Therefore for a QPTR of 9% power must be reduced 18%. The high neutron flux trip setpoint shall also be reduced within the following 4 hours.

**SRO ONLY** Candidate

QPTR FOLLOW-UP Question

With the calculated Quadrant Power Tilt, what are the Tech Spec actions (if any)?



**Operator Directions Handout  
(TO BE GIVEN TO APPLICANT)**

**Initial Conditions:**

- Unit 1 operating at 100% power.
  - Control Rod D-10, Control Bank B, Group 1 dropped and is currently indicating 0 steps.

**Initiating Cues**

- Control Rod D-10, Control Bank B, has dropped on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00, Rod Control System Malfunction, Step 15.
- The Shift Manager directs you to perform a Quadrant Power Tilt Calculation in accordance with Attachment 6, Calculation of Excore Quadrant Power Tilt Ratios.
- You are provided a copy of the Power Range Currents from the NIS Data Book providing Normalized Values.
- When you have determined the Quadrant Power Tilt, inform the examiner.

Actual detector currents taken from the Power Range NIs:

N-41 Upper Detector Current	120.5
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N-42 Upper Detector Current	96.5
N-42 Lower Detector Current	94.23
N-43 Upper Detector Current	114.7
N-43 Lower Detector Current	115.5
N-44 Upper Detector Current	119.1
N-44 Lower Detector Current	121.8

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NOTE: Calculations for QPTR should be carried out to four places to the right of the decimal place to provide for accuracy and consistency of results.

1. \_\_\_\_ Record the following data:

Reactor Power \_\_\_\_\_ % Date \_\_\_\_\_ Time \_\_\_\_\_

2. \_\_\_\_ Record the following Excore Detector Data:

Actual Excore Detector Readings				Expected Excore Detector Readings at 100% Power			
Upper		Lower		Upper		Lower	
N41U		N41L		N41U <sub>100</sub>		N41L <sub>100</sub>	
N42U		N42L		N42U <sub>100</sub>		N42L <sub>100</sub>	
N43U		N43L		N43U <sub>100</sub>		N43L <sub>100</sub>	
N44U		N44L		N44U <sub>100</sub>		N44L <sub>100</sub>	

3. \_\_\_\_ Normalize the Actual Excore Detector Readings to the expected Excore Detector readings at 100% power, and sum the normalized values for both the upper and lower detectors.

Upper Detector Fraction	Upper Detector Fraction Values	Normalized Value ( I <sub>U</sub> )	Lower Detector Fraction	Lower Detector Fraction Values	Normalized Value ( I <sub>L</sub> )
$\frac{N41U}{N41U_{100}}$	-----=		$\frac{N41L}{N41L_{100}}$	-----=	
$\frac{N42U}{N42U_{100}}$	-----=		$\frac{N42L}{N42L_{100}}$	-----=	
$\frac{N43U}{N43U_{100}}$	-----=		$\frac{N43L}{N43L_{100}}$	-----=	
$\frac{N44U}{N44U_{100}}$	-----=		$\frac{N44L}{N44L_{100}}$	-----=	
Sum of Normalized Values = $\Sigma I_U$ =			Sum of Normalized Values = $\Sigma I_L$ =		

NUMBER 0-AP-1.00	ATTACHMENT TITLE  CALCULATION OF EXCORE QUADRANT POWER TILT RATIOS	ATTACHMENT 6
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4. \_\_\_\_ Record N = the No. of Detectors in use = \_\_\_\_\_

5. \_\_\_\_ Calculate the average upper and lower detector current values.

$$\text{Average } I_U = \frac{\sum I_U}{N} = \text{-----} = \text{-----}$$

$$\text{Average } I_L = \frac{\sum I_L}{N} = \text{-----} = \text{-----}$$

6. \_\_\_\_ From Step 3, record the following values.

Maximum Normalized Upper Detector Current =  $I_{Umax}$  = \_\_\_\_\_

Maximum Normalized Lower Detector Current =  $I_{Lmax}$  = \_\_\_\_\_

7. \_\_\_\_ Calculate the maximum upper and lower Excore Quadrant Power Tilt Ratios.

☐ a. Upper Excore Quadrant Power Tilt Ratio =  $\frac{I_{Umax}}{\text{Average } I_U} = \text{-----}$

☐ b. Lower Excore Quadrant Power Tilt Ratio =  $\frac{I_{Lmax}}{\text{Average } I_L} = \text{-----}$

8. \_\_\_\_ Calculate tilt%:

☐ a. Subtract 1 from Step 7.a and multiply by 100 for Upper Tilt %: \_\_\_\_\_

☐ b. Subtract 1 from Step 7.b and multiply by 100 for Lower Tilt %: \_\_\_\_\_

9. \_\_\_\_ Notify Unit Supervisor.

10. \_\_\_\_ IF additional Quadrant Power Tilt Ratio Calculations are required, THEN 0-NPT-RX-011, Quadrant Power Tilt Ratio Calculations and Corrective Actions, Attachment 2, should be used.

Completed by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

## Surry Unit 1 NI Calibration Data

Power Range Currents

	N41		N42		N43		N44	
DELTA FLUX @ 100%	I (Top) μamps	I (Bottom) μamps	I (Top) μamps	I (Bottom) μamps	I (Top) μamps	I (Bottom) μamps	I (Top) μamps	I (Bottom) μamps
0	118.8	119.5	118.5	119.3	119.1	119.5	119.1	119.5
DELTA FLUX @ 120%	I (Top) μamps	I (Bottom) μamps	I (Top) μamps	I (Bottom) μamps	I (Top) μamps	I (Bottom) μamps	I (Top) μamps	I (Bottom) μamps
0	142.5	143.4	142.2	143.1	142.9	143.5	142.9	143.4
8	148.6	137.2	148.3	137.0	149.1	137.3	149.1	137.2
- 24	124.2	161.8	123.9	161.5	124.5	161.9	124.6	161.9

Data based on flux map number S1C26M15A

Computer and Recorder Constants

Recorder = K0411 = K0412 = K0413 = K0414 = 18.647

Performed / Verified By: LaFrance / Davis Date: 7/21/14

SR2014301  
**Administrative** Job Performance Measure G2.1.40

Applicant\_\_\_\_\_

Start Time\_\_\_\_\_

Examiner\_\_\_\_\_

Date \_\_\_\_\_

Stop Time\_\_\_\_\_

**Title****Authorize Fuel Movement****K/A: G2.1.40 Knowledge of refueling administrative procedures (2.8/3.9)****Applicability****Estimated Time****Actual Time**

SRO(I)/SRO(U)

20 Minutes

**Conditions**

- Task is to be PERFORMED in the simulator.

**Standards**

- Correctly identify all plant conditions that do not support fuel movement in accordance with 1-OSP-ZZ-004 attachment 8, given a specific set of plant conditions.

**Terminating Cues**

- 1-OSP-ZZ-004, attachment 8 assessment complete.

**Procedures**

- 1-OSP-ZZ-004, Unit 1 Safety Systems Status List For Cold Shutdown/Refueling Conditions, Revision 47.

**Tools and Equipment****Safety Considerations**

- None

- None

- It is a Monday DAYSHIFT.
- Unit One is in refueling shutdown with the head and upper internals removed. A request from the refueling supervisor has been made to authorize fuel movement (core offload) in accordance with 1-OSP-ZZ-004 attachment 8.
- Current conditions are as follows (items not observable from the control room):
  - Refueling containment integrity is set and verified by the shift manager.
  - Cavity level is 26.5'.
  - RHR pump discharge and cavity boron is currently 2404 ppm (sampled 30 minutes ago).
  - The reactor was shutdown 122 hours ago.
  - Both station batteries are operable and split out.
  - Both trains of SFP cooling are available with one in service.
  - All make-up flowpaths to the SFP are available.
  - 1-RM-Q7, CTMT PARTC ALERT/FAILURE and 1-RM-R7, 1-RM-RI-159 have just alarmed.
  - 'A' RHR pump in service to the 'A' HX. 'B' RHR pump and HX are tagged out for maintenance.
- Headset communications between the MCR and the manipulator crane have been verified.
- You are to authorize fuel movement after completing attachment 8, if conditions allow. If conditions do not allow, you are to list ALL issues present that must be resolved to allow fuel movement to commence.

### **Terminating Cues**

- Applicant has completed the attachment and discussed results and problems with examiner.

### **Tools and Equipment**

- 1-OSP-ZZ-004, Attachment 8
- Technical Specifications
- Simulator

### **Safety Considerations**

- None

### **Notes**

**PERFORMANCE CHECKLIST****Simulator Set-up**

- Recall a CSD IC (**IC 274 Protected**) or (**IC35 25% Cold Cal**) and ensure that RHR pump discharge and RCS temperatures are below 140 °F.
- Align HHSI and fill pressurizer to 56.5% cold cal if necessary.
- Fail Rad Monitor 1-RM-159 HI by inserting Malf RM0202
- Fail NI-32 low → NO0102- Severity –1
- Tagout 1-RH-P-1B and **place a red magnet above control switch.**

**Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (\*).
- **START TIME:** \_\_\_\_\_

**Evaluator's note- determination of items to be in non-compliance that actually are in compliance constitutes a critical step failure.**

**STEP 1:**

Refueling Containment Integrity set.

Remarks:  
IAW 1-OP-FH-001

**STANDARD:**

\_\_\_\_\_ Recalls (or refers to) turnover statement that refuel integrity is SET.

\_\_\_\_\_ Initials in "D" block for *Refueling Containment Integrity set*

**EVALUATOR NOTES:**

- **If asked:** The shift manager has verified that refueling integrity is set as directed by 1-OP-FH-001.

**COMMENTS:**

\_\_\_\_\_ SAT

\_\_\_\_\_ UNSAT

**STEP 2:**

## Radiation Monitors Operable:

- Manipulator Crane 1 operable
- Containment Gaseous 1 operable
- Containment Particulate 0 operable
- SFP Bridge 1 operable
- Vent-Vent Gaseous 1 operable
- Vent-Vent Particulate 1 operable

## Remarks:

Alarms 1-RM-Q7, and 1-RM-R7 will both be lit.

**STANDARD:**

\_\_\_\_\_ Examines each radiation monitor and verifies normal readings.

\_\_\_\_\_ \* **CRITICAL TASK- TRAINEE DETERMINES RADIATION MONITOR 1-RM-RI-159 OPERABILITY PREVENTS FUEL MOVEMENT.**

**EVALUATOR NOTES:**

- **If asked:** Radiation monitors are as they appear.

**COMMENTS:**

\_\_\_\_\_ **SAT**

\_\_\_\_\_ **UNSAT**



<p><b>STEP 3:</b></p> <p>Source Range Detectors (audible indication in CTMT must be verified operable)</p> <ul style="list-style-type: none"> <li>• 2 operable</li> </ul> <p>Remarks: None</p> <p><b>STANDARD:</b></p> <p>_____ Observes normal indication on NI-31</p> <p>_____ Determines that NI-32 is reading erroneously.</p> <p>_____ <b>* CRITICAL TASK- TRAINEE DETERMINES TWO SOURCE RANGE NIs ARE NOT OPERABLE.</b></p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"> <li>• <b>If directed:</b> the operating team will implement 1-AP-4.00 (NI Malfunction).</li> <li>• <b>If asked:</b> there is NO audible count rate in containment.</li> <li>• <b>Determination that audible count rate does not exist is not a critical step as the source range failure is the cause of the lack of audible count rate.</b></li> </ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 4:</b></p> <p>Cavity level &gt; 23 feet.</p> <p>Remarks: OU-SU-201, should be maintained as high as possible. No fuel movement permitted if &lt; 23 feet in Cavity</p> <p><b>STANDARD:</b></p> <p>_____ Recalls (or refers to) turnover statement that cavity level is 26.5'.</p> <p>_____ Determines that adequate cavity level exists to support fuel movement.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"> <li>• <b>If asked:</b> cavity level has been verified at 26.5'.</li> </ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p><b>STEP 5:</b></p> <p>RHR pump and Heat Exchanger: Cavity Level &gt; 23 feet    1 operable Cavity Level &lt; 23 feet    2 operable</p> <p><b>STANDARD:</b></p> <p>_____ Recalls (or refers to) turnover statement that cavity level is 26.5'.</p> <p>_____ Observes 1 RHR pump in operation and one tagged out.</p> <p>_____ Determines that with present cavity level and operable RHR pump, fuel movement can commence.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> cavity level has been verified at 26.5'.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 6:</b></p> <p>Direct communication between the Control Room and Manipulator Crane</p> <p>Remarks: When changing core geometry</p> <p><b>STANDARD:</b></p> <p>_____ Recalls (or refers to) turnover statement that communications have been established.</p> <p>_____ Determines that communication capability allows for fuel movement.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> operator is in the MCR equipped with a headset in communication with the refueling team.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p><b>STEP 7:</b></p> <p>RCS Boron concentration- <math>\geq 2350</math> PPM (Admin limit)</p> <p>Remarks: RCS must be sampled at least once every 24 hours if the head is unbolted (Not required if defueled and cavity is drained below flange level. (Ref 2.3.15)</p> <p><b>STANDARD:</b></p> <p>_____ Recalls (or refers to) turnover statement that RHR pump discharge and cavity boron is currently 2404 ppm (sampled 30 minutes ago).</p> <p>_____ Determines that current boron concentration allows for fuel movement.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> RHR pump discharge and cavity boron is currently 2404 ppm (sampled 30 minutes ago).</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 8:</b></p> <p>RHR Temperature: <math>\leq 140</math> °F</p> <p>Remarks: None</p> <p><b>STANDARD:</b></p> <p>_____ Observes RHR pump discharge temperature and determines that current RCS temperature allows for fuel movement.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> All RCS loops are isolated and drained.</li><li>• <b>If asked:</b> All CETCs have been disconnected.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

**STEP 9:**

Reactor shutdown greater than 100 hours

Remarks: For movement of irradiated fuel

**STANDARD:**

\_\_\_\_\_ Recalls (or refers to) turnover statement that unit has been shutdown 122 hours.

\_\_\_\_\_ Determines that sufficient time from shutdown exists to allow fuel movement.

**EVALUATOR NOTES:**

- **If asked:** The reactor was shutdown 122 hours ago.

**COMMENTS:**

\_\_\_\_\_ **SAT**

\_\_\_\_\_ **UNSAT**

<p><b>STEP 10:</b></p> <p>Control Room and Relay Room Emergency Ventilation- 2 Trains</p> <p>Remarks: None</p> <p><b>STANDARD:</b></p> <p>_____ Examines current configuration of MCR/ESGR ventilation and determines that all fans are available.</p> <p>_____ Determines that current MCR/ESGR Emergency Ventilation configuration allows for fuel movement by observing the configuration of 1-VS-F-41/42 and 2-VS-F-41/42.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> Conditions are as they appear.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 11:</b></p> <p>Control Room Chillers- 3 minimum</p> <p>Remarks: Operable IAW power supply requirements of TS 3.23</p> <p><b>STANDARD:</b></p> <p>_____ Examines current configuration of MCR chillers and determines that all chillers are available.</p> <p>_____ Determines that current MCR Chiller configuration allows for fuel movement by observing the configuration of 1-VS-E-4A, B, C, D, E.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> Conditions are as they appear.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p><b>STEP 12:</b></p> <p>MCR/ESGR AHU- 8 minimum</p> <p>Remarks: None</p> <p><b>STANDARD:</b></p> <p>_____ Examines current configuration of MCR/ESGR air handlers and determines that all Air Handling Units are operable.</p> <p>_____ Determines that current MCR/ESGR air handler configuration allows for fuel movement</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> Conditions are as they appear.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 13:</b></p> <p>120 Volt Vital Buses- 2 minimum</p> <p>Remarks: None</p> <p><b>STANDARD:</b></p> <p>_____ Observes that all vital busses are energized and NO UPS/Battery charger alarms are LIT.</p> <p>_____ Recalls (or refers to) turnover statement that all vital bus UPS are in a normal</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> All vital bus UPS are in a normal configuration.</li><li>• <b>If asked:</b> Both station batteries are operable and split out.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p><b>STEP 14:</b></p> <p>SFP Cooling- 1 train available</p> <p>Remarks: None</p> <p><b>STANDARD:</b></p> <p>_____ Observes that one spent fuel cooling pump is in service.</p> <p>_____ Recalls (or refers to) turnover statement that both trains of SFP cooling are available with one in service.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> both trains of SFP cooling are available with one in service.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 16:</b></p> <p>SFP makeup borated water source- 1 source available</p> <p>Remarks: None</p> <p><b>STANDARD:</b></p> <p>_____ Recalls (or refers to) turnover statement that all make-up flowpaths to the SFP are available.</p> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>• <b>If asked:</b> All make-up flowpaths to the SFP are available.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p><b>STEP 17:</b></p> <p>Reports to Shift Manager that task is complete</p> <p><b>STANDARD:</b></p> <p>_____ Reports that fuel movement <b><u>CANNOT</u></b> commence until the following problems are resolved:</p> <ul style="list-style-type: none"> <li>• 1-RM-RI-158 must be returned to operable status.</li> <li>• NI-32 must be returned to operable status</li> </ul> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
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**STOP TIME** \_\_\_\_\_:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



**Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)**

**Task**

- Task is to be performed in the simulator.
- Determine if current plant conditions support fuel movement..

**Directions**

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

**Initial Conditions:**

- Unit 1 is at Refueling Shutdown.
- The containment refueling SRO has called the control room for permission to commence core offload.

**Initiating Cues**

- It is a Monday DAYSHIFT.
- Unit One is in refueling shutdown with the head and upper internals removed. A request from the refueling supervisor has been made to authorize fuel movement (core offload) in accordance with 1-OSP-ZZ-004 attachment 8.
- Current conditions are as follows (items not observable from the control room):
  - Refueling containment integrity is set and verified by the shift manager.
  - Cavity level is 26.5'.
  - RHR pump discharge and cavity boron is currently 2404 ppm (sampled 30 minutes ago).
  - The reactor was shutdown 122 hours ago.
  - Both station batteries are operable and split out.
  - Both trains of SFP cooling are available with one in service.
  - All make-up flowpaths to the SFP are available.
  - 1-RM-Q7, CTMT PARTC ALERT/FAILURE and 1-RM-R7, 1-RM-RI-159 have just alarmed.
  - 'A' RHR pump in service to the 'A' HX. 'B' RHR pump and HX are tagged out for maintenance.
- Headset communications between the MCR and the manipulator crane have been verified.
- You are to authorize fuel movement after completing attachment 8, if conditions allow. If conditions do not allow, you are to list ALL issues present that must be resolved to allow fuel movement to commence.

**Operator Directions Handout  
(TO BE GIVEN TO APPLICANT)**

**Initial Conditions:**

- Unit 1 is at Refueling Shutdown.
- The containment refueling SRO has called the control room for permission to commence core offload.

**Initiating Cues**

- It is a Monday DAYSHIFT.
- Unit One is in refueling shutdown with the head and upper internals removed. A request from the refueling SRO has been made to authorize fuel movement (core offload) in accordance with 1-OSP-ZZ-004 attachment 8.
- Current conditions are as follows (items not observable from the control room):
  - Refueling containment integrity is set and verified by the shift manager.
  - Cavity level is 26.5'.
  - RHR pump discharge and cavity boron is currently 2404 ppm (sampled 30 minutes ago).
  - The reactor was shutdown 122 hours ago.
  - Both station batteries are operable and split out.
  - Both trains of SFP cooling are available with one in service.
  - All make-up flowpaths to the SFP are available.
  - 1-RM-Q7, CTMT PARTC ALERT/FAILURE and 1-RM-R7, 1-RM-RI-159 have just alarmed.
  - 'A' RHR pump in service to the 'A' HX. 'B' RHR pump and HX are tagged out for maintenance.
- Headset communications between the MCR and the manipulator crane have been verified.
- You are to authorize fuel movement after completing attachment 8, if conditions allow. If conditions do not allow, you are to list ALL issues present that must be resolved to allow fuel movement to commence.

(Page 1 of 2)

**Attachment 8**

**REFUELING OPERATIONS REQUIREMENTS**

EQUIPMENT	MIN REQ	D	N	TECH SPECS	REMARKS
Refueling Containment Integrity set	As Required			3.10.A.1	IAW 1-OP-FH-001
Radiation Monitors: • Manipulator Crane • Containment Gaseous • Containment Particulate • SFP Bridge • Vent-Vent Gaseous • Vent-Vent Particulate	1 operable 1 operable 1 operable 1 operable 1 operable 1 operable			3.10.A.3 3.10.B.1	If the Containment Air Recirculation fans are not running then refer to Tech Spec 3.10 for actions.
Source Range Detectors (audible indication in CTMT must be checked operable)	2 operable			3.10.A.2	
Cavity level > 23 feet	23 feet			3.10.A.6	OU-SU-201, should be maintained as high as possible. No fuel movement permitted if < 23 feet in Cavity.
RHR pump and Heat Exchanger: • Cavity Level > 23 feet • Cavity Level < 23 feet	1 operable 2 operable			3.10.A.4 3.10.A.5	
Direct communication between the Control Room and Manipulator Crane	Yes			3.10.A.8	When changing core geometry
RCS Boron concentration	≥ 2350 PPM (Admin limit)			CY-AP-PRI-100	RCS must be sampled at least once every 24 hours if the head is unbolted (Not required if defueled and cavity is drained below flange level. (Ref 2.3.15)
RHR Temperature	≤ 140 °F			1.0.C.1	
Reactor shutdown greater than 100 hours	100 hours			3.10.A.9	For movement of irradiated fuel

(Page 2 of 2)

**Attachment 8**

**REFUELING OPERATIONS REQUIREMENTS**

EQUIPMENT	MIN REQ	D	N	TECH SPECS	REMARKS
Control Room and Relay Room Emergency Ventilation	2 Trains			3.10.A.11 3.10.B.4	
Control Room Chillers	3			3.10.13	Operable IAW power supply requirements of TS 3.23
MCR/ESGR AHU	8			3.10.14	
120 Volt Vital Buses	2				As a minimum two 120 VAC Vital Buses shall be energized from the inverters connected to the respective DC Buses.
SFP Cooling	1 train available				(*) OU-AA-200, Attachment 5 OU-SU-201 SFP Cooling Pump powered from bus with available EDG preferred.
SFP makeup water source	2 sources available				(*) OU-AA-200, Attachment 5

(\*) If equipment requirements are not met, then the STA/SRO involved in the review of outage schedules will coordinate development of contingency plans IAW OU-AA-200.

U.S. Nuclear Regulatory Commission  
Surry Power Station

SR14301

**Administrative** Job Performance Measure G2.2.12

Applicant\_\_\_\_\_

Start Time\_\_\_\_\_

Examiner\_\_\_\_\_

Date \_\_\_\_\_

Stop Time\_\_\_\_\_

**Title****Review 1-OPT-FW-006, Auxiliary Feedwater MOV Test.****K/A: G.2.2.12 – Knowledge of surveillance procedures. RO: 3.7/ SRO: 4.1****Applicability****Estimated Time****Actual Time**

RO/SRO(D)/SRO(U)

10 Minutes

**Conditions**

- Task is to be PERFORMED in the CLASSROOM.

**Standards**

- Review 1-OPT-FW-006, Auxiliary Feedwater MOV Test.

**Initiating Cues**

- 1-OPT-FW-006 has been completed by the previous shift.
- You are to review the completed OPT for accuracy and completeness.
- Document any issues identified during review and operability requirements, if any, on the answer sheet provided.
- When you have completed the review, inform your examiner.

**Terminating Cues**

- 1-OPT-FW-006 review complete.

**Tools and Equipment**

- Copy of 1-OPT-FW-006

**Safety Considerations**

- None

**Initial Conditions:**

- Unit 1 at 100% power.

**Initiating Cues**

- 1-OPT-FW-006 has been completed by the previous shift.
- You are to review the completed OPT for accuracy and completeness.
- Document any issues identified during review and operability requirements, if any, on the answer sheet provided.
- When you have completed the review, inform your examiner.

**PERFORMANCE CHECKLIST****Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (\*).
- At the completion of the JPM **all SRO Candidates** will have a Follow-Up question.
- **START TIME:** \_\_\_\_\_

<p>STEP 1:     Reviews Scheduled PT Cover Sheet.</p> <p><b>STANDARD:</b></p> <p>a)   Reviews the following:</p> <ul style="list-style-type: none"><li>•   Reviews Schedule Date, Drop Dead Date, Actual Start Date &amp; Time, and Actual Finish Date &amp; time.</li><li>•   Determines that PT was performed on the Schedule Start Date.</li><li>•   Determines that PT was completed prior to the Drop Dead date.</li><li>•   Identifies check mark correct in Completed by DDD in Maximo, YES blank.</li><li>•   Identifies that Satisfactory blank is checked.</li><li>•   Identifies Departmental Signature on appropriate blank.</li></ul> <p><b>EVALUATOR NOTES:</b></p> <ul style="list-style-type: none"><li>•   If asked, it is desired to perform this Review now.</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
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<p>STEP 2:    Reviews Initial Conditions and Precautions and Limitations.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>• Identifies Initial Condition 3.1 initialed.</li> <li>• Identifies Precautions and limitations 4.1 through 4.5 initialed.</li> </ul> <p><b>EVALUATOR NOTES: NONE</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p>STEP 3:    Reviews section 6.1, Work Preparation, of section 6.0, INSTRUCTIONS.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>• Identifies correct use of N/A for Step 6.1.1.</li> </ul> <p><b>EVALUATOR NOTES: NONE</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p>STEP 4:    Reviews section 6.2, Testing 1-FW-MOV-151E, SG A AFW Flow Isol.</p> <p><b>STANDARD:</b></p> <p>a) Step 6.2.1: Cycle 1-FW-MOV-151E and verify full stroke. Record the time required to close <b>and</b> to open the MOV.</p> <ul style="list-style-type: none"> <li>• Identifies Close and Open times within the Acceptable Range.</li> </ul> <p>b) Step 6.2.2: Return 1-FW-MOV-151E to position specified by Shift Supervision. Circle as left position.</p> <ul style="list-style-type: none"> <li>• Identifies <b>Open</b> circled.</li> <li>• Identifies Return to position correctly verified by initial in verification blank.</li> </ul> <p>c) Step 6.2.3: record the stopwatch SQC No. and Cal Due Date.</p> <ul style="list-style-type: none"> <li>• Identifies SQC No. and Cal Due Date blanks filled out appropriately.</li> </ul> <p><b>EVALUATOR NOTES: NONE</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>



<p>STEP 5:     Reviews section 6.3, Testing 1-FW-MOV-151F, SG A AFW Flow Isol.</p> <p><b>STANDARD:</b></p> <p>a) Step 6.3.1: Cycle 1-FW-MOV-151F and verify full stroke. Record the time required to close <b>and</b> to open the MOV.</p> <ul style="list-style-type: none"> <li>Identifies Close and Open times within the Acceptable Range.</li> </ul> <p>b) Step 6.3.2: Return 1-FW-MOV-151F to position specified by Shift Supervision. Circle as left position.</p> <ul style="list-style-type: none"> <li><b>*Identifies Neither Open or Closed circled.</b></li> <li><b>*Identifies Return to position verification initial missing in verification blank.</b></li> </ul> <p>c) Step 6.3.3: record the stopwatch SQC No. and Cal Due Date.</p> <ul style="list-style-type: none"> <li>Identifies SQC No. and Cal Due Date blanks filled out appropriately.</li> </ul> <p><b>EVALUATOR NOTES:</b> Acknowledge that return to position open/closed not circled, and verification initial missing. Have the Candidate continue with the PT review.</p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p>STEP 6:     Reviews section 6.4, Testing 1-FW-MOV-151C, SG B AFW Flow Isol.</p> <p><b>STANDARD:</b></p> <p>a) Step 6.4.1: Cycle 1-FW-MOV-151C and verify full stroke. Record the time required to close <b>and</b> to open the MOV.</p> <ul style="list-style-type: none"> <li>Identifies Close and Open times within the Acceptable Range.</li> </ul> <p>b) Step 6.4.2: Return 1-FW-MOV-151C to position specified by Shift Supervision. Circle as left position.</p> <ul style="list-style-type: none"> <li>Identifies <b>Open</b> circled.</li> <li>Identifies Return to position correctly verified by initial in verification blank.</li> </ul> <p>c) Step 6.4.3: record the stopwatch SQC No. and Cal Due Date.</p> <ul style="list-style-type: none"> <li>Identifies SQC No. and Cal Due Date blanks filled out appropriately.</li> </ul> <p><b>EVALUATOR NOTES: NONE</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p>STEP 7:     Reviews section 6.5, Testing 1-FW-MOV-151D, SG B AFW Flow Isol.</p> <p><b>STANDARD:</b></p> <p>a) Step 6.5.1: Cycle 1-FW-MOV-151D and verify full stroke. Record the time required to close <b>and</b> to open the MOV.</p> <ul style="list-style-type: none"> <li>• Identifies Close and Open times within the Acceptable Range.</li> </ul> <p>b) Step 6.5.2: Return 1-FW-MOV-151D to position specified by Shift Supervision. Circle as left position.</p> <ul style="list-style-type: none"> <li>• <b>*Identifies Open Not circled.</b></li> <li>• Identifies Return to position correctly verified by initial in verification blank.</li> </ul> <p>c) Step 6.5.3: record the stopwatch SQC No. and Cal Due Date.</p> <ul style="list-style-type: none"> <li>• Identifies SQC No. filled in appropriately.</li> <li>• <b>*Identifies Cal Date Due Date: is blank.</b></li> </ul> <p><b>EVALUATOR NOTES:</b>          Acknowledge Open not circled, and Cal Date Due: is blank.          Have the Candidate continue the PT Review.</p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p>STEP 8:     Reviews section 6.6, Testing 1-FW-MOV-151A, SG C AFW Flow Isol.</p> <p><b>STANDARD:</b></p> <p>a) Step 6.6.1: Cycle 1-FW-MOV-151A and verify full stroke. Record the time required to close <b>and</b> to open the MOV.</p> <ul style="list-style-type: none"> <li>• Identifies Close and Open times within the Acceptable Range.</li> </ul> <p>b) Step 6.6.2: Return 1-FW-MOV-151A to position specified by Shift Supervision. Circle as left position.</p> <ul style="list-style-type: none"> <li>• Identifies <b>Open</b> circled.</li> <li>• Identifies Return to position correctly verified by initial in verification blank.</li> </ul> <p>c) Step 6.6.3: record the stopwatch SQC No. and Cal Due Date.</p> <ul style="list-style-type: none"> <li>• Identifies SQC No. and Cal Due Date blanks filled out appropriately.</li> </ul> <p><b>EVALUATOR NOTES: NONE</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p>STEP 9: Reviews section 6.7, Testing 1-FW-MOV-151B, SG C AFW Flow Isol.</p> <p><b>STANDARD:</b></p> <p>a) Step 6.7.1: Cycle 1-FW-MOV-151B and verify full stroke. Record the time required to close <b>and</b> to open the MOV.</p> <ul style="list-style-type: none"><li>Identifies Close and Open times within the Acceptable Range.</li></ul> <p>b) Step 6.7.2: Return 1-FW-MOV-151B to position specified by Shift Supervision. Circle as left position.</p> <ul style="list-style-type: none"><li>Identifies <b>Open</b> circled.</li><li>Identifies Return to position correctly verified by initial in verification blank.</li></ul> <p>c) Step 6.7.3: record the stopwatch SQC No. and Cal Due Date.</p> <ul style="list-style-type: none"><li>Identifies SQC No. and Cal Due Date blanks filled out appropriately.</li></ul> <p><b>EVALUATOR NOTES: NONE</b></p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 10: reviews Section 7.0 Follow-On.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"><li>Verifies Step 7.1.1 initialed.</li><li>Verifies Step 7.1.2 initialed.</li><li>Verifies Satisfactory checked.</li></ul> <p><b>EVALUATOR NOTES: NONE</b></p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

<p>STEP 11:    Reviews Section 7.2 Follow-On Tasks.</p> <p><b>STANDARD:</b></p> <p><b>*Identifies inappropriate N/A of Step 7.2.3.</b> (N/A should stop at Step 7.2.2), and Step 7.2.3 should be initialed.</p> <p><b>EVALUATOR NOTES:</b>          Acknowledge inappropriate N/A of Step 7.2.3.          Have the candidate continue review of the PT.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p>STEP 12:    Reviews Section 7.3 Notification, Documentation, and Procedure Closeout.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>• Identifies initial for Step 7.3.1.</li> <li>• Identifies Both Names listed in Table.</li> <li>• Identifies Signature and date at bottom of page.</li> </ul> <p><b>EVALUATOR NOTES: NONE</b>          Candidate must identify 4/5 of the incorrect items (80%) to be satisfactory.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

**STOP TIME:** \_\_\_\_\_

**Notes:**

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<p><b>EVALUATOR NOTE: Proceed to Follow-up question for SRO Candidates.</b></p>
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**ANSWER KEY**  
**NOT FOR TRAINEE**

1-OPT-FW-006 REVIEW

1. Step 6.3.2 - Identifies Neither Open or Closed circled.
2. Step 6.3.2 – Identifies Return to position verification initial missing in verification blank.
3. Step 6.5.2 – Identifies Open not circled.
4. Step 6.5.3 – Identifies Cal Date Due Date is blank.
5. Step 7.2.3 – Identifies inappropriate N/A of Step 7.2.3

**Candidate must identify 4/5 of the incorrect items (80%) to be satisfactory.**

**EVALUATOR'S REFERENCE COPY  
Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)**

**Task**

- Task is to be performed in the Classroom.

**Directions**

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

**Initial Conditions:**

- Unit 1 at 100% power.

**Initiating Cues**

- 1-OPT-FW-006 has been completed by the previous shift.
- You are to review the completed OPT for accuracy and completeness.
- Document any issues identified during review and operability requirements, if any, on the answer sheet provided.
- When you have completed the review, inform your examiner.

**SRO ONLY ANSWER KEY****NOT FOR TRAINEE**

## 1-OPT-FW-006 FOLLOW-UP Question

1-OPT-FW-006 has been completed and the following MOV had a “Close “stroke time outside the Acceptable range:

	Stroke Time	Reference	Acceptable Range
1-FW-MOV-151C, SG B AFW ISOL	28.2 sec	20.0 sec	17.0 – 23.0 sec

What actions are required by Technical Specifications?

ANSWER: TS 3.6.C.3 require two redundant flowpaths, including system piping, headers, valves, and control board indication required for operation.

TS 3.6.G.1 requires a 72 hour clock to restore to OPERABLE status.

**SRO ONLY Candidate**

## 1-OPT-FW-006 FOLLOW-UP Question

1-OPT-FW-006 has been completed and the following MOV had a “Close “stroke time outside the Acceptable range:

	Stroke Time	Reference	Acceptable Range
1-FW-MOV-151C, SG B AFW ISOL	28.2 sec	20.0 sec	17.0 – 23.0 sec

What actions are required by Technical Specifications?



**Operator Directions Handout  
(TO BE GIVEN TO APPLICANT)**

**Initial Conditions:**

- Unit 1 at 100% power.

**Initiating Cues**

- 1-OPT-FW-006 has been completed by the previous shift.
- You are to review the completed OPT for accuracy and completeness.
- Document any issues identified during review and operability requirements, if any, on the answer sheet provided.
- When you have completed the review, inform your examiner.

ANSWER SHEET

1-OPT-FW-006 REVIEW

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

U.S. Nuclear Regulatory Commission  
Surry Power Station

SR2014301

**Administrative** Job Performance Measure G2.3.4 (RO 3.2 / SRO 3.7)

Applicant \_\_\_\_\_

Start Time \_\_\_\_\_

Examiner \_\_\_\_\_

Date \_\_\_\_\_

Stop Time \_\_\_\_\_

**Title****Authorize Emergency Exposure in accordance with EPIP-4.04, Emergency Exposure Limits.****K/A: G2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions.****Applicability****Estimated Time****Actual Time**

SRO(D)/SRO(U)

5 Minutes

\_\_\_\_\_

**Conditions**

- Task may be PERFORMED in the Classroom.
- Unit has experienced a LBLOCA.

**Standards**

- Emergency Exposure Denied IAW EPIP-4.04.

**Initiating Cues**

- Nuclear Shift Manager Direction.

**Terminating Cues**

- EPIP-4.04, Emergency Exposure Limits, step 9.0 completed.

**Procedures**

- EPIP-1.01, Revision 56.
- EPIP-1.03, Revision 22.
- EPIP-4.04, Revision 9.

**Tools and Equipment**

- None

**Safety Considerations**

- None

**Initial Conditions**

- You are the Station Emergency Manager.
- Unit 1 experienced a LBLOCA today at 1330 hrs. An Alert was declared at 1340 based on EAL identifier FA1.1 due to loss of RCS barrier.
- All notifications have been made.
- The following unit conditions exist:
  - RMT is currently in service.
  - 1-SI-P-1A experienced excessive seal leakage and was spraying water on the motor. The pump has been secured.
  - 1-SI-P-1B is in service at this time.
- Maintenance has two mechanics standing by to repair the seal for 1-SI-P-1A. Both men are between the ages of 40-45.
- The calculated estimated TEDE dose is 12 Rem per individual.
- You are currently performing step 15 of EPIP-1.03.
- The Radiological Assessment Director (RAD) has performed EPIP-4.04 through step 9 as required and is waiting on authorization from you for emergency exposure.

**Initiating Cues**

- Here is the completed, up through step 9, EPIP-4.04 from the RAD. I need you to approve or disapprove the emergency exposure for the two mechanics. When you finish the actions necessary to accomplish this, please inform me.

**Notes**

- Fill out copies of EPIP-1.01 through step 8, and EPIP-1.03 through step 15. FA1.1 is the EAL identifier.
- Use today's date. Alert declared at 1340 due to a LBLOCA. Two-mechanics between the ages of 40-45 are prepared to repair a seal leak on 1-SI-P-1A and are waiting on approval from the SEM for emergency exposure. The estimated dose to each individual is 12 Rem TEDE. Use the name of the SRO being evaluated in the SM name spots in EPIP-1.01 (step 3), EPIP-1.03 (step 1), and EPIP-4.04 (step 1).
- Fill out EPIP 4.04 through step 9. Fill out two (2) Attachment 3 forms with name of individual and exposure. Both forms should be approved by the RAD with Final authorization by the Shift manager left blank.

**PERFORMANCE CHECKLIST****Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (\*).
- **Have copies of all procedures (EPIP-1.01, 1.03 and 4.04) available upon request.**
- **Role play as Radiological Assessment Director.**
- **START TIME:** \_\_\_\_\_

<p><b>STEP 1:</b></p> <p>AUTHORIZES EMERGENCY EXPOSURE:</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>a) Reviews EPIP-4.04 and notes that the limit to save valuable equipment is 10 Rem TEDE.</li> <li>b) Determines from initiating conditions and review of EPIP-4.04, ATTACHMENT 3 (12 REM) that both operators would exceed the maximum limit of Dose to protect equipment.</li> <li>c) * <b>Does not authorize (DISAPPROVES) emergency exposure for the two mechanics.</b></li> </ul> <p><b>EVALUATOR'S NOTE:</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 2:</b></p> <p>Report completion of Task.</p> <p><b>COMMENTS:</b></p> <p style="text-align: center;">**      <b>JPM COMPLETE</b>      **</p>	

STOP TIME: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)**

**Task**

- Task is to be performed in the simulator.

**Directions**

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

**Initial Conditions**

- You are the Station Emergency Manager.
- Unit 1 experienced a LBLOCA today at 1330 hrs. An Alert was declared at 1340 based on EAL identifier FA1.1 due to loss of RCS barrier.
- All notifications have been made.
- The following unit conditions exist:
  - RMT is currently in service.
  - 1-SI-P-1A experienced excessive seal leakage and was spraying water on the motor. The pump has been secured.
  - 1-SI-P-1B is in service at this time.
- Maintenance has two mechanics standing by to repair the seal for 1-SI-P-1A. Both men are between the ages of 40-45.
- The calculated estimated TEDE dose is 12 Rem per individual.
- You are currently performing step 15 of EPIP-1.03.
- The Radiological Assessment Director (RAD) has performed EPIP-4.04 through step 9 as required and is waiting on authorization from you for emergency exposure.

**Initiating Cues**

- Here is the completed, up through step 9, EPIP-4.04 from the RAD. I need you to approve or disapprove the emergency exposure for the two mechanics. When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout  
(TO BE GIVEN TO APPLICANT)**

**Initial Conditions**

- You are the Station Emergency Manager.
- Unit 1 experienced a LBLOCA today at 1330 hrs. An Alert was declared at 1340 based on EAL identifier FA1.1 due to loss of RCS barrier.
- All notifications have been made.
- The following unit conditions exist:
  - RMT is currently in service.
  - 1-SI-P-1A experienced excessive seal leakage and was spraying water on the motor. The pump has been secured.
  - 1-SI-P-1B is in service at this time.
- Maintenance has two mechanics standing by to repair the seal for 1-SI-P-1A. Both men are between the ages of 40-45.
- The calculated estimated TEDE dose is 12 Rem per individual.
- You are currently performing step 15 of EPIP-1.03.
- The Radiological Assessment Director (RAD) has performed EPIP-4.04 through step 9 as required and is waiting on authorization from you for emergency exposure.

**Initiating Cues**

- Here is the completed, up through step 9, EPIP-4.04 from the RAD. I need you to approve or disapprove the emergency exposure for the two mechanics. When you finish the actions necessary to accomplish this, please inform me.

SR2014301

**Administrative** Job Performance Measure G2.3.4 (RO 3.2 / SRO 3.7)

Applicant \_\_\_\_\_

Start Time \_\_\_\_\_

Examiner \_\_\_\_\_

Date \_\_\_\_\_

Stop Time \_\_\_\_\_

**Title**

Calculate Dose and Best Work Method

**K/A: G2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions. (3.2/3.7)****Applicability****Estimated Time****Actual Time**

ALL

30 Minutes

**Conditions**

- Task is to be PERFORMED in the classroom.

**Standards**

- Determines the maximum allowable time for opening 1-RH-MOV-1700 is 6 minutes.

**Initial Conditions:**

- Unit 1 has experienced a small break LOCA with a safety injection.
- The Operating Team is attempting to place the Residual Heat Removal System in service, but they are unable to open 1-RH-MOV-1700 from the Main Control Room.
- You have been tasked with entering Containment and locally opening 1-RH-MOV-1700.
- Your allowable dose limit for this job is 1800 mr.
- General area radiation levels have been manually estimated based on installed radiation monitor readings.
- Survey maps of the Unit 1 Containment are available, showing dose rates and one way travel time to reach the valve via the chosen route.
- Health Physics personnel are currently unavailable to provide assistance for dose determination.



- On the 3'6" elevation, travel time (one way) is all the way to 1-RH-MOV-1700. Calculate dose received on travel on the 3'6" based on pathway dose and not dose rate in loop room- time to walk across loop room floor to 1-RH-MOV-1700 is negligible.

**Initiating Cues**

You have been directed to determine:

1. The maximum time you will have to open 1-RH-MOV-1700 without exceeding your allowable dose.

**Terminating Cues**

- Determines the maximum time for opening 1-RH-MOV-1700 without exceeding dose limits.

**Tools and Equipment**

- Calculator
- Survey Data
- VPAP-2101

**Safety Considerations**

- None

**Notes**

**PERFORMANCE CHECKLIST****Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (\*).
- Provide survey map to candidate.
- **START TIME:** \_\_\_\_\_

<p><b>STEP 1:</b></p> <p>Calculate path exposure to 1-RH-MOV-1700.</p> <p><b>STANDARD:</b></p> <p>___ 1. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(1 MIN)(2 TRIPS) = 100 MR. (Personnel Hatch to Stairway)</p> <p>___ 2. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(3 MIN)(2 TRIPS) = 300 MR. (Stairway)</p> <p>___ 3. (12 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 800 MR. (Stairway on -3'6" to valve)</p> <p>___ 4. (100 MR)+(300 MR)+(800MR) = * <b>1200 MR.</b></p> <p><b>EVALUATOR'S NOTES:</b> Total exposure via this path: 1200 mr. (acceptable band – <b>1699-1701 mr</b>). <b>THIS IS A CRITICAL STEP</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 2:</b></p> <p>Calculate remaining allowable exposure at valve.</p> <p><b>STANDARD:</b></p> <p>___ 1. Allowable Dose to open the valve - (1800 MR) - (1200 MR) = * <b>600 MR</b></p> <p><b>EVALUATOR'S NOTES:</b> Total allowable dose: 600 MR. <b>THIS IS A CRITICAL STEP</b></p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

**STEP 3:**

Determine the maximum allowable time the operator has to open 1-RH-MOV-1700.

**STANDARD:**

\_\_\_ 1. (600 MR)(HR/6R)(1R/1000 MR)(1 HR/60 MIN) = \* **6 MIN.**  
(Personnel Hatch to Stairway)

**EVALUATOR'S NOTES:** Determines maximum allowable time to operate the valve is 6 minutes. **THIS IS A CRITICAL STEP**

**COMMENTS:**\_\_\_\_ **SAT**\_\_\_\_ **UNSAT****STOP TIME:**

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**Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)**

**Task**

- Task is to be performed in the classroom.

**Directions**

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

**Initial Conditions:**

- Unit 1 has experienced a small break LOCA with a safety injection.
- The Operating Team is attempting to place the Residual Heat Removal System in service, but they are unable to open 1-RH-MOV-1700 from the Main Control Room.
- You have been tasked with entering Containment and locally opening 1-RH-MOV-1700.
- Your allowable dose limit for this job is 1800 mr.
- General area radiation levels have been manually estimated based on installed radiation monitor readings.
- Survey maps of the Unit 1 Containment are available, showing dose rates and one way travel time to reach the valve via the chosen route.
- Health Physics personnel are currently unavailable to provide assistance for dose determination.
- On the 3'6" elevation, travel time (one way) is all the way to 1-RH-MOV-1700. Calculate dose received on travel on the 3'6" based on pathway dose and not dose rate in loop room- time to walk across loop room floor to 1-RH-MOV-1700 is negligible.

**Initiating Cues**

You have been directed to determine:

2. The maximum time you will have to open 1-RH-MOV-1700 without exceeding your allowable dose.

**Operator Directions Handout  
(TO BE GIVEN TO APPLICANT)**

**Task**

- Task is to be performed in the classroom.

**Initial Conditions:**

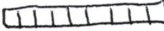
- Unit 1 has experienced a small break LOCA with a safety injection.
- The Operating Team is attempting to place the Residual Heat Removal System in service, but they are unable to open 1-RH-MOV-1700 from the Main Control Room.
- You have been tasked with entering Containment and locally opening 1-RH-MOV-1700.
- Your allowable dose limit for this job is 1800 mr.
- General area radiation levels have been manually estimated based on installed radiation monitor readings.
- Survey maps of the Unit 1 Containment are available, showing dose rates and one way travel time to reach the valve via the chosen route.
- Health Physics personnel are currently unavailable to provide assistance for dose determination.
- On the 3'6" elevation, travel time (one way) is all the way to 1-RH-MOV-1700. Calculate dose received on travel on the 3'6" based on pathway dose and not dose rate in loop room- time to walk across loop room floor to 1-RH-MOV-1700 is negligible.

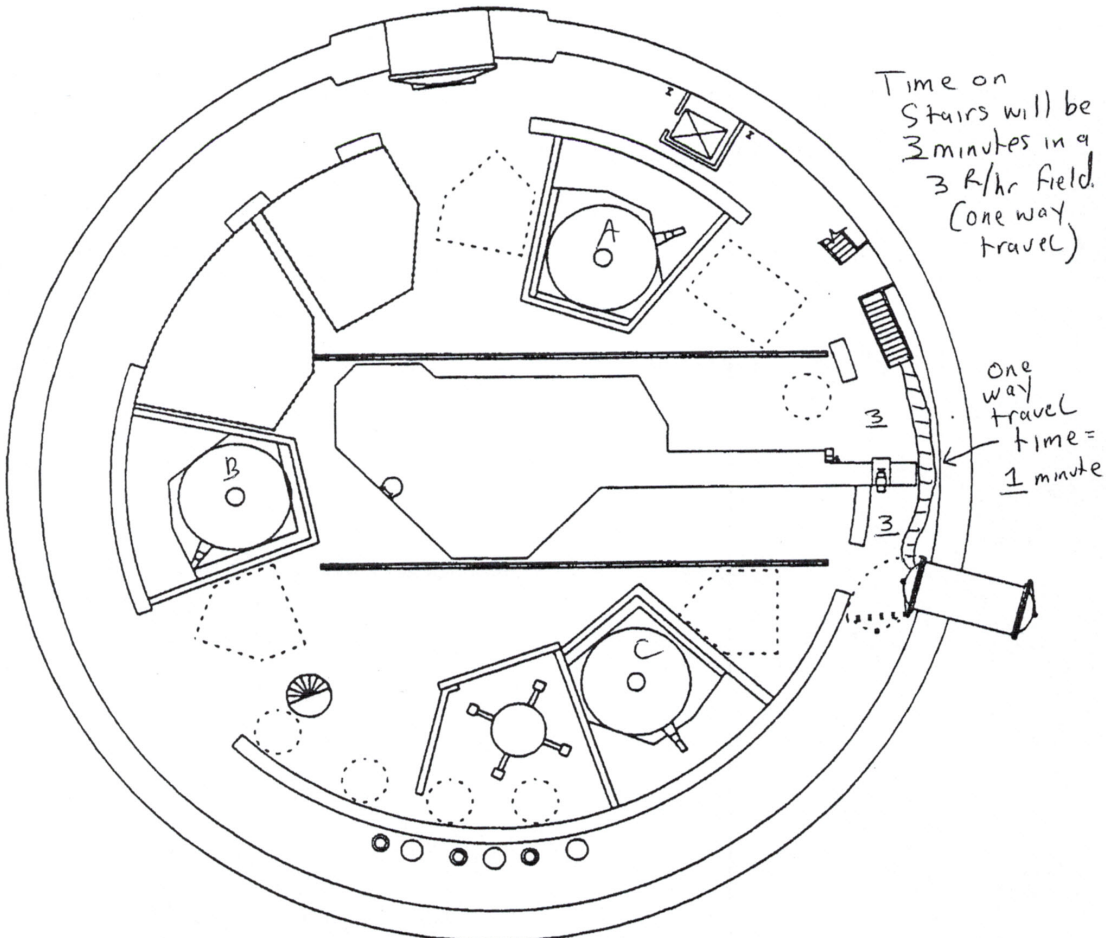
**Initiating Cues**

You have been directed to determine:

1. The maximum time you will have to open 1-RH-MOV-1700 without exceeding your allowable dose.

ATTACHMENT B  
(Page 1 of 1)

Report Number <b>100</b>	Location/Description <b>Unit 1 Containment 47' Elevation</b>		Reactor Power Unit(s) <b>Unit 1 1SD% Unit 2 100%</b>	
Purpose: <input type="checkbox"/> Routine <input checked="" type="checkbox"/> Special <input type="checkbox"/> RWP	Type: Radiation <input checked="" type="checkbox"/> Gamma <input type="checkbox"/> Beta <input type="checkbox"/> Neutron	Contamination <input type="checkbox"/> GA <input type="checkbox"/> LA <input type="checkbox"/> DRP		Air Sample <input type="checkbox"/> GA <input type="checkbox"/> WS <input type="checkbox"/> BZ
Instrument Model <b>Installed</b>	Serial # <b>N/A</b>	<input type="checkbox"/> All GA Smears < 1000 dpm/100cm <sup>2</sup> <input type="checkbox"/> All GA Smears < 20 dpm/100cm <sup>2</sup> Alpha <input type="checkbox"/> All LA Smears < 1000 dpm/LAS		<input type="checkbox"/> Air Sample Results ____ %DAC <input type="checkbox"/> No DRP Detected <input checked="" type="checkbox"/> All Gamma readings in mr/hr unless noted on map
Radiation monitors throughout containment	Comments: General area based on Containment Radiation Monitors. 1000mr=1R  Denotes Travel Path			
Surveyed By (Print/Signature)	Date <b>Today</b>	Time <b>Now</b>	Reviewed By (Print/Signature)	Date



\* All measurements in R/hr

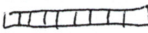
RA = Radiation Area	CA = Contaminated Area	LDWA = Low Dose Waiting Area
HRA = High Radiation Area	RCA = Radiological Control Area	HPA = Hot Particle Area
LHRA = Locked High Radiation Area	ARA = Airborne Radioactivity Area	NEA = Neutron Exposure Area
VHRA = Very High Radiation Area	RMA = Radioactive Material(s) Area	DRP = Discrete Radioactive Particle
① = Smear Location    Δ = A/S Location    # = G/A Dose Rate    #* = Contact Dose Rate    -X-X-X- = Radiological Boundary		

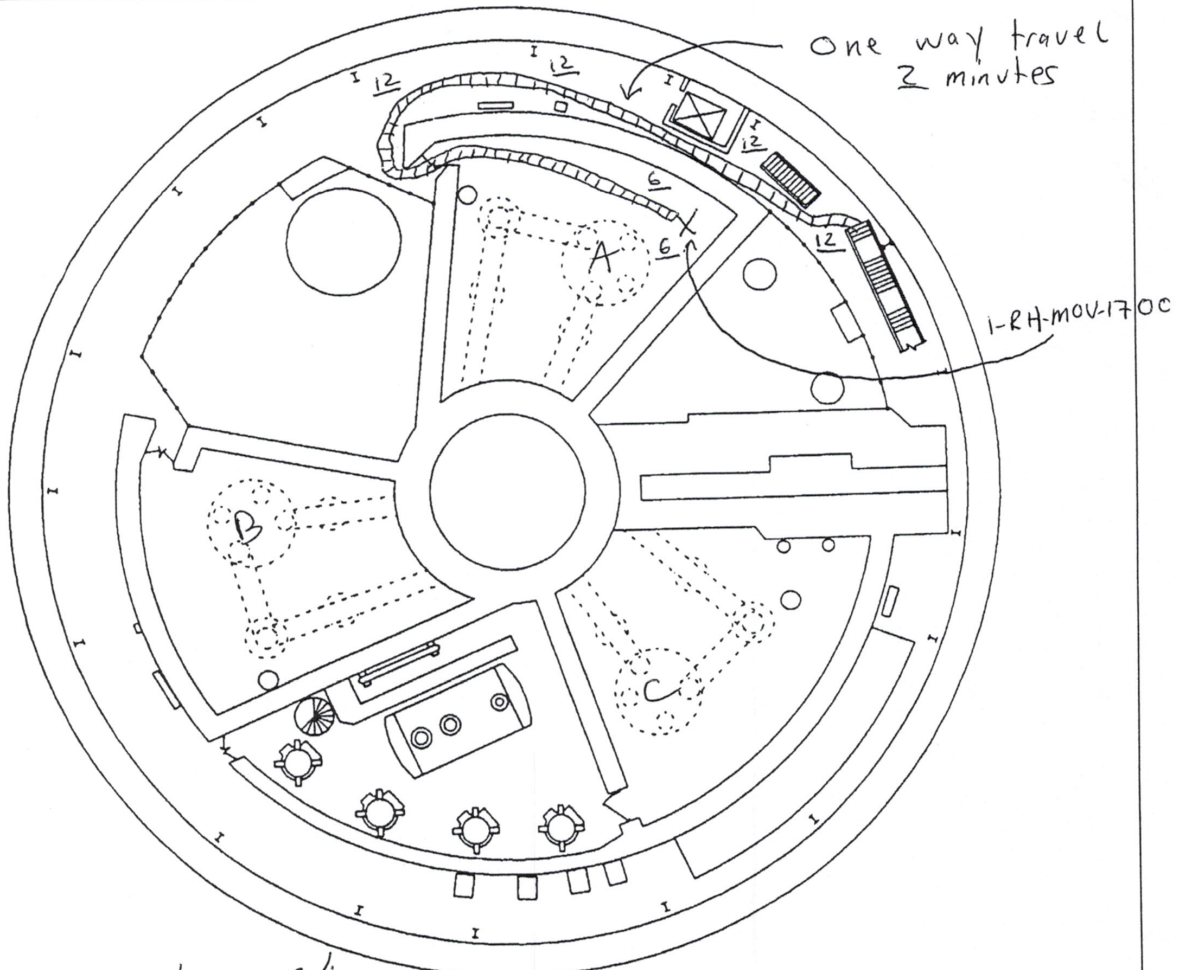
DOMINION

Stairway Pathway

RP-AA-221  
Revision 0  
Page 13 of 13

ATTACHMENT B  
(Page 1 of 1)

Map Number <b>150</b>	Location/Description <b>Unit One Containment -3'6" Elevation</b>		Reactor Power Unit(s) <b>Unit 1 ISD% Unit 2 100%</b>	
Purpose: <input type="checkbox"/> Routine <input checked="" type="checkbox"/> Special <input type="checkbox"/> RWP	Type: Radiation <input checked="" type="checkbox"/> Gamma <input type="checkbox"/> Beta <input type="checkbox"/> Neutron	Contamination <input type="checkbox"/> GA <input type="checkbox"/> LA <input type="checkbox"/> DRP		Air Sample <input type="checkbox"/> GA <input type="checkbox"/> WS <input type="checkbox"/> BZ
Instrument Model	Serial #	<input type="checkbox"/> All GA Smears < 1000 dpm/100cm <sup>2</sup> <input type="checkbox"/> All GA Smears < 20 dpm/100cm <sup>2</sup> Alpha <input type="checkbox"/> All LA Smears < 1000 dpm/LAS		<input type="checkbox"/> Air Sample Results ____%DAC <input type="checkbox"/> No DRP Detected <input checked="" type="checkbox"/> All Gamma readings in mr/hr unless noted on map
Installed Rad		Comments: General area based on Containment Radiation Monitors. 1000mr=1R		
Monitors		 Denotes Travel Path		
throughout				
Containment				
Surveyed By (Print/Signature)	Date Today	Time Now	Reviewed By (Print/Signature)	Date



\* All measurements in R/hr

A = Radiation Area HRA = High Radiation Area LHRA = Locked High Radiation Area VHRA = Very High Radiation Area	CA = Contaminated Area RCA = Radiological Control Area ARA = Airborne Radioactivity Area RMA = Radioactive Material(s) Area	LDWA = Low Dose Waiting Area HPA = Hot Particle Area NEA = Neutron Exposure Area DRP = Discrete Radioactive Particle
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① = Smear Location    Δ = A/S Location    # = G/A Dose Rate    #\* = Contact Dose Rate    -X-X-X- = Radiological Boundary

U.S. Nuclear Regulatory Commission  
Surry Power Station

SR2014301

**Administrative** Job Performance Measure G 2.4.39 (RO 3.8 / SRO 3.7)

Applicant \_\_\_\_\_

Start Time \_\_\_\_\_

Examiner \_\_\_\_\_

Date \_\_\_\_\_

Stop Time \_\_\_\_\_

**Title****Obtain Required information in accordance with EPIP-2.01, Notification of State and Local Governments.****K/A: G2.4.39 – Knowledge of RO responsibilities in emergency plan implementation.****Applicability****Estimated Time****Actual Time**

RO/SRO

12 Minutes

**Conditions**

- Task may be PERFORMED in classroom or Simulator.
- A simulated GENERAL EMERGENCY is in progress.

**Standards**

- Determines Meteorological data in accordance with EPIP-2.01, Notification of State and Local Governments.

**Initiating Cues**

- Nuclear Shift Manager direction.

**Terminating Cues**

- EPIP-2.01 steps 16-21 complete.

**Procedures**

- EPIP-2.01, Revision 43

**Tools and Equipment**

- None

**Safety Considerations**

- None



**Initial Conditions**

- You are an extra Reactor Operator assisting the shift.
- A General Emergency was declared one-half hour ago due to a LBLOCA.
- Initial Notifications to the State and Local governments were made on time.
- Initial Notification to the NRC was also made on time.
- PCS is inoperable.
- The Corporate Emergency Response Center reports that their link to our MET tower is inoperable.

**Initiating Cues**

- I am the Nuclear Shift Manager and you are the RO / BOP. You are to acquire the following MET data in accordance with EPIP-2.01 and give that information to the State and Local Emergency Communicator.
  - 1) Temperature
  - 2) Average Wind Direction
  - 3) Wind Speed
  - 4) Stability class

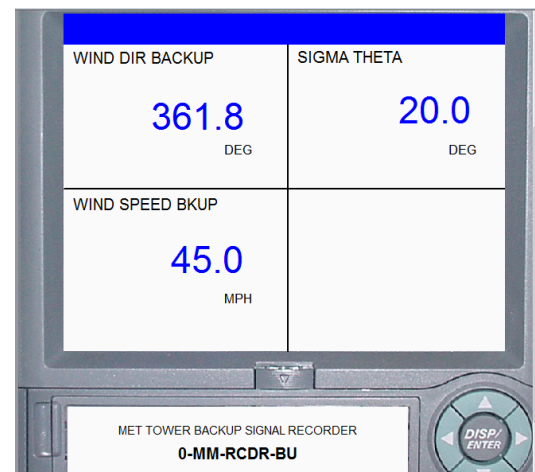
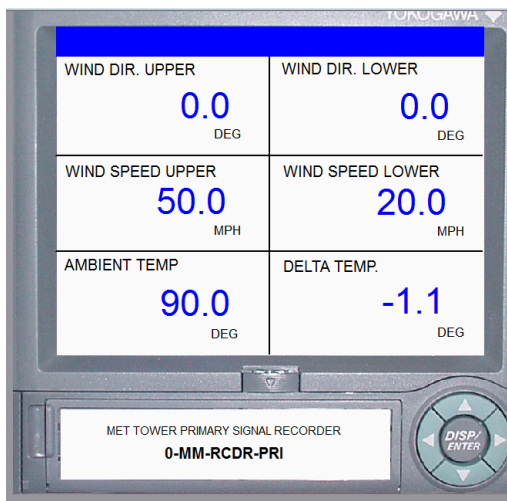
**Notes**

**PERFORMANCE CHECKLIST****Simulator Set-up**

- Enter the following Meter Overrides for MET PANEL

Recorder Name	Variable Name	Initial Value	Final Value	Recorder Reading
Wind Dir Upper	MET_WIND_DIR_UPR	0.6111111	0	0°
Wind Dir Lower	MET_WIND_DIR_LWR	0.6111111	0	0°
Wind Speed Upper	MET_WIND_SPD_UPR	0.23	0.5	50 mph
Wind Speed Lower	MET_WIND_SPD_LWR	0.23	0.2	20 mph
Ambient Temp.	MET_TEMP	0.651852	0.763	90 °F
Delta Temp	MET_DELTAT	1.0	0.22	-1.1
Wind Dir Backup	MET_WIND_DIR_BKP	0.6111111	0.67	361.8 °F
Wind Spd Backup	MET_WIND_SPD_BKP	0.23	0.45	45 mph
Sigma Theta	MET_WIND- MET_SIGMA_THETA	0.28	0.4	20°

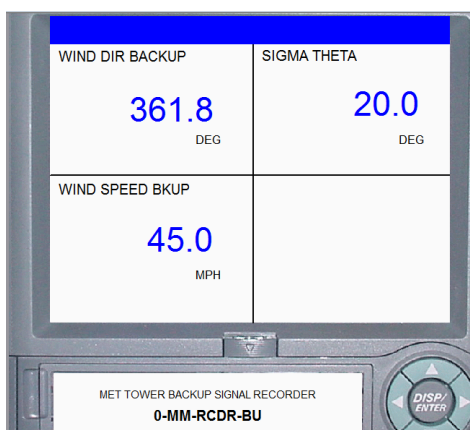
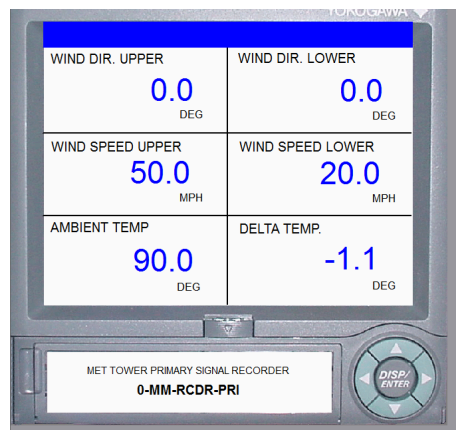
When complete the Recorders should look as shown below.



**Notes to the Evaluator.**

- Task critical elements are bolded and denoted by an asterisk (\*).
- **START TIME:** \_\_\_\_\_.

<p><b>STEP 1:</b></p> <p>Determines EPIP-2.01 steps 16 provides procedural guidance for obtaining MET data.</p> <p><b>STANDARD:</b></p> <p>a) Continuous Action Page directs RO to go to step 16.</p> <p><b>EVALUATOR'S NOTE:</b></p> <p>Candidate can also identify step 16 by review of procedure.</p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>STEP 2:</b></p> <p>Notes: <i>(Prior to Step 16)</i></p> <ul style="list-style-type: none"> <li>• Data may be obtained from MET panel charts, PCS, the computer modem or local data logger (Described in 0-AP-20.03, LOSS OF METEOROLOGICAL MONITORING INSTRUMENTATION).</li> <li>• Both the PCS EMCOMM feature and PCS Point Group #39, contains meteorological information averaged over the previous 15 minutes</li> </ul> <p><b>STANDARD:</b></p> <p>a) Reads and acknowledges the Notes.</p> <p><b>EVALUATOR'S NOTE:</b></p> <p><b>If asked:</b> PCS is inoperable, you are to use the MET Data Recorder.</p> <p><b>COMMENTS:</b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>



**STEP 3:**

Check ON-SITE METEOROLOGICAL INFORMATION - AVAILABLE. (Step 16)

**STANDARD:**

- a) Determines that METEOROLOGICAL INFORMATION is available.
- b) Initials Step 16.

**EVALUATOR'S NOTE:**

If asked: MET information is available on site.

**COMMENTS:**

\_\_\_\_\_ SAT  
\_\_\_\_\_ UNSAT

**STEP 4:**

Get current on-site meteorological information as requested. (Step 17)

- ☐ a) Refer to specified step(s) to acquire requested information:

Temperature	Step 18
Wind Speed	Step 19
Wind Direction	Step 20
Stability Class	Step 21

**STANDARD:**

- a) Candidate may obtain the information in any order.
- b) Initials Step 17.

**COMMENTS:**

\_\_\_\_\_ SAT  
\_\_\_\_\_ UNSAT

<p><b>STEP 5:</b></p> <p>Get Temperature from Main Tower Temperature Indicator. (<i>Step 18</i>)</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>a) Determines from MET Tower Primary Signal Recorder that Temperature is 90 °F.</li> <li>b) Records Temperature 90.0 °F on data sheet.</li> <li>c) Initials Step 18.</li> </ul> <p><b>EVALUATOR'S NOTE:</b></p> <p>Data sheet is provided to record indications, but candidate can write value on other paper.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>STEP 6:</b></p> <p>Notes: (Prior to Step 19)</p> <ul style="list-style-type: none"> <li>• Primary source of wind speed is the Main Tower Lower Level indicator. Alternate sources are (1) Backup Tower, and (2) Main Tower Upper Level.</li> <li>• The Dose Assessment Team may direct the use of meteorological data from the Main Tower Upper Level, based on the nature of the release.</li> </ul> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>a) Acknowledges Notes.</li> </ul> <p><b>EVALUATOR'S NOTE:</b></p> <p><b>If asked:</b> The Dose Assessment Team has not made any requests.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

<p><b>STEP 7:</b></p> <p>GET WIND SPEED (<i>Step 19</i>)</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"><li>a) Determines from MET Tower Primary Signal Recorder that Wind Speed is 20mph.</li><li>b) Records Wind Speed 20.0 mph on data sheet.</li><li>c) Initials Step 19</li></ul> <p><b>EVALUATOR'S NOTE:</b></p> <ul style="list-style-type: none"><li>• Note prior to Step 19 identifies the correct source for Wind Speed.</li><li>• Data sheet is provided to record indications, but candidate can write value on other paper</li></ul> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>STEP 7:</b></p> <p>Notes: (<i>Prior to Step 20</i>)</p> <ul style="list-style-type: none"><li>• An approximate average wind direction for the previous 15 minutes should be determined.</li><li>• Primary source of wind direction is the Main Tower Lower Level indicator. Alternate sources are (1) Backup Tower, and (2) Main Tower Upper Level.</li></ul> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"><li>a) Candidate reads and acknowledges Notes.</li></ul> <p><b>EVALUATOR'S NOTE:</b></p> <p><b>If asked:</b> Time Compression: 15 minutes has been met.</p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

<p><b>STEP 8:</b></p> <p>GET AVERAGE WIND DIRECTION FROM PCS. (<i>Step 20</i>)</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>a) Determines PCS is NOT Available.</li> <li>b) Performs RNO gets Average Wind Direction from MET Recorder.</li> <li>c) Records Wind Direction 0.0 reading on data sheet.</li> <li>c) Initials step.</li> </ul> <p><b>EVALUATOR'S NOTE:</b></p> <ul style="list-style-type: none"> <li>• Note prior to Step 20 identifies Primary source and Alternate source.</li> <li>• Data sheet is provided to record indications, but candidate can write value on other paper.</li> </ul> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>STEP 9:</b></p> <p>Notes: (<i>Prior to Step 21</i>)</p> <ul style="list-style-type: none"> <li>• Main Tower Delta T is the preferred source of stability class. Sigma Theta (Backup Tower) is the secondary source.</li> <li>• The value closer to "G" should be used if unable to distinguish Delta T or Sigma Theta value.</li> <li>• Numerical ranges presented below for Delta T and Sigma Theta are less than the range of the chart recorder and indicator in the Control Room. Indications are not expected to read outside the ranges found on these tables.</li> </ul> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>a) Candidate reads and acknowledges Notes.</li> </ul> <p><b>EVALUATOR'S NOTE:</b></p> <p><b>COMMENTS:</b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

**STEP 10:**

DETERMINE STABILITY CLASS. (Step 21)

STABILITY CLASS	CONTROL ROOM MAIN TOWER DELTA T (°F)	SIGMA THETA (°)
A (most unstable)	$\leq -1.20$	$\geq 22.5$
B	-1.19 to -1.08	22.4 to 17.5
C	-1.07 to -0.95	17.4 to 12.5
D	-0.94 to -0.32	12.4 to 7.5
E	-0.31 to +0.95	7.4 to 3.8
F	+0.96 to +2.54	3.7 to 2.1
G (most stable)	$> +2.54$	$< 2.1$

**STANDARD:**

- Candidate determines Stability class using Delta T. Delta T is -1.1 °F from MET Tower Primary Recorder.
- Records Stability Class B on data sheet.
- Initials Step.

**EVALUATOR'S NOTE:**

- Note prior to step 21 identifies the correct column (Delta T) to use.
- Data sheet is provided to record indications, but candidate can write value on other paper.

**COMMENTS:**

\_\_\_\_\_ SAT

\_\_\_\_\_ UNSAT



**STEP 11:**

Provides MET data to Emergency Communicator.

Temperature	90.0 °F
Wind Speed	20.0 mph
Wind Direction	0.0
Stability Class	B

**STANDARD:**

- a) \* Provides MET Data as shown above. This is a critical step.

**EVALUATOR'S NOTE:**

Accept data as Emergency Communicator

**COMMENTS:**

**\*\* JPM COMPLETE \*\***

\_\_\_\_\_ **SAT**

\_\_\_\_\_ **UNSAT**

**STOP TIME:** \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)**

**Directions**

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

**Initial Conditions**

- You are an extra Reactor Operator assisting the shift.
- A General Emergency was declared one-half hour ago due to a LBLOCA.
- Initial Notifications to the State and Local governments were made on time.
- Initial Notification to the NRC was also made on time.
- PCS is inoperable.
- The Corporate Emergency Response Center reports that their link to our MET tower is inoperable.

**Initiating Cues**

- I am the Nuclear Shift Manager and you are the RO / BOP. You are to acquire the following MET data in accordance with EPIP-2.01 and give that information to the State and Local Emergency Communicator.
  - 1) Temperature
  - 2) Average Wind Direction
  - 3) Wind Speed
  - 4) Stability class

**Operator Directions Handout  
(TO BE GIVEN TO APPLICANT)**

**Initial Conditions**

- You are an extra Reactor Operator assisting the shift.
- A General Emergency was declared one-half hour ago due to a LBLOCA.
- Initial Notifications to the State and Local governments were made on time.
- Initial Notification to the NRC was also made on time.
- PCS is inoperable.
- The Corporate Emergency Response Center reports that their link to our MET tower is inoperable.

**Initiating Cues**

- I am the Nuclear Shift Manager and you are the RO / BOP. You are to acquire the following MET data in accordance with EPIP-2.01 and give that information to the State and Local Emergency Communicator.
    - 1) Temperature
    - 2) Average Wind Direction
    - 3) Wind Speed
    - 4) Stability class
- 

Data Sheet

Temperature	
Wind Speed	
Wind Direction	
Stability Class	

U.S. Nuclear Regulatory Commission  
Surry Power Station

SR2014301

**Administrative** Job Performance Measure 2.4.41(RO 2.9 / SRO 3.7)

Applicant\_\_\_\_\_

Start Time\_\_\_\_\_

Examiner\_\_\_\_\_

Date\_\_\_\_\_

Stop Time\_\_\_\_\_

**Title****CLASSIFY AN EVENT AND DETERMINE THE REQUIRED PAR ACTIONS****K/A: G2.4.41 – Knowledge of the emergency action level thresholds and classifications. (2.9/4.6)****Applicability****Est Completion Time****Actual Time**

SRO ONLY

20 Minutes (**Portions \*\*TC\*\***)

\_\_\_\_\_

**Conditions**

- Task is to be PERFORMED in the SIMULATOR or CLASSROOM.
- A simulated GENERAL EMERGENCY is in progress.

**Standards**

- Evaluate a given set of plant conditions and determine that a 'General Emergency' exists in accordance with EPIP-1.01 and the EAL table, and then determine that the appropriate PAR for that 'General Emergency' is PAR 'B'.

**Initiating Cues**

- Significant event notification.
- EPIP-1.01, Emergency Manager Controlling Procedure.

**Terminating Cues**

- EPIP-1.06, Step 8 Completed.

**Procedures**

- EPIP-1.01, Emergency Manager Controlling Procedure, Revision 56.
- EPIP-1.06, Protective Action Recommendations, Revision 10.

**Tools and Equipment**

- None

**Safety Considerations**

- None

**MAKE SURE YOU PROVIDE THE CORRECT CUE SHEET (PAGE 1, LAST PAGE OF THIS JPM) FOR THE PORTION OF THE TASK TO BE PERFORMED!!!!**

### **Initial Conditions**

- You are the Nuclear Shift Manager. An event is in progress with plant conditions as follows:
- The station has experienced a loss of offsite power due to grid collapse. The system operator reports 16 hours for power restoration to Surry's switchyard.
- Both units are currently at Hot Shutdown.
- When attempting to load the AAC diesel on the 1J bus, the 1J bus faulted and electricians have determined that extensive damage has occurred to the buswork with repairs estimated to take 4 days.
- #1 EDG tripped on overspeed during start-up. Mechanics reset the overspeed, and when started, the diesel experienced extremely high vibrations and casing penetration by a piston, and was subsequently tripped locally.
- All radiation monitors indicate pre-event radiation levels.
- Unit 1 team is currently performing the actions of ECA-0.0, Loss of All AC power.
- Unit 2 team is completing the actions of ES-0.1, Reactor Trip Response.

### **Initiating Cues**

- Here is a copy of EPIP 1.01, you are directed to classify this event in accordance with EPIP-1.01 and inform me of your classification as soon as it has been made.
- **This portion of the JPM is TIME CRITICAL.**

**Performance Checklist**

**Notes to the Evaluator.**

- Task critical elements are denoted by an asterisk (\*). If substeps of a critical element also have an asterisk (\*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 1 before 3.
- **START TIME:** \_\_\_\_\_

<p><b><i>Evaluator's note- candidate may choose to make EAL classification straight from EAL tables and NOT implement steps of EPIP-1.01. Steps are given here as guidance. Critical task time ends when classification determined regardless of determination method.</i></b></p> <p>Caution and Note prior to step 1.</p> <p><b>CAUTION:</b> Declaration of the highest emergency class for which an Emergency Action Level is exceeded shall be made.</p> <p><b>NOTE:</b> The PCS is potentially unreliable in the event of an earthquake. Therefore, PCS parameters should be evaluated for accuracy should an earthquake occur.</p> <p><b><u>Standards</u></b></p> <p>(a) Acknowledges CAUTION and NOTE</p> <p><b><u>Evaluator's Note</u></b></p> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
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**EAL STEP 1:****EVALUATE EMERGENCY ACTION LEVELS:**

- a) Determine event category using the applicable Emergency Action Level Matrix:
  - Hot Conditions (RCS > 200 °F)
  - Cold Conditions (RCS ≤ 200 °F)
- b) Review EAL associated with event category
- c) Use Control Room monitors, PCS, and outside reports to get indications of emergency conditions listed in the EAL Matrix
- d) Verify EAL - CURRENTLY EXCEEDED
- e) Initiate a chronological log of events

**Standards**

- (a) Refers to the HOT chart
- (b) Determines event category to be Loss of Power.
- (c) Refers to given conditions to determine EAL applicability
- (d) DETERMINES EAL SG1.1 GENERAL EMERGENCY to be met.**
- (e) Initiates (or verbalizes) a chronological log of events.

**Evaluator's Note: If candidate makes EAL determination at this step, record stop time.**

**Evaluator's Comments**

**STOP TIME: \_\_\_\_\_**

**TIME CRITICAL- 15 minutes**

\_\_\_\_\_ **SAT**

\_\_\_\_\_ **UNSAT**

<p><b>EAL Step 2:</b></p> <p>RECORD EAL IDENTIFIER, TIME EMERGENCY DECLARED AND SM/SEM NAME.</p> <p><u>Standards</u></p> <p>(a) Determines that event is a General Emergency based on EAL SG1.1 (Loss of all offsite and onsite power to Unit 1 Emergency Busses H and J- This is a critical step.</p> <p>(b) Classifies event as a GENERAL EMERGENCY- This is a critical step.</p> <p><u>Evaluator's Note: If candidate makes EAL determination at this step, record stop time.</u></p> <p><u>Evaluator's Comments</u> STOP TIME: _____</p> <p><u>TIME CRITIAL- 15 minutes</u></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>EAL Step 3:</b></p> <p>ANNOUNCE THE FOLLOWING DECLARATIONS:</p> <ul style="list-style-type: none"> <li>• Station Emergency Manager position</li> <li>• Emergency Classification</li> <li>• EAL</li> <li>• Time Declared</li> </ul> <p><u>Standards</u></p> <p>(a) Makes announcement</p> <p><u>Evaluator's Note</u></p> <p><i>If candidate makes incorrect classification end the JPM at this point.</i></p> <p><u>Evaluator's Comments</u></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>



**EVALUATOR: Take EPIP-1.01 into your possession at this time.  
HANDOUT PAGE 2 of OPERATOR INSTRUCTIONS AT THIS TIME.**

**Initial Conditions**

- A simulated GENERAL EMERGENCY is in progress.
- You are the Nuclear Shift Manager. A GENERAL EMERGENCY has been declared on SG1.1.
- EPIP-1.05, Response to General Emergency, Step 3 has been completed.
- The State and Local Communicator has determined wind direction to be (from) 180° and speed to be 17 mph.
- There are no known impediments making evacuation dangerous.
- A dose assessment has not been made.
- All available radiation monitors indicate pre-event trends.

**Initiating Cues**

- Here's a copy of EPIP-1.06, Protective Action Recommendations. You are to **complete** EPIP-1.06, Protective Action Recommendations in its entirety.
- When you finish the actions necessary to accomplish this, please inform me.
- **This portion of the JPM is TIME CRITICAL.**

**Notes to the Evaluator.**

- **TIME CRITICAL REQUIREMENT:**  
This PAR must be identified and relayed to S&L communicators within 15 minutes.
- **START TIME:** \_\_\_\_\_

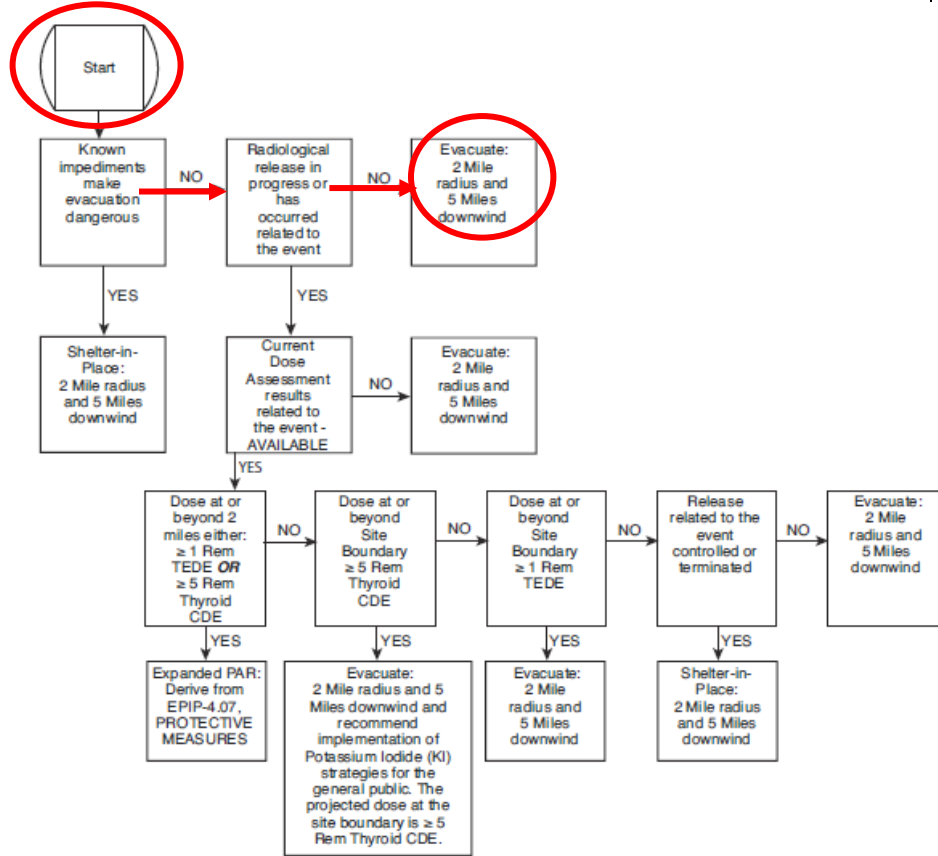
<p><b>PAR Step 1:</b></p> <p>Procedure Step 1</p> <p>INITIATE PROCEDURE.</p> <p><b><u>Standards</u></b></p> <p>Fills in Name, Time and Date on Step 1.</p> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>PAR Step 2:</b></p> <p>Procedure Step 1</p> <p>USE ATTACHMENT 1, PROTECTIVE ACTION RECOMMENDATION MATRIX, TO DETERMINE INITIAL PAR</p> <p><b><u>Standards</u></b></p> <p>(a) Goes to Attachment 1.</p> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

<p><b>PAR Step 3:</b></p> <p>Attachment 1 – Flowchart block 1-</p> <p>Known impediments make evacuation dangerous.</p> <p><b><u>Standards</u></b></p> <p>- Determines there are no known impediments that make evacuation dangerous.</p> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>PAR Step 4:</b></p> <p>Attachment 1 – Flowchart block 2-</p> <p>Radiological release in progress or has occurred related to the event. (YES or NO).</p> <p><b><u>Standards</u></b></p> <p>- Determines that no radiological release in progress.</p> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>

**PAR Step 5:**

Attachment 1 – Flowchart-

Evacuate 2 miles radius and 5 miles downwind.



Graphics No: NB214

**Standards**

Determines that PAR B is required- This is a critical step.

**Evaluator's Comments**

\_\_\_\_ SAT  
\_\_\_\_ UNSAT

<p><b>PAR Step 6</b>  <i>Evaluator's note – Candidate will now return to step 3 of the procedure (attachment 1 items complete)</i></p> <p>Notes prior to step 3-</p> <ul style="list-style-type: none"> <li>ATTACHMENT 2, AFFECTED SECTOR(S) MAP, is to be used for all PAR developments from this procedure. ATTACHMENT 2, AFFECTED SECOTR(S) MAP is not to be used for PARs developed IAW EPIP-4.07, PROTECTECTIVE MEASURES.</li> </ul> <p><b><u>Standards</u></b></p> <ul style="list-style-type: none"> <li>Acknowledges notes</li> </ul> <p><b><u>CUES</u></b></p> <ul style="list-style-type: none"> <li>None</li> </ul> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
<p><b>PAR Step 7</b></p> <p>Procedure Step 3</p> <p>IMPLEMENT ATTACHMENT 2, AFFECTED SECTOR(S) MAP:</p> <ol style="list-style-type: none"> <li>Record time wind data acquired.</li> <li>Record average wind direction from, in degrees and compass point.</li> <li>Record average wind speed in mph.</li> <li>Record affected sectors.</li> <li>Mark affected sectors on map (use any writing implement available, e.g., pen, pencil, highlighter etc.)</li> <li>GO TO Step 6</li> </ol> <p><b><u>Standards</u></b></p> <ul style="list-style-type: none"> <li>Completes attachment 2 as follows:</li> </ul> <p>* At (<b><u>now</u></b>) wind direction from <b><u>180° (S)</u></b>, Wind Speed <b><u>17 mph</u></b>, Sectors <b><u>RAB</u></b>.</p> <ul style="list-style-type: none"> <li>Using attachment 5 (as per the note), determines that affected sectors are R, A, B.</li> </ul> <p><b><u>CUES</u></b></p> <ul style="list-style-type: none"> <li><b>If asked:</b> Met data obtained at JPM start time.</li> </ul> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>

<p><b>PAR Step 8</b></p> <p>Procedure Step 6 COMPLETE ATTACHMENT 3, PROTECTIVE ACTION RECOMMENDATION FORM:</p> <p>a) Protective Action Recommendation:</p> <ol style="list-style-type: none"> <li>1) Mark appropriate PAR box(s)</li> <li>2) Record Mile radius and Miles downwind</li> <li>3) Record Downwind Sectors</li> </ol> <p>b) Remarks/Approval Information:</p> <ol style="list-style-type: none"> <li>1) Record Remarks (optional)</li> <li>2) Approve PAR (sign report)</li> <li>3) Record date and time report approved</li> </ol> <p><b><u>Standards</u></b></p> <ul style="list-style-type: none"> <li>- Completes item 1 of attachment 3 by marking EVACUATE <u>2</u> mile radius (360°) and <u>5</u> miles downwind in the following sectors <u>R, A, B</u> – this is a critical step.</li> <li>- Completes item 2 by signing and entering the current time and date.</li> </ul> <p><b><u>Evaluator's Note</u></b></p> <p>None</p> <p><b><u>CUES</u></b></p> <ul style="list-style-type: none"> <li>• If asked: None</li> </ul> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
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<p><b>PAR Step 9</b></p> <p>Procedure Step 7 - HAVE EMERGENCY COMMUNICATORS NOTIFY OFF-SITE AUTHORITIES OF PAR:</p> <ul style="list-style-type: none"> <li>- Virginia Emergency Operations Center notified IAW:             <ul style="list-style-type: none"> <li>▪ EPIP-1.06, PROTECTIVE ACTION RECOMMENDATIONS OR</li> <li>▪ EPIP-4.07, PROTECTIVE MEASURES</li> </ul> </li> <li>- NRC notified IAW EPIP-2.02, NOTIFICATION OF NRC (notification made from Control Room or TSC, when activated)</li> <li>- NRC notified IAW EPIP-4.33, HEALTH PHYSICS NETWORK COMMUNICATIONS (notifications made from TSC or LEOF/CEOF only after NRC requests HPN be established)</li> </ul> <p><b><u>Standards</u></b></p> <p>(a) <b>Directs State and Local EC to notify Virginia EOC - this is a critical step.</b></p> <p>(b) Directs NRC EC.</p> <p><b><u>CUES</u></b></p> <ul style="list-style-type: none"> <li>• <b>Tell SRO:</b> State and Local EC will transmit PAR to Virginia EOC.</li> <li>• <b>Tell SRO:</b> NRC EC will notify NRC of PAR.</li> <li>• <b>If asked:</b> HPN has not been requested yet.</li> </ul> <p><b><u>Evaluator's Note</u></b></p> <p><b>This step must be complete within 15 minutes of start of task.</b></p> <p><b>Record Time:</b> _____</p> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
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<p><b>PAR Step 10</b></p> <p>Procedure Step 8 -</p> <p>CHECK IF CURRENT PROTECTIVE ACTION RECOMMENDATION – INITIAL PAR.</p> <p><u><b>Standards</b></u></p> <p>Determines this is current PAR from</p> <p><u><b>CUES</b></u></p> <ul style="list-style-type: none"> <li>• <b>If Asked:</b> This is the initial PAR.</li> </ul> <p><u><b>Evaluator's Comments</b></u></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>PAR Step 11</b></p> <p>Procedure Step 9 -</p> <p>HAVE RADIOLOGICAL ASSESSMENT DIRECTOR (RAD) IMPLEMENT EPIP-4.07, PROTECTIVE MEASURES [RADIOLOGICAL ASSESSMENT COORDINATOR (RAC) IF IN LEOF/CEOF]</p> <p><u><b>Standards</b></u></p> <p>Tells Evaluator to Initiate EPIP-4.07.</p> <p><u><b>CUES</b></u></p> <ul style="list-style-type: none"> <li>• <b>Tell SRO:</b> EPIP-4.07 has been initiated.</li> </ul> <p><u><b>Evaluator's Comments</b></u></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>PAR Step 12</b></p> <p>CAUTION prior to step 10</p> <p><i>Previously issued Protective Action Recommendations should not be reduced until the threat is fully under control and after consulting with Commonwealth of Virginia emergency response organization</i></p> <p><u><b>Standards</b></u></p> <p>SRO Acknowledges the Caution.</p> <p><u><b>CUES</b></u></p> <p><u><b>Evaluator's Comments</b></u></p>	<p>_____ SAT</p> <p>_____ UNSAT</p>
<p><b>PAR Step 13</b></p> <p>NOTE prior to step 10</p>	<p>_____ SAT</p>

<p style="text-align: center;"><i>A "Shelter-in-Place" recommendation may supersede a "Radiological Evacuation" recommendation based on known impediments.</i></p> <p><b><u>Standards</u></b></p> <p>SRO Acknowledges the Note.</p> <p><b><u>CUES</u></b></p> <p><b><u>Evaluator's Comments</u></b></p>	<p>_____ <b>UNSAT</b></p>												
<p><b>PAR Step 14</b></p> <p>Procedure Step 10</p> <p>_____ 10 CHECK THE FOLLOWING:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 40%;"><u>IF:</u></th> <th style="width: 50%;"><u>THEN</u> do the following:</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Revised PAR provided by RAD/RAC IAW EPIP-4.07, PROTECTIVE MEASURES</td> <td>RETURN TO Step 4</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Average wind direction shifts to any new area(s) (refer to ATTACHMENT 2, AFFECTED SECTOR(S) MAP)</td> <td>RETURN TO Step 5</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>PAR in effect - UNCHANGED</td> <td>GO TO Step 11</td> </tr> </tbody> </table> <p><b><u>Standards</u></b></p> <p>(a) Determines that no conditions at this time necessitate a change to the current PAR.</p> <p><b><u>CUES</u></b></p> <ul style="list-style-type: none"> <li><b>asked:</b> HP does not recommend a radiological based PAR or implementation of Potassium Iodide strategies.</li> <li><b>asked:</b> Met data remains as previously reported.</li> </ul> <p><b><u>Evaluator's Comments</u></b></p>		<u>IF:</u>	<u>THEN</u> do the following:	<input type="checkbox"/>	Revised PAR provided by RAD/RAC IAW EPIP-4.07, PROTECTIVE MEASURES	RETURN TO Step 4	<input type="checkbox"/>	Average wind direction shifts to any new area(s) (refer to ATTACHMENT 2, AFFECTED SECTOR(S) MAP)	RETURN TO Step 5	<input type="checkbox"/>	PAR in effect - UNCHANGED	GO TO Step 11	<p>_____ <b>SAT</b></p> <p>_____ <b>UNSAT</b></p>
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<input type="checkbox"/>	PAR in effect - UNCHANGED	GO TO Step 11											



**PAR Step 15**

Procedure Step 11 - CHECK EMERGENCY - TERMINATED

**Standards**

- (a) Asks Evaluator if Emergency is terminated.
- (b) Asks Evaluator if RAD/RAC recommends a PAR change.
- (c) Determines Procedure is completed until conditions change.

**CUES**

- **If asked:** Emergency classification is still in effect.
- **If asked:** RAD/RAC does not recommend a PAR change at this time.

**Evaluator's Comments****STOP TIME:** \_\_\_\_\_\_\_\_\_\_ **SAT**\_\_\_\_\_ **UNSAT**

**KEY**

NUMBER EPIP-1.06	ATTACHMENT TITLE REPORT OF PROTECTIVE ACTION RECOMMENDATION	ATTACHMENT 3
REVISION 10		PAGE 1 of 1

PAR MESSAGE # \_\_\_\_\_

- NOTE:**
- Transmit to Virginia EOC only using the VEOC ARD.
  - IF VEOC ARD nonfunctional, THEN use VEOC autodial or direct dial (804) 674-2400 or (804) 310-8868.
  - IF all means of communications with VEOC nonfunctional, THEN use Insta-Phone.

This is Surry Power Station with a(n) ☐ Drill Message ☐ Emergency Message for Protective Action Recommendation. **Use the Report of Protective Action Recommendation form to copy this message.**

(READ SLOWLY)

**PROTECTIVE ACTION RECOMMENDATION:**

☐ SHELTER-IN-PLACE: \_\_\_\_ Mile radius 360° and \_\_\_\_ Miles downwind in the following sectors:

☒ EVACUATE: 2 Mile radius 360° and 5 Miles downwind in the following sectors:  
R, A, B

☐ BEYOND 10 MILE EPZ:

☐ Evacuate Area: \_\_\_\_ Centerline in degrees; \_\_\_\_ Distance in Miles; \_\_\_\_ Width in feet

☐ Shelter-in-place: \_\_\_\_ Centerline in degrees; \_\_\_\_ Distance in Miles; \_\_\_\_ Width in feet

☐ POTASSIUM IODIDE:

Recommend implementation of Potassium Iodide (KI) strategies for the general public.  
The projected dose at the site boundary is  $\geq 5$  Rem Thyroid CDE.

The time is \_\_\_\_\_ (24-hr time).

This is \_\_\_\_\_ / Emergency Communicator.

Message received by: Virginia EOC Watch Officer (name) \_\_\_\_\_.

This is Surry Power Station out at \_\_\_\_\_ (24-hr time) on \_\_\_\_\_ (date).

**REMARKS (OPTIONAL) / APPROVAL INFORMATION [DO NOT READ]**

**NOTE:** Shelter-in-Place may be recommended as a result of controlled releases, evacuation impediments or other known conditions which make evacuation dangerous.

REMARKS: \_\_\_\_\_

APPROVED BY: [Signature]  
Station Emergency Manager or Recovery Manager

Today / Now  
Date Time

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**PAGE 1****Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)****Directions**

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

**Initial Conditions**

- You are the Nuclear Shift Manager. An event is in progress with plant conditions as follows:
- The station has experienced a loss of offsite power due to grid collapse. The system operator reports 16 hours for power restoration to Surry's switchyard.
- Both units are currently at Hot Shutdown.
- When attempting to load the AAC diesel on the 1J bus, the 1J bus faulted and electricians have determined that extensive damage has occurred to the buswork with repairs estimated to take 4 days.
- #1 EDG tripped on overspeed during start-up. Mechanics reset the overspeed, and when started, the diesel experienced extremely high vibrations and casing penetration by a piston, and was subsequently tripped locally.
- All radiation monitors indicate pre-event radiation levels.
- Unit 1 team is currently performing the actions of ECA-0.0, Loss of All AC power.
- Unit 2 team is completing the actions of ES-0.1, Reactor Trip Response.

**Initiating Cues**

- Here is a copy of EPIP 1.01, you are directed to classify this event in accordance with EPIP-1.01 and inform me of your classification as soon as it has been made.
- **This portion of the JPM is TIME CRITICAL.**

**PAGE 2****Operator Directions Handout  
(TO BE READ TO APPLICANT BY EXAMINER)****Initial Conditions**

- A simulated GENERAL EMERGENCY is in progress.
- You are the Nuclear Shift Manager. A GENERAL EMERGENCY has been declared on SG1.1.
- EPIP-1.05, Response to General Emergency, Step 3 has been completed.
- The State and Local Communicator has determined wind direction to be (from) 180° and speed to be 17 mph.
- There are no known impediments making evacuation dangerous.
- A dose assessment has not been made.
- All available radiation monitors indicate pre-event trends.

**Initiating Cues**

- Here's a copy of EPIP-1.06, Protective Action Recommendations. You are to **complete** EPIP-1.06, Protective Action Recommendations in its entirety.
- When you finish the actions necessary to accomplish this, please inform me.
- **This portion of the JPM is TIME CRITICAL.**

**PAGE 2**  
**Operator Directions Handout**  
**(TO BE GIVEN TO APPLICANT)**

**Initial Conditions**

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**PAGE 1**  
**Operator Directions Handout**  
**(TO BE GIVEN TO APPLICANT)**

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