

Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-CEDM**

Task Title: **Respond to CEA(s) Misaligned by 8" or more**

Task Number: **202.007**

K/A Reference: **CRDS- K4.01. K4/03, 2.1.19, 2.1.20**

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:   √  

Classroom: \_\_\_\_\_ Simulator:   √   Plant: \_\_\_\_\_

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit 1 is at 80% power.**
- 2. An expeditious downpower was in progress. When Gp 5 CEAs were inserted, after ~ 1.5 inches of motion, CEA #35 slipped to its current position( ~ -8.5 inches). The CMI and secondary deviation alarms were received.**
- 3. The alarms currently in are:**
  - Secondary CEA Position Deviation  $\pm$  4"**
  - CEA Motion Inhibit**
- 4. The plant has been stabilized and CEDS is in OFF**

Initiating Cue:

**You are directed to respond to the alarms in accordance with plant procedures as the RO, and realign CEA # 35. The CRS has directed the CRO to maintain Tcold on program and initiate any boration required to maintain Rx power.**

Task Standard:

**Realign CEA # 35 and respond to associated alarms in accordance with Alarm manual for D-31, D-32, and AOP-1B section VIIA**

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the control room**

General References:

1.    **Alarm manual for 1C05**
2.    **OI-42**
3.    **AOP-1B**

Time Critical Task:

**No**

Validation Time:

**25 minutes**

Simulator Setup:

1. Reset the simulator IC-19 ( 80% MOC)
2. Insert Malfunction CEDS 0009 (35) One CEA , movement failure with slippage
3. Place CEDS in MS mode and go to “LOWER” on 1-HS-5502
4. CEA # 35 should pulse down ~ 1.5 inches then slips down another 8.5”
5. After 5 seconds place CEDs to OFF
6. Acknowledge alarms
7. Verify plant is stable ( effects of CEA # 35 moving 9.5 inches is negligible)
8. If necessary, adjust turbine load to stabilize Tcold
9. Freeze simulator

TIME START \_\_\_\_\_

_____	Locates Alarm Manual for 1C05	Same as element.
_____	Locates Alarm response for window D-31, and D-32.	Same as element

Examiner Note: Applicant may determine that realignment should be done in accordance with OI-42. CRS should say that realignment will be done per AOP 1-B, Section VIIA

CUE: Electric Shop has determined that the cause of the slippage was a defective power supply which has been replaced

_____	Attempt to realign the affected CEA(s):  Maintain Reactor Power as required by :	Determine that CRO will maintain power and NO action is necessary
	<ul style="list-style-type: none"> <li>Boration <b>PER</b> OI-2B, <u>CVCS BORATION, DILUTION AND MAKEUP OPERATIONS.</u></li> </ul>	
	<b>OR</b>	
	<ul style="list-style-type: none"> <li>Adjust Regulating CEAs.</li> </ul>	

_____*	Selects the desired group	Selects Group 5
_____*	Selects the desired CEA	Selects CEA 035
_____*	Select Manual Individual Mode	Selects Manual Individual Mode
_____*	IF CMI is in effect THEN override CMI as follows:	Determines CMI is in effect

**NOTE:** CMI will be bypassed to the affected group and applied to all other groups, and CMI bypass annunciation will alarm.

_____*	(1) Depress the Group Inhibit Bypass pushbutton.	Same as element.
_____*	(2) Depress and hold the Motion Inhibit Bypass pushbutton for at least 5 seconds before <b>AND</b> 5 seconds after CEA	Same as element.

motion.

**CAUTION:** Do NOT allow Reactor Power to rise above the power the unit was stabilized at in Section IV. PRELIMINARY, Step A.2, while the CEA is being realigned. Turbine load shall NOT be raised until the CEA is within its alignment requirements.

f. Realign the CEA:

(1) **IF** the CEA must be withdrawn, **THEN** withdraw the CEA using the "Pull and Wait" method:

- For shutdown CEA's, pull 3.75 inches and wait 10 seconds

Determines rates are not applicable.

- For regulating CEAs, pull 5.25 inches and wait 15 seconds.

Same as element using the CEA shim stick on 1C05. **(Pull no more than 6.75" on CEA #35 each time CEA is withdrawn).**

(2) **IF** the CEA must be inserted, **THEN** insert the CEA.

Determines step is N/A

**CUE ): When CEA # 35 is moved ~ 2.5 inches Alarm D-29 , Primary CEA Position Deviation + 4 inches, alarms**

Alarm 1C05, D-29, Primary CEA position Deviation  $\pm$  4 inches:

Stops CEA withdrawal acknowledge alarm

Reviews Alarm manual for D-29

Determines that Alarm is "Expected" for conditions.

\* Continues steps to align CEA # 35

- For regulating CEAs, pull 5.25 inches and wait 15 seconds.

Same as element using the CEA shim stick on 1C05. **(Pull no more than 6.75" on CEA #35 each time CEA is withdrawn).**

**CUE ): When CEA # 35 is moved ~ 4 inches Alarm D-30 , Primary CEA Position Deviation  $\pm$  8 inches, alarms**

Alarm 1C05, D-30, Primary CEA position Deviation  $\pm$  8 inches:

Stops CEA withdrawal acknowledge alarm

Reviews Alarm manual for D-30

Determines that Alarm is "Expected" for conditions.

\_\_\_\_\_ \* Continues steps to align CEA # 35

**CUE: Insert Malfunction to Stick CEA ,When Candidate attempts to move the CEA it will not move**

<p>_____ *</p>	<p>f.1 IF the CEA will NOT move, THEN determine if the CEA is untrippable with input from:</p> <ul style="list-style-type: none"> <li>• Electrical Maintenance</li> <li>• System Engineer</li> </ul>	<p>Determines that CEA will not move informs CRS</p>
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**CUE: Electric Maintenance has determined that the CEA is trippable**

<p>_____ *</p>	<p>f.2 IF the CEA is untrippable, THEN PROCEED to Section V., UNTRIPPABLE CEAs OR TWO OR MORE CEAs MISALIGNED BY GREATER THAN 15 INCHES, Page 18.</p>	<p>Determines that this step is N/A</p>
<p>_____</p>	<p>f.3 IF the CEA will NOT move due to an electrical or control system malfunction, THEN initiate a CR AND notify electrical maintenance to perform repairs.</p>	<p>Same as element</p>

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

**Examiner Note:** The task is complete when the applicant has determined the CEA cannot be moved but is trippable and has determined that a CR must be written. The evaluator will end the JPM

**Verification of Completion**Job Performance Measure Number: 2008-CEDM

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

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Applicant Response: \_\_\_\_\_

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\_\_\_\_\_

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

1. Unit 1 is at 80% power.
2. An expeditious downpower was in progress. When Gp 5 CEAs were inserted, after ~ 1.5 inches of motion, CEA #35 slipped to its current position( ~ -8.5 inches). The CMI and secondary deviation alarms were received.
3. The alarms currently in are:
  - Secondary CEA Position Deviation + 4"
  - CEA Motion Inhibit
4. The plant has been stabilized and CEDS is in OFF

INITIATING CUE:

You are directed to respond to the alarms in accordance with plant procedures as the RO, and realign CEA # 35. The CRS has directed the CRO to maintain Tcold on program and initiate any boration required to maintain Rx power.



Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-SDC-1**

Task Title: **Respond to a loss of RCS inventory while SDC is in use**

Task Number: 202.024

K/A Reference: **025AA1.02 (3.8, 3.9)**

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:   √  

Classroom: \_\_\_\_\_ Simulator:   √   Plant: \_\_\_\_\_

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit 1 is in Mode 5 for maintenance with the PZR manway removed.**
- 2. The RCS was being maintained at 38'.**
- 3. SDC was aligned for service and RCS temperature was 105 °F.**
- 4. The Reactor has been shutdown for 10 days.**
- 5. A leak has resulted in RCS level lowered to 36', and resulted in a loss of SDC.**
- 6. The running LPSI Pp has been secured due to cavitation and AOP-3B has been implemented.**
- 7. You are performing the duties of the Unit 1 CRO.**

Initiating Cue:

**The CRS has directed you to restore SDC per AOP-3B, Step V.E.**

Task Standard:

**This JPM is complete when RCS level has been restored. No further actions are required. The evaluator is expected to end the JPM.**

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the control room**

General References:

1.    **AOP-3B**

Time Critical Task:

**No**

Validation Time:

**20 minutes**

Simulator Setup:

1. Reset the simulator IC-4 (Shutdown RX Vessel – 37.4)
2. IC-4. Refueling cart available and connected for service.
3. Raise RCS level to 38' using LPSI suction from the RWT. Ensure suction valve is shut once level reached. Place a sticky over Refueling Level cart level indications with 36' indicated.
4. Ensure all 4 LPSI Header MOVs are throttled open to 800 gpm (with FIC-306 set point at 3400. Once MOVs are throttled, return FIC-306 set point to 3000 gpm.
5. Place both LPSI Pumps in PTL and allow temperature to rise to 105F

TIME START \_\_\_\_\_

\_\_\_\_\_ Locates and identifies AOP3B, Block Step VE Same as element.

**CUE: The CRS has directed you to perform block step IV E of AOP-3B**

\_\_\_\_\_ 1.Start CHG PPs as necessary to maintain .... Determines that charging pumps are not available

\_\_\_\_\_ \* 1.1 **IF** the CHG PPs can **NOT** maintain RCS  
RCS level. level,  
**THEN** restore level **PER ATTACHMENT (7),**  
**FILLING THE RCS.** Refers to attachment 7

Note: (HPSI PP fill, Containment Spray PP fill, and gravity fill) are arranged in order of priority.  
The method with the highest priority should be employed first, based on equipment availability.  
CUE: The CRS directs to us 11 HPSI pump for filling

\_\_\_\_\_ \* 1. Fill the RCS with a HPSI PP. Same as element

\_\_\_\_\_ \* a. Verify the MINI FLOW RETURN TO RWT ISOL  
valves are open: Same as element

- 1-SI-659-MOV
- 1-SI-660-MOV

\_\_\_\_\_ \* b. Place the SI PP RECIRC LOCKOUT  
handswitches in LOCKOUT. Same as element

- 1-HS-3659A
- 1-HS-3660A

CUE: CRS directs you to use 11 HPSI pump through the AUX Header

\_\_\_\_\_ \* c. **IF** 11 HPSI PP is to be used through the Main  
Header,  
**THEN** complete the following: Determines that this step is  
Not applicable

\_\_\_\_\_ \* d. **IF** 11 HPSI PP is to be used through the Aux  
Header,  
**THEN** complete the following: Determines that this step is  
applicable

\_\_\_\_\_ \* (1) Open 11 RWT OUT valve, 1-SI-4142-MOV. Same as element  
(2) Open HPSI AUX HDR ISOL valve, 1-SI-656-  
MOV.

\_\_\_\_\_ \* (3) Shut **EITHER** HPSI HDR XCONN valves:: Same as element

- 1-SI-653-MOV
- 1-SI-655-MOV

\_\_\_\_\_ \* (4) Verify the AUX HPSI HDR valves are shut: Same as element

- 1-SI-617-MOV
- 1-SI-627-MOV
- 1-SI-637-MOV
- 1-SI-647-MOV

\_\_\_\_\_ \* (5) Start 11 HPSI PP. Same as element

**CAUTION:** Do NOT exceed the following cooldown limits in any one hour:

- greater than 256°F 100°F/hr
- 106°F to 256°F 40°F/hr
- less than 106°F 35°F/hr

**CAUTION**

When RCS temperature is less than 365°F AND the RCS vent opening is less than 2.6 square inches, flow into the RCS is limited to less than 210 GPM unless a leak exists. If a leak exists, flow may exceed 210 GPM as long as pressure is maintained less than 380 PSIA (or 260 PSIA if the SDC Header Return Isolation valves, 1-SI-651-MOV and 1-SI-652-MOV, are open).

- |  |   |
|--|---|
| <p>_____ * (6) Throttle <b>ONE</b> AUX HPSI HDR valve to maintain flow between 150 and 200 GPM.</p> <ul style="list-style-type: none"> <li>• 1-SI-617-MOV</li> <li>• 1-SI-627-MOV</li> <li>• 1-SI-637-MOV</li> <li>• 1-SI-647-MOV</li> </ul> | <p>Same as element</p>  |
| <p>_____ * (7) <b>IF</b> a leak exists,<br/><b>THEN</b> perform the following actions as required:</p>   | <p>Determines that a leak exists</p>  |
| <p>_____ * Throttle the selected AUX HPSI HDR valve as necessary to maintain adequate level.</p>   | <p>MOVs should be jogged no more than 5 times within 2 minutes. Then allow at least 5 minutes before operating again.</p> |
| <p>_____ (a) Maintain RCS pressure less than 380 PSIA (260 PSIA if the SDC Header Return Isolation valves, 1-SI-651-MOV and 1-SI-652-MOV, are open)</p>  | <p>Same as element</p>  |
| <p>_____ <b>IF</b> the leak is suspected on the associated Header, <b>THEN</b> shut the selected AUX HPSI HDR valve <b>AND</b> choose another AUX HPSI HDR valve <b>PER</b> Step (6).</p>  | <p>Determines Not applicable</p>  |
| <p>_____ (8) <b>IF</b> performing Once-Through-Cooling, <b>THEN</b> return to the appropriate section of this AOP.</p>   | <p>Determines Not applicable</p>  |

**CUE :** Level is rising ( Remove sticky and inform candidate that level is rising and is at 38' feet, the leak has located and isolated, secure filling RCS

- |   |                        |
|---|------------------------|
| <p>_____ (9) <b>WHEN</b> filling is <b>NO</b> longer desired, <b>THEN</b> complete the following:</p>                 | <p>Same as element</p> |
| <p>_____ * (a) Stop 11 HPSI PP.</p>   | <p>Same as element</p> |
| <p>_____ (b) Shut the AUX HPSI HDR valve opened in Step 1.d.6.</p>  | <p>Same as element</p> |
| <p>_____ (c) <b>IF</b> HPSI HDR XCONN valve, 1-SI-655-MOV, was shut in Step 1.d.3, <b>THEN</b> open 1-SI-655-MOV.</p> | <p>Same as element</p> |

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

ELEMENT  
(\* = CRITICAL STEP)

STANDARD

Examiner Note: The JPM is complete when an increase in RCS level is noted and 11 HPSI is secured and MOV shut
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**Verification of Completion**Job Performance Measure Number: 2008-SDC

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

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Applicant Response:

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Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date:

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## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

1. Unit 1 is in Mode 5 for maintenance with the PZR manway removed.
2. The RCS was being maintained at 38'.
3. SDC was aligned for service and RCS temperature was 105 °F
4. The Reactor has been shutdown for 10 days.
5. A leak has resulted in RCS level lowered to 36', and resulted in a loss of SDC.
6. The running LPSI Pp has been secured due to cavitation and AOP-3B has been implemented.
7. You are performing the duties of the Unit 1 CRO.

INITIATING CUE:

The CRS has directed you to restore SDC per AOP-3B, Step V.E..

Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-PPCS**

Task Title: **Respond to a Pressurizer Spray Valve Failure**

Task Number: **064.036**

K/A Reference: **008-AA2.19**

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:   √  

Classroom: \_\_\_\_\_ Simulator:   √   Plant: \_\_\_\_\_

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit 1 is at 100% power.**
- 2. Pressurizer pressure channels indicate low pressurizer pressure**
- 3. Proportional heaters indicate maximum current**
- 4. All available backup heaters are energized**
- 5. The alarms currently in are:**
  - PZR PRESS CH 100**
  - RCP Seal Pressure Low**

Initiating Cue:

**You are directed to respond to the alarms in accordance with plant procedures as the RO.**

Task Standard:

**Respond to the alarms and abnormal conditions in accordance with Alarm manual and recommend tripping the reactor and securing 11A RCP**

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the control room**

General References:

1.    **Alarm manual for 1C06**

Time Critical Task:

**No**

Validation Time:

**10 minutes**

Simulator Setup:

1. Reset the simulator IC-24 ( 100% MOC)
2. Insert Malfunction RCS-016
3. Run the simulator for ~ 11 Minutes or until ANN PZR Press CH 100 Alarm
4. Pressurizer Pressure should be approximately 2125 PSIA
5. Acknowledge alarms
6. Freeze simulator

TIME START \_\_\_\_\_

- |       |   |                  |
|-------|---|------------------|
| _____ | Locates Alarm Manual for 1C06           | Same as element. |
| _____ | Locates Alarm response for window E-29, | Same as element  |

Examiner Note:     Applicant may refer to other alarms associated with the low pressurizer condition as well. Candidate may note spray valve open initially and attempt to close before referring to the Alarm Manual.

**Cue - Spray valve 1-RC-100E is open**

- |         |   |                              |
|---------|---|------------------------------|
| _____   | Notes that pressurizer pressure is LOW, and checks the possible causes:   | Same as element              |
| _____ * | 2. Perform the following:   | Identifies 1-RC-100E is Open |
|         | a. <b>CHECK</b> Pressurizer spray valves shut.  |                              |
| _____   | b. <b>CHECK</b> Pressurizer heaters energized.  | Same as element              |
| _____   | c. <b>IF</b> required,  |                              |
| _____   | <b>THEN PERFORM</b> any of the following:   |                              |
| _____   | <b>ENERGIZE</b> Pressurizer heaters   | Same as element              |
| _____   | <b>SHIFT</b> Pressurizer pressure control channels  | Determines not applicable    |
| _____ * | <b>THEN</b> attempt to <b>SHUT</b> Pressurizer spray valve by swapping 1-HS-100-8 to the opposite Pressurizer spray valve | Same as element              |

**Cue- Spray valve 1-RC-100E is still open**

- |         |   |                 |
|---------|---|-----------------|
| _____ * | SHUT Pressurizer spray valves using 1-HIC-100 in manual | Same as element |
|---------|---|-----------------|

**Cue- Spray valve 1-RC-100E is still open**

- |         |  |                 |
|---------|--|-----------------|
| _____ * | IF one Pressurizer spray valve has failed OPEN, THEN attempt to SHUT Pressurizer spray valve by swapping 1-HS-100-8 to the opposite Pressurizer spray valve. | Same as element |
|---------|--|-----------------|

**Cue- Spray valve 1-RC-100E is still open**

ELEMENT  
(\* = CRITICAL STEP)

STANDARD

_____*	IF Pressurizer spray valves can NOT be shut, THEN PERFORM the following:	Determines that 1-RC-100E cannot be shut.
_____*	(1) TRIP the reactor.	Same as element.
_____*	(2) IMPLEMENT Reactivity Control section of EOP-0, Post-Trip Immediate Actions.	Same as element
_____*	(3) STOP the RCP(s) associated with the open Pressurizer spray valve(s):  <ul style="list-style-type: none"><li>• 11A for 1-RC-100E-CV</li><li>• 11B for 1-RC-100F-CV</li></ul>	Secures 11 A RCP

Note: Candidate may recommend tripping 11B RCP as well.

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

Examiner Note:	The task is complete when the applicant has completed reactivity portion of the EOP-0 plaque and secured 11A RCP.
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**Verification of Completion**Job Performance Measure Number: 2008-PPCS

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

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Applicant Response: \_\_\_\_\_

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Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. Pressurizer pressure channels indicate low pressurizer pressure
3. Proportional heaters indicate maximum current
4. All available backup heaters are energized
5. The alarms currently in are:
  - PZR PRESS CH 100
  - RCP Seal Pressure Low

INITIATING CUE:

You are directed to respond to the alarms in accordance with plant procedures as the RO. Do you have any questions? You may begin.



Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-MFW**

Task Title: **Respond to a feedwater rupture at power**

Task Number: **202.035**

K/A Reference: **054- AA1.01**

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:   √  

Classroom: \_\_\_\_\_ Simulator:   √   Plant: \_\_\_\_\_

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

1. Unit 1 is at Mode 100% at NOP and NOT.
2. Due to a leak, the following alarms have come in over time on 1C03; C04 (Condensate Pumps Discharge Pressure Low), C16 (Condenser Hotwell Level), and C25 (SGFP Suction Pressure Low).
3. AOP-3G has been implemented. The reactor has just been tripped and the RO is performing reactivity control per EOP-0
4. You are performing the duties of the Unit 1 CRO.

Initiating Cue:

The CRS has directed you to perform AOP-3G, Block Step VIII.A. Are there any questions?

Task Standard:

This JPM is complete when the condensate system has been secured and auxiliary feedwater initiated per AOP-3G Step VIII.A.

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the control room**

General References:

1.    **Alarm manual for 1C03**
2.    **AOP 3G**

Time Critical Task:

**No**

Validation Time:

**10 minutes**

Simulator Setup:

- a. IC-18, U-1 at 100% Power. .
- b. Initiate malfunction CD008 at 10% condensate booster pump common discharge header rupture.
- c. Insert malfunction AFW005 for 13 AFW Pump breaker failure.
- d. Run Simulator until alarms C04, C16 and C25 are in alarm ( ~ 1 min.) and freeze.

**CCNPP LICENSED OPERATOR**  
**JOB PERFORMANCE MEASURE AOP-3G-9F**

ELEMENT

STANDARD

(\* = CRITICAL STEP)

TIME START \_\_\_\_\_

CUE:	Begin at Step VIII.A.1.
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- |       |  |  |
|-------|--|--|
| _____ | <b>1. IF</b> a rapid unexplained reduction or loss of Condensate or Feedwater header pressure occurs simultaneously with a lowering of Hotwell level, <b>OR</b> other indications of a rupture are observed, <b>THEN</b> with the approval of the SM/CRS, perform the following actions: | Determines step is applicable and starts performing the actions for a condensate header rupture at power |
|-------|--|--|

CUE:	The RO has tripped the reactor and is performing reactivity control.
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- |       |  |  |
|-------|--|--|
| _____ | a. Trip the Reactor                                | Determines this step is being performed by RO  |
| _____ | b. Perform the Reactivity control portion of EOP-0 | Determines this step is being performed by RO  |
| _____ | c. Trip both SGFPs.                                | Pushes the trip pushbuttons for 11 and 12 SGFPs and verifies SGFP speeds are lowering on the OCS or SGFP HICs. Verifies HP and LP stop valves for both SGFPs are closed. |

CUE:	When the handswitches for the Condensate and Booster pumps are operated they indicate stopped.
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- |       |   |   |
|-------|---|---|
| _____ | d. Secure the following pumps, and place their handswitches in PULL TO LOCK: <ul style="list-style-type: none"> <li>• Condensate Booster Pumps</li> <li>• Condensate Pumps</li> <li>• Heater Drain Pumps</li> </ul> | Places HS for all Condensate and Condensate Booster Pumps in PTL. |
|-------|---|---|

CUE: closed.	When the FW isolation valve handswitches are operated the valves indicate
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- |       |   |   |
|-------|---|---|
| _____ | e. Shut the SG FW ISOL valves: <ul style="list-style-type: none"> <li>• 1-FW-4516-MOV</li> <li>• 1-FW-4517-MOV</li> </ul> | Shuts FW MOVs using HS-4516 and HS-4517 |
|-------|---|---|

**CCNPP LICENSED OPERATOR**  
**JOB PERFORMANCE MEASURE AOP-3G-9F**

ELEMENT

STANDARD

(\* = CRITICAL STEP)

**CUE: When 13 AFW pump is attempted to be started it does not start**

____*	f. Start an AFW PP.	Recognizes that 13 AFW pump did not start
____*	b. Open the SG AFW STM SUPP & BYPASS valves: <ul style="list-style-type: none"> <li>▪ (11 SG) 1-MS-4070-CV</li> <li>▪ (11 SG) 1-MS-4070A-CV</li> <li>▪ (12 SG) 1-MS-4071-CV</li> <li>▪ (12 SG) 1-MS-4071A-CV</li> </ul>	Same as element

TIME STOP \_\_\_\_

TERMINATING CUE:	This JPM is complete when the condensate system has been secured and an AFW pump has been started initiated per AOP-3G. The evaluator is expected to end the JPM. No further actions are required.
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**Verification of Completion**Job Performance Measure Number: 2008-MFW

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

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Applicant Response: \_\_\_\_\_

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Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

## Initial Conditions:

1. Unit 1 is at Mode 100% at NOP and NOT.
2. Due to a leak, the following alarms have come in over time on 1C03; C04 (Condensate Pumps Discharge Pressure Low), C16 (Condenser Hotwell Level), and C25 (SGFP Suction Pressure Low).
3. AOP-3G has been implemented. The reactor has just been tripped and the RO is performing reactivity control per EOP-0
4. You are performing the duties of the Unit 1 CRO.

INITIATING CUE:

The CRS has directed you to perform AOP-3G, Block Step VIII.A. Are there any questions? You may begin

.

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Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-SDC-2**

Task Title: **Respond to a loss of Shutdown with the RCS open**

Task Number: 202.024

K/A Reference: **025AA1.02 (3.8, 3.9)**

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: √

Classroom: \_\_\_\_\_ Simulator: √ Plant: \_\_\_\_\_

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit 1 is in Mode 5 for maintenance with the PZR manway removed.**
- 2. The RCS was being maintained at 41.7'.**
- 3. SDC was aligned for service and RCS temperature was 115 °F.**
- 4. The Reactor has been shutdown for 10 days..**
- 5. Fluctuations in 12 LPSI Motor amps, discharge pressure, flow and noise has been reported are noted**
- 6. You are performing the duties of the Unit 1 CRO.**

Initiating Cue:

**The CRS has directed you to respond to these conditions per AOP-3B, IV.A.4.**

Task Standard:

**This JPM is complete when SDC has been restored. No further actions are required. The evaluator is expected to end the JPM.**



Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the control room**

General References:

1.    **AOP-3B**

Time Critical Task:

**No**

Validation Time:

**25 minutes**

Simulator Setup:

1. Reset the simulator IC-3 (Shutdown RX Vessel – 41.7)
2. IC-3. Refueling cart available and connected for service.
3. Ensure all 4 LPSI Header MOVs are throttled open to 800 gpm (with FIC-306 set point at 3400. Once MOVs are throttled, return FIC-306 set point to 3000 gpm.
4. Ensure 12 LPSI pump is running and 11 LPSI is in PTL
5. Set up conditions for LPSI cavitation indications
  - a. Override green indicator light for 1-SI-651 MOV to indicate partial open
  - b. Use remote function for 1-SI-651-MOV to open its breaker and manually position it to ~ 20% (.2). then reclose the MOV breaker.
  - c. Run Simulator until “LPSI PUMP SUCTION PRESS LO alarm in, then freeze the simulator.
6. Bring candidate into the simulator, brief the initial conditions and then put the simulator in run when the candidate is ready

TIME START \_\_\_\_\_

\_\_\_\_\_ Locates AOP-3B, Step IV.A.4 Same as element.

CUE: Fluctuations in motor amps ,discharge pressure, pump discharge flow, "LPSI PUMP SUCTION PRESS LO" alarm is in. Inform candidate that excessive noise in the ECCS has been reported coming from the area of 12 LPSI pump.

- \_\_\_\_\_ \* 4. **IF** a LPSI PP is determined to be cavitating/gas bound by considering the following:
- Fluctuations in motor amps
  - Fluctuations in discharge pressure
  - Fluctuations in pump discharge flow
  - Excessive pump noise
  - "LPSI PUMP SUCTION PRESS LO" alarm actuation
- \_\_\_\_\_ \* **THEN** complete the following actions:
- \_\_\_\_\_ \* a. **IF** the RCS is in reduced inventory, **THEN** perform the following actions:
- (1) **IF** RCS level is less than 37.6 feet,
- \_\_\_\_\_ \* **THEN** verify flow is less than or equal to 1500 gpm.
- (2) **IF** RCS level is greater than 37.6 feet,
- \_\_\_\_\_ \* **THEN** verify flow is less than or equal to 2000 gpm.
- (3) **IF** the appropriate SDC Flow is Restored **AND** LPSI PP cavitation/gas binding stops,
- \_\_\_\_\_ \* **THEN IMPLEMENT** the appropriate Operating Procedure.
- \_\_\_\_\_ \* b. Stop the operating LPSI PP(s).
- \_\_\_\_\_ \* c. Place **BOTH** LPSI PP handswitches in PULL TO LOCK.

Determines step is applicable.  
Monitors 12 LPSI pump indications

Determines this step is not applicable

Determines this step is applicable  
Same as element

Determines this step is not applicable

Same as element

Place 12 LPSI pump in PTL

**CAUTION**

Isolation of the LPSI PP suction flow path can cause pump damage if the LPSI PPs are allowed to operate.

- \_\_\_\_\_ \* 5. Check that the SDC HDR RETURN ISOL valves are open:
- 1-SI-651-MOV
  - 1-SI-652-MOV
- \_\_\_\_\_ 5.1 **IF ANY** of the SDC HDR RETURN ISOL valves are **NOT** fully open, **THEN** complete the following:

Determines that 1-SI-651-MOV is not fully open

Same as element

- |  |  |  |
|--|--|--|
| _____  | a. Stop the operating LPSI PP(s).  | Determines this step is not applicable   |
| _____  | b. Place <b>BOTH</b> LPSI PP handswitches in PULL TO LOCK.   | Determines this step is not applicable   |
| _____  | c. Initiate Aux Spray as necessary <b>PER</b> Step C.5.b.1, to maintain RCS pressure less than 260 PSIA.   | Determines this step is not applicable   |
| CUE: When the candidate attempts to open 1-SI-651 from the control room, it opens (Remove the override from the indicator lights). |  |  |
| _____ *  | d. Attempt to open the affected SDC HDR RETURN ISOL valve(s) from the Control Room: <ul style="list-style-type: none"> <li>▪ 1-SI-651-MOV</li> <li>▪ 1-SI-652-MOV</li> </ul>   | Attempts to open 1-SI-651. Note candidate should hold the handswitch in open until SI-651 indicates full open ( ~40 seconds) |
| _____ *  | e. <b>IF BOTH</b> SDC HDR RETURN ISOL valves are open,<br><b>THEN</b> attempt to restore SDC <b>PER</b> ATTACHMENT (3), RETURNING SHUTDOWN COOLING TO SERVICE.   | Observes that both valves are open and refers to attachment 3  |
| _____  | f. <b>IF</b> the affected SDC HDR RETURN ISOL valve(s) will <b>NOT</b> open from the Control Room,<br><b>THEN</b> assign an operator to perform Step B, Page 17, AND concurrently <b>PROCEED</b> to Step C, Page 20. | Determines this step is not applicable proceeds to attachment 3  |
| _____  | 1. Ensure RCS pressure is less than 260 PSIA.  | Same as element  |
| _____  | 2. Ensure RCS temperature is less than 300°F.  | Determines that RCS temperature is less than 300°F   |
| _____ *  | 3. Ensure the SDC HDR RETURN ISOL valves are open: <ul style="list-style-type: none"> <li>• 1-SI-651-MOV</li> <li>• 1-SI-652-MOV</li> </ul>  | Same as element  |
| CUE: When asked 1-SI-444 , and 1-SI-432 are locked shut  |  |  |
| _____  | 4. Ensure the LPSI PP NORM SUCT ISOL valves are Locked Shut: <ul style="list-style-type: none"> <li>• (11 LPSI PP) 1-SI-444</li> <li>• (12 LPSI PP) 1-SI-432</li> </ul>  | Calls ABO to ensure valves are positioned  |
| CUE: When asked 1-SI-441 , and 1-SI-440 are locked open  |  |  |

- \_\_\_\_\_ 5. Ensure the LPSI PP SDC SUCT ISOL valves are Locked Open:  
     • (11 LPSI PP) 1-SI-441  
     • (12 LPSI PP) 1-SI-440

Calls ABO to ensure valves are positioned

**CUE: When asked 1-SI-447 , and 1-SI-435 are locked open**

- \_\_\_\_\_ 6. Verify the LPSI PP DISCH ISOL valves are Locked Open:  
     • (11 LPSI PP) 1-SI-447  
     • (12 LPSI PP) 1-SI-435

Calls ABO to ensure valves are positioned

**Cue: When asked air is not suspected of being trapped in the SDC return header**

- \_\_\_\_\_ 7. IF air is suspected of being trapped in the SDC Return Header THEN vent the SDC Return Header.

Determines that this step is not applicable.

**Cue : Use remote function to vent 11 & 12 LPSI pumps and when asked inform candidate that Rad Safety has been notified and ABO has vented pumps**

- \_\_\_\_\_ 8. IF air is suspected in the LPSI PPs, THEN vent the LPSI PP casings:

Determine that pumps have been vented

- \_\_\_\_\_ 9. Shut the S/D COOLING TEMP CONTR valve, 1-SI-657-CV.

Verifies output of HIC-657 is zero or HS-3657 is in CLOSE. Checks position indication for SI-657.

- \_\_\_\_\_ \* 10. Partially open the SDC FLOW CONTR valve, 1-SI-306-CV, as follows:

Same as element

- \_\_\_\_\_ \* a. Place the SDC FLOW CONTR, 1-FIC-306, to MANUAL.

Same as element

- \_\_\_\_\_ \* b. Adjust the SDC FLOW CONTR, 1-FIC-306, to 95% output.

Candidate should note that output must be increased to throttle 1-SI-306-CV closed

- \_\_\_\_\_ 11. Verify LPSI HDR flowpath:

- \_\_\_\_\_ \* a. IF the RCS level is at or below the 37.6 foot elevation, THEN verify the following:  
     (1) Two LPSI HDR valves are shut and in PULL TO OVERRIDE.  
     (2) The remaining two LPSI HDR valves are in PULL TO OVERRIDE, AND throttled to obtain between 800 and 850 GPM in each LPSI loop  
     OR the remaining two LPSI HDR valves are open.

Determines this step is not applicable

- \_\_\_\_\_ \* b. **IF** the RCS level is between the 41 foot and the 37.6 foot elevation,  
**THEN** verify the following:  
(1) Two LPSI HDR valves are shut and in PULL TO OVERRIDE.  
(2) The remaining two LPSI HDR valves are in PULL TO OVERRIDE,  
**AND** throttled to obtain between 1050 and 1100 GPM in each LPSI loop  
**OR** the remaining two LPSI HDR valves are open. Determines this step is not applicable
- \_\_\_\_\_ \* c. **IF** the RCS level is above the 41 foot elevation,  
**THEN** verify **ALL** LPSI HDR valves are open: Same as element
- 1-SI-615-MOV
  - 1-SI-625-MOV
  - 1-SI-635-MOV
  - 1-SI-645-MOV

**CAUTION : Do NOT operate the LPSI PPs at shutoff head.**

- \_\_\_\_\_ \* 12. Start a LPSI PP. Same as element. Starts 12 LPSI Pump
- \_\_\_\_\_ \* 13. **IF** the RCS level is above the 41 foot elevation,  
**THEN** slowly adjust the SDC FLOW CONTR, 1-FIC-306, to raise SDC flow to 3000 GPM. Determines this step is applicable  
Same as element
- \_\_\_\_\_ \* 14. **IF** the RCS level is between the 41 foot and the 37.6 foot elevation,  
**THEN** slowly adjust the SDC FLOW CONTR, 1-FIC-306, to raise SDC flow to 2000 GPM. Determines this step is NOT applicable
- \_\_\_\_\_ \* 15. **IF** the RCS level is at or below the 37.6 foot elevation,  
**THEN** slowly adjust the SDC FLOW CONTR, 1-FIC-306, to raise SDC flow to 1500 GPM. Determines this step is NOT applicable
- CUE: The CRS desires to have FIC-306 in Auto.
- \_\_\_\_\_ \* 16. Place the SDC FLOW CONTR, 1-FIC-306, in AUTO if desired Places FIC-306 in AUTO after matching setpoint to actual SDC flow.

**CAUTION Do NOT exceed the following cooldown limits in any one hour:**  
greater than 256°F 100°F/hr  
106°F to 256°F 40°F/hr  
less than 106°F 35°F/hr

**CAUTION Do NOT exceed a heatup rate of 14°F/MIN for the Shutdown Cooling Heat Exchanger as indicated on TI-303X and TI-303Y.**

**CAUTION Do NOT exceed 4800 GPM flow through one SDC HX.**

CUE: The CRS desires to restore RCS temperature to 115 °F. When checked, SI-657 indicates intermediate and SDC temperature is 1118°F and slowly lowering.

- \_\_\_\_\_ \* 17. Adjust the S/D COOLING TEMP CONTR, If HS-3657 is in CLOSE, places HS-3657 to AUTO. Raises output of HIC-657. Checks SDC temperature slowly lowering (TR-351 on 1C09).
- 1-HIC-3657, as necessary to maintain the desired temperature and current mode.
- (Mode 4) less than 300°F
  - (Mode 5) less than 200°F
  - (Mode 6) less than 140°F

TERMINATING CUE:	This JPM is complete when SDC flow has been restored . The evaluator is expected to end the JPM. No further actions are required.
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TIME STOP \_\_\_\_\_

**Verification of Completion**Job Performance Measure Number: 2008-SDC-2

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

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Applicant Response:

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Result:            SAT \_\_\_\_\_            UNSAT \_\_\_\_\_



Examiner's Signature and Date:

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## APPLICANT'S CUE SHEET

**INITIAL CONDITIONS:**

1. Unit 1 is in Mode 5 for maintenance with the PZR manway removed.
2. The RCS was being maintained at 41.7'.
3. SDC was aligned for service and RCS temperature was 115 °F.
4. The Reactor has been shutdown for 10 days..
5. Fluctuations in 12 LPSI Motor amps, discharge pressure, flow and noise has been reported are noted
6. You are performing the duties of the Unit 1 CRO.

**INITIATING CUE:**

The CRS has directed you to respond to these conditions per AOP-3B, IV.A.4. Are there any questions? You may begin

Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-480V**

Task Title: **Return 480V Bus # 11A to Service Following Maintenance**

Task Number: **005/006.001**

K/A Reference: **A2.05 (2.9, 3.0)**

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: √\_\_\_\_\_

Classroom: \_\_\_\_\_ Simulator: √\_\_\_\_\_ Plant: \_\_\_\_\_

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

1. 480 V unit bus 11A has been completely de-energized for bus maintenance.
2. The work has just been completed and safety tags cleared.
3. DC control power is available to the bus feeder breakers. 4KV bus #11 and transformer U-440-11A are energized.
4. All load breakers from bus 11A are open.
5. All alarms are clear on transformers U-4000-11 and U-440-11A.
6. You are performing the duties of a spare licensed operator.

Initiating Cue:

1. The CRS directs you to re-energize 480 V bus #11B from service transformer U-440-11B per the OI. Are there any questions? You may begin

Task Standard:

This JPM is complete when 480 V unit bus #11A is energized from 4.16 KV bus #11.

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the control room**

General References:

1.    **OI-27D**

Time Critical Task:

**No**

Validation Time:

**15 minutes**

Simulator Setup:

1. IC-13, U1, 100%
2. Deenergize 11A 480 Volt bus

TIME START \_\_\_\_\_

CUE:	The General Precautions and Initial Conditions have been met. Begin at Step 6.6.B.3
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_____	Identify and locate OI-27D, Step 6.6.B.3.	Same as element.
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* _____ 3.	<b>TURN</b> the control switch to the CLOSE position to close the desired breaker.	[3]
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CUE:	Bus 11A voltage is 480V and red breaker CLOSE indicating light is lit.
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_____ 4.	<b>VERIFY</b> breaker close indication.	[4]
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CUE:	White potential indicating light is lit, on 1C18, for Bus 11A.
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_____ 5.	<b>VERIFY</b> potential indicating light is illuminated.	Checks white potential indicating light illuminated on mimic for 480V Bus 11A, on 1C18.
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CUE:	Each phase's voltage is approximately 480V.
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_____ 6.	<b>IF</b> bus voltage is <b>NOT</b> between 445 and 510 volts on each phase, <b>THEN REFER</b> to OI-28, <b>OPERATION OF 500 KV SWITCHYARD. [B0120]</b>	Checks each phase's voltage by rotating voltmeter selector switch and checks voltage on each phase.
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TIME STOP \_\_\_\_\_

TERMINATING CUE:	This JPM will be complete when 480V unit bus #11A is energized from 4.16 KV bus #11 and unit bus 11A voltage is checked. No further actions are required.
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**Verification of Completion**Job Performance Measure Number: 2008-480

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

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Applicant Response: \_\_\_\_\_

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Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

## Initial Conditions:

7. 480 V unit bus 11A has been completely de-energized for bus maintenance.
  8. The work has just been completed and safety tags cleared.
  9. DC control power is available to the bus feeder breakers. KV bus #11 and transformer U-440-11A are energized.
  10. All load breakers from bus 11A are open.
  11. All alarms are clear on transformers U-4000-11 and U-440-11A.
  12. You are performing the duties of a spare licensed operator.
- :

INITIATING CUE:

The CRS directs you to re-energize 480 V bus #11A from service transformer U-440-11A per the OI. Are there any questions? You may begin.



Facility: **Calvert Cliffs 1&2**Job Performance Measure No.: **2008-NIS**Task Title: **Calculate Tq using the excore NIs**

Task Number: 204.129

K/A Reference:

Method of testing:Simulated Performance: \_\_\_\_\_ Actual Performance:   √  Classroom: \_\_\_\_\_ Simulator:   √   Plant: \_\_\_\_\_

READ TO THE APPLICANT:

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit 1 is at 70% power and has been operating for maintenance and has been here for several weeks.**
- 2. The plant computer has "crashed" and is inoperable.**
- 3. You are performing the duties of the Unit-1 RO**

Initiating Cue:

**AOP-7H has been implemented and the CRS directs you to determine the azimuthal power tilt (Tq) using the excore NIs per Block Step IV.F.**

Task Standard:

**This JPM is complete when calculated azimuthal power tilt (Tq) is determined to be within acceptable limits per AOP-7H Step IV.F.**

Evaluation Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Required Materials:

1. Calculator
2. Blank AOP-7H Attachment 5

General References:

1. AOP-7H
2. NEOP-13

Time Critical Task:

No

Validation Time:**15 minutes**Simulator Setup:**None**

TIME START \_\_\_\_\_

_____	Identify and locate AOP-7H Section IV.F.	Same as element.
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**CUE:** In the simulator, let the operator demonstrate how excore detector readings are taken from "RPS". For consistency, the following detector values should be provided to the operator rather than the operator using the detector readings at RPS. Provide the operator with Attachment (1). The attachment has the same excore detector readings as below.

(3) excore detectors are operable with the following readings:

"A" upper:	98.3%
"B" upper:	98.2%
"C" upper:	98.5%
"A" lower:	99.1%
"B" lower:	98.9%
"C" lower:	99.6%

- |          |  |   |
|----------|--|---|
| _____ 1. | <b>IF ALL</b> four Linear Power Channels are operable,<br><b>THEN</b> perform the following:   | Determines only three (3) channels are operable and step is not applicable. |
| 1.1.     | <b>IF</b> only 3 Linear Power Channels are operable AND Reactor Power is less than 75% , <b>THEN</b> calculate Tq using three Excore detectors as follows: | Determines this step is applicable  |
| 1.2.     | <b>IF</b> only 3 Linear Power Channels are operable AND Reactor Power is greater than 75% .....  | Determines this step is not applicable                                      |

_____	. Record the readings on ATTACHMENT (5), <u>Tq CALCULATION USING EXCORE DETECTORS.</u>	Records Readings on Attachment 5.
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* _____	. Calculate an upper <b>AND</b> a lower Tq using the method in ATTACHMENT (5), <u>Tq CALCULATION USING EXCORE DETECTORS.</u>	Calculates Upper Tq to be 0.004 (+ .0005) if using CUE values. Calculates Lower Tq to be 0.0056 (+ .0005) if using CUE values. It is also acceptable if Ops Calc is used to determine Tq.
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ELEMENT  
(\* = CRITICAL STEP)

STANDARD

\_\_\_\_ 2. IF Tq is greater than 0.03,

Determines Tq is less than 0.03.

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

Examiner Note:	This JPM is complete when calculated azimuthal power tilt (Tq) is determined to be within acceptable limits per AOP-7H Step IV.F. No further actions are required. The operator is expected to end the JPM.
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**Verification of Completion**Job Performance Measure Number: 2008-NIS

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

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Applicant Response: \_\_\_\_\_

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Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

- a. Unit 1 is at 100% power and has been operating at full power for seven weeks.
- b. The plant computer has "crashed" and is inoperable.
- c. You are performing the duties of the Unit-1 RO.

INITIATING CUE:

Initiating Cue: AOP-7H has been implemented and the CRS directs you to determine the azimuthal power tilt (Tq) using the excore NIs per Block Step IV.F. Are there any questions? You may begin.

Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-CCW**

Task Title: **Respond to a CCW Leak**

Task Number: **202.067**

K/A Reference: **026-AA1.05**

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:   √  

Classroom: \_\_\_\_\_ Simulator:   √   Plant: \_\_\_\_\_

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit 1 is at 100% power.**
- 2. Component Cooling Head Tank LVL Alarm at 1C13**
- 3. Component Cooling Head Tank LVL lowering at 1C13**
- 4. CNTMT Normal Sump Level Hi Alarm at 1C10**
- 5. AOP 7C is implemented**

Initiating Cue:

**CRS has directed you to perform block step V.C. on page 10 of AOP 7C**

Task Standard:

**Perform block step V.C. of AO7C , determine that CCW leak exist in the CNTMT, and isolate CCW to CNTMT and recommend tripping the reactor and securing RCPs.**



Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the control room**

General References:

1.    **Alarm manual for 1C13**
2.    **AOP 7C**

Time Critical Task:

**No**

Validation Time:

**15 minutes**

Simulator Setup:

1. Reset the simulator IC-24 ( 100% MOC)
2. Insert Malfunction CCW-03 at ~ 4.5%
3. Run the simulator for ~ 2 Minutes or until Alarm K17 on 1C-13 comes in
4. Acknowledge alarms
5. Freeze simulator

TIME START \_\_\_\_\_

_____	Locates AOP7C	Same as element.
_____	Locates Section V.C on page 10	

CUE- RO has been assigned to monitor for Reactor Trip Criteria

_____	1. <b>IF</b> a CC pump is cavitating as indicated by <b>ANY</b> of the following:	Determines that CCW Pumps are not cavitating
	<ul style="list-style-type: none"> <li>• Fluctuation in pump motor AMPS</li> <li>• Fluctuation in Normal and/or Standby header pressures</li> <li>• Excessive pump noise</li> </ul>	
_____	<b>THEN</b> stop the running pump(s).	Determines Not applicable
_____	2. <b>IF</b> flooding is occurring,	Determines Not Applicable
_____	<b>THEN</b> , with the approval of the SM/CRS, perform the following actions:	Determines Not Applicable
_____	3. <b>IF NO</b> CC Pumps are operating, <b>THEN</b> , with the approval of the SM/CRS, take <b>ALL</b> of the following protective actions.	Determines Not Applicable
_____	a. Trip the Reactor. b. Perform Reactivity Control immediate actions of EOP-0, POST TRIP <b>IMMEDIATE ACTIONS.</b> c. Stop ALL RCPs. d. Continue to IMPLEMENT EOP-0.	Determines Not Applicable
_____	4. Place IX BYPASS valve, 1-CVC-520-CV,in BYPASS.	Same as element

**NOTE**

ATTACHMENT (2), COMPONENTS COOLED BY COMPONENT COOLING WATER, may be used as a guide to identify the leak.

**NOTE**

The location of the leakage may be indicated by sump alarms or room level alarms.

**Cue- CNTMT Sump Hi Level Alarm is in**

_____*	5. Attempt to identify the location of the leak.	Candidate determines that leak is in containment
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- |  |  |
|--|--|
| <p>_____ 6. <b>IF</b> the leak has <b>NOT</b> been located,<br/> <b>THEN</b> consider isolating one CC HX at a<br/> time to check for tube leaks.<br/> a. Secure Component Cooling Flow to<br/> the desired Component Cooling Heat<br/> Exchanger <b>PER</b> OI-16, COMPONENT<br/> COOLING SYSTEM.<br/> b. Shut the applicable CC HX Supply<br/> valves:<br/> 11 CC HX<br/> 11 CC HX STBY SUPP, 1-CC-147<br/> 11 CC HX NORM SUPP, 1-CC-148<br/> 12 CC HX □<br/> 12 CC HX NORM SUPP, 1-CC-154<br/> 12 CC HX STBY SUPP, 1-CC-155</p> | <p>Determine Not applicable</p>  |
| <p>_____ 7. <b>IF</b> the leak can <b>NOT</b> be isolated,<br/> <b>AND</b> the SM determines that the leakage<br/> is excessive,<br/> <b>THEN</b> commence a normal Unit shutdown<br/> <b>PER</b> OP-3, NORMAL POWER<br/> OPERATION, and/or OP-4, PLANT<br/> SHUTDOWN FROM POWER<br/> OPERATION TO HOT STANDBY.</p>  | <p>Determines Not applicable</p>   |
| <p>_____ *8. <b>IF</b> the leak has been located,<br/> <b>AND</b> Unit conditions permit the leak to be<br/> isolated, <b>THEN</b> isolate the leak.</p>   | <p>Recommends isolating CCW to<br/> containment and tripping the reactor<br/> then securing RCPs</p> |

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

Examiner Note: The task is complete when the CCW to containment has been isolated AND the CRO recommends tripping the reactor and securing the RCPs.

**Verification of Completion**Job Performance Measure Number: 2008-CCW

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Applicant Response: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

## Initial Conditions:

1. Unit 1 is at 100% power.
2. Component Cooling Head Tank LVL Alarm at 1C13
3. Component Cooling Head Tank LVL lowering at 1C13
4. CNTMT Normal Sump Level Hi Alarm at 1C10
5. AOP 7C is implemented

:

INITIATING CUE:

CRS has directed you to respond to the loss of CCW by performing block step V.C. on page 10 of AOP 7C

Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-IA1**

Task Title: **Respond to loss of IA while shutdown**

Task Number: 202.070

K/A Reference: **I/A- A-2.01**

Method of testing:

Simulated Performance:   √        Actual Performance:       

Classroom:             Simulator:             Plant:   √  

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit One is in Mode 6 performing a core offload.**
- 2. A loss of Instrument Air is occurring and AOP-7D has been implemented.**
- 3. There are no temporary air compressors connected or available.**
- 4. The CRS has directed you to assist with implementing AOP-7D.**

Initiating Cue:

**Initiating Cue: You have been directed by the Unit One CRS to investigate the cause of lowering Instrument Air header pressure IAW AOP-7D, Block Step VI.A.**

Task Standard:

**This JPM is complete when actions are taken to respond to an Instrument Air leak and 11 IA Dryer is bypassed and isolated.**

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the plant**

General References:

1.    **AOP-7D**
2.    **OI-19**

Time Critical Task:

**No**



Validation Time:

**30 minutes**

Simulator Setup:

1. NONE

TIME START \_\_\_\_\_

- |          |   |                                   |
|----------|---|-----------------------------------|
| _____    | Locate AOP-7D step VI.A                                     | Same as element.                  |
| _____ 1. | <b>IF</b> Temporary Air Compressor is supplying air system, | Determines that this step is N/A. |

**CUE:** IA Header pressure is 82 PSIG and slowly lowering, 11 IA Compressor is running as the lead compressor (1-HS-2062 in SPEED) and 12 Compressor is the standby compressor (1-HS-2064 in AUTO) but NOT running.

**NOTE:** ATTACHMENT (1), CRITICAL VALVES CONTROLLED BY IA (B0078), lists the pressure required to control the critical valves.

- |          |   |  |
|----------|---|--|
| _____ 2. | <b>WHEN</b> IA header pressure lowers to 93 PSIG, <b>THEN</b> ensure that the standby Instrument Air Compressor is running. | Observes indications and determines that that only the lead Instrument Air Compressor (11) is running. |
|----------|---|--|

**CUE:** After 12 IAC is placed in SPEED, it starts and runs properly. IA pressure is still slowly lowering though, even with both compressors now running.

- |           |   |   |
|-----------|---|---|
| _____ 2.1 | <b>IF</b> the standby IA Compressor fails to auto start, <b>THEN</b> place the standby Compressor handswitch to the SPEED position. | Determines step is applicable and places 1-HS-2064 in SPEED. Observes indications that 12 IAC is running. |
|-----------|---|---|

**NOTE:** ATTACHMENT (2), VALVES SUPPLIED BY SALTWATER AIR, lists Saltwater Air loads.

**CUE:** The Control Room has performed step 3, continue.

- |          |  |   |
|----------|--|---|
| _____ 3. | <b>IF</b> IA pressure is less than 90 PSIG and lowering, <b>THEN</b> start 11 and 12 SALTWATER AIR COMPRs. | Determines step has been completed in Control Room. |
|----------|--|---|

**CUE:** 11 IA Dryer is in service and appears to be inadvertently blowing down.

**NOTE:** The IA Dryer malfunction light will be brightly lit for the inservice IA Dryer and the dryer will de-energize with both chambers in service if IA Pressure has lowered to  $93 \pm 1$  PSIG.

- |          |  |                                |
|----------|--|--------------------------------|
| _____ 4. | <b>IF</b> IA Dryer is the cause of the lowering IA pressure, <b>THEN</b> bypass the in service IA Dryer. | Determines step is applicable. |
|----------|--|--------------------------------|

**CUE:** IA-148 indicates open.

* _____	a. Open the IA Dryer Bypass valve, 1-IA-148.	Opens valve.
---------	--	--------------

**CUE:** IA-147 and IA-100 indicate shut.

* _____	b. <b>IF</b> 11 Dryer is in service, <b>THEN</b> shut 11 Dryer Inlet and Outlet valves: <ul style="list-style-type: none"><li>• (Inlet Valve) 1-IA-147</li><li>• (Outlet valve) 1-IA-100</li></ul>	Shuts IA-147 and IA-100.
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_____	c. <b>IF</b> 12 Dryer is in service, <b>THEN</b> shut 12 Dryer Inlet and Outlet valves: <ul style="list-style-type: none"><li>• (Inlet Valve) 1-IA-1100</li><li>• (Outlet valve) 1-IA-1101</li></ul>	Determines step is N/A
-------	--	------------------------

**CUE:** IA Header pressure is starting to rise.

**CUE:** The CRS does not wish to place the standby IA Dryer in service at this time.

d. Shift to the standby Air Dryer <b>PER</b> OI-19, <u>INSTRUMENT AIR</u> , as desired.	Determines step is N/A
---	------------------------

<b>TERMINATING CUE:</b>	The task is complete when 11 IA Dryer is bypassed and isolated. No further actions are required. The evaluator is expected to end the JPM.
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TIME STOP \_\_\_\_\_

**Verification of Completion**Job Performance Measure Number: 2008-IA1

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Applicant Response: \_\_\_\_\_

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\_\_\_\_\_  
\_\_\_\_\_

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

1. Unit One is in Mode 6 performing a core offload.
2. A loss of Instrument Air is occurring and AOP-7D has been implemented.
3. There are no temporary air compressors connected or available.
4. The CRS has directed you to assist with implementing AOP-7D.

INITIATING CUE:

Initiating Cue: You have been directed by the Unit One CRS to investigate the cause of lowering Instrument Air header pressure IAW AOP-7D, Block Step VI.A. Are there any questions? You may begin..

Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-4KV**

Task Title: **De-energize a 4 KV Bus during a control room evacuation**

Task Number: 004.001

K/A Reference: **062-A4.04**

Method of testing:

Simulated Performance:   √        Actual Performance:       

Classroom:             Simulator:             Plant:   √  

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit One has implemented AOP9A due to a control room fire.**
- 2. The CRS has assigned you to perform Block step IV BU, denenergize 4KV Bus 12**
- 3. All steps of AOP-9A up to step BU have been completed**

Initiating Cue:

**You are the U-1 RO and the CRS has directed you to perform step IV. BU of AOP-9A to de-energize 12 4KV Bus.**

Task Standard:

**This JPM is complete when 12 4KV Bus is de-energized.**

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the plant**

General References:

1.    **AOP-9A**
2.    **OI-27C**
3.    **CCNPP Industrial Safety Manual**

Time Critical Task:

**No**

Validation Time:

**30 minutes**

Simulator Setup:

1. NONE



**CUE:** CRS Directs performing AOP 9A step IV BU. All steps up to BU have been performed

Same as element.

## Voltage Rated Gloves

FRCs – 8/ca/cm

## Safety Glasses

## Hearing Protection

Opens the upper cabinet door for  
breaker 152-1201 and removes the  
close fuses

Locates breaker 152-1201 and opens the breaker verifies the breaker is open.

Open the upper cabinet door for breaker 152-1209 and removes the close fuses.

Locates breaker 152-1209 and opens the breaker verifies the breaker is open.

Notify the evaluator that 4KV Bus 12 has been de-energized

The task is complete when candidate has informed the evaluator that the 12 4KV Bus is de-energized

NUREG-1021, Revision 9

**Verification of Completion**Job Performance Measure Number: 2008-4KV

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Applicant Response: \_\_\_\_\_

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\_\_\_\_\_

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

1. Unit One has implemented AOP9A due to a control room fire.
2. The CRS has assigned you to perform Block step IV BU, denenergize 4KV Bus 12 .
3. All steps of AOP-9A up to BU have been completed.

INITIATING CUE:

You are the U-1 RO and the CRS has directed you to perform step IV. BU of AOP-9A to de-energize 12 4KV Bus.

Facility: **Calvert Cliffs 1&2**

Job Performance Measure No.: **2008-MSIV**

Task Title: **Locally verify MSIV shut due to a Control Room Evacuation**

Task Number: 083.024

K/A Reference: **039-A4.01**

Method of testing:

Simulated Performance:   √        Actual Performance:       

Classroom:             Simulator:             Plant:   √  

**READ TO THE APPLICANT:**

**I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.**

Initial Conditions:

- 1. Unit One has implemented AOP9A due to a control room fire.**
  - 2. The CRS has assigned you to perform Block step IV AC of AOP 9A to verify locally that MSIVs are shut.**
- .

Initiating Cue:

**Initiating Cue: You have been directed by the Unit One CRS to locally verify that MSIVs are shut IAW AOP-9A, Block Step IV.AC.**

Task Standard:

**This JPM is complete when MSIV 11 & 12 have been verified shut and reported to the evaluator.**

Evaluation Criteria:

1.    **All critical steps completed.**
2.    **All sequential steps completed in order.**
3.    **All time-critical steps completed within allotted time.**
4.    **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

Required Materials:

1.    **Procedures and manuals normally available in the plant**

General References:

1.    **AOP-9A**
2.    **OI-8E**

Time Critical Task:

**No**

Validation Time:

**30 minutes**

Simulator Setup:

1. NONE

TIME START \_\_\_\_\_

**CUE:** CRS Directs performing AOP 9A step IV C.

**Note:** Candidate should comply with all RP procedures and policies for entering the RCA.

**Note:** Candidate should determine stay time for heat stress for entering the MSIV room.

- |  |   |
|--|---|
| <p>_____ Locate AOP-9A step IV.C</p>   | <p>Same as element.</p>                 |
| <p>_____ * 1. Shut Instrument Air Isolation to 11 MSIV Hydraulic Pump, 1-IA-1069.</p>  | <p>Same as element</p>                  |
| <p><b>CUE: 11 MSIV is open as indicated</b></p>  |   |
| <p>_____ * 2. IF 11 MSIV is open,<br/><b>THEN:</b></p>   | <p>Determines that 11 MSIV is open</p>  |
| <p>_____ * a. Remove the Dump Solenoid Valve Cap on <b>ONE</b> of the following:<br/>11 MSIV Dump SV Channel A, 1-MSH-4042A-SV<br/><b>OR</b><br/>11 MSIV Dump SV Channel B, 1-MSH-4042B-SV</p> | <p>Same as element</p>                  |
| <p>_____ * b. Place a wrench on the selected Dump Solenoid stem nut.</p>   | <p>Same as element</p>                  |
| <p>_____ * c. Rotate the wrench in the clockwise direction (approximately five turns) to bleed hydraulic fluid back to the reservoir.</p>  | <p>Same as element</p>                  |
| <p>_____ * 3. Shut Instrument Air Isolation to 12 MSIV Hydraulic Pump, 1-IA-1070.</p>  | <p>Same as element</p>                  |
| <p><b>CUE: 12 MSIV is open as indicated</b></p>  |   |
| <p>_____ * 4. IF 12 MSIV is open,<br/><b>THEN:</b></p>   | <p>Determines that 12 MSIV is open</p>  |
| <p>_____ * a. Remove the Dump Solenoid Valve Cap on <b>ONE</b> of the following:<br/>12 MSIV Dump SV Channel A, 1-MSH-4047A-SV<br/><b>OR</b><br/>12 MSIV Dump SV Channel B, 1-MSH-4047B-SV</p> | <p>Same as element</p>                  |
| <p>_____ * b. Place a wrench on the selected Dump Solenoid stem nut.</p>   | <p>Same as element</p>                  |
| <p>_____ * c. Rotate the wrench in the clockwise direction (approximately five turns) to bleed hydraulic fluid back to the reservoir.</p>  | <p>Same as element</p>                  |
| <p>_____ 5. Notify 1C43 the MSIVs are shut.</p>  | <p>Notify evaluator that MSIVs shut</p> |

<p><b>TERMINATING CUE:</b></p>	<p>The task is complete when candidate has informed the evaluator that the MSIVs are verified shut.</p>
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ELEMENT  
(\* = CRITICAL STEP)

STANDARD

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



**Verification of Completion**Job Performance Measure Number: 2008-MSIV

Applicant: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of Attempts: \_\_\_\_\_

Time to Complete: \_\_\_\_\_

Follow up Question: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Applicant Response: \_\_\_\_\_

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\_\_\_\_\_  
\_\_\_\_\_

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature and Date: \_\_\_\_\_

## APPLICANT'S CUE SHEET

INITIAL CONDITIONS:

1. Unit One has implemented AOP9A due to a control room fire.
2. The CRS has assigned you to perform Block step IV AC of AOP 9A to verify locally that MSIVs are shut.

INITIATING CUE:

You have been directed by the Unit One CRS to locally verify that MSIVs are shut IAW AOP-9A, Block Step IV.AC Are there any questions? You may begin.