APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: RO-ADMIN-1

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** RO-ADMIN-1

**Task Title:** Ensure adequate shutdown margin exists with all CEAs operable, in Mode 3

**Task Number:** 201.072

**K/A Reference:** 2.1.37 (4.3, 4.6)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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-2 had been operating at 100% power for 100 days when power was reduced, three days ago, for work which required 21 SGFP to be secured (work still in progress).
2. Today at 0800, Unit-2 experienced an uncomplicated reactor trip
3. RCS boron concentration is 1300 PPM per a grab sample obtained at 1100
4. Current time, for purposes of this JPM, is 1130
5. $T_{AVG}$ is stable at 532°F
6. Core Burnup is 13,500 MWD/MTU on Cycle 20
7. Start-up is anticipated to occur in approximately 36 hours
8. A Xenon report has yet to be provided by Reactor Engineering.
9. POWERTRAX is currently unavailable
10. You are performing the duties of an extra RO

**Initiating Cue:**

The CRS directs you to verify and document that shutdown margin is adequate, **using the figure method**, for the present plant conditions per NEOP-301. Are there any questions? You may begin.

**Task Standard:**

Adequate shutdown margin is verified, using the figure method, for the stated core conditions, with all CEAs operable, in Mode 3

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

1. NEOP-301, Operator Surveillance Procedure
2. NEOP-23, Technical Data Book (U-2)

**General References:**

Procedures and manuals normally available in the Control Room

**Time critical task:**

No

**Validation Time:**

20 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| ❑ Locates NEOP-301, Operator Surveillance Procedure | Same as element |
| ❑ Selects NEOP-301, Operator Surveillance Procedure, Section 6.1, Shutdown Margin (All CEAs Operable) | Same as element |
| **CAUTION**<br>The allowable times to verify SDM in Step 6.1.1 are applicable for $T_{AVG}$ greater than or equal to 515°F with a steady or increasing soluble Boron concentration. With $T_{AVG}$ greater than or equal to 515°F and with steady or increasing Boron concentration, SDM will be acceptable for a minimum of 4 hours under all non-accident conditions. SDM must be verified prior to decreasing TAVG below 515°F or reducing Boron concentration. Initiating a cooldown to below a $T_{AVG}$ of 515°F or reducing soluble Boron concentration prior to verifying SDM will invalidate the times to verify SDM in Step 6.1.1 and may lead to a loss of adequate shutdown margin. | |
| ❑ 6.1.1 - **DETERMINE** the allowable time to verify shutdown margin by performing Step 6.1.1.1. **OR** Step 6.1.1.2: | Selects 6.1.1.1. based on information provided in Cues |
| ❑ 6.1.1.1. - Reference the following table … | References the table and determines SDM must be verified within **6** hours |
| ❑ 6.1.1.2. - **MODEL** the trip using the XENON code (or POWERTRAX). | Determines step is N/A |
| **NOTE**<br>Either of Steps 6.1.2 or 6.1.3 below may be performed to calculate the required SDM for MODE 3 with $T_{AVG}$ greater than or equal to 300°F. | |
| **NOTE**<br>Precautions 5.4 and 5.5 describe the differences between the various methods below which can be used to determine the required boron concentration. | |
| ❑ 6.1.2 - MODE 3, 4, or 5 (Figure Method) | |
| ❑ 6.1.2.1. - **DETERMINE** the required shutdown boron concentration by using one of the two following methods: | Selects 6.1.2.1.a. based on information provided in Cues |
| **CUE** | If requested, the $B_{10}$ Correction Factor is 0.93. |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ 6.1.2.1.a. - **REFER** to Figure 1-II.A.3 of NEOP-13 (Figure 2-II.A.3 of NEOP-23). | Refers to Figure 2-II.A.3 of NEOP-23. Determines required shutdown boron concentration is **1231 PPM** |
| ❑ 6.1.2.1.b. - **DETERMINE** using POWERTRAX. | Determines step is N/A |
| ❑ 6.1.2.1. - **VERIFY AND DOCUMENT** the following bulleted conditions on Attachment 2 within the time period determined in Step 6.1.1. **AND** at least once per 24 hours thereafter: | Obtains copy of Attachment 2 |
| **CUE** Sequence number for NEOP-23, Attachment 2 is "1" | |
| ❑ RCS $T_{AVG}$ is acceptable for current operating MODE.<br>❑ A soluble Boron concentration sample from the RCS has been obtained.<br>❑ RCS soluble Boron concentration is greater than or equal to the required Shutdown Boron Concentration. | • Logs Sequence #: 1 (not critical)<br>• Logs Unit#: 2 (not critical)<br>• Logs Cycle #: 20 (not critical)<br>• Logs RCS $T_{AVG}$: **532°F**<br>• Logs Mode: **3**<br>• Logs Burnup: 13,500 MWD/MTU<br>• Logs CEA position: **IN**<br>• Logs boron conc: **1300 PPM**<br>• Logs date/time of sample: **Today at 1100**<br>• Logs req'd boron conc: **1231 PPM**<br>• Logs method used: Figure<br>• Logs figure used: 2-II.A.3<br>• Logs SDM valid until: tomorrow at 1130<br>• Enters initials/date/time as preparer (date/time not critical) |

**TERMINATING CUE:** This JPM is complete when the status of core shutdown margin has been determined and recorded. No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **RO-ADMIN-1**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-2 had been operating at 100% power for 100 days when power was reduced, three days ago, for work which required 21 SGFP to be secured (work still in progress).
2. Today at 0800, Unit-2 experienced an uncomplicated reactor trip
3. RCS boron concentration is 1300 PPM per a grab sample obtained at 1100
4. Current time, for purposes of this JPM, is 1130
5. $T_{AVG}$ is stable at 532°F
6. Core Burnup is 13,500 MWD/MTU on Cycle 20
7. Start-up is anticipated to occur in approximately 36 hours
8. A Xenon report has yet to be provided by Reactor Engineering.
9. POWERTRAX is currently unavailable
10. You are performing the duties of an extra RO

**Initiating Cue:**

EOP-Attachment 13 requires a shutdown margin calculation be performed. The CRS directs you to verify and document that shutdown margin is adequate, **using the figure method**, for the present plant conditions, per NEOP-301.

Are there any questions? You may begin.

**Attachment 2, Shutdown Margin Verification**

Sequence # _____

Unit _____ Cycle _____

| $T_{AVG}$ (°F) | MODE | Burnup (MWD/MTU) | CEA Position * | Boron Sample (ppm)** | Date/Time Of Sample | Req'd Boron Conc (ppm) | Method (PDIL+BIAS Or Figure) | Figure Used or Attachment and Sequence# | SDM Valid Until (Date/Time) | Preparer (Init/Date/Time) | SRO Review (Init/Date/Time) |
|---|---|---|---|---|---|---|---|---|---|---|---|
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* Enter IN, OUT, or PDIL. Enter N/A if in MODE 6
** During MODE 6, this Boron Grab Sample is the minimum value of Refueling Pool or filled portion of the RCS.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: RO-ADMIN-2

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** RO-ADMIN-2

**Task Title:** Monitor Azimuthal Power Tilt (Tq) using Excore Nuclear Instrumentation

**Task Number:** 204.129

**K/A Reference:** 2.1.25 (3.9/4.2)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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 power was recently reduced to 70% power to facilitate repairs to 11 SGFP.
2. CEAs are currently inserted to 108 inches on Group 5.
3. Channel "D" LRNI is out of service for maintenance. T.S. LCOs 3.3.1.A and 3.3.1.D have been entered.
4. The plant computer has "crashed" and is inoperable.
5. OPS CALC is not available.
6. You are performing the duties of the CRO.
7. NI Readings are as follows:

| Channel | Upper | Lower |
|---|---|---|
| A | 70.9 | 69.9 |
| B | 68.3 | 67.2 |
| C | 69.7 | 68.7 |
| D | 0 | 0 |

**Initiating Cue:**

AOP-7H, Loss of Plant Computer, has been implemented and the CRS directs you to determine the Azimuthal Power Tilt (Tq) using the excore NIs per Section IV.E and determine if any limits are being exceeded.

**Task Standard:**

Calculate and determine whether or not Tq is in spec.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

1. Procedures and manuals normally available in the plant
2. AOP-7H, Loss of Plant Computer in Mode One or Two, ATTACHMENT (2)
3. AOP-7H, Loss of Plant Computer in Mode One or Two, ATTACHMENT (5)

**General References:**

1. AOP-7H, Loss of Plant Computer in Mode One or Two.
2. AOP-7H, Loss of Plant Computer in Mode One or Two, ATTACHMENT (2)
3. T.S. 3.2.4 Azimuthal Power Tilt - Tq
4. NEOP-301, Operator Surveillance Procedure

**Time critical task:**

No

**Validation Time:**

20 minutes

**Simulator Setup:**

None

| | |
|---|---|
| **TIME START:** _____ | |
| ❑ Locates AOP-7H, Section IV.C. - IF Greater than 50% Rated Thermal Power, Monitor Tq. | Same as element. |
| ❑ VI.C.1 - **IF ALL** four Linear Power Channels are operable, **THEN** perform **EITHER** of the following to calculate upper and lower Tq … | Determines Step is N/A |
| **NOTE**<br>For the purposes of Tq monitoring, a total of 3 upper and 3 lower RPS power range detectors are required to be operable. The failed detectors can be on different channels. | |
| ❑ VI.C.2 - **IF ONLY** 3 upper **AND** three lower RPS power range detectors are operable, **THEN** perform the following: | Determines Step is applicable |
| ❑ VI.C.2.a. - **IF** greater than 75% Rated Thermal Power, **THEN** reduce power to less than or equal to 75% Rated Thermal Power within 12 hours. | Determines Step is N/A |
| ❑ VI.C.2.b. - Perform either of the following to calculate upper and lower Tq: | Same as element |
| ❑ Calculate Tq using Opscalc function Tq Calculator | Determines Step is N/A |
| **OR** | |
| ❑ Calculate Tq using the method in ATTACHMENT (2), Tq CALCULATION USING EXCORE DETECTORS | Determines Step is applicable |
| ❑ Record the readings on ATTACHMENT (2), Tq CALCULATION USING EXCORE DETECTORS | Records Readings on Attachment 2 and performs calculations the correct formula on Attachment 2. Results:<br>Upper Tq = .02970 (.029 to .030)<br>Lower Tq = .03152 (.031 to .032) |
| ❑ VI.C.3 - **IF** less than three upper **OR** three lower RPS power range detectors are operable, **THEN** reduce power to less than or equal to 50% Rated Thermal Power within four hours, **AND** exit Step C. | Determines Step is N/A |
| ❑ VI.C.4 - Ensure that Tq is within limits of LCO 3.2.4, as directed by NEOP-301, OPERATOR SURVEILLANCE PROCEDURE. | Determines Tq is greater than 0.03 and escalates issue to CRS |

**TERMINATING CUE**: This JPM is complete when calculated azimuthal power tilt (Tq) is determined to be outside acceptable limits. No further actions are required.

**TIME STOP**: _____

**Verification of Completion**

Job Performance Measure Number: **RO-ADMIN-2**

Applicant: _____

NRC Examiner: _____

Date Performed: _____

Facility Evaluator: _____

Number of Attempts: _____

Time to Complete: _____

Follow up Question: _____

_____

_____

_____

Applicant Response: _____

_____

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_____

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_____

Result: SAT _____ UNSAT _____

Examiner's Signature and Date: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-1 power was recently reduced to 70% power to facilitate repairs to 11 SGFP.
2. CEAs are currently inserted to 108 inches on Group 5.
3. Channel "D" LRNI is out of service for maintenance. T.S. LCOs 3.3.1.A and 3.3.1.D have been entered.
4. The plant computer has "crashed" and is inoperable.
5. OPS CALC is not available.
6. You are performing the duties of the CRO.
7. NI Readings are as follows:

| Channel | Upper | Lower |
|---|---|---|
| **A** | 70.9 | 69.9 |
| **B** | 68.3 | 67.2 |
| **C** | 69.7 | 68.7 |
| **D** | 0 | 0 |

**Initiating Cue:**

AOP-7H, Loss of Plant Computer, has been implemented and the CRS directs you to determine the Azimuthal Power Tilt (Tq) using the excore NIs per Section IV.C and determine if any limits are being exceeded.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: RO-ADMIN-3

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** RO-ADMIN-3

**Task Title:** Apply Technical Specifications to a failed Containment Pressure Transmitter

**Task Number:** 204.129

**K/A Reference:** 2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications (3.9, 4.6)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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. The U-1 ABO reports that a scaffold builder in U-1 45 East Penetration Room has bumped Containment Pressure transmitter 1-PT-5313A. It appears the wires coming from the transmitter are separated.
3. The ABO also reports that he is in the process of writing a CR and he will be indicating that it does affect operability

**Initiating Cue:**

You are directed to determine which Tech Spec LCO's apply, the LCO actions that must be taken and the completion time limits for these actions Applicable prints and the technical specifications are provided

**Task Standard:**

Determine the TS LCO's that apply and the LCO actions that must be taken including required completion times.

**Evaluation Criteria:**

1. This JPM evaluates an RO's expected level of knowledge regarding the application of Tech Specs
2. All critical steps completed (denoted by shading).
3. All sequential steps completed in order.
4. All time-critical steps completed within allotted time.
5. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

1. 60723SH0002 (OM-65-SH-2) Operations DWG Ventilation System
2. 1E-058 ESFAS Logic Diagram
3. 1E-058A ESFAS Logic Diagram
4. Technical Specifications
5. Technical Specification Basis
6. NO-1-200, Control of Shift Activities

**General References:**

1. 60723SH0002 (OM-65-SH-2) Operations DWG Ventilation System
2. 1E-058 ESFAS Logic Diagram
3. 1E-058A ESFAS Logic Diagram
4. Technical Specifications
5. Technical Specification Basis

**Time critical task:**

No

**Validation Time:**

15 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START: _____** | |
| ❑ Review prints and initial conditions. | Same as element. |
| ❑ Refer to Technical Specifications | Same as element |
| **Examiner Note:** None. | |
| ❑ Identify the TS LCO's that apply | Determines TS LCO 3.3.1 Action A applies for RPS Trip Unit 9 (Table 3.3.1-1) & 3.3.4 ESFAS ZD Sensor Module SIAS CP (Table 3.3.4-1) |
| ❑ Identify the TS LCO Actions that are required: | Determines that the required action is to Trip or Bypass affected RPS-Trip Unit or ESFAS-Sensor Module |
| ❑ Identify the required completion time for the actions. | Determines that the initial required completion time is 1 hour for both channels. And to restore the Channel to Operable status or place the affected RPS Trip Unit or ESFAS Sensor in Trip within 48 hours (**the 48 hr action is not critical, only the 1 hour action**) |

**TERMINATING CUE:** This JPM is complete when applicant has determined applicable TS LCO, LCO Action required, and completion time. No further actions are required.

**TIME STOP: _____**

**Verification of Completion**

Job Performance Measure Number: **RO-ADMIN-3**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-1 is at 100% power.
2. The U-1 ABO reports that a scaffold builder in U-1 45 East Penetration Room has bumped Containment Pressure transmitter 1-PT-5313A. It appears the wires coming from the transmitter are separated.
3. The ABO also reports that he is in the process of writing a CR and he will be indicating that it does affect operability

**Initiating Cue:**

You are directed to determine which Tech Spec LCO's apply, the LCO actions that must be taken and the completion time limits for these actions. Applicable prints and the technical specifications are provided.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: RO-ADMIN-4

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

| Appendix C | Job Performance Measure Worksheet | Form ES-C-1 |
|---|---|---|

**Facility:** Calvert Cliffs 1 & 2 Job Performance Measure No.: RO-ADMIN-4

**Task Title:** Determine Proper Radiological Controls associated with manipulating a valve in the RCA

**Task Number:** None

**K/A Reference:** 2.3.7 (3.5/3.6)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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. U-1 is in Mode 3.
2. The Unit-1 RCS leakrate is elevated.
3. You are performing the duties of an extra ABO and have been assigned to enter the RCA and verify 1-CVC-325, CVCS DIVERSION TO DEGAS ISOL, is shut, to help locate the source of the leak.

**Initiating Cue:**

The CRS has estimated a total time to accomplish this work of ~5 minutes. In preparation for a pre-job brief, you are to identify all appropriate radiological controls associated with this evolution, including:

1. RWP and Work Order
2. Protective Clothing required
3. Dosimetry required
4. Contaminated areas
5. Highest expected dose rate.

**Task Standard:**

Using correct OI Valve Lineup, Survey Map and Correct RWP determine appropriate radiological controls.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

1. Procedures and manuals normally available in the plant
2. RWP-2 Rev 2
3. Survey MAP for 5' AUX BLDG Unit-1 VCT Room

**General References:**

1. RWP-2 Rev 2
2. Survey MAP for 5' AUX BLDG Unit-1 VCT Room

**Time critical task:**

No

**Validation Time:**

10 minutes

**Simulator Setup:**

None

| ELEMENT (shaded + * = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| ❑ Reviews survey sheet for specific areas to be entered. | Locates appropriate survey map and determines that a contaminated area must be entered located around CVC-325 but no need to enter a high radiation area |
| **Cue:** Provide candidate with several RWP's including RWP# 2 | |
| ❑ Candidate refers to the proper RWP. (RWP# 2-2 needed due to 22 mrem/hr at 30 cm) | Locates and selects RWP# 2-2. |
| **Cue:** Provide the candidate with several MO's including the correct MO. | |
| ❑ Candidate refers to list of MO's and selects proper MO | Locates and selects MO# OPS-NO-WO |
| **Cue:** After candidate identifies entry into contaminated area they should ask RP Tech for Dress Requirements respond with "Full Anti-C's due to reaching over contaminated piping" | |
| ❑ Candidate identifies entry into contaminated area and protective clothing requirements. | Candidate determines that Full Anti-C's are required due to CVC-325 being in a contaminated area.<br>Is student does not ask RP tech for input they may write "per RP tech" on answer sheet. |
| ❑ Candidate identifies the highest expected dose levels | Candidate determines that the highest expected dose rate is between 22-40 mr/hr depending on how close they get to pipe. |
| **Cue:** When candidate asks RP Tech for teledosimetry requirements respond with "No teledosimetry required" | |
| ❑ Candidate determines dosimetry requirements | Candidate determines DLR & ED are required for entry and NO other dosimetry is required |

**TERMINATING CUE:** This JPM is complete when candidate has identified all radiological controls listed above for entering the RCA, evaluator will terminate this JPM.

ELEMENT (shaded + * = CRITICAL STEP) STANDARD

**TIME STOP: _____**

**NOTE TO EXAMINER:** Collect the applicant work sheet at the completion of the JPM

**Verification of Completion**

Job Performance Measure Number: **RO-ADMIN-4**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. U-1 is in Mode 3.
2. The Unit-1 RCS leakrate is elevated.
3. You are performing the duties of an extra ABO and have been assigned to enter the RCA and verify 1-CVC-325, CVCS DIVERSION TO DEGAS ISOL, is shut, to help locate the source of the leak.

**Initiating Cue:**

The CRS has estimated a total time to accomplish this work of ~5 minutes. In preparation for a pre-job brief, you are to identify all appropriate radiological controls associated with this evolution, including:

1. RWP and Work Order
2. Protective Clothing required
3. Dosimetry required
4. Contaminated areas
5. Highest expected dose rate.

# APPLICANTS WORK SHEET

Identify appropriate radiological controls associated with this evolution, including:

1. Appropriate RWP and Work Order#

2. Protective Clothing required

3. Dosimetry required

4. Contaminated areas

5. Highest expected dose rates

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SRO-ADMIN-1

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SRO-ADMIN-1

**Task Title:** Ensure adequate shutdown margin exists with all CEAs operable, in Mode 3

**Task Number:** 201.072

**K/A Reference:** 2.1.37 (4.3, 4.6)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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-2 had been operating at 100% power for 100 days when power was reduced, three days ago, for work requiring 21 SGFP to be secured (work still in progress)
2. At 0900 this morning Unit-2 experienced an uncomplicated reactor trip
3. $T_{AVG}$ is stable at 532°F
4. Core Burnup is 13,500 MWD/MTU
5. Start-up is anticipated to occur in approximately 36 hours
6. RCS boron concentration is 1210 PPM per a grab sample obtained at 1430
7. POWERTRAX is currently unavailable
8. Current time, for purposes of this JPM, is 1500
9. You are performing the duties of the Unit-2 CRS

**Initiating Cue:**

EOP-Attachment 13 requires a shutdown margin calculation be performed. The CRO has performed the required calculation, using the figure method, and has asked you to perform the SRO Review of the Shutdown Margin verification.

**Task Standard:**

Candidate correctly determines Shutdown Margin Exists with the Plant in Mode 3

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

NEOP-301, Operator Surveillance Procedure

NEOP-23, Technical Data Book (U-2)

**General References:**

Procedures and manuals normally available in the Control Room

**Time critical task:**

No

**Validation Time:**

20 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START: _____** | |
| ❑ Locates NEOP-301, Operator Surveillance Procedure and proceeds to Step 6.1.2.3. | Same as element |
| ❑ 6.1.2.3. - Independently verify the information in Attachment 2 | Same as element (using NEOP-301, Operator Surveillance Procedure and NEOP-23, Technical Data Book (U-2) |
| ❑ Conducts review of completed Attachment 2, Shutdown Margin Verification | Notes RCS $T_{AVG}$, Mode, Burnup, CEA position, Boron Sample information, Method and Figure used are entered correctly (not critical)<br>Notes SDM Valid Until time is incorrect (not critical)<br>Refers to Figure 2-II.A.3 of NEOP-23. Determines required shutdown boron concentration is **1231 PPM.** Notes required boron concentration listed on Att. 2 is in error (value for Mode 5 was used). |
| **CUE** | What actions, if any, are required, based on your review of the Shutdown Margin Verification worksheet?. |
| ❑ 6.1.2.4. - **IF** the RCS soluble Boron concentration is less than the required shutdown Boron concentration for the current burnup, **THEN IMMEDIATELY START** boration at greater than or equal to 40 gpm of borated water at or above required Shutdown Boron Concentration. | Directs boration at greater than or equal to 40 gpm of borated water at or above required Shutdown Boron Concentration |

**TERMINATING CUE:** This JPM is complete when the status of core shutdown margin has been determined and boration of the RCS directed. No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP: _____**

**Verification of Completion**

Job Performance Measure Number: **SRO-ADMIN-1**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-2 had been operating at 100% power for 100 days when power was reduced, three days ago, for work requiring 21 SGFP to be secured (work still in progress)
2. At 0900 this morning Unit-2 experienced an uncomplicated reactor trip
3. $T_{AVG}$ is stable at 532°F
4. Core Burnup is 13,500 MWD/MTU
5. Start-up is anticipated to occur in approximately 36 hours
6. RCS boron concentration is 1210 PPM per a grab sample obtained at 1430
7. POWERTRAX is currently unavailable
8. Current time, for purposes of this JPM, is 1500
9. You are performing the duties of the Unit-2 CRS

**Initiating Cue:**

EOP-Attachment 13 requires a shutdown margin calculation be performed. The CRO has performed the required calculation, using the figure method, and has asked you to perform the SRO Review of the Shutdown Margin verification per NEOP-301, starting at Step 6.1.2.3.

Are there any questions? You may begin.

**Attachment 2, Shutdown Margin Verification**

Sequence # 1

Unit 2 Cycle 20

| $T_{AVG}$ (°F) | MODE | Burnup (MWD/MTU) | *CEA Position | Boron Sample (ppm)** | Date/Time Of Sample | Req'd Boron Conc (ppm) | Method (PDIL+BIAS Or Figure) | Figure Used or Attachment and Sequence# | SDM Valid Until (Date/Time) | Preparer (Init/Date/Time) | SRO Review (Init/Date/Time) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 532 | 3 | 13,500 | IN | 1210 | Today @ 1430 | 1180 | Figure | 2.II.A.3 | Tomorrow @ 1450 | DFL today @ 1450 | |
| | | | | | | | | | | | |
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* Enter IN, OUT, or PDIL. Enter N/A if in MODE 6
** During MODE 6, this Boron Grab Sample is the minimum value of Refueling Pool or filled portion of the RCS.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SRO-ADMIN-2

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SRO-ADMIN-2

**Task Title:** Ability to implement plant procedures for a Condenser Tube Leak

**Task Number:** 202.008

**K/A Reference:** 2.1.34 (2.7, 3.5)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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 88% reactor power.
2) At 0015, 12A Waterbox was secured IAW AOP-10, Abnormal Secondary Chemistry Conditions, due to a condenser tube leak.
   a. Condensate Demineralizers are in service with full flow
   b. Condenser High Level Dump is manually isolated
   c. S/G Blowdown flow has been maximized
3) At 0045, exceeded Action Level 2 values for sodium in the Steam Generators, 52 ppb in 11 S/G & 55 ppb in 12 S/G.
4) At 1800, Chemistry notifies the Control Room we are still exceeding Action Level 2 values that sodium levels are lowering slowly. Chemistry anticipates exiting Action Level 2 at 0330
5) You are performing the duties of an extra SRO.

**Initiating Cue:**

The Shift Manager directs you to perform AOP-10, Section VI. (Please verbalize progress thru the AOP with the evaluator.)

**Task Standard:**

This JPM is complete when it is determined a reactor trip is required. No further actions are required. The evaluator is expected to end the JPM.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

AOP-10, Abnormal Secondary Chemistry Conditions.

CP-217, Specifications and Surveillance - Secondary Chemistry

**General References:**

Procedures and manuals normally available in the Control Room

**Time critical task:**

No

**Validation Time:**

15 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| ❑ Locates AOP-10, Section VI | Same as element. |
| ❑ VI.A. - Determine If A Reactor Trip Is Required. | |
| ❑ VI.A.1. - **IF** Feedwater Sodium is greater than 200 ppb **AND** Condensate Sodium is greater than 200 ppb, **THEN** perform the following:<br>❑ VI.A.1.a. - Trip the Reactor<br>❑ VI.A.1.b. - Perform the Reactivity control portion of EOP-0.<br>❑ VI.A.1.c. - Initiate Auxiliary Feed.<br>❑ VI.A.1.d. - Trip **BOTH** SGFPs<br>❑ VI.A.1.e. - **IMPLEMENT** the remainder of EOP-0 | Reviews step against information provided on the cue sheet. Determines no actions are required at this time |
| **CUE:** The CRS is directing the Crew in the performance of AOP-10, Section VI.B | |
| ❑ VI.B. - Determine required plant conditions. | |
| ❑ VI.C. - Actions with power greater than or equal to 50% | |
| **NOTE:**<br>If SG chemistry levels are reduced below the Action Level 3 value, before or during the power reduction, power level is still required to be reduced below 5%. | |
| ❑ VI.C.1. - **IF** Plant Chemistry determines SG Chemistry is in Action Level 3, as a result of a Condenser tube leak, **THEN** commence an orderly plant shutdown to be less than 5% power as quickly as safe operation permits **PER** OP-3 and OP-4. | Determines step is N/A at this time |
| ❑ VI.C.2. - **IF** Plant Chemistry determines that SG Chemistry is in Action Level 2, as a result of a Condenser tube leak, **THEN** perform the following actions: | Determines step is applicable |
| ❑ VI.C.2.a. - Within 24 hours of initiating Action Level 2, reduce power to less than 50% **PER** OP-3, NORMAL POWER OPERATION. | Determines power must be reduced to less than 50% by 0045 |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ VI.C.2.b. - **WHEN** the following conditions exist:<br>• The source of the impurity ingress is controlled<br>• SG Chemistry is less than the value for Action Level 2<br>**THEN** the power reduction may be terminated and power stabilized. | Determines step is N/A at this time |
| ❑ VI.C.2.c. - **IF** the SG chemistry level has **NOT** been reduced to less than Action Level 1 within 300 hours of entering Action Level 2 **THEN** consider the SG Chemistry level to be in Action Level 3, **AND** commence an orderly plant shutdown to be less than 5% power as quickly as safe operation permits **PER** OP-3 and OP-4. | Determines step is N/A at this time |
| **CUE:** 12A Waterbox is secured for leak location/repair | |
| ❑ VI.C.3. - Attempt to locate and repair the tube leak. | Determines actions already in progress per Evaluator CUE |
| **NOTE TO EVALUATOR:** Candidate will have to refer back to Step VI.C.1. to determine actions required based on data provided in the following CUE | |
| **CUE:** Chemistry reports **S/G sodium has exceeded Action Level 3** values | |
| ❑ VI.C.1. **IF** Plant Chemistry determines SG Chemistry is in Action Level 3, as a result of a Condenser tube leak, **THEN** commence an orderly plant shutdown to be less than 5% power as quickly as safe operation permits **PER** OP-3 and OP-4. | Determines a plant shutdown to <5% power is required. |
| **NOTE TO EVALUATOR:** Candidate will have to refer back to Step VI.A.1. to determine if a Reactor Trip is required based on data provided in the following CUE | |
| **CUE:** Chemistry reports **Condensate** and **Feedwater Sodium levels** are **210 ppb** and rising rapidly. The source appears to be 13B Waterbox. | |
| ❑ VI.A. - Determine If A Reactor Trip Is Required. | |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ VI.A.1. - **IF** Feedwater Sodium is greater than 200 ppb **AND** Condensate Sodium is greater than 200 ppb, **THEN** perform the following:<br>❑ VI.A.1.a. - Trip the Reactor<br>❑ VI.A.1.b. - Perform the Reactivity control portion of EOP-0.<br>❑ VI.A.1.c. - Initiate Auxiliary Feed.<br>❑ VI.A.1.d. - Trip **BOTH** SGFPs<br>❑ VI.A.1.e. - **IMPLEMENT** the remainder of EOP-0 | Determines reactor trip is required using values for Condensate and Feedwater Sodium levels provided by Evaluator CUE |

**TERMINATING CUE:** This JPM is complete when it is determined a reactor trip is required. No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **SRO-ADMIN-2**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1) Unit-1 is at 88% reactor power.
2) At 0015, 12A Waterbox was secured IAW AOP-10, Abnormal Secondary Chemistry Conditions, due to a condenser tube leak.
   a. Condensate and Feed sodium levels are 50 ppb and 45 ppb respectively
   b. Condensate Demineralizers are in service with full flow
   c. Condenser High Level Dump is manually isolated
   d. S/G Blowdown flow has been maximized
3) At 0045, exceeded Action Level 2 values for sodium in the Steam Generators, 52 ppb in 11 S/G & 55 ppb in 12 S/G.
4) At 0755, Chemistry notifies the Control Room we are still exceeding Action Level 2 values, and sodium levels are lowering slowly. Chemistry anticipates exiting Action Level 2 at 0330 tomorrow.
5) You are performing the duties of an extra SRO.

**Initiating Cue:**

The Shift Manager directs you to perform AOP-10, Section VI. (Please verbalize progress thru the AOP with the evaluator.)

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SRO-ADMIN-3

| Appendix C | Job Performance Measure Worksheet | Form ES-C-1 |
|---|---|---|

| | | | |
|---|---|---|---|
| **Facility:** | Calvert Cliffs 1 & 2 | **Job Performance Measure No.:** | SRO-ADMIN-3 |
| **Task Title:** | Apply Technical Specifications to a relay failure | | |
| **Task Number:** | 204.129 | | |
| **K/A Reference:** | 2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications (3.9, 4.6) | | |

Method of testing:

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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. An IM Technician performed a visual inspection of ESFAS ZA Actuation Relay Cabinet. The technician reports that two SIAS A8 power relays are discolored and show signs of deformation possibly due to excessive temperature. These relays CANNOT be considered operable.
3. The affected relays are as follows:
   - SIAS A8 Relay at B5 (11 LPSI)
   - SIAS A8 Relay at B8 (11 & 12 CAC Fans)

**Initiating Cue:**

You are directed to determine which Tech Spec LCO's apply, the LCO actions that must be taken and the completion time limits for these actions Applicable prints and the technical specifications are provided

**Task Standard:**

Determine the TS LCO's that apply and the LCO actions that must be taken including required completion times.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

1. 1E-076 Sheet 1, LPSI Pump 11.
2. 1E-076 Sheet 11C Containment Cooling Fan 11
3. 1E-076 Sheet 11D Containment Cooling Fan 12
4. 1E-058 ESFAS Logic Diagram
5. 1E-058A ESFAS Logic Diagram
6. Technical Specifications
7. Technical Specification Basis

**General References:**

1. 1E-076 Sheet 1, LPSI Pump 11.
2. 1E-076 Sheet 11C Containment Cooling Fan 11
3. 1E-076 Sheet 11D Containment Cooling Fan 12
4. 1E-058 ESFAS Logic Diagram
5. 1E-058A ESFAS Logic Diagram
6. Technical Specifications
7. Technical Specification Basis

**Time critical task:**

No

**Validation Time:**

15 minutes

**Simulator Setup:**

None

| ELEMENT (shaded + * = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| ❑ Review prints and initial conditions. | Same as element. |
| ❑ Refer to Technical Specifications | Same as element |
| **Examiner Note:**<br>Applicant may enter TS LCO's 3.5.2 & 3.6.6 for inoperable components. This action is not necessarily required but may be entered as a conservative application of the Technical Specifications. | |
| ❑ Identify the TS LCO Actions that are required | Determines TS LCO 3.3.5 Action C applies for loss of Function 1.b (SIAS Actuation Logic) in Table 3.3.5-1 |
| ❑ Identify the TS LCO's that apply: | Determines that required action is to restore affected Actuation Logic channel(SIAS Channel A) to Operable status |
| ❑ Identify the required completion time for the actions. | Determines that required completion time is 48 hours |

**TERMINATING CUE:** This JPM is complete when applicant has determined applicable TS LCO, LCO Action required, and completion time. No further actions are required.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **SRO-ADMIN-3**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-1 is at 100% power.
2. An IM Technician performed a visual inspection of ESFAS ZA Actuation Relay Cabinet. The technician reports that two SIAS A8 power relys are discolored and show signs of deformation possibly due to excessive temperature. These relays CANNOT be considered operable.
3. The affected relays are as follows:
   - SIAS A8 Relay at B5 (11 LPSI)
   - SIAS A8 Relay at B8 (11 & 12 CAC Fans)

**Initiating Cue:**

You are directed to determine which Tech Spec LCO's apply, the LCO actions that must be taken and the completion time limits for these actions Applicable prints and the technical specifications are provided

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SRO-ADMIN-4

**Facility**: Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SRO-ADMIN-4

**Task Title**: Approve a Liquid Waste Discharge Permit

**Task Number:** 064.040

**K/A Reference**: 2.3.6 (2.0, 3.8)

Method of testing:

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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 3 with 11A and 13B Waterboxes removed from service for cleaning
2. Unit-2 is at 88% power with 21A Waterbox removed from service for cleaning
3. 12 RCWMT discharge has been risk assessed and is on the schedule for today.
4. You are performing the duties of the CRS.

**Initiating Cue:**

The Shift Chemistry Technician has delivered a permit for the discharge of 12 RCWMT for your review and approval. If necessary, identify any issues associated with the planned discharge.

**Task Standard:**

This JPM is complete when the candidate rejects the permit because the required numbers of Circulating Water Pumps are not operating and RMS values are inconsistent. No further actions are required.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

Procedures and manuals normally available in the plant

**General References:**

CP-601, Liquid Radioactive Waste Release Permit

**Time Critical Task:**

No

**Validation Time:**

20 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START**: _____ | |
| **CUE: Provide the candidate the prepared copy of CP-601, Attachment 2 (12 RCWMT Discharge Permit)** | |
| ❑ Release Criteria is understood: | Same as element. |
| ❑ Discharge Point | Determines Unit 1 is checked. |
| ❑ Min # Circ Water Pumps Required | Determines 5 CW Pps are required |
| ❑ Dilution Flow Rate Pre-Release: | Determines 1,000,000 GPM is consistent with 5 CW Pps running |
| ❑ Maximum Release Flow Rate: 120 GPM | |
| ❑ RMS Number: 0-RE-2201 | |
| **CUE: If checked, RMS reads as stated on permit.** | |
| ❑ RMS Background: | Checks RMS reading for agreement with permit value |
| ❑ Expected RMS Reading: | Notes value is above RMS background |
| ❑ Adjustable Setpoint: | Notes that Adjustable Setpoint is lower than Expected Reading |
| **Note to Evaluator: Candidate may determine permit criteria not met when reviewing Min # of Circ Water Pumps required.** | |
| ❑ Required plant configuration for conducting release has been established | Determines Unit 1 has only 4 CW Pps running and does not meet permit conditions |
| ❑ Chemistry Tech discussed permit with SRO/SM. | Informs Chemistry Tech of mistakes found on permit and does not approve permit. |

Terminating Cue: This JPM is complete when the candidate rejects the permit because the required numbers of Circulating Water Pumps are not operating and RMS values are inconsistent. No further actions are required. The evaluator is expected to end the JPM.

Time Stop: _____

**Verification of Completion**

Job Performance Measure Number: **SRO-ADMIN-4**

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 in Mode 3 with 11A and 13B Waterboxes removed from service for cleaning
2. Unit-2 is at 88% power with 21A Waterbox removed from service for cleaning
3. You are performing the duties of the CRS.

**Initiating Cue:**

The Shift Chemistry Technician has delivered a permit for the discharge of 12 RCWMT for your review and approval. If necessary, identify any issues associated with the planned discharge.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SRO-ADMIN-5

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SRO-ADMIN-5

**Task Title:** Determine Appropriate Emergency Response Actions

**Task Number:** 204.097

**K/A Reference:** 2.4.41 (2.9, 4.6)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☒ Simulator: ☐ Plant: ☐

**Read to the examinee:**

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-~~2~~ 1 was at 100% power when an electrical fault occurred on 14 4KV bus occurred.
2. A reactor trip was manually initiated by de-energizing 480VAC busses when TM/LP trip setpoints reached.
3. EOP-8 was implemented due to multiple events in progress (steam leak and LOCA in containment).
4. CSAS A cannot be verified due to failure of 11 CS pump
5. RI-5317A & B Containment High Range Rad Monitors are currently reading ≈4000 R/hr
6. You are performing the duties of the Shift Manager.
7. This JPM is **TIME CRITICAL**.

**Initiating Cue:**

You have been requested to determine appropriate Emergency Response Actions, per the ERPIP, based on the current plant conditions provided.

**Task Standard:**

Determines EAL classification, Protective Action Recommendations and completes the initial notification form within prescribed time limits.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within required time (TIME CRITICAL).

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

1. Shift Manager ERPIP Book

~~1.~~2.EAL – Hot Chart

~~2.~~3.EP-ChLst-MCR01 "Shift Manager Checklist"

~~3.~~4.CNG-EP-1.01-1019 "Shift Emergency Operations"

~~4.~~5.~~A blank copy of ERPIP 3.0, Attachment 3, "INITIAL NOTIFICATION FORM~~CNG-EP-1.01-1013 "Emergency Classification and PAR""

~~5.~~6.~~ERPIP 3.0 Attachment 4, "GENERAL EMERGENCY ACTIONS~~EP-Form-ALL12 "Onsite Protective Measures Flowchart"

7. ~~ERPIP 3.0 Attachment 5, "GENERAL EMERGENCY PROTECTIVE ACTION RECOMMENDATIONS~~EP-Form-ALL36 "Emergency PA Announcements"

~~6.~~8.EP-Fprm-ALL21 "CCNPP ERONS Notification Details"

**General References:**

Procedures and manuals normally available in the Control Room

**Time critical task:**

Yes

**Validation Time:**

12 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **EVALUATOR NOTE:**<br>The "EAL CLOCK" starts ***after*** candidate reads "Initial Conditions" CUE sheet. | |
| **TIME START:** _____ | |
| **EAL CLOCK TIME START**: _____ | |
| ❑ Identify and locate Shift Manager Checklist | Same as element |
| ❑ 1.1 - Entry into the Emergency Plan | |
| ❑ 1.1.1 - Implement Checklist per CNG-EP-1.01-1019 | |
| ❑ 1.1.2 - Print your name and today's date | Same as element |
| ❑ 1.1.3 - Call or direct an available individual to call the Shift Communicator and Dose Assessor to the Control Room | Same as element |
| ❑ 1.2 - Emergency Classification and PAR and Notifications | |
| **NOTE:** Emergency Classification and declaration shall be completed as soon as possible but no later than 15 minutes from the time indications an EAL threshold being met or exceeded are available in the Control Room | |
| ❑ 1.2.1 - If entry is due to a security event, THEN perform the appropriate actions in the station specific procedure in parallel with completing this checklist | Determines step is N/A |
| ❑ 1.2.2 - Classify the events in progress using CNG-EP-1.01-1013, Emergency Classification and PAR | Reference Tab 3, EAL Wall Chart |
| ❑ Identify Tab 3 CNG-EP-1.01-1013 | |
| ❑ 5.3 - Emergency Classification and Declaration | |
| ❑ 5.3.A - An emergency condition must be assessed, classified, and declared within 15 minutes of the availability of indications that an EAL has been exceeded | Same as element |
| ❑ 5.3.B - Assess and classify abnormal conditions | |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ 5.3.B.1 - Determining if one or more EAL thresholds in the EAL matrix have been matched or exceeded.<br>❑ 5.3.B.2 - Classifying the event at the highest level emergency classification for which an EAL is currently being met or exceeded | Evaluates EAL HOT CHART and determines a **GENERAL EMERGENCY** classification is warranted, under EAL **F.G.1.1**, in the Fission Product Barrier Category, based on the loss of all 3 fission product barriers.<br>Fuel Clad Barrier-Containment Radiation reading > 3500 rem/hr<br>RCS Barrier- Containment Radiation reading > 6 rem/hr<br>Containment Barrier->4.25psig with less than minimum cooling (2 CAC's, zero CS pumps) |
| **CUE:** | When a Peer Check of the EAL call is requested, acknowledge the request. |
| ❑ Checklist 1.2.2.A - **IF** time permits, **THEN** validate the emergency classification with the STA (peer check), if available. | Requests Peer Check from STA |
| ❑ 1.2.2.B - Declare the event by announcing the following:<br>"I am declaring an _____(EAL) at _____(time) due to _____ (brief reason) and assuming the role as Emergency Director<br>❑ **EAL Clock Time Stop ( _____ ) minus EAL Clock Time Start ( _____ ) = _____ minutes** | Fills out checklist<br>~~Time ≤ 15 minutes~~Time ≤ 15 minutes |
| **CUE:** | DIR 10 = 265°, DIR 60 = 272° |
| ❑ 1.2.3 - Determine if protective actions for onsite personnel are necessary using EP-FORM-ALL 12, Onsite Protective Measures Flowchart | Implement OCA Evacuation and Accountability based on GE and safe to evacuate personnel |
| **CUE:** | Inform candidate the Unit-1 CRS will implement PA announcements as necessary |
| ❑ 1.2.4 - Announce, or direct PA announcements, for station personnel as necessary | Directs U-2 CRS to perform announcements |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ 1.2.5 Determine the appropriate PAR per CNG-EP-1.01-1013, Emergency Classification and PAR | Reference TAB 3 |
| ❑ EP-1.01-1013 5.4.B If the event is classified as a General Emergency, then go to appropriate attachment | Reference Attachment 2 for CCNPP |
| ❑ Att 2 Step 1.A If a controlled release…… | Determines step is N/A |
| ❑ Att 2 Step 1.B **IF** the criteria of item A above are **NOT** met, **THEN** select appropriate PAR as follows: | |
| ❑ Att 2 Step 1.B.1 **IF** "From" wind direction is between 168.75 – 303.75, **THEN** recommend:<br>❑ Evacuate **PAZ 1** unless conditions make evacuation dangerous, notify the public in PAZ 1 to take KI, shelter remainder of the 10 mile EPZ | Same as Element |
| ❑ SM Checklist 1.3 Notifications for Change in Classification or PAR | |
| ❑ 1.3.1 **IF** the ERO has **NOT** been activated, **THEN** notify the ERO as follows:<br>❑ 1.3.1.A Complete station specific ERONS Notification Details Form | Determines step is Applicable and references Tab 6 |
| ❑ Tab 6 EP-FORM-ALL21 | |
| ❑ Event | Drill |
| ❑ Reason for Notification | General Emergency |
| ❑ Action | Staff Normal Emergency Facilities for Emergency |
| ❑ Time Event Declared | Enters time event determination made |
| ❑ Message Approval | Signs name and enters current time |
| ❑ SM Checklist 1.3.1.B **(NMP ONLY) ….** | Determines step is N/A |
| ❑ 1.3.1.C Provide completed ERONS form to Shift Communicator **AND** direct them to notify ERO | Gives form to Communicator |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ 1.3.1.D **IF** no one is available ….. | Determines step is N/A |
| **NOTE:** Notification to the state and local are required within 15 minutes of the Emergency Declaration or a change in PAR | |
| ❑ 1.3.2.A - Complete station specific initial notification form | References Tab 8<br>EP-FORM-ALL23 |
| ❑ Complete Item A.1. | Checks "**is**" a drill |
| ❑ Complete Item A.2. | Checks "**Unit-21**" |
| ❑ Complete Item A.3. | Checks "**General Emergency**" |
| ❑ Complete Item A.4. | Enters "**F.G.1.1**" |
| ❑ Complete Item A.5. | Checks "**Yes**" |
| ❑ Complete Item A.5.a | Checks "**Yes**" |
| ❑ Complete Item A.5.b | Checks "**Airborne**" |
| ❑ Complete Item A.6. | Checks box for "**A.6.c**", "Evacuate **PAZ 1** unless conditions make evacuation dangerous, notify the public in PAZ 1 to take KI, shelter remainder of the 10 mile EPZ." |
| ❑ Complete Item A.7. | Time entered is time GE declared not current time. Date is current date. |
| ❑ Complete ED name & signature | Same as element |
| ❑ SM Checklist 1.3.2.A.1 **(GNP Only) ……** | Determines step is N/A |
| **CUE:** When a Peer Check of the EAL call is requested, acknowledge the request. | |
| ❑ 1.3.2.B - IF time permits, THEN obtain a peer check of completed form information | Same as element |
| ❑ 1.3.2.C - Provide completed form to the Shift Communicator **AND** direct them to notify State and Local | Same as element<br>Time ≤ 15 minutes |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ **EAL Form to Communicator ( _____ ) minus EAL Clock Time Stop ( _____ ) = _____ minutes** | |

**TERMINATING CUE**: This JPM is complete when an EAL classification is determined based on given plant conditions, the initial notification form is completed **and** the CR Communicator has been requested to recall the ERO and to notify offsite agencies. No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP: _____**

| Appendix C | Job Performance Measure Worksheet | Form ES-C-1 |
|---|---|---|

**Verification of Completion**

Job Performance Measure Number: **SRO-ADMIN-5**

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:**

1. Unit-~~2~~-1 was at 100% power when an electrical fault occurred on 14 4KV bus occurred.
2. A reactor trip was manually initiated by de-energizing 480VAC busses when TM/LP pre-trip setpoints reached.
3. EOP-8 was implemented due to multiple events in progress (steam leak and LOCA in containment).
4. CSAS A cannot be verified due to failure of 11 CS pump
5. RI-5317A & B Containment High Range Rad Monitors are currently reading ≈4000 R/hr
6. You are performing the duties of the Shift Manager.
7. This JPM is **TIME CRITICAL**.

**Initiating Cue:**

You have been requested to implement Emergency Response Actions, per the ERPIP, based on the current plant conditions provided.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-1 (Alt Path)

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-1 **(Alt Path)**

**Task Title:** Evaluates Operator's ability to align a LPSI Pp for Core Flush via Hot Leg Injection

**Task Number:** 201.058

**K/A Reference:** 005.A4.01 (3.6, 3.4), 011.EA1.11 (4.2, 4.2)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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. A Loss of Coolant Accident (LOCA) has occurred on Unit-1.
2. SIAS actuated 9 hours ago.
3. RCS pressure ~ 20 PSIA with CETs indicating ~ 230° F
4. Containment pressure is ~ 5 PSIG.
5. Core flush, using 11 HPSI Pp for Pressurizer Injection via the Charging Header, is aligned thru EOP-5, Step IV.AE.1.g.
6. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to continue with the procedure, beginning at Step IV.AE.1.h., of EOP-5-1.

**Task Standard**:

Establishes Core Flush, via Hot Leg Injection, using 11 Low Pressure Safety Injection Pump

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

EOP-5, Loss of Coolant Accident (Unit-1)

**General References:**

Procedures and manuals normally available in the Control Room

**Time critical task:**

No

**Validation Time:**

25 minutes

**Simulator Setup:**

_____ 1. Reset to IC-24 with both units at 100% (IC-117 is 1 min prior to RAS with RCS Cold Leg Rupture **rcs001** at **100% inserted)**

_____ 2. Place simulator in **RUN**.

_____ 3. Insert following Malfunctions/Remote Functions:

_____ a. RCS Cold Leg 12B Rupture: **rcs001** at **100%** at time **zero**

_____ b. 1-SI-651-MOV Bkr: **1-SI-651-MOV** to **CLOSED**, with a **15 second delay**, on **Event 1**

_____ c. 1-SI-652-MOV Bkr: **1-SI-652-MOV** to **CLOSED**, with a **45 second delay**, on **Event 1**

_____ 4. Perform applicable EOP Block steps thru Step R, Prepare for RAS.

_____ 5. **WHEN** RAS actuates, perform Step S, Verify RAS Actuation; Step AD, Perform LOW Temperature Actions; and Step AE.1, Commence Core Flush using Pressurizer Injection, thru Step AE.1.g.

_____ 6. IF required, insert Override **P1C07_1FIA212_MT** (1-FIA-212 CHRG FLOW MT) to a final value of **100 GPM** with **no ramp time**

_____ 7. Place 11 & 12 LPSI Pump Handswitches in PTL.

_____ 8. Place simulator in **FREEZE**.

_____ 9. Obtain an Independent Verification for steps 3, 4, 5, and 6.

_____ 10. Acknowledge all panel alarms and plant computer alarms and ensure "Horn On" for annunciators.

_____ 11. Select "Clock" time.

_____ 12. **WHEN** cued by evaluator, go to **RUN**.

_____ 13. **WHEN** cued by evaluator, activate **Event 1**.

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START: _____** | |
| **EXAMINER's NOTE**<br>Once applicant has located the correct section of the EOP, provide them with a working copy of the procedure section. | |
| Locates EOP-5-1, Step IV.AE.1.h. | |
| ☐ IV.AE.1.g. - **IF** 13 HPSI PP is available, **THEN** perform the following actions: | Same as element |
| ☐ IV.AE.1.h.(1) - Verify 13 HPSI PP is running. | Same as element |
| ☐ IV.AE.1.h.(2) - Verify HPSI HDR XCONN valve, 1-SI-653-MOV, is shut. | Same as element |
| ☐ IV.AE.1.h.(3) - Shut AUX HPSI HDR valves:<br>☐ 1-SI-617-MOV<br>☐ 1-SI-627-MOV<br>☐ 1-SI-637-MOV<br>☐ 1-SI-647-MOV | Same as element |
| ☐ IV.AE.1.h.(4) - Verify 11 or 12 HPSI PP is running. | Same as element |
| ☐ IV.AE.1.h.(5) - **IF** approximately 150 GPM is **NOT** indicated **THEN** initiate Hot Leg Injection. | Determines step is Applicable. Proceeds to Step IV.AE.1.1 |
| **BEGIN ALTERNATE ACTIONS** | |
| ☐ IV.AE.1.1 - **IF** Pressurizer Injection is **NOT** adequate **AND** the following conditions are met:<br>☐ RCS pressure is less than 270 PSIA {245}<br>☐ RCS pressure minus containment pressure is <75 PSID<br>☐ HPSI PP(s) are available<br>**THEN** line up for Hot Leg Injection as follows: | Determines step is APPLICABLE. |
| **CUE:** The CRS desires that 11 LPSI Pump be used for Hot Leg Injection | |
| ☐ IV.AE.1.1.a. - Place the selected LPSI PP RAS OVERRIDE switch in OVERRIDE. | Same as element |
| ☐ IV.AE.1.1.b. - Verify the CNTMT SUMP DISCH valves are open:<br>☐ 1-SI-4144-MOV<br>☐ 1-SI-4145-MOV | Same as element |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ☐ IV.AE.1.1.c. - Open SDC RECIRC ISOL valve, 1-SI-399-MOV. | Same as element |
| ☐ IV.AE.1.1.d. - Shut LPSI HDR valves:<br>❑ 1-SI-615-MOV<br>❑ 1-SI-625-MOV<br>❑ 1-SI-635-MOV<br>❑ 1-SI-645-MOV | Same as element |
| **CUE:** | Acknowledge, as ABO, and activate **Event 1** to close the breakers for 1-SI-651-MOV (52-11466) and 1-SI-652-MOV (52-10424) and report completed. |
| ☐ IV.AE.1.1.e. - Close the power supply breaker to the SDC HDR RETURN ISOL valves:<br>❑ 1-SI-651-MOV breaker, 52-11466<br>❑ 1-SI-652-MOV breaker, 52-10424 | Contacts ABO to shut associated breakers |
| **Evaluator NOTE:**<br>Operator must hold handswitch in OPEN for each valve OR valve will stop moving. | |
| ☐ IV.AE.1.1.f. - Open SDC HDR RETURN ISOL valves:<br>❑ 1-SI-651-MOV<br>❑ 1-SI-652-MOV | Same as element |
| ☐ IV.AE.1.1.g. - Start the selected LPSI PP. | Starts 11 LPSI PP per previous CUE. |
| ☐ IV.AE.1.1.h. - Maintain a flowrate of at least 150 GPM. | Verifies from LPSI HDR flow indication, on 1-FIC-306, that adequate flow exists. |
| **END ALTERNATE ACTIONS** | |

**TERMINATING CUE:** This JPM is complete when the operator has determined that adequate flow exists after HOT LEG injection is established. No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **SIM-1**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. A Loss of Coolant Accident (LOCA) has occurred on Unit-1.
2. SIAS actuated 9 hours ago.
3. RCS pressure ~ 20 PSIA with CETs indicating ~ 230° F
4. Containment pressure is ~ 5 PSIG.
5. Core flush, using 11 HPSI Pp for Pressurizer Injection via the Charging Header, is aligned thru EOP-5, Step IV.AE.1.g.
6. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to continue with the procedure, beginning at Step IV.AE.1.h., of EOP-5-1.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-2 (Alt Path)

Rev. 1

APPLICANT: _____

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-2 **(Alt Path)**

**Task Title:** Respond to CEA(s) Misaligned by 15 inches or more

**Task Number:** 202.008

**K/A Reference:** 003AA1.02 (3.6, 3.4)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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 1 at 100% power.
2. STP O-29-1, MONTHLY CEA PARTIAL MOVEMENT TEST, was in progress. When CEA 01 was being exercised, it became misaligned from its group.
3. AOP-1B has been implemented and all stabilizing actions have been performed.
4. Electrical Maintenance discovered and replaced a faulty power supply during troubleshooting.
5. CEA alignment time expires in 90 minutes.
6. You are performing the duties of the Unit-1 RO.
7. The CRO is responsible to hold power constant during Control Rod realignment.

**Initiating Cue:**

The CRS directs you to realign CEA #1 per AOP-1B Step VI.B. **Are there any questions? You may begin.**

**Task Standard:**

**Manually realigns CEA-01 to within 7.5 inches of the remaining CEAs in Group 5.**
**Trips reactor when CEA-01 and CEA-36 drop into the core.**
**Verifies Reactor is shut down.**

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

AOP-1B, CEA Malfunction

AOP-1B Trip Criteria Hard Card

**General References:**

1C05-ALM, Reactivity Control Alarm Manual

AOP-1B, CEA Malfunction

**Time critical task:**

No

**Validation Time:**

15 minutes

**Simulator Setup/Booth Operator Instructions:**

_____ 1. **Reset** to IC-24 with both units at 100%.

_____ 2. Place Simulator in **RUN**.

_____ 3. Select Manual Individual, depress Group 5 Inhibit Bypass, depress and hold CMI Bypass pushbutton, then insert CEA #1 to approximately 110 inches withdrawn. After 5 seconds release the CMI Bypass pushbutton.

_____ 4. Place CEDS control panel in **OFF**

_____ 5. Place the Group 5 Inhibit Bypass to **OFF**.

_____ 6. Verify the button for Group 5 is selected (lit)

_____ 7. Verify the individual CEA button for CEA #1 is selected (lit).

_____ 8. Allow plant to stabilize.

_____ 9. CEA 01 Drop: **ceds012_01** on **Event 1**.

_____ 10. CEA 36 Drop: **ceds012_36** on **Event 1 with a 15 second delay**.

_____ 11. Obtain Independent Verification for completion of steps 3 through 11.

_____ 3. CEA #1 inserted to approximately 110 inches withdrawn.

_____ 4. CEDS control panel in OFF

_____ 5. Group 5 Inhibit Bypass to OFF

_____ 6. Group 5 is selected (lit)

_____ 7. CEA button for CEA #1 is selected (lit)

_____ 8. Plant is stabilized

_____ 9. CEA 01 Drop is assigned to Event 1

_____ 10. CEA 36 Drop is assigned to Event 1 with 15 second delay

_____ 12. Acknowledge all panel and plant computer alarms.

_____ 13. Ensure "HORN ON" for annunciation.

_____ 14. Select Clock Time and **GO TO FREEZE**.

_____ 15. Place in **CONTINUE**

_____ 16. When cued by evaluator, actuate **Event 1**.

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| **CUE** Once AOP-1B is located, hand AOP-1B Trip Criteria Hard Card to applicant | |
| ❑ Locates AOP-1B Section VI.B - ATTEMPT CEA REALIGNMENT | Same as element. |
| ❑ VI.B.1 - **IF** at any time the CEA is realigned, **THEN** perform the subsequent actions in Section IV., PRELIMINARY, Step B, Page 16. | Determines step is N/A. |
| **CUE:** There is 90 minutes remaining for realignment of CEA-01. | |
| ❑ VI.B.2 - **IF** the CEA alignment time has expired, **THEN PROCEED** to Step B.4, Page 24. | Determines step is N/A. |
| **CAUTION**<br>**CEA movement should be minimized until the cause of the misalignment has been determined.** | |
| **CUE:** The electric shop discovered and replaced a faulty power supply during the troubleshooting. The CRS directs you to continue the procedure. | |
| **CUE:** The CRS has directed the CRO to maintain power level no higher than the present level using boration per OI-2B. | |
| ❑ VI.B.3 - Attempt to realign the affected CEA(s): | Same as element |
| ❑ VI.B.3.a. - Maintain Reactor Power as required by :<br>❑ Boration **PER** OI-2B, CVCS BORATION, DILUTION AND MAKEUP OPERATIONS.<br>**OR**<br>❑ Adjust Regulating CEAs. | Determines no action needed based on Cue from evaluator. |
| ❑ VI.B.3.b. - Select the desired group. | Checks group 5 selected. |
| ❑ VI.B.3.c. - Select the desired CEA. | Checks CEA 01 selected. |
| ❑ VI.B.3.d. - Select Manual Individual Mode. | Same as element |
| ❑ VI.B.3.e. - **IF** CMI is in effect, **THEN** override CMI as follows: | Determines CMI is in effect. |
| **NOTE**<br>CMI will be bypassed to the affected group and applied to all other groups, and CMI Bypass annunciation will alarm. | |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ VI.B.3.e.(1) - Depress the Group Inhibit Bypass pushbutton. | Same as element |
| ❑ VI.B.3.e.(2) - Depress and hold the Motion Inhibit Bypass pushbutton for at least 5 seconds before **AND** 5 seconds after CEA motion. | Same as element |
| **CAUTION**<br>**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.** | |
| ❑ VI.B.3.f. - Realign the CEA: | |
| ❑ VI.B.3.f.(1) - IF the CEA must be withdrawn, THEN withdraw the CEA using the "Pull and Wait" method: | Determines step is applicable |
| ❑ For shutdown CEA's, pull 3.75 inches and wait 10 seconds | Determines this rate is N/A. |
| ❑ For regulating CEAs, pull 5.25 inches and wait 15 seconds | Determines rate is applicable and commences recovery of CEA-01 **(withdraws CEA no more than 6.75" each time CEA is withdrawn).** |
| ❑ VI.B.3.f.(2) - IF the CEA must be inserted, then insert the CEA. | Determines step is N/A |
| **EVALUATOR NOTE:**<br>The intent of this JPM, going forward, is for the **OPERATOR** to recognize that a Reactor Trip is required when two CEAs become misaligned by greater than 15 inches per Step V.A.1. criteria. | |
| **CUE:** Signal the booth operator to activate **Event 1** to drop CEA-01 to the bottom after the student has performed a minimum of two pull and wait cycles. CEA-36 will drop when CEA 01 is fully inserted. | |
| The following alarms annunciate when CEA # 01 drops:<br>❑ Dropped CEA PI,<br>❑ Primary PDIL,<br>❑ Secondary PPDIL,<br>❑ Secondary PDIL, and<br>❑ CEA deviation alarms annunciate | Operator stops withdrawing CEA, notes alarms and CEA status, and recommends tripping the reactor |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| Locates AOP-1B, Section V.A.1 - PLANT SHUTDOWN | Same as element |
| **PERFORM ALTERNATE ACTIONs** | |
| ❑ V.A.1. - **IF** two or more CEAs are misaligned from the other CEAs in their respective group by greater than 15 inches, **THEN** perform the following actions: | Same as element |
| **CUE:** **IF** the operator recommends tripping the reactor to the CRS, **acknowledge** tripping the reactor and implement EOP-0. | |
| ❑ V.A.1.a. - Trip the reactor | Depresses manual reactor trip buttons on 1C05. |
| **END OF ALTERNATE ACTIONs** | |
| ❑ V.A.1.b. - IMPLEMENT EOP-0, POST TRIP IMMEDIATE ACTIONS. | Verifies reactor is tripped by observing a prompt drop in NI power and a negative startup rate. Reports reactor is tripped. |

**TERMINATING CUE:** This JPM is complete when the manual reactor trip pushbuttons are depressed, the reactor is verified tripped and the reactor is reported tripped. No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **SIM-2**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-1 is in Mode 1 at 100% power.
2. STP O-29-1, MONTHLY CEA PARTIAL MOVEMENT TEST, was in progress. When CEA 01 was being exercised, it became misaligned from its group.
3. AOP-1B has been implemented and all stabilizing actions have been performed.
4. Electrical Maintenance discovered and replaced a faulty power supply during troubleshooting.
5. CEA alignment time expires in 90 minutes.
6. You are performing the duties of the Unit-1 RO.
7. The CRO is responsible to hold power constant during Control Rod realignment.

**Initiating Cue:**

The CRS directs you to realign CEA #1 per AOP-1B Step VI.B. **Are there any questions? You may begin.**

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-3 (Alt Path)

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-3 **(Alt Path)**

**Task Title:** Attempt to Correct the Abnormal SDC Condition

**Task Number:** 202.026

**K/A Reference:** 025AK3.03 (3.9, 4.1)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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 has been shut down for 5 days and is presently in Mode 5 to repair RCS instrumentation sensing lines.
2. SDC is in service, using 12 LPSI Pp, and RCS temperature is 150°F. The RCS is being cooled down to a temperature band of 100-110°F.
3. RCS pressure is 150 PSIA with a bubble in the Pressurizer. The S/Gs are still available.
4. The ABO reported smoke coming from 12 LPSI Pp motor.
5. 12 LPSI Pp Breaker has just tripped.
6. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to respond to the Loss of SDC per AOP-3B, Abnormal Shutdown Cooling Conditions, starting in Section IV, Step A.6.

**Task Standard:**

SDC flow is restored, using a Containment Spray Pump, per AOP-3B. Reactor Coolant system temperature is observed to be lowering.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

AOP-3B, Abnormal Shutdown Cooling Conditions

**General References:**

Procedures and manuals normally available in the control room

**Time critical task:**

No

**Validation Time:**

15 minutes

**Simulator Setup/Booth Operator Instructions:**

_____ 1. **Reset** to IC-07, (Unit-1 in Mode 5 with a PZR bubble with the RCS at 150° F and 250 PSIA).

_____ 2. **Insert** the following malfunctions/overrides:

_____ 3. 11 LPSI Pump Bkr Failure: **si003_01**, on **Event 1**

_____ 4. 12 LPSI Pump Bkr Failure: **si003_02**, on **Event 1**

_____ 5. 11 CS PP DISCH: **1-SI-314**, to **1.0** on **Event 2**

_____ 6. 11 LPSI RWT SUCTION: **1-SI-444**, to **1.0** on **Event 2**

_____ 7. Place in **RUN**

_____ 8. Lower RCS Pressure to approximately 150 PSIA using Auxiliary Spray.

_____ 9. Activate **Event 1.**

_____ 10. Place in **FREEZE**.

_____ 11. Obtain Independent Verification for completion of the following steps:

_____ 5. 11 CS PP DISCH, 1-SI-314, is set to open on Event 2

_____ 6. 11 LPSI RWT SUCTION, 1-SI-444, is set to open on Event 2

_____ 8. RCS Pressure has been stabilized at approximately 150 PSIA

_____ 9. 11 & 12 LPSI Pump Bkr Failures are inserted as Event 1

_____ 10. Simulator has been placed in FREEZE

_____ 12. Acknowledge all panel and plant computer alarms.

_____ 8. Select "Horn On" for annunciators.

_____ 9. Select "Clock" time.

_____ 10. When cued by evaluator, place in **RUN**.

_____ 11. When directed, activate **Event 2** to open 1-SI-314 and 1-SI-444. Report complete after agreed upon delay (≈60 seconds each).

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START: _____** | |
| Locates AOP-3B, Step IV.A.6. | Same as element. |
| IV.A. PRELIMINARY | |
| ❑ IV.A.6. - **IF** SDC is lost due to failure of the operating LPSI PP **AND** the cause will **NOT** result in a common mode failure, **THEN** complete the following actions: | Determines step is applicable. |
| ❑ IV.A.6.a. - Place the failed PP handswitch in PULL TO LOCK. | Places 12 LPSI in PTL. Determines 12 LPSI Pump failure will not result in a common mode failure. |
| ❑ IV.A.6.b. - **IF** RCS purification is in service, **THEN** place IX BYP valve handswitch 1-HS-2520 in the BYP position. | Same as element. |
| ❑ IV.A.6.c. - Shut S/D COOLING TEMP CONTR valve, 1-SI-657-CV. | Lowers output of HIC-657 on 1C09 to zero or places HS-3657 on 1C09 to CLOSE. Checks position indication for SI-657. |
| ❑ IV.A.6.d. - Place the SHUTDOWN CLG FLOW CONTR, 1-FIC-306, in MANUAL. | Shifts FIC-306 on 1C08 to MANUAL. |
| ❑ IV.A.6.e. - Adjust the output of the SHUTDOWN CLG FLOW CONTR, 1-FIC-306, to 95%. | Adjusts output of FIC-306 to 95%. |
| ❑ IV.A.6.f. - Verify **BOTH** RAS OVERRIDE switches in OVERRIDE:<br>❑ 11 LPSI PP RAS OVERRIDE, 1-HS-302XA<br>❑ 12 LPSI PP RAS OVERRIDE, 1-HS-302YA. | Checks position on HS-302XA and 302YA on 1C08 and 1C09. If not in OVERRIDE position, places HS in OVERRIDE |
| **CAUTION:**<br>**Before starting the standby LPSI PP, the cause for the running LPSI PP failure should be determined to preclude a common mode failure.** | |
| **CUE:** The CRS states that 11 LPSI is not affected by the same motor issue that caused 12 LPSI pump to trip. | |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ IV.A.6.g. Start the standby LPSI PP. | Tries to start 11 LPSI. Determines pump has not started. Goes to the alternate action step IV.A.6.g.1. |
| **PERFORM ALTERNATE ACTION(S)** | |
| **CUE:** • CRS reports he will assign the extra operator to perform B, Page 17. • CRS reports steps C.1 thru C.4 have been completed and directs you to begin at Step C.5. | |
| ❑ IV.A.6.g.1.- **IF** the standby LPSI PP does **NOT** start, **THEN** assign an operator to perform B, Page 17, AND concurrently **PROCEED** to Step C, Page 20 | Determines extra CRO will perform step B and next step is C.5 based on CRS direction. |
| IV.C. ATTEMPT TO RESTORE FROM ABNORMAL SDC CONDITION | |
| ❑ IV.C.5. - **IF NO** LPSI PPs are available, **THEN** align the CS PPs for cooling. | Determines step is applicable. |
| **CAUTION:** **To prevent CS Pump shaft seal and bearing damage, RCS temperature shall be less than 120° F OR the associated ECCS Pump Room Air Cooler shall be functional.** | |
| ❑ IV.C.5.a. - Verify RCS temperature less than 120° F **OR** the associated ECCS PP Room Air Cooler is functional. | Checks that ECCS PP Room Air Coolers are not OOS. |
| **CAUTION:** **To prevent over pressurization of the ECCS PP suction headers, RCS pressure shall be less than 170 PSIA.** | |
| ❑ IV.C.5.b. - Check that RCS pressure is less than 170 PSIA. | Checks RCS pressure less than 170 PSIA on PI-103 and/or PI-103-1 on panel 1C06. |
| ❑ IV.C.5.c. - Check that the SDC HDR RETURN ISOL valves are open:<br>❑ 1-SI-651-MOV<br>❑ 1-SI-652-MOV | Same as element |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ IV.C.5.d. - Shut the 11 RWT OUT valves:<br>❑ 1-SI-4142-MOV<br>❑ 1-SI-4143-MOV | Same as element |
| ❑ IV.C.5.e. - Isolate CS PP Min Flow to the RWT: | |
| ❑ IV.C.5.e.(1) - Place the SI PP RECIRC LOCKOUT handswitches to ON.<br>❑ 1-HS-3659A<br>❑ 1-HS-3660A | Same as element |
| ❑ IV.C.5.e.(2) - Shut the MINI FLOW RETURN TO RWT ISOL valves:<br>❑ 1-SI-659-MOV<br>❑ 1-SI-660-MOV | Same as element |
| **CUE:** CRS directs use of 11 CS PP<br>**Driver:** Acknowledge request. Activate **Event 2** to open 1-SI-314 and 1-SI-444. Report complete after agreed upon time delay (≈60 seconds each). | |
| ❑ IV.C.5.f. - **IF** 11 CS PP is desired for SDC, **THEN** open the following valves:<br>❑ 11 CS PP Discharge valve, 1-SI-314<br>❑ 11 LPSI PP NORM SUCT ISOL valve, 1-SI-444 | Contacts ABO to position 1-SI-314 and 1-SI-444 to the open position |
| ❑ IV.C.5.g. - **IF** 12 CS PP is desired for SDC... | Determines step is N/A. |
| ❑ IV.C.5.h. - Shut the S/D COOLING TEMP CONTR valve, 1-SI-657-CV. | Verifies output of 1-HIC-657 is zero or 1-HS-3657 is in CLOSE. Checks position indication for 1-SI-657. |
| ❑ IV.C.5.i. - Place the SHUTDOWN CLG FLOW CONTR, 1-FIC-306, in MANUAL. | Same as element |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ IV.C.5.j. - Adjust the output of the SHUTDOWN CLG FLOW CONTR, 1-FIC-306, to 95%. | Same as element |
| ❑ IV.C.5.k. - Start the selected CS PP. | Starts 11 CS PP |
| ❑ IV.C.5.l. - Slowly adjust the SHUTDOWN CLG FLOW CONTR, 1-FIC-306, to raise SDC flow to 1500-2000 GPM. | Same as element |
| **CUE:** CRS desires SHUTDOWN CLG FLOW CONTR, 1-FIC-306, be placed in auto | |
| ❑ IV.C.5.m. - **IF** desired to place SHUTDOWN CLG FLOW CONTR, 1-FIC-306, in AUTO, **THEN** perform the following. | |
| ❑ IV.C.5.m.(1) - Adjust the setpoint on 1-FIC-306 to match SDC flow | Same as element |
| ❑ IV.C.5.m (2) - Place 1-FIC-306 in AUTO. | Same as element |
| **CUE:** The CRS directs to continue RCS cooldown to a temperature band of 100 to 110 °F | |
| ❑ IV.C.5.n. - Adjust the S/D COOLING TEMP CONTR valve, 1-SI-657-CV, as desired. | **IF** 1-HS-3657 is in CLOSE, places in AUTO then raises output of 1-HIC-3657 to lower RCS temperature.<br>Checks RCS temperature slowly lowering (TR-351 on panel 1C09). |
| **ALTERNATE ACTION(S) COMPLETED** | |

**TERMINATING CUE:** This JPM is complete when SDC has been restored using a CS Pump and SDC temperature is observed to be lowering. The evaluator is expected to end the JPM. No further actions are required.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **SIM-3**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-1 has been shut down for 5 days and is presently in Mode 5 to repair RCS instrumentation sensing lines.
2. SDC is in service, using 12 LPSI Pp, and RCS temperature is 150°F. The RCS is being cooled down to a temperature band of 100-110°F.
3. RCS pressure is 150 PSIA with a bubble in the Pressurizer. The S/Gs are still available.
4. The ABO reported smoke coming from 12 LPSI Pp motor.
5. 12 LPSI Pp Breaker has just tripped.
6. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to respond to the Loss of SDC per AOP-3B (Abnormal Shutdown Cooling Conditions) starting in Section IV, Step A.6.

**Are there any questions? You may begin.**

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-4 (Alt Path)

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-4 (**Alt Path**)

**Task Title:** Respond to a Failure of a Pump with Reactor Power < 5%

**Task Number:** 202.037

**K/A Reference:** 054AA1.02 (4.4, 4.4), 054AA2.03 (4.1, 4.2)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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 ~0.5% power during plant startup from an extended outage.
2. 13 Condensate pump is tagged out.
3. Annunciator windows C-01 and C-02 "11 & 12 CONDS PUMP OIL FLOW LO" on 1C03 came into alarm. Shortly thereafter, 11 and 12 Condensate pumps tripped.
4. 11 & 12 SGFP's subsequently tripped on low suction pressure and annunciator windows C-25 "SGFP(S) SUCT PRESS LO" and C-26 "11 SGFPT TRIP" and C-30 "12 SGFPT TRIP" on 1C03 are in alarm.
5. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to respond to the Condensate Pump trip per AOP-3G, Main Feedwater Malfunctions, Section VI, Block Step A.

**Task Standard:**

Restores S/G levels using the Auxiliary Feedwater per the appropriate plant procedure.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

AOP-3G, Main Feedwater Malfunctions

**General References:**

Procedures and manuals normally available in the control room

**Time critical task:**

No

**Validation Time**:

20 minutes

**Simulator Setup:**

_____ 1. Reset to IC-9 (U-1 ZPPDIL with 11 SGFP in service).

_____ a. Pull CEA's to criticality and level power at $10^{-5}$%

_____ 2. Insert the following malfunctions / overrides

_____ a. 13 Cond Pp: **P1C03_1HS4428**, to **PULL**, at **time zero**.

_____ b. 11 Cond Pp Breaker failure: **cd004_01** at **time zero**

_____ c. 12 Cond Pp Breaker failure: **cd004_02** at **time zero**

_____ d. 13 AFW Pump Breaker Failure: **afw005**, on **Event 1**.

_____ 3. Place 13 Condensate Pump handswitch in **PTL**.

_____ 4. Place a caution tag on 13 Condensate Pump handswitch.

_____ 5. Place simulator in **RUN**.

_____ 6. **WHEN** 11 SGFP trips, place simulator in **FREEZE**.

_____ 7. Acknowledge all panel and computer alarms.

_____ 8. Ensure "Horn On" is selected for annunciators.

_____ 9. Ensure "Clock" is selected for time.

_____ 10. Obtain Independent Verification for completion of steps 2 through 4 and 6.

_____ 2. Malfunctions/Overrides entered as specified.

_____ 3. 13 Cond Pp H/S is in **PTL**

_____ 4. 13 Cond Pp H/S is Caution Tagged in **PTL**

_____ 6. 11 SGFP tripped and the Simulator is in **FREEZE**

_____ 11. **WHEN** cued by evaluator, place simulator in **RUN**.

_____ 12. **WHEN** cued by evaluator, activate **Event 1**.

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **EVALUATOR NOTE**<br>Cue driver to place simulator in **RUN.** | |
| **TIME START: _____** | |
| ❑ Identifies and locates AOP-3G Section VI | Same as element |
| **VI.A. - DETERMINE IF A REACTOR TRIP IS REQUIRED** | |
| **CUE** Once CRO has determined S/G levels inform operator that the **RO will monitor S/G levels for trip strategy**. | |
| ❑ VI.A.1 - **IF** SG level is approaching (-) 40 inches, **THEN**, with the approval of the SM/CRS, perform the following actions … | Monitors S/G levels on 1C03, determines a reactor trip is not necessary and that the RO will monitor for trip criteria. |
| **VI.B. - ESTABLISH A SOURCE OF FEEDWATER** | |
| **CAUTION**<br>**Excessive feeding at low power conditions will affect $T_{COLD}$ and Reactivity. PZR level and RCS pressure can be affected.** | |
| **CAUTION**<br>**A severe waterhammer may result if Main Feedwater flow is restored after it has been stopped for greater than 80 minutes.** | |
| **CUE:** TBO reports there is no indication of a faulted bus. | |
| ❑ VI.B.1. - **IF** the following conditions exist:<br>❑ A SGFP has tripped<br>❑ The standby SGFP is available<br>❑ There is sufficient time available to start the standby pump<br>**THEN** perform the following actions: … | Determines step is N/A. (Standby SGFP is not available due to low suction header pressure trip conditions) |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CAUTION**<br>**A severe waterhammer may result if Main Feedwater flow is restored after it has been stopped for greater than 80 minutes.** | |
| ❑ VI.B.2. - **IF** time does **NOT** permit starting the standby SGFP, **THEN**, with the approval of the SM/CRS, … | Determines step is N/A. (Tripped SGFP cannot be restarted) |
| ❑ VI.B.3. - **IF** a Condensate Booster Pump has tripped, **THEN** perform the following … | Determines step is N/A. Proceeds to Step 4. |
| ❑ VI.B.4. - **IF** a Condensate Pump has tripped, **THEN** perform the following actions … | Determines backup Cond Pps are NOT available based on initiating cue |
| **PERFORM ALTERNATE ACTIONS** | |
| **CAUTION**<br>**Starting a pump without determining the cause of the failure could initiate a common mode failure.** | |
| ❑ VI.B.4.a.1 - **IF** a backup Condensate Pump did **NOT** start, **THEN**, with the approval of the SM/CRS, attempt to start the backup Condensate Pump. | Determines step is N/A per Initiating Cue. |
| **CUE:** When requested, direct operator **do NOT attempt** to start tripped pumps. | |
| ❑ VI.B.4.a.2 - **IF** a backup Condensate Pump will **NOT** start, **THEN**, with the approval of the SM/CRS, attempt to start the tripped Condensate Pump. | Requests concurrence from CRS to attempt to start a tripped pump. |
| **ALTERNATE ACTIONS COMPLETED** | |
| ❑ VI.B.5. - **IF** Main Feedwater flow has been restored … | Determines step is N/A and continues to step 6. |
| **NOTE**<br>Restoration of Main or Auxiliary Feedwater will affect RCS $T_{COLD}$. | |
| ❑ VI.B.6. - Control RCS $T_{COLD}$ by using **ANY** of the following methods, as applicable:<br>❑ adjusting TBVs<br>❑ adjusting ADVs<br>to maintain the following temperature band: | Monitors $T_{COLD}$ on 1C05 and/or 1C06, and TBV operation. |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ **IF** the Reactor is critical, **THEN** within 2°F of program $T_{COLD}$ | Determines $T_{COLD}$ is within 2°F of program. |
| ❑ **IF** the Reactor is **NOT** critical | Determines step is N/A |
| ❑ VI.B.7. - **IF** Main Feedwater will **NOT** be restored, **THEN** perform the following actions: | Determines step is applicable |
| **CUE:** | Once power level evaluated, inform operator that RO will maintain power less than 1%. |
| **NOTE**<br>This step should be performed concurrently with the remaining steps. | |
| ❑ VI.B.7.a. - Reduce power to less than 1% | Determines power less than 1% |
| ❑ VI.B.7.b. - Shut the S/G BD valves:<br>❑ 1-BD-4010-CV<br>❑ 1-BD-4011-CV<br>❑ 1-BD-4012-CV<br>❑ 1-BD-4013-CV | Same as element |
| ❑ VI.B.7.c. - Initiate AFW using 13 AFW PP as follows: | Same as element. |
| ❑ VI.B.7.c.(1) - Verify open the motor driven SG AFW Block Valves:<br>11 SG<br>❑ 1-AFW-4522-CV<br>❑ 1-AFW-4523-CV<br>12 SG<br>❑ 1-AFW-4532-CV<br>❑ 1-AFW-4533-CV | Same as element. |
| **EVALUATOR NOTE**<br>**COORDINATE** with Simulator Driver to **Activate Event 1** (13 AFW Pump trip) approximately 30 seconds after 13 AFW Pump is started. | |
| ❑ VI.B.7.c.(2) - Start 13 AFW PP | Same as element. |
| **CUE:** | Acknowledge report that 13 AFW Pump has tripped and alternate actions being taken. |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **BEGIN ALTERNATE ACTIONS** | |
| ❑ VI.B.7.c.1 - Initiate AFW using 11 or 12 AFW PP as follows: | Determines step is applicable. |
| ❑ VI.B.7.c.1(1) - Verify open the steam driven SG AFW Block Valves:<br>11 SG<br>❑ 1-AFW-4520-CV<br>❑ 1-AFW-4521-CV<br>12 SG<br>❑ 1-AFW-4530-CV<br>❑ 1-AFW-4531-CV | Same as element |
| ❑ VI.B.7.c.1(2) - Open the SG AFW STM SUPP & BYPASS valves:<br>❑ (11 SG) 1-MS-4070-CV<br>❑ (11 SG) 1-MS-4070A-CV<br>❑ (12 SG) 1-MS-4071-CV<br>❑ (12 SG) 1-MS-4071A-CV | Same as element |
| ❑ VI.B.7.c.1(3) - Adjust and maintain 11 or 12 AFW PP discharge pressure at least 100 PSI greater than SG pressure using the AFW PP SPEED CONTRs:<br>❑ (11 AFW) 1-HC-3987A<br>❑ (12 AFW) 1-HC-3989A | Same as element<br>No action required discharge pressure is >100psia above S/G pressure |
| ❑ VI.B.7.c.1(4) - Ensure the feedwater flowrate does NOT cause RCS cooldown to exceed the following limits for any one hour: [B0126]<br>❑ Greater than 256°F 100°F/hr<br>❑ 106°F to 256°F 40°F/hr<br>❑ Less than 106°F 35°F/hr | Monitors RCS temperature. Adjusts flow as necessary. |
| **CAUTION**<br>**Total AFW flow should NOT exceed 600 GPM per unit (300 GPM per unit when feeding both Units from either Unit 1 OR Unit 2).** | |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ VI.B.7.c.1(5) - Adjust the SG FLOW CONTRs to maintain level at approximately zero inches:<br>❑ (11 SG) 1-FIC-4511A<br>❑ (12SG) 1-FIC-4512A | Monitors SG level. Adjusts flow to maintain SG level. |
| ❑ VI.B.7.c.1(6) - Operate AFW Pump Room Ventilation, PER OI-32A, AUXILIARY FEEDWATER SYSTEM. | Dispatches Aux Bldg operator to verify AFW ventilation in service per OI-32A. |
| **END OF ALTERNATE ACTIONS** | |
| ❑ VI.B.7.d. - Shut the SG FW ISOL valves:<br>❑ (11 SG) 1-FW-4516-MOV<br>❑ (12 SG) 1-FW-4517-MOV | Same as element |
| ❑ VI.B.7.e. - Notify Plant Chemistry that the AFW System is in service. | Same as element |
| ❑ VI.B.8. - **IF** AFW is maintaining SG levels between (-)24 inches and (+)30 inches, **THEN**, with the approval of SM/CRS, perform **ONE** of the following:<br>❑ Maintain power less than 1% while attempting to restore the Main Feedwater System.<br>❑ **IMPLEMENT** OP-4, PLANT SHUTDOWN FROM POWER OPERATION TO HOT STANDBY to shutdown the Unit. | Determines step is applicable.<br>Monitors S/G levels and maintains a positive trend to restore between (-) 24 inches and (+) 30 inches. |

**TERMINATING CUE**: This JPM is complete when S/G levels are trending toward between -24 inches and +30 inches using either steam driven AFW train. No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP**: _____

**Verification of Completion**

Job Performance Measure Number: **SIM-4**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Unit-1 is at ~0.5% power during plant startup from an extended outage.
2. 13 Condensate pump is tagged out.
3. Annunciator windows C-01 and C-02 "11 & 12 CONDS PUMP OIL FLOW LO" on 1C03 came into alarm. Shortly thereafter, 11 and 12 Condensate pumps tripped.
4. 11 & 12 SGFP's subsequently tripped on low suction pressure and annunciator windows C-25 "SGFP(S) SUCT PRESS LO" and C-26 "11 SGFPT TRIP" and C-30 "12 SGFPT TRIP"on 1C03 are in alarm.
5. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to respond to the Condensate Pump trip per AOP-3G, Main Feedwater Malfunctions, Section VI, Block Step A.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-5

Rev.1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-5

**Task Title:** Bleed and Feed to cool the quench tank

**Task Number:** No specific CCNPP task

**K/A Reference:** 007A1.01, A1.02, A1.03

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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. Alarm Window E-01, "QUENCH TK •TEMP •LVL •PRESS", has just come into alarm due to a long term slowly leaking safety valve which causes alarm every 8-10 hours (CR previously written).
2. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to respond to the Quench Tank alarm.

Are there any questions? You may begin.

**Task Standard:**

Verifies the Operator's Ability to Restore Quench Tank Parameters.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

OP-3, Power Operations
OI-1B, Quench Tank Operations

**General References:**

Procedures and manuals normally available in the control room

**Time critical task:**

No

**Validation Time:**

10 minutes

**Simulator Setup:**

_____ 1. **Reset** to IC-24 with both units at 100% in **FREEZE**.

_____ 2. **Open** and start schedule Sim-5

   a. **Override** P1C06_1TIA116_MT to 122 @ time zero,
   P1C06_1TIA116_LTHIGH to on @ time zero,
   P1C06_E01_LTON to On at time zero

   b. **Override** P1C06_1TIA to 115 over 30 seconds on Event 1,
   P1C06_1TIA116_LTHIGH to off after 10 seconds on Event 1,
   P1C06_E01_LTON to delete on Event 2

_____ 3. Remove the Quench Tank Temperature computer point from scan

_____ 4. Pump RCDT, then freeze.

_____ 5. Have a blank Locked Valve Deviation Sheet available.

_____ 6. **Acknowledge** all panel alarms and ensure "Horn On" for annunciators.

_____ 7. **Select** "Clock" time.

_____ 8. **WHEN** cued go to **RUN**.

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CUE** Have simulator driver place Simulator in **RUN** | |
| **TIME START: _____** | |
| ❑ Identifies Alarm Manual 1-C06, Window E-01 | Same as Element |
| **1C06 ALM Window E-01** | |
| ❑ Determines which parameters are causing alarm. | Identifies the following:<br>Temp is in alarm high at 122° |
| **BEGIN ALARM MANUAL ACTIONS** | |
| ❑ 1.a -Shut any open valves listed under leaking or open Possible Causes | Verifies all valves shut |
| ❑ 1.b - IF a PORV is leaking or open and fails to shut when RCS pressure is reduced below its lift setpoint, **THEN CONSIDER** placing the applicable PORV Override handswitch , 1-HS-1402 or 1-HS-1404, in OVERRIDE or SHUT PORV Block, 1-RC-403-MOV or 1-RC-405-MOV. | Determines step is N/A |
| ❑ 1.c - **RETURN** parameter to within normal limits by venting, filling, draining or feed and bleed as necessary **PER** OI-1B, Quench Tank Operations. | Locates OI-1B, determines 6.5 is the correct section |
| **CUE** CRS will Evaluate Tech Specs | |
| ❑ 1.d - **REFER** to Technical Specifications 3.4.11 and 3.4.12 for PORV operability requirements. | Determines step is N/A |
| **CUE** CRS Directs a Feed & Bleed to be performed per OI-1B | |
| ❑ OI-1B - Section 6.5, Bleed & Feed the Quench Tank | |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CUE** All Initial Conditions Are Satisfied | |
| ❑ 6.5.A - Initial Conditions | |
| ❑ 6.5.A.1. - RCS Pressure is greater than 50 PSIA. | Satisfied per CUE |
| ❑ 6.5.A.2. - Quench Tank temperature is higher than normal due to leakage or discharge from any of the following:<br>❑ Pressurizer Power Operated Relief Valve<br>❑ Pressurizer Safety Valve<br>❑ Safety Injection System Relief Valve<br>❑ Pressurizer Vents<br>❑ Reactor Vessel Head Vents | Satisfied per CUE |
| ❑ 6.5.A.3. - No relief or safety valve discharge to the Quench Tank is in progress. | Satisfied per CUE |
| ❑ 6.5.B - Procedure | |
| **NOTE**<br>Steps 6.5.B.1 through 6.5.B.4 may be performed in any order to minimize the amount of liquid or gaseous waste. | |
| **CAUTION**<br>• Do **NOT** attempt to adjust the Quench Tank parameters until after the relief or safety valve has completed lifting.<br>• The Sparger Nozzles will become uncovered at approximately 24 inches indicated level and the Quench Tank may experience a rapid increase in pressure if this occurs. The amount of time the Sparger Nozzles will be uncovered should be minimized. | |
| ❑ 6.5.B.1 - Drain the Quench Tank as follows: | |
| ❑ 6.5.B.1.a. - **PUMP** the RCDT **PER** OI-17C as necessary while draining the Quench Tank to maintain RCDT level below the Hi level alarm setpoint (45 inches) | Determines step is not necessary |
| ❑ 6.5.B.1.b. - **OPEN** QUENCH TK DRN, RC-401-CV. | Same as element |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CAUTION**<br>• Quench Tank pressure should be continuously monitored to ensure pressure does **NOT** exceed 10 psig<br>• Maintain Quench Tank pressure greater than 0 psig to prevent flashing in the discharge piping | |
| ❑ 6.5.B.1.c. - **IF** a lowering pressure develops in the Quench Tank that prevents draining, **THEN PERFORM** one of the following:<br>❑ **OPEN** the applicable Containment Nitrogen Supply Valve, 0-$N_2$-238<br>**OR**<br>❑ **THROTTLE OPEN** N2-6318-PCV Bypass Isolation, 0-N2-591, while monitoring pressure at PI-6318 so as not to exceed 10 PSIG | Determines step is N/A |
| **NOTE**<br>Draining the Quench Tank below the low level alarm is acceptable during the bleed and feed due to the tank being refilled immediately | |
| **CUE** | If student asks or starts draining CRS directs "DO NOT Drain below 20 inches" |
| ❑ 6.5.B.1.d. - **DRAIN** the Quench Tank to the desired level but not less than 15 inches | Same as element |
| ❑ 6.5.B.1.e. - **SHUT** QUENCH TK DRN, RC-401-CV | Same as element |
| **CAUTION**<br>Quench Tank pressure should be continuously monitored to ensure pressure does **NOT** exceed 10 PSIG | |
| ❑ 6.5.B.2 - **PERFORM** one of the following:<br>❑ **OPEN** the Containment Nitrogen Supply Valve, 0-$N_2$-238<br>**OR**<br>❑ **THROTTLE OPEN** O-$N_2$-591 Bypass Isolation while monitoring pressure at PI-6318 so as not to exceed 10 PSIG | Determines step is N/A |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CAUTION**<br>• Quench Tank pressure should be continuously monitored to ensure pressure does **NOT** exceed 10 psig<br>• Maintain Quench Tank pressure greater than 0 psig to prevent flashing in the discharge piping | |
| ❑ 6.5.B.3. - **WHEN** QT pressure is at the desired pressure, **THEN SHUT** Containment Nitrogen Supply Valve 0-$N_2$-238 or Bypass Isolation Valve 0-$N_2$-591 | Determines step is N/A |
| **NOTE**<br>DW-5460-CV may be opened on an intermittent basis under administrative control **PER** T/S 3.6.3.1. This shall be controlled PER NO-1-205. | |
| ❑ 6.5.B.4. - **FILL** the Quench Tank as follows: | Same as element |
| **CUE** Provide applicant with Locked Valve Deviation Sheet, to document manipulation of DW-5460-CV, when requested | |
| ❑ Completes Locked Valve Deviation Sheet prior to opening DW-5460-CV | Same as element |
| ❑ 6.5.B.4.a. - **OPEN** DI WTR CNTMT ISOL, DW-5460-CV. | Same as element<br>**When fill begins have driver insert Event 1, after 30 seconds when TIA-116 High Temp Alarm clears insert Event 2** |
| ❑ 6.5.B.4.b - **IF** Quench tank pressure approaches 0 PSIG while filling tank **THEN PERFORM** the following … | Determines step is N/A |
| ❑ 6.5.B.4.c - **FILL** the Quench Tank to the desired level but **NOT** greater than 35 inches | Same as element |
| ❑ 6.5.B.4.d - **SHUT** DI WTR CNTMT ISOL, DW-5460-CV. | Same as element |
| ❑ 6.5.B.5. - **REPEAT** Steps 6.5.B.1 through 6.5.B.4 until Quench Tank temperature is less than 120°F AND the Quench Tank high temperature alarm is clear. | Determines step is N/A |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ 6.5.B.6. - **FILL OR DRAIN** the Quench Tank to approximately 28.5 inches (between the high and low level alarm). | Same as element (if performed) |
| ❑ 6.5.B.7. - **ENSURE SHUT** the Containment Nitrogen Supply Valve 0-N2-238 or Bypass Isolation Valve 0-N2-591 | Same as element |
| ❑ 6.5.B.8. - **IF** the Quench Tank is going to be vented **THEN** NOTIFY Rad Con Supervision | Determines step is N/A |
| **CAUTION**<br>When lowering pressure in the Quench Tank following an energy release event (for example, any event that may have caused steam/condensation buildup in the discharge piping), the venting shall occur in small pressure increments (approximately 2 psi increments), with a wait of approximately 20 minutes in between vents. This is to prevent thermal changes on the Code Safety valve discs (caused by flashing the liquid to steam which has a cooling effect). Too large of a thermal change will cause the Code Safety to leak. | |
| ❑ 6.5.B.9. - **ESTABLISH** Quench Tank pressure of less than 10 psig by venting to the Waste Gas header as follows: | Same as element (if performed)<br>Candidate may see pressure >3 psig and decide to lower pressure based on Note in the Procedure |
| ❑ 6.5.B.9.a. - **OPEN** the following valves:<br>❑ WGS CNTMT ISOL WGS-2180-CV<br>❑ WGS CNTMT B/U ISOL WGS-2181-CV<br>❑ QUENCH TK VENT RC-400-CV | Same as element (if performed) |
| **CUE** | CRS directs that quench tank pressure anywhere between 3-10 psig is acceptable |
| **NOTE**<br>Quench Tank normal operating pressure is 3 PSIG | |
| ❑ 6.5.B.9.b. - **WHEN** the Quench Tank is at the desired pressure, **THEN SHUT** the following valves: | Same as element (if performed) |
| ❑ WGS CNTMT ISOL WGS-2180-CV<br>❑ WGS CNTMT B/U ISOL WGS-2181-CV<br>❑ QUENCH TK VENT RC-400-CV | Same as element (if performed) |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|

**TERMINATING CUE**: The JPM is complete when the CRS is informed that Quench Tank parameters are returned to normal. No further actions are required. The examinee is expected to end the JPM. If the examinee performs Step 9, the examiner may end the JPM due to extended time required to vent the Quench Tank.

**TIME STOP: _____**

**Verification of Completion**

Job Performance Measure Number: **SIM-5**

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: _____

## Attachment 2, Locked Valve / Controller Deviation Sheet

UNIT: _____

REASON FOR DEVIATION: _____ CRS APPROVAL *DFL*

Initial for original start of an evolution.

**This Attachment shall be completed per Subsections 5.5, Locked Valve Deviations, and 5.6, Controller Deviations, of this procedure.**

| EQUIPMENT | | VALVE/CONTROLLER PLACED OUT OF NORMAL POSITION | | | | | | VALVE/CONTROLLER RETURNED TO NORMAL POSITION | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VALVE/ CONTROLLER NUMBER | VALVE/ CONTROLLER DESCRIPTION | CRS INIT. (1) | DATE | ABNORMAL POSITION | CRO INFORM INIT. | QUAL OPER INIT. | T.S. FLOW PATH SECOND CHECK INITIALS | NORMAL POSITION | CRO INFORM INIT. | QUAL OPER INIT. | 2ND CHECK (VERIFIER) INIT. | DATE | CRS INIT. |
| 1-DW-5460-CV | DI Water Containment Isolation | N/A | | Open | | | N/A | | | | | | |
| | | | | | | | | | | | | | |
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(1) The Control Room Supervisor (CRS) initial column for individual valve/controller positioning shall be blank for the original valves/controllers listed.

**EXAMINEE'S CUE SHEET**

**Initial Conditions:**

1. Alarm Window E-01, "QUENCH TK •TEMP •LVL •PRESS", has just come into alarm due to a long term slowly leaking safety valve which causes alarm every 8-10 hours (CR previously written).
2. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

The CRS directs you to respond to the Quench Tank alarm.

Are there any questions? You may begin

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-6 (Alt Path)

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-6

**Task Title:** Verify the Vital Auxiliaries Safety Function is Satisfied

**Task Number:** 201.013

**K/A Reference:** 062A4.01 (3.3, 3.1)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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. EOP-0 has been implemented and Turbine Trip has been verified.
2. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

You are to perform EOP-0-1, Step IV.C - Verify the Vital Auxiliaries Safety Function is Satisfied.

**Task Standard:**

Candidate energizes 14 4KV Bus via its Alternate Feeder and reports Vital Auxiliaries as complete.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

EOP-0, Post Trip Immediate Actions

**General References:**

Procedures and manuals normally available in the control room

**Time critical task:**

No

**Validation Time:**

10 minutes

**Simulator Setup:**

_____ 1. Reset to IC-24

_____ 2. Insert the following malfunctions:

_____ a. 11 4KV bus fault: **4kv001_01** at **time zero**.

_____ b. 1B DG start failure: **dg001_02** at **time zero**.

_____ 3. Insert the following override:

_____ a. OC DG 14 4KV Bus Fdr Bkr H/S: **P1C18B_KF1406** to **TRIP** at **time zero**.

_____ 4. Place in **RUN** for approximately one (1) minute, then trip the reactor.

_____ 5. After turbine trips **SHUT** the MSIVs to prevent uncontrolled cooldown of the RCS.

_____ 6. **OPEN** the normal feeder to 14 4KV bus and match its flag back to red (i.e. take its handswitch to close without the synch stick).

_____ 7. Place simulator in **FREEZE**.

_____ 8. Obtain an Independent Verification for steps 2 thru 6.

_____ 2. Malfunctions are correctly inserted

_____ 3. Override is correctly inserted

_____ 4. Reactor is tripped

_____ 5. MSIVs are shut

_____ 6. 14 4KV Bus Normal Breaker is open with a "red" flag

_____ 9. When cued, by the evaluator, place the simulator in **RUN**.

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| ❑ Identifies & locates EOP-0-1, Step IV.C or uses plaque located on DG panel | Same as element. |
| **IV.C. - VERIFY THE VITAL AUXILIARIES SAFETY FUNCTION IS SATISFIED** | |
| ❑ IV.C.1. - Check 11 **OR** 14 4KV Vital Bus is energized. | Determines neither 4KV bus is energized. |
| **CAUTION**<br>Attempts should **NOT** be made to re-energize a bus if a fault is suspected. | |
| **PERFORM ALTERNATE ACTIONS** | |
| ❑ IV.C.1.1. - **IF BOTH** 4KV Vital Buses are de-energized, **THEN** energize 11 **OR** 14 4KV Vital Bus from a DG by performing the following: | Determines step is applicable. |
| **EVALUATOR NOTE:**<br>The report of taking Alternate Actions can be made at the discretion of the operator but should be reported as soon as practical. | |
| ❑ IV.C.1.1.a. - Start the 0C DG using the 0C DG EMERGENCY START PB, 0-HS-0707. | Same as element |
| **CUE:** Report 4KV Bus/DG status if requested: TBO reports an apparent fault on 11 4KV bus. OSO reports 1B DG tripped, on start, due to a mechanical problem. | |
| ❑ IV.C.1.1.b. - Verify 1A or 1B DG is running. | Checks 1A DG voltage and frequency on 1C18A. Determines 1A DG is running but did not close in on 11 4KV bus due to fault. May contact OSO to emergency S/D as no power to auxiliaries.<br>Determines 1B DG is not running. Pushes 1B Start pushbutton (1-HS-1424). Determines both DGs have failed to energize their respective 4KV bus. |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ IV.C.1.1.b. (1) - Verify the associated DG OUT BKR closed:<br>❑ 11 Bus - 152-1703<br>❑ 14 Bus - 152-1403 | Determines that 1A DG breaker will not close due to a fault on the 11 4KV bus and 1B DG will not start due to a DG issue. |
| **NOTE**<br>The actions of Step IV.C.1.2 may be performed on 11 4KV bus but the alternate feeder will not close due to the existing ground fault. | |
| **CUE** TBO reports there are no dropped flags on the 14 4KV Bus Feeder Breaker | |
| ❑ IV.C.1.2. - **IF** 1A and 1B DGs can **NOT** be loaded **AND** 13KV is available, **THEN** energize 11 **OR** 14 4KV Vital Bus as follows: | Determines 13KV power is available and the step is applicable. |
| ❑ IV.C.1.2.a. - Verify the DG OUT BKR is open. | Checks DG output breaker position or may take the breakers to PTL. |
| ❑ IV.C.1.2.b. - Place the 4KV BUS LOCI/SD SEQUENCER MANUAL INITIATE keyswitch in ON. | Places **14 4KV** Bus LOCI/SD sequencer manual initiate keyswitch to "ON". |
| ❑ IV.C.1.2.c. - Insert the sync stick **AND** close the alternate 4KV feeder breaker. | Inserts sync stick into jack for 14 4KV alternate feeder breaker (152-1401) and operates 1-CS-152-1401 handswitch to close the breaker and energize the bus. May acknowledge the annunciator window "SEQUENCER INITIATED" alarm on 1C08. |
| **NOTE**<br>Exit from EOP-0 shall NOT be delayed in anticipation of 0C DG availability. | |
| ❑ IV.C.1.3. - **IF** 11 and 14 4KV Buses are deenergized, **THEN** use the 0C DG to energize 11 **OR** 14 4KV Bus as follows: | Determines step is N/A. |
| **END OF ALTERNATE ACTIONS** | |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ IV.C.2 - IF **EITHER** 11 **OR** 14 4KV Vital Bus is **NOT** energized and the 0C DG is **NOT** running … | Determines step is N/A. |
| ❑ IV.C.3 - Check **ALL** 125V DC BUS VOLTS greater than 105 volts:<br>❑ 11<br>❑ 12<br>❑ 21<br>❑ 22 | Checks 125V DC bus voltages on 1C24A. |
| ❑ IV.C.4 - Check at least THREE 120V AC Vital Buses are energized:<br>❑ 11<br>❑ 12<br>❑ 13<br>❑ 14 | Checks 120V AC bus voltages on 1C24A. |
| ❑ IV.C.5 - Check **EITHER** 1Y09 **OR** 1Y10 is energized: | Checks 208/120V instruments AC bus voltage on 1C24A.<br>Determines that 1Y10 is energized. |
| ❑ IV.C.6 - Verify Component Cooling flow to the RCPs. | Starts 12 or 13 CC Pump. |
| ❑ Checks CC flow to RCPs by also ensuring 1-CC-3832-CV and 1-CC-3833-CV are open. The RCPs are not tripped. | Same as element |
| ❑ IV.C.7 - **IF ANY** electrical bus perturbations have occurred, **THEN** dispatch an operator to verify Switchgear Room Ventilation operating **PER** OI-22H, SWITCHGEAR VENTILATION AND AIR CONDITIONING. | Dispatches operator to verify Switchgear Room Ventilation operating per OI-22H. |
| ❑ Reports Vital Auxiliaries are complete. | Makes appropriate Safety Function Report to the CRS with information regarding status of electrical system. |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|

**TERMINATING CUE**: This JPM is complete when 14 4Kv bus is powered from its Alternate Feeder, a Component Cooling Pump is started and the Vital Auxiliaries Safety Function is reported as complete. No further actions are required. The applicant is expected to end the JPM.

**TIME STOP**: _____

**Verification of Completion**

Job Performance Measure Number: **SIM-6**

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:**

1. EOP-0 has been implemented and Turbine Trip has been verified.
2. You are performing the duties of the Unit-1 CRO.

**Initiating Cue:**

You are to perform EOP-0-1, Step IV.C - Verify the Vital Auxiliaries Safety Function is Satisfied.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-7

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-7

**Task Title:** Shift Component Cooling Heat Exchangers

**Task Number:** 015.003

**K/A Reference:** 008.A4.01(3.3, 3.1)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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. Both Units are at 100% power
2. 11 & 12 Component Cooling Heat Exchanger are in service.

**Initiating Cue:**

You are performing the duties of Unit 1 CRO. The CRS directs you to secure 11 Component Cooling Heat Exchangers IAW the Operating Instruction in preparation for tagging out 11 Salt water Header.

**Task Standard:**

Place 11 CCHX in standby in accordance with OI-16 Sect. 6.6

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

None

**General References:**

OI-16 Component Cooling System

**Time critical task:**

No

**Validation Time:**

10 minutes

**Simulator Setup:**

_____ 1. Reset to IC-24, both units at 100% power.

_____ 2. Ensure 11 CCHX in service and 12 CC pump running.

_____ 3. Place simulator in **RUN**.

_____ 4. Ensure 1-HIC-5208 at 0% output

_____ 5. Acknowledge all panel and plant computer alarms.

_____ 6. Ensure the "HORN ON" is selected for annunciators.

_____ 7. Place in **FREEZE**.

_____ 8. Obtain Independent Verification for completion of step 2.

_____ 9. When cued by evaluator, go to **RUN**.

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CUE** Initial Conditions and General Precautions are satisfied. | |
| **TIME START:** _____ | |
| ❑ Identifies OI-16, Section 6.6 | Same as element. |
| ❑ 6.6 - SHIFTING FROM 2 COMPONENT COOLING HEAT EXCHANGER OPERATION TO SINGLE COMPONENT COOLING HEAT EXCHANGER OPERATION [CONTINUOUS USE] | |
| ❑ 6.6.A - Initial Conditions | |
| ❑ 6.6.A.1 - Two Component Cooling Heat Exchangers are in service. | |
| **CAUTION:**<br>RCS boron concentration will be affected when CVCS ion exchangers are returned to service if the Letdown heat exchanger outlet temperature has changed since they were bypassed. **[B0270]**<br>• Lower Letdown system temperature will add positive reactivity.<br>• Higher Letdown system temperature will add negative reactivity. | |
| **CUE** The CRS desires the CVC Ion Exchangers to be bypassed. | |
| **CUE** The RO will log stop time in the CVCS Ion Exchanger and Filter Log | |
| ❑ 6.6.B - Procedure | |
| ❑ 6.6.B.1. - **IF** it is desired to bypass the CVCS ion exchangers, **THEN** PLACE IX BYPASS, 1-CVC-520-CV, to BYPASS **AND** RECORD stop time in the CVCS Ion Exchanger and Filter Log. **[B0018] [B0270]** | Places 1-CVC-520-CV in Bypass<br>RO will log stop time |
| ❑ 6.6.B.2 - **IF** two Component Cooling pumps are in service **THEN STOP** the selected Component Cooling Pump. | Determines step is N/A |
| **CAUTION**<br>When 13 Component Cooling Pump is running, the associated Component Cooling Pump □ aligned to the same power supply shall be placed in PTL. This is to prevent all three pumps from running on a SIAS signal without a UV signal, which could damage the tubes and/or baffle plates of the SDC Heat Exchangers. This Caution is **NOT** applicable when less than three Component Cooling Pumps are available. **[B0590]** | |
| ❑ 6.6.B.3 - IF 13 Component Cooling Pump is running and aligned to 11 480 V Bus, AND 11 and 12 Component Cooling Pumps are in AUTO, THEN PLACE 11 Component Cooling Pump in PTL. [B0590] | Determines step is N/A |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ 6.6.B.4 - IF 13 Component Cooling Pump is running and aligned to 14 480 V Bus, AND 11 and 12 Component Cooling Pumps are in AUTO, THEN PLACE 12 Component Cooling Pump in PTL. [B0590] | Determines step is N/A |
| ❑ 6.6.B.5 - IF 13 Component Cooling Pump is NOT running, THEN ENSURE all available Component Cooling Pumps are in AUTO. | Same as element |
| **CAUTION**<br>Two CC Pumps SHALL **NOT** be operated with only one CCHX aligned for service, unless for a very short period of time as in bumping a pump or momentary pump shifting. | |
| ❑ 6.2.B.6. - SHUT the Component Cooling Heat Exchanger outlet on the heat exchanger being removed from service:<br>• 11 CC HX CC OUT, 1-CC-3824-CV<br>• 12 CC HX CC OUT, 1-CC-3826-CV | Shuts 1-CC-3824-CV |
| **NOTE:**<br>To minimize biological growth in the Saltwater System, Saltwater flow should **NOT** be aligned to BOTH in-service CCHXs during low heat conditions, unless required to maintain SW PP minimum flow requirements. | |
| ❑ 6.2.B.7 - **SHUT** the Component Cooling Heat Exchanger saltwater outlet controller for the heat exchanger being removed from service:<br>(N/A if needed OPEN to maintain SW PP minimum flow)<br>• 11 COMP CLG HX SALTWATER FLOW CONTR, 1-HIC-5206<br>• 12 COMP CLG HX SALTWATER FLOW CONTR, 1-HIC-5208 | Shuts 1-HIC-5206 |
| **NOTE:**<br>• For optimum Reactor Coolant Pump seal life and performance, controlled bleed-off temperature must be maintained between 110°F and 180°F.<br>• Maintaining RCP OUT TEMPs at approximately 100°F on 1C13 will ensure optimal seal life and performance, as well as maintain RCP CBO temperatures between 110°F and 180°F. | |
| ❑ 6.2.B.8 - **ADJUST** the in-service CCHX SW outlet CV to maintain approximately 100°F on the RCP outlet temperature indications on 1C13.<br>• 11 COMP CLG HX SALTWATER FLOW CONTR, 1-HIC-5206<br>**OR**<br>• 12 COMP CLG HX SALTWATER FLOW CONTR, 1-HIC-5208 | Monitors CC temperature and opens 1-HIC-5208 to some minimum value (approximately where 1-HIC-5206 was previously positioned) |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CAUTION:**<br>RCS boron concentration will be affected when CVCS ion exchangers are returned to service if the Letdown heat exchanger outlet temperature has changed since they were bypassed. **[B0270]**<br>• Lower Letdown system temperature will add positive reactivity.<br>• Higher Letdown system temperature will add negative reactivity. | |
| **CUE** The RO will log start time in the CVCS Ion Exchanger and Filter Log | |
| ❑ 6.2.B.9 - **IF** the CVCS ion exchangers were bypassed in Step B.1, **THEN PERFORM** the following:<br>❑ 6.2.B.9.a. - **CHECK** the Letdown heat exchanger outlet temperature has stabilized less than or equal to 120□F.<br>❑ 6.2.B.9.b. - **PLACE** IX BYPASS, 1-CVC-520-CV, to AUTO.<br>❑ 6.2.B.9.c. - **RECORD** the flowrate in the CVCS Ion Exchanger and Filter Log for the in service ion exchanger and filter. **[B0018]** | Same as element |

**TERMINATING CUE**: This JPM is complete when 11 CCHX is removed from service. No further actions are required. The examinee is expected to end the JPM.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **SIM-7**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Both Units are at 100% power
2. 11 & 12 Component Cooling Heat Exchanger are in service.

**Initiating Cue:**

You are performing the duties of Unit 1 CRO. The CRS directs you to secure 11 Component Cooling Heat Exchangers IAW the Operating Instruction in preparation for tagging out 11 Salt water Header.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: SIM-8

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** SIM-8

**Task Title:** Test Gaseous Waste Discharge RMS Channel RI-2191

**Task Number:** 079.018

**K/A Reference:** 071A4.09 (3.3, 3.5)

**Method of testing:**

Simulated Performance: ☐ Actual Performance: ☒

Classroom: ☐ Simulator: ☒ Plant: ☐

**Read to the examinee:**

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. Both Units are at 100% power
2. You are performing the duties of an extra Licensed Operator.
3. A pre-job brief has been completed for the performance of STP-O-101-0 Gaseous Waste Discharge RMS Channel RI-2191, Semi-Annual Functional Test.
4. The Prerequisites, Section 4.0 of STP-O-101-0, have been completed.
5. Steps 6.1.J. and 6.1.K were previously completed. A step deletion form has been completed so these steps do not have to be performed again.

**Initiating Cue:**

The Unit-1 CRS directs you to complete performance of STP-O-101-0, Gaseous Waste Discharge RMS Channel RI-2191, Semi-Annual Functional Test, beginning with a review of the Precautions, Section 5, and continuing through Section 6.1, Functional Test Of RMS Channel RI-2191.

**Task Standard:**

Successfully complete STP-O-101-0 Sect. 6.1.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

STP-O-101-0, Gaseous Waste Discharge RMS Channel RI-2191, Semi-Annual Functional Test

**General References:**

Procedures and manuals normally available in the control room

**Time critical task:**

No

**Validation Time:**

15 minutes

**Simulator Setup:**

_____ 1. Reset to IC-24, both units at 100% power

_____ 2. Place simulator in **RUN**.

_____ 3. Acknowledge all panel and plant computer alarms.

_____ 4. Ensure the "HORN ON" is selected for annunciators.

_____ 5. Place in **FREEZE**.

_____ 6. When cued by evaluator, go to **RUN**.

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| **CUE:** Provide candidate with a marked up copy of STP-O-101-0, Gaseous Waste Discharge RMS Channel RI-2191, Semi-Annual Functional Test | |
| 6.1 - Functional Test of RMS Channel RI-2191 | |
| **CUE:** ABO reports Waste Gas Discharge Filter Outlet Isolation, 0-WGS-629 is SHUT and has been peer checked | |
| ❑ 6.1.A. - ***[PC]* SHUT** Waste Gas Discharge Filter Outlet Isolation, 0-WGS-629. | Requests ABO to shut valve and obtain a peer check. |
| **CUE:** ABO reports Waste Gas Discharge Filter Outlet Isolation, 0-WGS-630 has been checked shut. | |
| ❑ 6.1.B. - **CHECK SHUT** Waste Gas Discharge Filter Bypass, 0-WGS-630. | Requests ABO to shut valve. |
| ❑ 6.1.C. - **OPEN** the following valves at 1C33: | |
| ❑ WASTE GAS DISCH, 0-WGS-2191-CV | Same as element. |
| ❑ WASTE GAS DISCH, 0-WGS-2192-CV | Same as element. |
| ❑ 6.1.D - **PLACE** the operation selector switch for Gaseous Discharge RMS 0-RI-2191 to CHECK SOURCE. | Same as element. |
| ❑ 6.1.D.1 - **CHECK** proper channel response by observing upscale meter deflection. | Same as element. |
| ❑ 6.1.E. - PLACE Gaseous Waste Discharge Channel 0-RI-2191 operation selector switch to PULSE CAL AND CHECK the following: | Same as element. |
| ❑ 6.1.E.1. - 0-RI-2191 Channel HIGH ALARM light illuminated. | Same as element. |
| ❑ 6.1.E.2. - "0-RE-2191", RMS STATUS PNL 1C22H, amber light (ALARM) illuminates. | Same as element. |
| ❑ 6.1.E.3. - 1C17 "RAD MON PANEL 1C22" annunciator alarms. | Same as element. |
| ❑ 6.1.E.4. - 0-WGS-2191-CV shuts. | Same as element. |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| ❑ 6.1.E.5. - 0-WGS-2192-CV shuts. | Same as element. |
| ❑ 6.1.F. - **POSITION** the following handswitches as follows: | Same as element. |
| ❑ 6.1.F.1. - 0-WGS-2191-CV, 0-HS-2191, to CLOSE. | Same as element. |
| ❑ 6.1.F.2. - 0-WGS-2192-CV, 0-HS-2192, to CLOSE. | Same as element. |
| ❑ 6.1.G. - **PLACE** operation selector switch for 0-RI-2191 to RESET, then to OPERATE. | Same as element. |
| ❑ 6.1.G.1. - **CHECK** 1C17 "RAD MON PANEL 1C22" annunciator clears. | Same as element. |
| ❑ 6.1.G.2. - **CHECK** HIGH ALARM and RMS Status lights extinguished. | Same as element. |
| ❑ 6.1.H. - **PLACE** operation selector switch for 0-RI-2191 to RESET and **CHECK** the following: | Same as element. |
| ❑ 6.1.H.1. - 0-RI-2191 Channel LOW ALARM light illuminated. | Same as element. |
| ❑ 6.1.H.2. - "0-RE-2191", RMS STATUS PNL 1C22H, amber light (ALARM) illuminates. | Same as element. |
| ❑ 6.1.H.3. - 1C17 "RAD MON PANEL 1C22" annunciator alarms. | Same as element. |
| ❑ 6.1.I. - **PLACE** operation selector switch for 0-RI-2191 to OPERATE and **CHECK** the following: | Same as element. |
| ❑ 6.1.I.1. - **CHECK** 1C17 "RAD MON PANEL 1C22" annunciator clears. | Same as element. |
| ❑ 6.1.I.2. - **CHECK** LOW ALARM and RMS Status lights extinguished. | Same as element. |

**NOTE TO EVALUATOR**

Simulator equipment is not modeled such that Steps "J" and "K" can be completed as written. Cues are provided to have the candidate omit the performance of Step "J" and to perform only the applicable portion of Step "K"

| ELEMENT (shaded = CRITICAL STEP) | | STANDARD |
|---|---|---|
| **CUE:** | Steps 6.1.J & K. are to be skipped in its entirety. | |
| ❑ 6.1.J. - **DEENERGIZE** 0-RI-2191 Channel by removing one of the fuses from the drawer front at 1C22. | | Step skipped per Evaluator CUE |
| ❑ 6.1.K. - **INSTALL** the fuse removed in the previous step. | | Step skipped per Evaluator CUE |
| ❑ 6.1.K.1. - **PLACE** operation selector switch for 0-RI-2191 to RESET, then to OPERATE. | | Step skipped per Evaluator CUE |
| ❑ 6.1.K.2. - **CHECK** 1C17 "RAD MON PANEL 1C22" annunciator clears. | | Step skipped per Evaluator CUE |
| ❑ 6.1.K.3. - **CHECK** normal operation of 0-RI-2191 by observing normal channel behavior. | | Step skipped per Evaluator CUE. |
| ❑ 6.1.L. - **CHECK** all RMS channels to ensure no new alarms actuated during this test. | | Same as element. |
| **CUE:** | ABO reports Waste Gas Discharge Filter Outlet Isolation, 0-WGS-629 is OPEN and has been peer checked | |
| ❑ 6.1.M. - ***[PC]* OPEN** 0-WGS-629. | | Same as element. |

**TERMINATING CUE**: This JPM is complete when the candidate receives the report stating "0-WGS-629 is OPEN and has been peer checked". No further actions are required. The evaluator is expected to end the JPM.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **SIM-8**

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. Both Units are at 100% power
2. You are performing the duties of an extra Licensed Operator.
3. A pre-job brief has been completed for the performance of STP-O-101-0 Gaseous Waste Discharge RMS Channel RI-2191, Semi-Annual Functional Test.
4. The Prerequisites, Section 4.0 of STP-O-101-0, have been completed.
5. Steps 6.1.J. and 6.1.K were previously completed. A step deletion form has been completed so these steps do not have to be performed again.

**Initiating Cue:**

The Unit-1 CRS directs you to complete performance of STP-O-101-0, Gaseous Waste Discharge RMS Channel RI-2191, Semi-Annual Functional Test, beginning with a review of the Precautions, Section 5, and continuing through Section 6.1, Functional Test Of RMS Channel RI-2191.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: PLANT-1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** PLANT-1

**Task Title:** Align the Reserve Battery to 11 DC Bus

**Task Number:** XXXXXX

**K/A Reference:** 058 AA1.03 (3.1, 3.3)

**Method of Testing:**

Simulated Performance: ☒ Actual Performance: ☐

Classroom: ☐ Simulator: ☐ Plant: ☒

**Read to the examinee:**

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. You are performing the duties an extra Licensed Operator.

**Initiating Cue:**

The Control Room Supervisor has directed you to align the Reserve Battery to 11 DC Bus per OI-26A, Section 6.10. Are there any questions? You may begin.

**Task Standard:**

Locates and simulates manual operation of plant components to align the Reserve Battery to 11 DC Bus, per OI-26A, Section 6.10.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

OI-26A, 125 Volt Vital DC

**General References:**

OI-26A, 125 Volt Vital DC
Industrial Safety Manual Chapter 12, Electrical Safety

**Time critical task:**

No

**Validation Time:**

12 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | | STANDARD |
|---|---|---|
| **TIME START: _____** | | |
| ❑ 6.10.A - **INITIAL CONDITIONS** | | |
| **CUE:** | All Initial Conditions have been completed. The Reserve Battery is available for use on 11 125 VDC Bus, Tech Specs 3.8.4 and 3.8.1 have been reviewed for applicability, Risk level change has been reviewed ( Risk goes from Green to Yellow) and the pre-job briefing has been completed. | |
| ❑ 6.10.A 1 - The Reserve Battery is available for use on 11 125 VDC Bus<br>❑ 6.10.A 2 -The following Tech Specs have been reviewed for applicability for both units:<br>• 3.8.4 DC Sources-Operating<br>• 3.8.1 AC Sources-Operating<br>❑ The Risk Level change has been reviewed and briefing completed. | | |
| **NOTE TO EVALUATOR**<br>Candidate should determine PPE requirements using the Industrial Safety Manual, Chapter 12.<br>For Operating disconnects with enclosure doors closed (opening and closing) the following are required:<br>• No Minimum Arc Rating Required for FR Clothing 100% Cotton Long Sleeve Shirt and Pants, OR 100% cotton short sleeve shirt and pants under FR Lab Coat, Safety Glasses | | |
| **NOTE**<br>Ask candidate where and how to obtain the Kirk keys for the Disconnect Switches to be operated. Candidate should describe the process of signing out the keys from the Operations Work Control SRO whose office is located in the North Service Building | | |
| ❑ 6.10.B - **PROCEDURE** | | |
| **CUE:** | Inform candidate they have obtained the required keys from the OWC Office | |
| ❑ 6.10.B.1 - **OBTAIN** the Kirk keys for Disconnect Switches ISC1D67-1 RESERVE BATTERY TO DC BUS 11 and 0DISC1D67-2 RESERVE BATTERY TO DC BUS 11 from OWC. | | Same as element |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **NOTE**<br>Annunciator U-16 11 12 BATT OPEN CIRCUIT DISCONNECTED at 1C34 may alarm. | |
| **CUE:** Acknowledge candidates request for a Peer Check | |
| ❑ 6.10.B.2 - **[PC] PLACE** Disconnect Switch 95-1103 11 125 VDC BUS FROM 11 BATTERY to OFF. | Same as element |
| **CUE:** **If** there is a labeling issue, inform applicant a Temporary Label Request has been submitted. **Acknowledge** candidates request for a Peer Check | |
| ❑ 6.10.B.3 - **[PC] ENSURE** ON Disconnect Switch 0DISC1D50 125V BATTERY 01 DISC SW (Located on Panel 1D50). | Same as element |
| **CUE:** **If** there is a labeling issue, inform applicant a Temporary Label Request has been submitted. **Acknowledge** candidates request for a Peer Check | |
| ❑ 6.10.B.4 - **[PC] PLACE** 0HS1D54 125V BATTERY 01 XFER SW (Located on Panel 1D54) to LOAD position. | Same as element |
| **NOTE**<br>The Kirk Keys are captured when the interlock for 0DISC1D67-1 and 0DISC1D67-2 have been removed and the disconnects are closed. | |
| ❑ 6.10.B.5 - **INSERT** Kirk Key into Disconnect Switch:0DISC1D67-1 RESERVE BATTERY TO DC BUS 11 (Located on Panel 0PNL1D67). | Same as element |
| ❑ 6.10.B.6 - **INSERT** Kirk Key into Disconnect Switch 0DISC1D67-2 RESERVE BATTERY TO DC BUS 11 (Located on Panel 0PNL1D67). | Same as element |
| ❑ 6.10.B.7 - **ROTATE** the Kirk Key for Disconnect Switch 0DISC1D67-1 RESERVE BATTERY TO DC BUS 11 180 degrees in the clockwise direction. | Same as element |
| ❑ 6.10.B.8 - **ROTATE** the Kirk Key for Disconnect Switch 0DISC1D67-2 RESERVE BATTERY TO DC BUS 11 180 degrees in the clockwise direction. | Same as element |

| ELEMENT (shaded = CRITICAL STEP) | | STANDARD |
|---|---|---|
| **CUE:** | Acknowledge candidates request for a Peer Check | |
| ❑ | 6.10.B.9 - **[PC] PLACE** Disconnect Switch 0DISC1D67-1 RESERVE BATTERY TO DC BUS 11 to ON. | Same as element |
| **CUE:** | Acknowledge candidates request for a Peer Check | |
| ❑ | 6.10.B.10 - **[PC] PLACE** Disconnect Switch 0DISC1D67-2 RESERVE BATTERY TO DC BUS 11 to ON. | Same as element |

**TERMINATING CUE:** This JPM is complete when the Reserve Battery is aligned to 11 DC BUS per OI-26A, Section 6.10. No Other Actions Are Required. The student is expected to this JPM.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **PLANT-1**

Examinee: _____

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: _____

## EXAMINEE'S CUE SHEET

**Initial Conditions:**

1. You are performing the duties of an extra Licensed Operator

**Initiating Cue:**

The Control Room Supervisor has directed you to align the Reserve Battery to 11 DC Bus per OI-26A, Section 6.10. Are there any questions? You may begin. Are there any questions? You may begin.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: PLANT-2

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** PLANT-2

**Task Title:** Isolate Fire Effects for 11 Cavity Cooling Fan Damper & Restore Switchgear Room Ventilation

**Task Number:** 078.009

**K/A Reference:** 015 A2.02 (3.1, 3.5)

**Method of testing:**

Simulated Performance: ☒ Actual Performance: ☐

Classroom: ☐ Simulator: ☐ Plant: ☒

**Read to the examinee:**

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. A severe fire has resulted in a Control Room evacuation.
2. You are performing the duties of the Unit-1 ABO
3. You have obtained the Safe Shutdown key ring and equipment from the Safe Shutdown Key and Equipment Lockers.

**Initiating Cue:**

You have just completed Step "BI" and are directed to continue AOP-9A. Step "BJ", Isolate Fire Effects for the 11 Cavity Cooling Fan Damper is your next step.

Are there any questions? You may begin.

**Task Standard:**

Isolates Fire Effects from Cavity Cooling Fan Damper and Restores Switchgear Ventilation to Service.

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

AOP-9A-1, Control Room Evacuation and Safe Shutdown Due To A Severe Control Room Fire

Key to Safe Shutdown hose locker

**General References:**

AOP-9A-1, Control Room Evacuation and Safe Shutdown Due To A Severe Control Room Fire

**Time Critical Task:**

No

**Validation Time:**

15 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| **NOTE**<br>Candidate should comply with all RP procedures and policies for entering the RCA. | |
| **CUE:** Once the candidate describes how they would obtain a copy of the procedure provide them with a copy of AOP-9A-1, Block Step IV.BJ. | |
| ❑ Locates AOP-9A-1, Block Step IV.BJ. | Same as element |
| ❑ Candidate proceeds to Unit-1 69' Electrical Penetration Room (69' Aux Bldg) | Same as element |
| BJ. ISOLATE FIRE EFFECTS FOR 11 CAVITY COOLING FAN DAMPER | |
| **NOTE**<br>11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A is located on breaker 52-11454. | |
| ❑ BJ.1. - Insert Key into Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A | **Simulates** inserting key |
| ❑ BJ.2. - Place 11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A, to CR ISOL. | **Simulates** rotating the key to the CR ISOL position |
| ❑ BJ.3. - Notify the RO 11 Cavity Cooling Fan is available to start **PER** Step BT. | Same as element. |
| ❑ BJ.4 - **GO TO** 69" Fan Room to Perform Step BK | Same as element. |
| BK. RESTORE SWITCHGEAR ROOM VENTIALTION | |
| **NOTE**<br>Equipment to tie the damper is located at 11 SWGR HVAC | |
| **CUE** Once ATMOS DISCH GRAVITY DMPR, 1-HVAC-230 is located, inform applicant damper is tied open. | |
| ❑ BK.1. - Tie open ATMOS DISCH GRAVITY DMPR, 1-HVAC-230 | Locates damper |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **CUE** Inform applicant the Unit-2 ABO has completed steps BK.2 and BK.3 | |
| ❑ BK.2. - **GO TO** the Auxiliary Building roof | N/A based on cue provided |
| ❑ BK.3 - Open the Roof Duct Cover, U-1 SWGR HVAC COMMON SUPPLY DUCT COVER DAMPER, 1-HVAC-5426E. | N/A based on cue provided |
| ❑ BK.4 - Return to the 69" Unit-1 Fan Room | Same as element |
| ❑ BK.5. - Place 11 Switchgear Room Vent Fan handswitch, 1-HS-5426, to START. | **Simulates** placing 1-HS-5426 to START |
| ❑ BK.6. - Notify 1C43 that 11 Switchgear HVAC Fan has been started. | Same as element |

**TERMINATING CUE:** This task is complete when steps BJ.1 thru BK.6 have been completed. Task completion will be signaled by the evaluator. No further actions are necessary.

**TIME STOP:** _____

**Verification of Completion**

Job Performance Measure Number: **PLANT-2**

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: _____

**EXAMINEE'S CUE SHEET**

**Initial Conditions:**

1. A severe fire has resulted in a Control Room evacuation.
2. You are performing the duties of the Unit-1 ABO
3. You have obtained the Safe Shutdown key ring and equipment from the Safe Shutdown Key and Equipment Lockers.

**Initiating Cue:**

You have just completed Step "BI" and are directed to continue AOP-9A. Step "BJ", Isolate Fire Effects for the 11 Cavity Cooling Fan Damper is your next step.

Are there any questions? You may begin.

APPLICANT: _____

# CALVERT CLIFFS NUCLEAR POWER PLANT

# 2014 NRC

# INITIAL LICENSED

# OPERATOR EXAM

# JPM #: PLANT-3

Rev. 1

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

**Facility:** Calvert Cliffs 1 & 2 **Job Performance Measure No.:** PLANT-3

**Task Title:** Startup the Instrument Air System using the Fire Main for Compressor cooling

**Task Number:** 019.014

**K/A Reference:** 2.1.30 (4.4, 4.0)

**Method of testing:**

Simulated Performance: ☒ Actual Performance: ☐

Classroom: ☐ Simulator: ☐ Plant: ☒

**Read to the examinee:**

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 3.
2. 11 Instrument Air Compressor is in service.
3. The Fire System Booster Jockey Pump is in Auto.
4. Service Water System maintenance requires isolating Service Water to the Unit-1 Instrument Air Compressors.
5. You have received your pre-job brief from the CRS and are performing the duties of an extra TBO qualified operator.
6. The OSO is standing by to assist as necessary

**Initiating Cue:**

The CRS directs you to align the Fire Main for Compressor Cooling to the Instrument Air Compressors per OI-19 Section 6.4.

**Task Standard:**

Correctly aligns the Fire Main to Air Compressors IAW OI-19

**Evaluation Criteria:**

1. All critical steps completed (denoted by shading).
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.

**Critical Step Basis:**

Critical steps are those that when not performed correctly, in the proper sequence, and/or at the proper time, will prevent the system from functioning properly or preclude successful completion of the task.

**Required Materials:**

OI-19, Instrument Air, Section 6.4, System Operation Using Fire Main for Compressor Cooling

**General References:**

Procedures and manuals normally available in the Control Room

**Time Critical Task:**

No

**Validation Time:**

15 minutes

**Simulator Setup:**

None

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|
| **TIME START:** _____ | |
| ❑ Identify & locate OI-19, Section 6.4 | Same as element |
| **CUE:** ALL initial conditions and precautions are met. Proceed to Step 6.4.B. A Fire System Use Permit has been obtained. | |
| **OI-19, System Operation Using Fire Main For Compressor Cooling, Section 6.4.B** | |
| ❑ 6.4.B.1. - **OBTAIN** a Fire System Use Permit. | Determines from Cue that a Fire System Use Permit has been obtained. |
| ❑ 6.4.B.2. - **ALIGN** the Fire Booster Pumps as follows: | |
| ❑ 6.4.B.2.a. - **PLACE** BOOSTER JOCKEY PUMP FIRE PROT/SYS, 0-HS-9600, in AUTO. | Same as element. |
| **CUE:** **WHEN** requested, acknowledge as OSO that 0-HS-6227 has been placed in PTL. | |
| ❑ 6.4.B.2.b. - **PLACE** MAIN PRESSURIZER #13, 0-HS-6227 in PTL. | Requests the OSO or FASW to place 0-HS-6227 in PTL. |
| **CUE:** **WHEN** each valve is operated properly report stem has lowered and valve travel has stopped. | |
| ❑ 6.4.B.3. - **SHUT** the following valves **AND MONITOR** AFW room temperature **PER** TBO log notes:<br>❑ INLET TO AUX FD PP RM CLR, 1-SRW-502.<br>❑ OUT FROM AUX FD PP RM CLR, 1-SRW-503. | Locates each valve and shuts it. Initiates AFW Pp RM temperature monitoring. |
| **NOTE:**<br>• Compliance with MN-1-110, PROCEDURE CONTROLLED ACTIVITIES, is required when using temporary hose connections.<br>• The supply and discharge fire hoses are located in the AOP/EOP locker outside the SRW Room. | |
| ❑ 6.4.B.4. - **ALIGN** Fire Main to supply cooling water to the Instrument Air Compressors as follows: | Locates AOP/EOP locker containing required fire hoses. |

| ELEMENT (shaded = CRITICAL STEP) | | STANDARD |
|---|---|---|
| ❑ 6.4.B.4.a. - **CONNECT** a fire hose to the nearest available Fire Hose Station adjacent to AUX WTR SUPP TO I&P/A COMPR, 1-SRW-182. | | Same as element |
| **CUE:** | Once Fire Main Supply to the hose has been simulated to be cracked open: a clear stream of water is being discharged from fire hose. | |
| ❑ 6.4.B.4.b. - **CRACK OPEN** Fire Main Supply to the hose connected in Step above **AND** purge fire main to a drain until clear water is discharged **AND THEN SHUT** the supply valve. | | Flushes the Fire Hose until clear water is discharged and then shuts valve. |
| **EVALUATOR NOTE**<br>1-SRW-182 and fire hose pipe connection is located above 11 IAC north end. | | |
| ❑ 6.4.B.4.c. - **CONNECT** the fire hose to Auxiliary Water Supply to Air Compressors, 1-SRW-182 | | Same as element |
| **CUE:** | **WHEN** valve is operation is properly simulated report: stem has risen and valve travel has stopped and hose is pressurized. | |
| ❑ 6.4.B.4.d. - **OPEN** the Fire Main Supply valve at the Fire Hose Station that was connected to in step 4.a. | | Same as element |
| ❑ 6.4.B.4.e. - **CONNECT** a separate fire hose to AUX WTR FROM TO I & P/A DISCH COMPR, 1-SRW-184, to act as drain line. | | Same as element |
| ❑ 6.4.B.4.f. - **ENSURE** the open end of the Fire Hose just connected is **DIRECTED** to a floor drain and properly secured. | | Same as element |
| **CUE:** | **WHEN** requested, acknowledge, as other TBO, the request to verify that hoses have been connected properly. | |
| ❑ 6.4.B.4.g. - **ENSURE** that another TBO qualified operator INDEPENTLY **VERIFIES** the hoses connected properly. | | Same as element |
| ❑ 6.4.B.4.h. - **LOG** the connection of hose in the Turbine Building Operator's Log | | Verbalizes logging the hose connections in the TBO Log. |
| **CAUTION:** | | |

| ELEMENT (shaded = CRITICAL STEP) | | STANDARD |
|---|---|---|
| Steps 4.i, 4j, 4.k and 4.l must be completed in a timely manner due to the Fire Main and Service Water System being cross-connected. | | |
| **EVALUATOR NOTE**<br>1-SRW-184 is located above 11 IAC north end. | | |
| **CUE:** | **WHEN** valve is operation is properly simulated report: Stem has risen and valve travel has stopped. | |
| ❑ 6.4.B.4.i. - **OPEN** AUX WTR FROM I & P/A DISCH COMPR, 1-SRW-184. | | Same as element |
| **EVALUATOR NOTE**<br>1-SRW-182 is located above 11 IAC north end. | | |
| **CUE:** | **WHEN** valve is operation is properly simulated report: stem has risen and valve travel has stopped. | |
| ❑ 6.4.B.4.j. - **OPEN** AUX WTR SUPP TO I & P/A COMPR, 1-SRW-182. | | Same as element |
| **EVALUATOR NOTE**<br>1-SRW-181 is located above and northeast of 11 IAC. | | |
| **CUE:** | **WHEN** valve is operation is properly simulated report: stem has lowered and valve travel has stopped. | |
| ❑ 6.4.B.4.k. - **SHUT** SRW SUPP HDR STOP TO I & P/A COMPR, 1-SRW-181. | | Same as element |
| **EVALUATOR NOTE**<br>1-SRW-183 is located above 11 IAC north end. | | |
| **CUE:** | **WHEN** valve is operation is properly simulated report: stem has lowered and valve travel has stopped. | |
| ❑ 6.4.B.4.l. - **SHUT** SRW DISCH HDR STOP FROM I & P/A COMPR, 1-SRW-183. | | Same as element |
| **CUE:** | 11 Instrument Air Compressor is running. | |
| ❑ 6.4.B.5. - **IF** the Instrument Air Compressors are shutdown, **THEN START** the Instrument Air Compressors as follows … | | Determines step is N/A from Initiating Cue. |

| ELEMENT (shaded = CRITICAL STEP) | STANDARD |
|---|---|

| **NOTE**<br>• Optimal Service Water return temperature is 110° F. SRW Return Temperature will be lower during colder months.<br>• The IA Compressor TCV bypass valve SHALL be a minimum of ½-turn open under all normal operating conditions. | |
|---|---|
| **CUE:** | Using your pen/pencil or a laser pointer place on meter to indicate approximately 112° F allowing operator to interpret value. |
| ❑ 6.4.B.6. - **IF** an Instrument Air Compressor is running, **THEN MONITOR** the Service Water Outlet Temperature maintaining at 110° F (+10° F) | Identifies proper TI and recognizes SRW outlet temperature is in the normal range. |
| **CUE:** | Acknowledge report that fire main water may have been introduced into the SRW system |
| ❑ 6.4.B.7. - **NOTIFY** Chemistry that fire main water may have been introduced into the SRW system. | Same as element |

**TERMINATING CUE**: This JPM is complete when the Fire Main has been aligned for Compressor Cooling and 11 Instrument Air Compressor Service Water Outlet Temperature has been checked. No further actions are required.

**TIME STOP**: _____

**Verification of Completion**

Job Performance Measure Number: **PLANT-3**

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: _____

**EXAMINEE'S CUE SHEET**

**Initial Conditions:**

1. Unit-1 is in Mode 3.
2. 11 Instrument Air Compressor is in service.
3. The Fire System Booster Jockey Pump is in Auto.
4. Service Water System maintenance requires isolating Service Water to the Unit-1 Instrument Air Compressors.
5. You have received your pre-job brief from the CRS and are performing the duties of an extra TBO qualified operator.
6. The OSO is standing by to assist as necessary

**Initiating Cue:**

The CRS directs you to align the Fire Main for Compressor Cooling to the Instrument Air Compressors per OI-19 Section 6.4.

Facility: **Calvert Cliffs Nuclear Power Plant** Scenario #: **1** OP-Test #: **CCNPP 2014**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: **Unit-1 is at 100% power, MOC. Unit-2 is in Mode 1.**

Turnover: **12 MSL and N-16 Monitors, 12 AFW Pump, and the 1B DG are OOS. The 0C DG is aligned to 14 4KV Bus per OI-21B. 11 Charging Pump is the lead pump. Instructions for the crew are to maintain power at 100%**

| Event # | Malfunction # | Event Type* | Event Description |
|---|---|---|---|
| 1 | **152-1206** | C - BOP/SRO<br>R - ATC | 11 Heater Drain Pump trip |
| 2 | **rcs026_01** | I- ATC<br>T - SRO | 1-LT-110X (selected channel) fails LOW |
| 3 | **srw002_02** | C - ALL | 12 SRW Header leak in Turbine Bldg |
| 4 | **fw006_02** | C - BOP/SRO | 12 MFRV fails as is (mechanical binding) |
| 5 | **ceds010_19**<br>**ceds010_32** | C - ATC | CEAs 19 and 32 fail to insert on Reactor trip. (Boration using normal path) |
| 6 | **swyd002** | M - ALL | Complete Loss of Offsite Power |
| 7 | **dg002_02** | C - BOP/SRO<br>T - SRO | 1A DG Start Failure |

* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (T)ech Spec

Critical Tasks: (shaded)

1. Notes two CEAs failed to insert, commences RCS boration before exit of EOP-0.
2. Notes excessive Feed Flow, secures main feed & initiate auxiliary feed before exit of EOP-0
3. Reenergizes a 4kV Bus with the 0C D/G prior to 125 VDC voltage < 106V.

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of Scenario |

OP-Test #: **2014** **Scenario #: 1**

## SCENARIO OVERVIEW

## SRW LEAK IN TURBINE BLDG / LOSS OF OFFSITE POWER

Units 1 and 2 are operating at 100% power. 12 MSL and N-16 Monitors, 12 AFW Pump, and the 1B DG are OOS. The 0C DG is aligned to 14 4KV Bus per OI-21B. 11 Charging Pump is the lead pump.

First, a trip of 11 HDP occurs causing crew to implement AOP-3G. The crew should control maximize SGFP suction pressure by bypassing precoats and demins. The crew should start the 3rd Condensate Booster pump then exit AOP-3G.

Next, the selected PZR level control channel will fail LOW requiring the crew to shift channels to regain plant control.

After these actions are completed, a large SRW leak will initiate in the turbine building and the crew will have to isolate turbine building SRW and trip the reactor. Two CEAs will fail to insert on the reactor trip and 12 S/G MFRV will fail to 30% open. Approximately 2 to 3 minutes after the trip, a loss of offsite power will occur. During EOP-0 the ATC is expected to commence boration for the 2 stuck CEA's per the Reactivity Control Plaque. The BOP should recognize that 12 MFRV has failed to close and take action per the Heat Removal Plaque and secure main feed and initiate auxiliary feed.

The crew is expected to initially implement EOP-2. Upon entry into EOP-2, the 1A DG is lost requiring the crew to reenergize 14 4KV bus with the 0C DG. If unable to restore power to any 4KV bus the crew will transition to EOP-7, Station Blackout. If plant conditions degrade or the crew is unsure of the diagnosis it is acceptable for them to enter EOP-8. If EOP-8 is entered all critical tasks still apply unless individual tasks are invalidated by the exam team.

Scenario ends after 0C D/G aligned to 14 4KV bus.

**INSTRUCTOR SCENARIO INFORMATION:**

_____ 1. Reset to IC-24

_____ 2. Perform "**Switch Check**"

_____ 3. Place simulator in **RUN**, advance charts and clear alarm display.

_____ 4. Place simulator in **FREEZE**.

_____ 5. Enter Triggers:

_____ a. PZR Level <160" as **Event 10**

_____ 6. Enter Malfunctions:

_____ a. 12 AFW Pump Tripped: **afw001_02** at **time zero**

_____ b. 1B DG Start Failure: **dg001_02** at **time zero**

_____ c. 2B DG Start Failure: **dg001_03** at **time zero**

_____ d. Stuck CEA # 19: **ceds010_19** at **time zero**

_____ e. Stuck CEA # 32: **ceds010_32** at **time zero**

_____ f. 11 Heater Drain Pump trip: **152-1206** to **TRIP** on **Event 1**.

_____ g. PZR lvl control channel 1-LT-110X fails: **rcs026_01** to **LOW** on **Event 2**.

_____ h. 12 SRW Hdr Turb Bldg leak: **srw002_02** at **30%**, with a **3 minute ramp time**, on **Event 3**.

_____ i. Complete Loss of Offsite Power: **swyd002** on **Event 4**.

_____ j. 1A DG Start Failure: **dg002_02** on **Event 5**

_____ 7. Enter Panel Overrides:

_____ a. 12 AFW PP TURB TRIP SW: **P1C04_1HS3988_LTWHIT** to **OFF** at **time zero**.

_____ b. 12 AFW PP TURB TRIP SW: **P1C04_1STP3988_LTRED** to **OFF** at **time zero.**

_____ c. 12 AFW PP TURB TRIP SW: **P1C04_1STP3988_LTWHI** to **OFF** at **time zero.**

_____ d. Mn Stm Eff RMS Alarm window: **P1C03_C43_LTON** to **Off** at **time zero.**

_____ e. Mn Stm N-16 RMS Alarm window: **P1C03_C47_LTON** to **Off** at **time zero.**

_____ 8. Enter Remote Functions / Administrative:

_____ a. **189-1406** (DG0C BUS 14 DISC) to **CLOSED** at **time zero** and place a pink tag on control room indication for disconnect.

_____ b. Non-Essential 4KV Motor Overload **P1C17_L19_LTON to ON** on **Event 1**

_____ c. 12 S/G MFRV: **1-FW-1121-CV** to **30%** on **Event 10**

_____ d. Tie MCC-104 to MCC-114 as follows:

_____ 1. **52-10401** (FDR to MCC 104R) to **OPEN** as **Event 7**.

_____ 2. **52-10420** (MCC TIE 104R TO 114R/INTERLOCK) **to CLOSED** with a **30 second delay** as **Event 7**.

_____ e. Tie MCC-114 to MCC-104 as follows:

_____ 1. **52-11401** (FDR TO MCC 114R) to **OPEN** as **Event 8**.

_____ 2. **52-10420** (MCC TIE 104R TO 114R/INTERLOCK) to **CLOSED** with a **30 second delay** as **Event 8**.

_____ f. 12 MSL and N-16 Rad Monitors to **BYPASS ON** using the key switch on the monitors (Key stored in lock box by simulator conference room door)

_____ g. Ensure PZR level control handswitch, 1-HS-110, selected to X on panel 1C06.

_____ h. Place Yellow Tag on 12 AFW Pump.

_____ i. Place Yellow Tag on 1B DG start pushbutton.

_____ j. Place 1B DG OUT BKR, 1-CS-152-1403, in PULL-TO-LOCK and caution tag handswitch.

_____ k. Place the 0C DG feeder breakers to 4KV Buses 11, 21, & 24 in PULL-TO-LOCK.

_____ l. Place pink tags on the 0C DG feeder breakers to 4KV Buses 11, 21, & 24.

_____ m. Place a Yellow Dot on 1C03 Alarm Windows C-43 & C-47

_____ n. Check all magnetic plaques are correct.

_____ 9. **Independently** verify correct completion of the following:

_____ a. Malfunctions and Event Triggers correctly entered

_____ b. Panel Overrides correctly entered

_____ c. Remote Functions / Administrative actions correctly entered/performed

_____ 10. Select "**Clock**" time and ensure "**Horn On**" for annunciators.

_____ 11. Place simulator in **RUN** and reset/acknowledge panel and plant computer alarms.

_____ 12. Brief the Crew:

| | |
|---|---|
| 1. Present plant conditions: | Unit-1 @ 100% power MOC (10,885 MWD/MTU)<br>Unit-2 @ 100% power EOC (17,800 MWD/MTU) |
| 2. Power history: | 100% power for previous 128 days |
| 3. Equipment out of service: | • 12 AFW Pump for past 4 hours for bearing replacement (back in 4 hours).<br>• 1B DG for cylinder work (back in 1 day), 0C is pre-aligned to 14 4KV bus |
| 4. Abnormal conditions: | 12 MSL & N16 Rad Monitors OOS for last 7 days. IM troubleshooting |
| 5. Surveillances due: | OI-49 in 4 hrs. |
| 6. Instructions for shift: | Maintain 100% power per OP-3. |

_____ 13. Allow crew 3 to 5 minutes to walk down control panels.

_____ 14. Instructions for the Booth Operator:

_____ a. Activate **Event 1** trip of 11 Heater Drain Pump, when cued by Lead Evaluator.

_____ b. Activate **Event 2**, 1-LT-110X failure when cued by Lead Evaluator.

_____ c. Activate **Event 3**, 12 SRW Header leak in the Turbine Bldg, when cued by Lead Evaluator.

_____ d. Ensure **Event 10** triggered, 1-CV-1121 failure, immediately upon reactor trip.

_____ e. Activate **Event 4**, Complete Loss of Offsite Power after EOP-0 Alternate Actions for excessive feed flow have been completed (AFW flow initiated, SGFPs tripped and MFIVs shut) due to the stuck open MFRV, when cued by Lead Evaluator.

_____ f. Activate **Event 5**, 1A DG start failure, after implementing EOP-2, or when cued by Lead Evaluator.

_____ 15. Post Session - **Restore** panels to as found conditions by removing administrative aids applied to panels per step 7, Enter Remote Functions / Administrative.

**RESPONSES TO CREW REQUESTS**

If a request and response is not listed, delay the response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

Allow 2-3 minutes to perform requests from or to give reports to the Control Room unless otherwise specified.

| REQUEST | RESPONSE |
|---|---|
| 1. TBO/PPO investigate loss of 11 Heater Drain Pump. | Acknowledge and after 2 minutes, report that 11 HDP bkr is tripped with overload flag dropped.<br>After 4 minutes report nothing abnormal at pump other than it is secured |
| 2. OWC/I&C need assistance for failed PZR level control channel 1-LT-110X. | Acknowledge. |
| 3. TBO investigate SRW Leak. | Acknowledge, wait **1 minute** then inform the crew that the leak is on the inlet to the Main Turbine oil cooler downstream of 1-SRW-252 TURB LO CLR SRW SUPP. (IF SRW not isolated to TB yet then leak is active, once isolated then flow lessened in pressure until stopping approx 2 min later) |
| 4. Report status of offsite power. | Report that there was a major fault in this area and that it will take several hours to repair the damage. |
| 5. TBO tie 1Y10 to 1Y09. | Acknowledge wait **1 minute** and use remote function **1SY09** (TIE 1Y09/1Y10 TO THE LIVE BUS) **TO 1Y09**. Report complete. |
| 6. ABO tie MCC-104 to MCC-114 | Acknowledge and activate **Event 7**. |
| 7. ABO tie MCC-114 to MCC-104 | Acknowledge. If **Event 7** is inserted, ***delete*** it from the schedule and activate **Event 8**. |
| 8. TBO tie 1Y09 to 1Y10. | Acknowledge. **WHEN** 0C DG has reenergized 14 4KV bus then wait **1 minute** and use remote function **1SY09** (TIE 1Y09/1Y10 TO THE LIVE BUS) **TO 1Y10**. Report complete. |
| 9. OSO investigate loss of 1A DG. | After 5 minutes, report that there is no apparent cause for the 1A DG to have tripped. |

| Op-Test #: **2014** | Scenario #: **1** | Event #: **1** | Page **7** of 20 |
|---|---|---|---|
| Event Description: **Trip of 11 Heater Drain Pump** | | Event Type: | **C – BOP/SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Announce "Non-Essential 4KV Motor Overload" alarm |
| | BOP | ❑ Recognize 11 Heater Drain Pump trip and report to SRO |
| | BOP | ❑ Refers to Alarm Manual |
| | SRO | ❑ Implement AOP-3G "Malfunction of Main Feedwater System"<br>❑ Direct BOP/ATC to monitor for trip criteria (S/G level approaching -40") |
| | SRO | ❑ Direct BOP to perform block step V "Failure of a Pump >5% Power" |
| | BOP | ❑ Perform V.B.2 "Maximize SGFP Suction Pressure" as necessary<br>o Condenser Hotwell Controller 1-LIC-4405 to 50%<br>o Open Precoat Bypass valve 1-CD-5818-CV<br>o Open Condensate Demin Bypass valve 1-CD-4439-MOV |
| | ATC | ❑ Inserts CEAs to prevent exceeding thermal power limits |
| | BOP | ❑ Ask permission of SRO to attempt restart of HDP |
| | SRO | ❑ When asked by BOP to restart HDP respond by not allowing due to unknown reason for trip |
| | BOP | ❑ Start 13 Condensate Booster Pump |
| | BOP | ❑ Inform Chemistry of bypassing Demins & Precoats |
| | SRO | ❑ Exit AOP-3G and implement OP-3 |

Examiner notes:

**Event concludes when actions in AOP-3G complete and crew transitions back to OP-3.**

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, 1-LT-110X (PZR Level) failing LOW**

| Op-Test #: **2014** | Scenario #: **1** | Event #: **2** | Page **8** of 20 |
|---|---|---|---|
| Event Description: **LT-110X Failure** | | Event Type: | **I - ATC**<br>**T - SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC/BOP | ❑ Recognizes multiple alarms and reports to SRO |
| | SRO | ❑ Directs ATC to monitor the primary and BOP to check Alarm Manual for E-33 & E35 |
| | ATC | ❑ Reports PZR level Channel X instrument has failed low and actual PZR level is rising |
| | ATC/BOP | ❑ Refers to the Alarm Manual for following actions:<br>❑ Shifts PZR LVL CH SEL switch, 1-HS-110, to Y.<br>❑ Shifts PZR HTR LO LVL CUT-OFF SEL switch, 1-HS-100-3, to Y. |
| | SRO | ❑ Refers to NO-1-200 for common tap failure |
| | ATC | ❑ Resets Proportional Heaters and monitors primary pressure and level restoring to normal values. |
| | SRO/BOP | ❑ Directs BOP to check containment parameters, Channel X PZR Pressure, and PT-102B to look for common tap failures |
| | SRO | ❑ Contacts OWC/I&C to investigate LT-110X failure |
| | SRO | ❑ Evaluates T.S. 3.3.10 Post-Accident Monitoring (PAM) Instrumentation for applicability. May reference STP-0-63-1. Determines LCO 3.3.10, Condition "A" is applicable. |

Examiner notes:

**Event concludes when ARM actions complete & Common Tap Analysis complete.**
**If SRO's understanding of Technical Specifications applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.**

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, Large SRW Leak in TB, when desired**

| Op-Test #: **2014** | Scenario #: **1** | Event #: **3** | Page **9** of 20 |
|---|---|---|---|
| Event Description: **Large SRW Leak in TB** | | Event Type: | **M-All** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Acknowledges alarms. Determines both SRW Head Tanks are rapidly lowering. |
| | SRO | ❑ Implements AOP-7B, Loss of Service Water |
| | SRO | ❑ Determines Trip Criteria and assigns to ATC/BOP. |
| | BOP | ❑ Inform SO-TSO and reduces MVARs to zero. |
| | BOP | ❑ Isolates SRW to turbine building by shutting:<br>1-SRW-1600-CV<br>1-SRW-1637-CV<br>1-SRW-1638-CV<br>1-SRW-1639-CV |
| | BOP | ❑ Stops 12 SRW PP and place its handswitch in **PTL** (may not be performed if SRW head tank levels observed to be rising prior to stopping pump) |
| | BOP | ❑ Starts Salt Water Air Compressors |
| | ATC | ❑ Trips the reactor and implements EOP-0 |

Examiner notes:

**Event concludes when the Reactor is tripped**

**NOTE TO EXAMINER**

**Next malfunctions already inserted (MFRV failure and CEA's 19 & 32 failure to insert)**

| Op-Test #: **2014** | Scenario #: **1** | Event #: **3(cont)/4/5** | Page **10** of 20 |
|---|---|---|---|
| Event Description: **Reactor Trip** | | Event Type: | **M - ALL**<br>**R – ATC**<br>**C – BOP/SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | ❑ Trips the Reactor by depressing the Manual Reactor Trip pushbuttons at 1C05 |
| | ATC<br>(CT) | ❑ Performs Reactivity Control Safety Function<br>❑ Depress Manual Reactor Trip Pushbutton on 1C05<br>❑ Check Reactor tripped using NI power indications on 1C05<br>❑ Verifies all CEAs fully inserted<br>❑ **IF** more than ONE CEA fails to fully insert, **THEN** borate the RCS to at least 2300 ppm as follows:<br>❑ a. Shut the VCT M/U valve, 1-CVC-512-CV.<br>❑ b. Open the BA DIRECT M/U valve, 1-CVC-514-MOV.<br>❑ c. Open the BAST GRAVITY FD valves:<br>❑ 1-CVC-508-MOV<br>❑ 1-CVC-509-MOV<br>❑ d. Verify the M/U MODE SEL SW, 1-HS-210, is in MANUAL.<br>❑ e. Start a BA PP.<br>❑ f. Shut the VCT OUT valve, 1-CVC-501-MOV.<br>❑ g. Start **ALL** available CHG PPs.<br>❑ Verify DI Water Makeup is secured<br>❑ Check 11 & 12 RC makeup Pumps secured on 1C07<br>❑ Check VCT M/U 1-CVC-512-CV is shut on 1C07<br>❑ If aligned for direct makeup to RCS then shut RWT Charging Pump Suction 1-CVC-504-MOV on 1C07<br>❑ Reports Reactivity Control Safety Function **Complete.** |

Examiner notes:

| Op-Test #: **2014** | Scenario #: **1** | Event #: **3/4/5 (cont.)** | Page **11** of 20 |
|---|---|---|---|
| Event Description: **Reactor Trip** | | Event Type: | **M - ALL**<br>**R – ATC**<br>**C – BOP/SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Performs Turbine Trip<br>❑ Checks Reactor tripped then:<br>❑ Depresses both Turbine Trip Pushbuttons on 1C02<br>❑ Checks Main Turbine stop Valves shut on MK VI screen<br>❑ Checks Turbine Speed drops on MK VI screen<br>❑ Checks Turbine Generator Output Breakers open<br>❑ 11 GEN BUS BKR 0-CS-552-22 on 1C01<br>❑ 11 GEN TIE BKR 0-CS-552-23 on 1C01<br>❑ Checks Generator Field Breaker open on 1C01<br>❑ Checks Generator Exciter Field breaker open on 1C01<br>❑ Ensures MSR 2nd Stage Steam source Valves are shut<br>❑ Reports Turbine Trip **Complete** |
| | BOP | ❑ Performs Vital Auxiliaries Safety Function<br>❑ Checks 11 or 14 4KV bus energized.<br>❑ Checks **ALL** 125V DC BUS VOLTS greater than 105 volts on 1C24: (notes failed voltmeter for 11 125V DC Bus)<br>☐ 11 ☐ 12 ☐ 21 ☐ 22<br>❑ Checks at least THREE 120V AC Vital Buses are energized on 1C24:<br>☐ 11 ☐ 12 ☐ 21 ☐ 22<br>❑ Checks EITHER 1Y09 OR 1Y10 energized on 1C24.<br>❑ Verifies Component Cooling Flow to the RCP's<br>❑ Reports Vital Auxiliaries Safety Function **Complete** |

Examiner notes:

| Op-Test #: **2014** | Scenario #: **1** | Event #: **3/4/5 (continued)** | Page **12** of 20 |
|---|---|---|---|
| Event Description: **Reactor Trip** | | Event Type: | **M – ALL**<br>**R – ATC**<br>**C – BOP/SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | ❑ Performs Pressure & Inventory Control Safety Function, including alternate actions<br>❑ Checks pressurizer pressure stabilizes between 1850 and 2300 PSIA **AND** is trending to 2250 PSIA.<br>❑ Determines PORVs not leaking by checking Acoustic Monitor and Quench Tank parameters<br>❑ Reports Pressure and Inventory Safety Function **Complete** |
| | BOP<br>(CT) | ❑ Performs Core & RCS Heat Removal Safety Function<br>❑ Checks TBVs/ADVs controlling S/G pressure 850-920 PSIA and $T_{COLD}$ 525-535°F<br>❑ Shuts both MSIVs if S/G pressure drops to 800 PSIA<br>❑ Verifies SGIS actuated if S/G pressure drops below 685 PSIA<br>❑ Checks S/G level (-)170" to (+) 50" on 1C03<br>❑ **IF** Feedwater flow is lost **OR** excessive, **THEN** perform the following actions:<br>❑ Start an AFW PP<br>❑ Trip the SGFPs<br>❑ Shut the SG FW ISOL valves<br>❑ Operate the AFW System to restore S/G levels to between (-)170 and (+)30 inches<br>❑ Checks at least one RCP is in a loop with a S/G available for heat removal (on 1C06)<br>❑ Checks $T_{HOT}$ minus $T_{COLD}$ is less than 10°F by checking indicators on 1C06<br>❑ Reports Core & RCS Heat Removal Safety Function **Complete**. |

Examiner notes:

**Event concludes when the 11 4KV bus is lost due to Loss of Offsite Power**

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, Loss of Offsite Power, when desired**

| Op-Test #: **2014** | Scenario #: **1** | Event #: **6** | Page **13** of 2[illegible] |
|---|---|---|---|
| Event Description: **EOP-0 (LOOP)** | | Event Type: | **C – ALL** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | ❑ Notes Loss of Offsite Power. Informs SM, directs the RO and CRO to reevaluate safety functions. |
| | ATC | ❑ RE-evaluates Reactivity Control safety function:<br>❑ Restarts a charging pumps to restore boration<br>❑ Reports Reactivity Control safety function is still **Complete**. |
| | ATC | ❑ Re-evaluates PIC safety function:<br>❑ Check pressurizer pressure between 1850 and 2300 PSIA **AND** trending to 2250 PSIA<br>❑ Check pressurizer level stabilizes between 80 and 180 inches **AND** is trending to 160 inches<br>❑ Reports Pressure and Inventory safety function as still **Complete**. |
| | BOP | ❑ Re-evaluates VA safety function<br>❑ Check 11 **OR** 14 4KV Vital Bus is energized<br>❑ **IF EITHER** 11 **OR** 14 4KV Bus is not energized **AND** the 0C DG is **NOT** running, **THEN** depress the 0C DG EMERGENCY START PB, 0-HS-0707:<br>❑ Check ALL 125V DC BUS VOLTS >105 volts<br>❑ Check at least THREE 120V AC Vital Buses energized<br>❑ Check **EITHER** 1Y09 **OR** 1Y10 energized<br>❑ Verify Component Cooling flow to the RCP's<br>o Restarts 11 Component Cooling Pump<br>❑ IF **ANY** electrical bus perturbations have occurred, **THEN** dispatch an operator to verify Switchgear Ventilation in service per OI-22H<br>❑ Reports VA is **Complete** (notes 14 4kV bus and 1Y10 are deenergized). |

Examiners notes:

| Op-Test #: **2014** | Scenario #: **1** | Event #:**6 (cont.)** | Page **14** of 20 |
|---|---|---|---|
| Event Description: **EOP-0 (LOOP)** | | Event Type: | **C – ALL** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Re-evaluates Core and RCS Safety Function<br>❑ Reestablishes RCS Heat Sink by operating the TBVs or ADVs to maintain: (may exceed these bands initially but actions taken to return)<br>o S/G pressure between 850 and 920 PSIA.<br>o TCOLD between 525° F and 535° F.<br>o Restart AFW flow if 13 AFW PP started initially<br>❑ Reports HR safety function **Cannot Be Met** due to NO RCPs operating. |
| | BOP | ❑ Performs Containment Environment Safety Function<br>❑ Checks Containment Pressure < 0.7 PSIG using narrow range pressure on 1C10<br>❑ Checks Containment Temperature < 120°F using cavity and dome temperature indicators on 1C10.<br>❑ Checks Containment Gaseous RMS at 1C22 not in alarm with no abnormal rising trend<br>❑ Reports Containment Environment Safety Function **Complete** or **Cannot be Met** due Loss of Power Effects (based on timing of LOOP) |
| | BOP | ❑ Perform Rad Levels External to Containment Safety Function<br>❑ Check the following RMS alarms are clear with no unexplained rise:<br>❑ U-1 Wide Range Noble Gas Monitor<br>❑ U-1 Condenser Off Gas @ 1C22<br>❑ U-1 S/G Blowdown @ 1C22<br>❑ U-1 Main Vent Gaseous @ 1C22<br>❑ Reports Rad Levels External to Containment Safety Function **Complete** or **Cannot be Met** due to Loss of Power Effects (based on timing of LOOP) |

Examiner's notes:

| Op-Test #: **2014** | **Scenario #: 1** | Event #:**6 (cont.)** | Page **15** of 20 |
|---|---|---|---|
| Event Description: **EOP-0 (LOOP)** | | Event Type: | **C – ALL** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | ❑ Perform EOP-0 brief<br>❑ Ensures all are attentive<br>❑ Reviews Safety Functions not met<br>❑ HR not met due to no operating RCP's<br>❑ CE (potential) due to loss of power effects<br>❑ RLEC (potential) due to loss of power effects<br>❑ Reviews Safety system Actuations<br>❑ UV<br>❑ SIAS or SGIS if slow to recognize overfeed condition<br>❑ Solicits Input<br>❑ Concludes the brief directing the crew to continue to monitor Safety Functions while the event is diagnosed. |
| | SRO | ❑ Refers to EOP-0 flowchart<br>❑ Core and RCS Heat Removal not met due to no operating RCP's - Flowchart leads to EOP-2<br>❑ CE and RLEC potentially not met due loss of power effects - Flowchart leads to EOP-2<br>❑ Implements EOP-2 |

Examiner notes:

**Event conclusion is implementation of EOP-2, Loss of Offsite Power**

| Op-Test #: **2014** | **Scenario #: 1** | Event #: **7** | Page **16** of 20 |
|---|---|---|---|
| Event Description: **EOP-2 entry LOOP** | | Event Type: | **C – BOP/SRO**<br>**T - SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | ❑ Perform EOP-2 Entry Brief |
| | BOP | ❑ Verify Shutdown Sequencer loads are operating<br>❑ IF 13 AFW PP starts AND 11 or 12 AFW PP is operating, THEN secure 13 AFW PP. |
| | BOP | ❑ IF COMPONENT COOLING FLOW HAS BEEN LOST, THEN RESTORE FLOW<br>o If CC pump not started in EOP-0 then should be started (not expected) |
| | BOP | ❑ IF 500KV OFFSITE POWER HAS BEEN LOST, THEN PROTECT THE CONDENSER FROM OVERPRESSURE AND MINIMIZE S/G INVENTORY LOSS<br>❑ Shut BOTH MSIVs.<br>❑ Shut the S/G B/D valves: |
| | BOP | ❑ ESTABLISH RCS HEAT SINK<br>❑ Operate the ATMOSPHERIC DUMP VALVES to maintain the following:<br>❑ S/G pressures between 850 and 920 psia<br>❑ TCOLD between 525 and 535°F<br>❑ Establish Auxiliary Feedwater flow to at least ONE S/G using 11 or 12 AFW PP as follows:<br>❑ Verify the S/G steam driven train S/G AFW BLOCK valves are open with the handswitches in AUTO<br>❑ Open the SG AFW STM SUPP & BYPASS valves<br>❑ IF Main Feedwater is NOT available, THEN secure the Main Feedwater System |
| | ATC | ❑ Operate Charging and Letdown to restore and maintain pressurizer level between 101 and 180 inches |

Examiner notes:

**NOTE TO EXAMINER**

**Cue driver to Initiate Loss of 1A D/G as desired after EOP-2 Implementation**

| Op-Test #: **2014** | **Scenario #: 1** | Event #: **7 (cont.)** | Page **17** of 20 |
|---|---|---|---|
| Event Description: **EOP-2 entry LOOP** | | Event Type: | **C – BOP/SRO**<br>**T - SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | ❑ MAINTAIN RCS SUBCOOLING BETWEEN 30 AND 140°F<br>❑ Operate Pressurizer HTRs and SPRAY as necessary to maintain RCS subcooling between 30 and 140°F based on CET temperatures: |
| | BOP<br>(CT) | ❑ ATTEMPT TO RESTORE POWER<br>❑ IF 11 OR 14 4KV Bus is NOT energized, AND 500KV offsite power is NOT available, THEN perform ANY of the following:<br>❑ IF the 0C DG is NOT supplying a vital 4KV bus AND it is desired to place the 0C DG on 14 4KV Bus THEN perform the following:<br>❑ IF the 0C DG is NOT running, THEN direct an operator to perform an emergency start from the local panel PER OI-21C, 0C DIESEL GENERATOR.<br>❑ WHEN the 0C DG is up to rated speed and voltage, THEN verify the 0C DG OUT BKR, 152-0703 is closed.<br>❑ WHEN disconnect 189-1406 is closed AND breaker 152-0703 is closed, THEN perform the following:<br>❑ Close 07 4KV BUS TIE, 152-0701<br>❑ Insert the sync stick AND close the 0C DG 14 4KV BUS FDR, 152-1406 |

Examiner notes:

**The scenario will end when crew has restored power to 14 4KV Bus and Evaluators are satisfied with crews plant control (Crew may take time to restore 11 4KV bus, this would meet the critical task, but not optimal)**

**If SRO's understanding of Technical Specification applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.**

**TS LCO 3.8.1.A, 3.8.1.B, 3.8.1.D, 3.8.1.G, 3.8.1.H, 3.8.1.I, 3.8.1.K & 3.0.3**

After scenario ends ask SRO for ERPIP call. The correct Emergency Action Level declaration for this scenario is:

**ALERT**, per S.A.1.1 for AC Power capability (1 source from Station Blackout)

**SITE AREA EMERGENCY.** Per S.S.1.1 possible if 0C DG not on 14 4KV bus ( or 11 4KV bus) within 15 min of 1A DG loss

# SHIFT TURNOVER INFORMATION SHEET [B0459]

DATE: **Today** **ON-COMING SHIFT: DAYS**

| *UNIT STATUS* | | | | |
|---|---|---|---|---|
| PARAMETER | UNIT 1 | | UNIT 2 | |
| **MODE OF OPERATION** | 1 | | 1 | |
| **REACTOR POWER (%)** | 100 | | 100 | |
| **GENERATION NET (MWe)** | 890 | | 876 | |
| **RCS LEAKAGE (gpm)** | .06 | | 0.05 | |
| **RCS BORON (ppm)** | 902 | | 118 | |
| **UNIT RISK (HIGHEST FOR DAY)** | **CDF: MED** | **LERF: MED** | **CDF: LOW** | **LERF: LOW** |
| **BULK POWER NOTIFICATIONS** | Normal | | | |

| *NON-ROUTINE SURVEILLANCE REQUIREMENTS and ACTION STATEMENTS [B0125]* | | |
|---|---|---|
| List action statements expiring during the oncoming shift, non-routine, conditional, & mode dependent surveillances (e.g. chemistry samples, operability verifications, ETPs, <7 day STPs) | | |
| | | |
| | | |

| ***OD's/RECO's/FA's and REF's requested by OPS*** | | | | | |
|---|---|---|---|---|---|
| **Unit** | **Description** | **Date Requested** | **Type Requested** | **Resp. Group** | **ECD** |
| | | | | | |
| | | | | | |

| *Surveillances coming Due* | | | |
|---|---|---|---|
| Unit 1 | | Unit 2 | |
| DATE | STP | DATE | STP |
| | | | |
| | | | |

*D. F. Lavato*

Shift Manager

# SHIFT TURNOVER INFORMATION SHEET [B0459]

| EQUIPMENT AVAILABILITY | | |
|---|---|---|
| **ELECTRICAL SYSTEM** | **UNIT 1** | **UNIT 2** |
| 500KV High Lines | ☒**5051** ☒**5072** | ☒**5052** |
| 500KV Buses | ☒ **BLACK** | ☒**RED** |
| 13KV Supplies | ☒ **P-13000-1** | ☒ **P-13000-2** |
| SMECO Bkr Status | ☒ **252-2301** ☐**0SH301** | ☒ **0SH302** |
| Site Self Power Feeders | ☐ **252-1106** | ☐ **252-2106** |
| 13KV Buses | ☒**11** ☒**12** ☒**23** | ☒**21** ☒**22** |
| Voltage Regulators | **Auto** 1102 **Auto** 2102 **Auto** 1101 | **Auto** 1103 **Auto** 2103 **Auto** 2101 |
| 4KV Transformers | ☒**U-4000-11** ☒**U-4000-21** ☒**U-4000-13** | ☒**U-4000-12** ☒**U-4000-22** ☒**U-4000-23** |
| 4KV Buses | ☒**11** ☒**12** ☒**13** ☒**14** | ☒**21** ☒**22** ☒**23** ☒**24** |
| Diesel Generators | ☐**1A** ☐**1B** ☐**0C** | ☐**2A** ☐**2B** ☐**0C** |
| 480V Buses | ☒**11A** ☒**11B** ☒**14A** ☒ **14B** | ☒**21A** ☒**21B** ☒**24A** ☒**24B** |
| 125VDC Battery Chargers | ☒**11** ☒**23** ☒**12** ☒**24** | ☒**14** ☒**22** ☒**13** ☒**21** |
| 125VDC Buses | ☒**11** ☒**12** | ☒**22** ☒**21** |
| 120VAC Vital Buses | ☒**11** ☒**21** ☒**13** ☒**23** | ☒**14** ☒**24** ☒**12** ☒**22** |

| OOS SR EQUIPMENT | | OOS NSR EQUIPMENT | |
|---|---|---|---|
| **UNIT 1 & COMMON** | **UNIT 2** | **UNIT 1 & COMMON** | **UNIT 2** |
| 12 AFW Pump | | | |
| 1B DG | | | |
| 12 MSL Rad Mon | | | |
| 12 $N^{16}$ Rad Mon | | | |

# SHIFT TURNOVER INFORMATION SHEET [B0459]

| *GENERAL INFORMATION* | | | | |
|---|---|---|---|---|
| **UNIT 1** | | | | |
| | | | 11 HEADER | 12 HEADER |
| Max Header Pressure PE1-12-21-O-M | SW PUMP | 11 | 35 psig (yesterday) | |
| | | 12 | | 33.5 psig (yesterday) |
| | | 13 | 34 psig (yesterday) | 32 psig (yesterday) |

***LONG TERM NOTES***

1. IAW OD-09-005, maintain containment pressure less than 1.0 psig in order to ensure the containment response to a Design Basis Loss of Coolant Accident inside containment remains within design limits.

***SHORT TERM NOTES***

1. DO NOT place 13 SWS Pump in service until 1-SWS-126 (13 SWS PP DISCHARGE VENT) is replaced (CR-2012-007257).
2. IF11 SGFP B/U Lube Oil Pump spurious auto start occurs, notify I&C to retrieve data from the recorder during the next business day.
3. 12 MSL & N-16 Rad Monitors OOS
4. 1B DG for cylinder work, OI-49 due in 4 hours.
5. 12 AFW Pump for past 4 hours for bearing replacement

Facility: **Calvert Cliffs Nuclear Power Plant** Scenario #: **2** OP-Test #: **CCNPP 2014**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: **Unit-1 is at 100% power, EOC. Unit-2 is in Mode 5.**

Turnover: **13 Cond Booster Pump is tagged out for inspection of high vibrations (expect back at end of shift), 12 AFW Pump OOS for governor work (out for 2 hours, back in in 4 hours) Instructions for the crew are to maintain power at 100%**

| Event # | Malfunction # | Event Type* | Event Description |
|---|---|---|---|
| 1 | **Rapid Downpower** | R - ATC<br>N - BOP/SRO | Call from ESO to reduce load to 800 MWE in <15 min |
| 2 | **120v003_01** | C - All<br>T - SRO | Loss of 1Y01 |
| 3 | **ms018_04**<br>**ms010_01** | C - BOP/SRO<br>T - SRO | S/G Level LT-1114-D variable leg leak in containment |
| 4 | **ms010_01** | M - All | Steam line break in containment / Reactor Trip |
| 5 | **esfa004_01**<br>**esfa004_02**<br>**esfa012** | I -All | CSAS A&B Automatic Failure<br>SGIS Automatic Actuation Failure |
| 6 | **Emergency Airlock** | T - SRO | Containment Integrity breached |
| * | (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (T)ech Spec | | |

Critical Tasks: (shaded)

1. Trips all RCP's within 10 minutes of CIS actuation (no CC flow to RCP's).
2. Determines CSAS failure and manually actuates CSAS prior to exiting EOP-0.
3. Identifies and isolates 11 S/G prior to RCS subcooling exceeding 140°F.

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of JPM |

OP-Test #: **2014** **Scenario #: 2**

## SCENARIO OVERVIEW
## DOWNPOWER, 1Y01 FAILURE, S/G LEVEL INSTRUMENT FAILURE, STEAM LEAK

Initial Conditions: Unit-1 is at 100% power. Core Burnup is 17,536 MWD/MTU. Unit-2 is in Mode 5. 13 Condensate Booster Pump is tagged out for inspection of high vibrations (expected back at end of shift) and 12 AFW Pump is tagged out for governor work (expected back in 4 hours). Instructions for the crew are to maintain power at 100%.

First a call from ESO directs power reduction to ≤800 MWe in ≤ 15 minutes, crew should perform this downpower and stop effectively, demonstrating good plant control.

Next, a loss of 1Y01 occurs, requiring implementation of AOP-7J. The crew is expected to determine associated T.S. LCOs. Affected RPS and ESFAS Channels will be de-energized using the appropriate Operating Instructions.

Next a small leak develops due to a crack in the weld of an instrument sensing leg tap on #11 S/G resulting in LR-1114D failing low. The crew is expected to review NO-1-200 for common tap analysis and associated T.S. LCO's. After several minutes the crack propagates to a major steam leak requiring a reactor trip.

SGIS and CSAS will fail to automatically actuate requiring the operator to manually actuate CSAS and take required actions for SGIS.

The crew is expected to implement EOP-4. If plant conditions degrade or the crew is unsure of the diagnosis it is acceptable for them to enter EOP-8. If EOP-8 is entered all critical tasks still apply unless individual tasks are invalidated by the exam team.

Scenario ends after containment pressure rapidly lowering is recognized and actions taken (EAL implications).

## INSTRUCTOR SCENARIO INFORMATION

_____ 1. Reset to IC-14.

_____ 2. Perform switch check.

_____ 3. Place simulator in CONTINUE, advance charts and clear alarm display.

_____ 4. Place simulator in FREEZE.

_____ 5. Enter Triggers

_____ a. None

_____ 6. Enter Malfunctions

_____ a. SGIS Automatic Actuation failure: **esfa012** at **time zero**.

_____ b. CSAS "A" Automatic Actuation failure: **esfa004_01** at **time zero**.

_____ c. CSAS "B" Automatic Actuation failure: **esfa004_02** at **time zero**.

_____ d. 13 Cond Booster Pump Breaker failure: **cd005_03** at **time zero**.

_____ e. Loss of 1Y01: **120v003_01** on **Event 1**.

_____ f. S/G Level Transmitter (LT-1114D) failure: **ms018_04** to **LOW** on **Event 2**.

_____ g. Steam leak inside Containment from 11 S/G: **ms010_01** from **0.1** to **0.4** over a **3 minute ramp** on **Event 2**.

_____ h. Steam leak inside Containment from 11 S/G: **ms010_01** from **0.4** to **8** over a **3 minute ramp** on **Event 3**.

_____ i. Containment Equipment Hatch Fails: **EQUIPMENT+HATCH** to **20%** on **Event 4**.

_____ 7. Enter Panel Overrides

_____ a. 12 AFW PP TURB TRIP SW: **P1C04_1HS3988_LTWHIT** to **OFF** at **time zero**.

_____ b. 12 AFW PP TURB TRIP SW: **P1C04_1STP3988_LTRED** to **OFF** at **time zero.**

_____ c. 12 AFW PP TURB TRIP SW: **P1C04_1STP3988_LTWHI** to **OFF** at **time zero.**

_____ d. Main Steam supply to 12 AFW PP **1-MS-107 SHUT at time zero**

_____ e. Reactor Regulating System Chan X S1, **RRS-S1(X) to OFF on Event 5**

_____ f. Shift 11 ADV to 1C43, **1-MS-3938-HV to 1C43 on Event 6**

_____ 8. Enter Remote Functions / Administrative

_____ a. Place 13 Cond Booster Pump in PTL.

_____ b. Place a Caution tag on 13 Cond Booster Pump.

_____ c. Place a Caution tag on 12 AFW Pump.

_____ 9. Set simulator time to real time, then place simulator in CONTINUE.

_____ 10. Allow crew 3-5 minutes to acclimate themselves with their positions.

_____ 11. Brief the Crew:

| | |
|---|---|
| 1. Present plant conditions: | 100% load at EOC 18,250 MWD/MTU |
| 2. Power history: | Long term steady state. |
| 3. Equipment out of service: | • 13 Cond Booster Pump is tagged out for inspection of high vibrations (expect back at end of shift)<br>• 12 AFW Pump OOS for governor work (out for 2 hours, back in in 4 hours) |
| 4. Abnormal conditions: | None |
| 5. Surveillances due: | None |
| 6. Instructions for shift: | Maintain 100% Power |

_____ 12. Allow crew 3-5 minutes to acclimate themselves with their positions.

_____ 13. Instructions for the Booth Operator.

_____ a. Call as ESO and inform CRS that due to abnormal conditions at Waugh Chapel a power reduction to 800 MWe is required in <15 minutes.

_____ b. Activate **Event 1** (Loss of 1Y01) on Lead Evaluators cue after power stabilized

_____ c. Activate **Event 2** (Sensing Line leak on LT-1114D 11 S/G Level indicator) when cued by lead evaluator (when crew is sending PWS to downpower ESFAS & AFAS).

_____ d. Activate **Event 3** (Modify Stm Leak from .4 to 8% over 3 min) to increase the size of the leak when cued by lead evaluator.(10-15 minutes after initial break)

_____ e. Activate **Event 4** (Containment Boundary breach) on Lead Evaluators cue after peak containment pressure reached.

## Responses to Crew Request

If a request and response is not listed, delay the response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

Allow 2-3 minutes to perform requests from or to give reports to the Control Room unless otherwise specified.

| REQUEST | RESPONSE |
|---|---|
| 1. PWS/TBO investigate loss of 1Y01. | After two minutes, report acrid smell from 11 Inverter. |
| 2. EM investigate loss of 1Y01. | After ten minutes report inverter appears to have failed and that bus appears OK. |
| 3. Place RCS loop 11 Instruments to RRS Channel Y switch, S1, to OFF. | After 1 minute, use **Event 5**. |
| 4. Deenergize ESFAS AL cabinet | Acknowledge Request.<br>After 10 minutes report complete. |
| 5. Deenergize ESFAS ZD cabinet | Acknowledge Request.<br>After 10 minutes use remote function to open and close ESFAS doors then report complete. |
| 6. Deenergize AFAS AL cabinet | Acknowledge Request.<br>After 10 minutes report complete |
| 7. PWS bypass AFAS ZD sensor modules. | Acknowledge Request.<br>After 10 minutes report complete |
| 8. Verify SRW Pp Rm ventilation l/u per OI-15. | Acknowledge request.<br>After 10 minutes report complete |
| 9. PWS check AFAS cabinet for alarms | After 3 minutes report ZG 11 S/G level pegged low, also ZD and AL are de-energized. |
| 10. Align the ADVs hand transfer valves for 11 S/G to the 1C43 position. | Acknowledge request. After 2-3 minutes, shift control to 1C43 using **EVENT 6.** |
| 11. When Emergency Airlock opened per Evaluator cue | After 2 Minutes report as security that cameras show steam coming from emergency airlock on west road |

| Op-Test #: **2014** | Scenario #: **2** | Event #: **1** | Page **6** of 20 |
|---|---|---|---|
| Event Description: **Rapid Downpower** | | Event Type: | **R – ATC**<br>**N – BOP/SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | ❑ Order Rapid Downpower to ≈90% in <15 min |
| | ATC | ❑ Borate to RCS by performing the following: (This step may be omitted due to core burnup, downpower could be performed using CEA's only)<br>❑ OPEN the BA Direct M/U Valve, 1-CVC-514-MOV<br>❑ VERIFY two charging pumps are running<br>❑ START a BA PP, AFTER 30 seconds, THEN STOP the operating BA PP<br>❑ SHUT the BA Direct M/U Valve, 1-CVC-514-MOV<br>❑ OPEN the RWT CHG PP Suct Valve, 1-CVC-504-MOV<br>❑ SHUT the VCT Outlet Valve, 1-CVC-501-MOV |
| | SRO | ❑ Review Pre-Prepared Rapid Downpower Plan and inform ATC of target CEA height |
| | ATC | ❑ Insert CEA's per SRO direction |
| | ATC | ❑ Equalize Pressurizer boron as follows:<br>❑ ENERGIZE all Pressurizer Backup Heater Banks<br>❑ ADJUST the setpoint on the selected Pressurizer Pressure Controller, PIC-100X, to maintain Pressurizer pressure at 2250 PSIA |
| | BOP | ❑ REDUCE Turbine Generator load to maintain Tc within 5 °F of program |
| | | ❑ |

Examiner notes

| Op-Test #: **2014** | Scenario #: **2** | Event #: **1 (cont)** | Page **7** of 20 |
|---|---|---|---|
| Event Description: **Rapid Downpower** | | Event Type: | **R – ATC**<br>**N – BOP/SRO** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | ❑ When approaching 800 MWe direct ATC/BOP to secure downpower |
| | ATC | ❑ SECURE borating the RCS by:<br>❑ VERIFY the VCT Outlet Valve, 1-CVC-501-MOV, is OPEN<br>❑ VERIFY the RWT Suct Valve, 1-CVC-504-MOV, is SHUT |
| | BOP | ❑ Place Turbine Control System back in Manual (if Auto used) |
| | ATC | ❑ Withdraw CEA's as required to maintain Reactor Power (due to Xenon buildup) |

Examiner notes

**Event concludes when Reactor Power is stabilized.**

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, Loss of 1Y01, when desired**

Op-Test #: **2014** Scenario #: **2** Event #: **2** Page **8** of 20

Event Description **Loss of 1Y01** Event Type: **C – All**
**T- SRO**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC/BOP | ❑ Recognizes multiple alarm(s) and reports to SRO |
| | BOP | ❑ Checks RPS and reports "RPS **Not** Calling for Trip" |
| | BOP | ❑ Check 1C24 and determine only 1Y01 lost and reports to SRO |
| | ATC/BOP | ❑ Refer to Alarm Manuals |
| | SRO | ❑ Implement AOP-7J and assign steps |
| | ATC | ❑ Selects Channel "Y" on PZR Press, PZR Level, PZR Htr Cutoff, and RRS Channel Selector. Direct OWC to isolate RCS Loop 11 instruments by placing "S1" switch to off. |
| | ATC | ❑ Reset Proportional Heaters |
| | ATC/SRO | ❑ Isolate L/D (Shut CVC-515 & 516) and operate Chg Pp's to control level 201-225" |
| | BOP/SRO | ❑ Restore 11 SW HDR<br>❑ Verify 12 CCHX in service<br>❑ Verify 11A/11B SRW HX OUT valve H/S's OPEN |
| | ATC/BOP | ❑ Review alarms consistent with loss of 1Y01 |
| | SRO | ❑ Directs OWC to have EM investigate the loss of 1Y01 Bus |
| | SRO | ❑ Review TS. 3.3.1.A & D, 3.3.3.A, 3.3.4.A & C, 3.3.5.A & C, 3.3.6.A, 3.3.9A & B, 3.3.10.A, 3.3.11.A, 3.4.14.B, 3.8.1.B, 3.8.7.A, 3.8.9.B |

Examiner notes:

**Event concludes when crew directs de-energizing ESFAS & AFAS.**

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, 11 S/G Level sensing line leak**

Op-Test #: **2014** Scenario #: **2** Event #: **3** Page **9** of 20

Event Description: **11 S/G level sensing line leak**

Event Type: **C – BOP/ SRO**
**T - SRO**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP/SRO | ❑ Notes "AFAS ACTUATED" alarm on 1C04 and reports to SRO<br>❑ Reports 1-MS-4070A & 1-MS-4070 opening and 1-LT-1114D on 1C04 failed low |
| | SRO | ❑ Directs OWC to check AFAS cabinet for alarms |
| | BOP/SRO | ❑ SRO may direct securing AFW flow to S/G's by either shutting associated block valves or shutting 1-MS-4070 |
| | SRO | ❑ After report from OWC checks NO-1-200 common tap analysis, directs BOP to check containment parameters |
| | BOP | ❑ Reports degrading containment parameters |
| | SRO | ❑ Implement AOP-7K Overcooling in Mode 1 |
| | BOP | ❑ Adjust turbine load to maintain $T_{COLD}$ on program |
| | SRO | ❑ Determine TS 3.3.4.A applicable |

Examiner notes:

**Event concludes when crew determines the failure is causing small steam leak in containment.**

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, Steam Leak in containment worsens**

Op-Test #: **2014** Scenario #: **2** Event #: **4** Page **10** of 20

Event Description: **Steam Leak in Containment/Reactor Trip** Event Type: **M - All**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | ❑ Recognizes lowering $T_{COLD}$ and reports to SRO |
| | BOP | ❑ Recognizes degrading containment parameters and reports to SRO |
| | SRO | ❑ Orders Reactor Trip prior to Auto Trip |
| | ATC | ❑ Performs Reactivity Control Safety Function<br>❑ Depress Manual Reactor Trip Pushbutton on 1C05<br>❑ Check Reactor tripped using NI power indications on 1C05<br>❑ Verifies all CEAs fully inserted<br>❑ Verify DI Water Makeup is secured<br>❑ Check 11 & 12 RC makeup Pumps secured on 1C07<br>❑ Check VCT M/U 1-CVC-512-CV is shut on 1C07<br>❑ If aligned for direct makeup to RCS then shut RWT Charging Pump Suction 1-CVC-504-MOV on 1C07<br>❑ Reports Reactivity Control Safety Function **Complete** |
| | BOP | ❑ Performs Turbine Trip<br>❑ Checks Reactor tripped then:<br>❑ Depresses both Turbine Trip Pushbuttons on 1C02<br>❑ Checks Main Turbine stop Valves shut on MK VI screen<br>❑ Checks Turbine Speed drops on MK VI screen<br>❑ Checks Turbine Generator Output Breakers open<br>❑ 11 GEN BUS BKR 0-CS-552-22 on 1C01<br>❑ 11 GEN TIE BKR 0-CS-552-23 on 1C01<br>❑ Checks Generator Field Breaker open on 1C01<br>❑ Checks Generator Exciter Field breaker open on 1C01<br>❑ Ensures MSR 2nd Stage Steam source Valves are shut<br>❑ Reports Turbine Trip **Complete** |

| Op-Test #: **2012** | Scenario #: **2** | Event #: **4 (cont.)** | Page **11** of 20 |
|---|---|---|---|
| Event Description: | **Steam Leak in Containment** | Event Type: | **M-All** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Performs Vital Auxiliaries Safety Function<br>❑ Checks 11 or 14 4KV bus energized.<br>❑ Checks **ALL** 125V DC BUS VOLTS greater than 105 volts on 1C24:<br>☐ 11 ☐ 12 ☐ 21 ☐ 22<br>❑ Checks at least THREE 120V AC Vital Buses are energized on 1C24:<br>☐ 11 ☐ 12 ☐ 21 ☐ 22<br>❑ Checks EITHER 1Y09 OR 1Y10 energized on 1C24.<br>❑ Verifies Component Cooling Flow to the RCP's<br>❑ Reports Vital Auxiliaries Safety Function **Complete** |
| | ATC | ❑ Performs Pressure & Inventory Control Safety Function, including alternate actions<br>❑ Operates heaters and spray to restore pressurizer pressure between 1850 and 2300 PSIA **AND** is trending to 2250 PSIA.<br>❑ Operates charging and letdown to restore PZR level between 80 and 180 inches<br>❑ Ensures RCS subcooling >30°F<br>❑ Reports Pressure and Inventory Safety Function **Not Met due to negative trends on PZR level and pressure** |

Examiner notes:

| Op-Test #: **2014** | Scenario #: **2** | Event #: **5** | Page **12** of 20 |
|---|---|---|---|
| Event Description: | **SGIS and CSAS failure** | Event Type: | **I - All** |

| | | |
|---|---|---|
| | BOP | ❑ Performs Core & RCS Heat Removal Safety Function<br>❑ Checks TBVs/ADVs controlling S/G pressure 850-920 PSIA and $T_{COLD}$ 525-535°F<br>❑ Shuts both MSIVs when S/G pressure drops to 800 PSIA<br>❑ Verifies SGIS actuated when S/G pressure drops below 685 PSIA (reports SGIS failure to SRO when recognized)<br>❑ Verifies AFAS Block when 115 PSID pressure differential between 11 & 12 S/G's<br>❑ **IF** Feedwater flow is lost **OR** excessive, **THEN** perform the following actions:<br>❑ Start an AFW PP, Trip the SGFPs, Shut the SG FW ISOL valves (open block valve if shut earlier)<br>❑ Operate the AFW System to restore S/G levels to between -170 and +30 inches<br>❑ Checks at least one RCP is in a loop with a S/G available for heat removal (on 1C06)<br>❑ Checks $T_{HOT}$ minus $T_{COLD}$ is less than 10°F by checking indicators on 1C06<br>❑ Reports Core & RCS Heat Removal Safety Function **Cannot be Met** due to Low $T_{COLD}$, Low S/G pressure and level and no RCP's. |

Examiner notes:

| Op-Test #: **2014** | Scenario #: **2** | Event #: **5 (cont)** | Page **13** of 20 |
|---|---|---|---|
| Event Description: | **SGIS and CSAS failure** | Event Type: | **I - All** |

| | | |
|---|---|---|
| | ATC<br>(2 CT's) | ❑ Performs Containment Environment Safety Function<br>❑ Checks Containment Pressure < 0.7 PSIG<br>❑ Verifies all CAC's operating with Emergency Outlet valves open<br>❑ Verifies SIAS and CIS when pressure >2.8 PSIG<br>❑ Trips all RCP's due to no CC flow<br>❑ Verifies CSAS when pressure >4.25 PSIG (Manually initiates with pushbuttons)<br>❑ Checks Containment Temperature, verifies CAC's operating<br>❑ Checks Containment Gaseous RMS at 1C22 not in alarm with no abnormal rising trend.<br>❑ Reports Containment Environment Safety Function **Cannot be Met** due high containment pressure and temperature |

| Op-Test #: **2014** | **Scenario #: 2** | Event #: **5 (cont.)** | Page **14** of 20 |
|---|---|---|---|
| Event Description: **SGIS and CSAS failure** | | Event Type: **I - ALL** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Perform Rad Levels External to Containment Safety Function<br>❑ Check the following RMS alarms are clear with no unexplained rise:<br>❑ U-1 Wide Range Noble Gas Monitor<br>❑ U-1 Condenser Off Gas @ 1C22<br>❑ U-1 S/G Blowdown @ 1C22<br>❑ U-1 Main Vent Gaseous @ 1C22<br>❑ Reports Rad Levels External to Containment Safety Function **Complete** |
| | SRO | ❑ Perform EOP-0 brief<br>❑ Ensures all are attentive<br>❑ Reviews Safety Functions not met<br>❑ PIC not met due to low PZR level and pressure<br>❑ HR not met due low S/G press and level and no operating RCP's<br>❑ CE due to high Containment pressure and temperature<br>❑ Reviews Safety system Actuations<br>❑ SGIS (failed), SIAS, CIS, CSAS (failed), AFAS, AFAS Block<br>❑ Solicits Input<br>❑ Concludes the brief directing the crew to continue to monitor Safety Functions while the event is diagnosed. |
| | BOP | ❑ Refers to EOP-0 flowchart<br>❑ PIC, HR and CE not met - Flowchart leads to EOP-4<br>❑ Implements EOP-4 |

Examiners notes:

| Op-Test #: **2014** | **Scenario #: 2** | Event #: **5 (cont.)** | Page 15 of 20 |
|---|---|---|---|
| Event Description: **SGIS and CSAS failure** | | Event Type: **I - ALL** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | ❑ Assign step G Identify Isolate and Confirm affected S/G to BOP |
| | BOP (CT) | ❑ Identify the affected S/G by observing the following:<br>❑ S/G with the highest steam flow<br>❑ S/G with the lowest pressure<br>❑ RCS loop with the lowest $T_{COLD}$<br>❑ S/G with the most rapid downward level trend<br>❑ Isolate the affected S/G<br>❑ Direct TBO to shut 11 ADV from SWGR Room<br>❑ Verify 11 SG FW ISOL shut FW-4516-MOV<br>❑ Verify 11 MSIV BYP shut MS-4045-MOV<br>❑ Shut 11 SG B/D Valves BD-4010 & 4011-CV's<br>❑ Shut 11 SG AFW STM SUPP 7 BYP valves MS-4070A & 4070<br>❑ Shut 11 SG AFW Block valves AFW-4520, 4521, 4522, 4523<br>❑ Shut MS UPSTREAM DRN ISOL valve by placing HS-6622 in close<br>❑ Direct ABO/OSO to observe no Safety Valves leaking on 11 S/G |

Examiner's notes:

| Op-Test #: **2014** | **Scenario #: 2** | Event #: **5 (cont.)** | Page **16** of 20 |
|---|---|---|---|
| Event Description: **SGIS and CSAS failure** | | Event Type: **I - ALL** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Maintain RCS Temps<br>❑ IF the difference between unaffected S/G temperature and CET temperature exceeds 25°F during the blowdown, THEN cool the unaffected S/G to within 25°F of CET temperature using the unaffected S/G ADV<br>❑ WHEN the RCS cooldown due to blowdown of the affected S/G has stopped, THEN operate the unaffected S/G ADV to stabilize RCS temperatures as follows:<br>❑ WHEN unaffected S/G temperature is within 25°F of the lowest CET temperature during blowdown, THEN maintain the following:<br>❑ Unaffected S/G pressure approximately constant<br>❑ $T_{COLD}$ approximately constant |
| | ATC | ❑ Commence RCS Boration<br>❑ Ensure VCT M/U shut CVC-512-CV<br>❑ BA Direct M/U valve open CVC-514<br>❑ BAST Gravity FD valves open CVC-508 & 509-CV's<br>❑ All BA Pumps running<br>❑ VCT Outlet valve shut CVC-501-MOV<br>❑ All Chg Pumps running |

Examiner notes:

| Op-Test #: **2014** | **Scenario #: 2** | Event #: **6 (cont.)** | Page **16** of 20 |
|---|---|---|---|
| Event Description: **Containment Failure** | | Event Type: **T - SRO** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **NOTE TO EXAMINER**<br>**Cue Booth Operator to insert next malfunction, Containment Emergency Air Lock failure** | | |
| | BOP | ❑ Report Containment pressure rapidly dropped from Approximately 10 PSIG to 0 PSIG |
| | SRO | ❑ Recognize failure of containment emergency airlock triggers ERPIP Call of F.U.1.1 and Tech Spec 3.6.1.A & 3.6.2.C |

Examiner notes:

**Scenario concludes when crew recognizes the failure of the containment. SRO actions can be done as post scenario questioning**

# SHIFT TURNOVER INFORMATION SHEET [B0459]

DATE: **Today** **ON-COMING SHIFT: DAYS**

*UNIT STATUS*

| PARAMETER | UNIT 1 | | UNIT 2 | |
|---|---|---|---|---|
| **MODE OF OPERATION** | 1 | | 5 | |
| **REACTOR POWER (%)** | 100 | | $10^{-6}$ | |
| **GENERATION NET (MWe)** | 890 | | -14 | |
| **RCS LEAKAGE (gpm)** | .06 | | N/A | |
| **RCS BORON (ppm)** | 180 | | 2452 | |
| **UNIT RISK (HIGHEST FOR DAY)** | **CDF: MED** | **LERF: MED** | **CDF: LOW** | **LERF: LOW** |
| **BULK POWER NOTIFICATIONS** | Normal | | | |

*NON-ROUTINE SURVEILLANCE REQUIREMENTS and ACTION STATEMENTS [B0125]*

List action statements expiring during the oncoming shift, non-routine, conditional, & mode dependent surveillances (e.g. chemistry samples, operability verifications, ETPs, <7 day STPs)

| | | |
|---|---|---|
| | | |
| | | |

***OD's/RECO's/FA's and REF's requested by OPS***

| Unit | Description | Date Requested | Type Requested | Resp. Group | ECD |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

*Surveillances coming Due*

| Unit 1 | | Unit 2 | |
|---|---|---|---|
| **DATE** | **STP** | **DATE** | **STP** |
| | | | |
| | | | |

*L. C. Beavers*

Shift Manager

# SHIFT TURNOVER INFORMATION SHEET [B0459]

| EQUIPMENT AVAILABILITY | | |
|---|---|---|
| **ELECTRICAL SYSTEM** | **UNIT 1** | **UNIT 2** |
| 500KV High Lines | ☒ **5051** ☒ **5072** | ☒ **5052** |
| 500KV Buses | ☒ **BLACK** | ☒ **RED** |
| 13KV Supplies | ☒ **P-13000-1** | ☒ **P-13000-2** |
| SMECO Bkr Status | ☒ **252-2301** ☐ **0SH301** | ☒ **0SH302** |
| Site Self Power Feeders | ☐ **252-1106** | ☐ **252-2106** |
| 13KV Buses | ☒ **11** ☒ **12** ☒ **23** | ☒ **21** ☒ **22** |
| Voltage Regulators | **Auto** 1102 **Auto** 2102 **Auto** 1101 | **Auto** 1103 **Auto** 2103 **Auto** 2101 |
| 4KV Transformers | ☒ **U-4000-11** ☒ **U-4000-21** ☒ **U-4000-13** | ☒ **U-4000-12** ☒ **U-4000-22** ☒ **U-4000-23** |
| 4KV Buses | ☒ **11** ☒ **12** ☒ **13** ☒ **14** | ☒ **21** ☒ **22** ☒ **23** ☒ **24** |
| Diesel Generators | ☐ **1A** ☐ **1B** ☐ **0C** | ☐ **2A** ☐ **2B** ☐ **0C** |
| 480V Buses | ☒ **11A** ☒ **11B** ☒ **14A** ☒ **14B** | ☒ **21A** ☒ **21B** ☒ **24A** ☒ **24B** |
| 125VDC Battery Chargers | ☒ **11** ☒ **23** ☒ **12** ☒ **24** | ☒ **14** ☒ **22** ☒ **13** ☒ **21** |
| 125VDC Buses | ☒ **11** ☒ **12** | ☒ **22** ☒ **21** |
| 120VAC Vital Buses | ☒ **11** ☒ **21** ☒ **13** ☒ **23** | ☒ **14** ☒ **24** ☒ **12** ☒ **22** |

| OOS SR EQUIPMENT | | OOS NSR EQUIPMENT | |
|---|---|---|---|
| **UNIT 1 & COMMON** | **UNIT 2** | **UNIT 1 & COMMON** | **UNIT 2** |
| 12 AFW Pump | | 13 Cond Booster PP | |
| | | | |
| | | | |
| | | | |

# SHIFT TURNOVER INFORMATION SHEET [B0459]

| *GENERAL INFORMATION* | | | | |
|---|---|---|---|---|
| **UNIT 1** | | | | |
| | | | 11 HEADER | 12 HEADER |
| Max Header Pressure PE1-12-21-O-M | SW PUMP | 11 | 35 PSIG (yesterday) | |
| | | 12 | | 33.5 PSIG (yesterday) |
| | | 13 | 34 PSIG (yesterday) | 32 PSIG (yesterday) |

***LONG TERM NOTES***

1. IAW OD-09-005, maintain containment pressure less than 1.0 PSIG in order to ensure the containment response to a Design Basis Loss of Coolant Accident inside containment remains within design limits.

***SHORT TERM NOTES***

1. **DO NOT** place 13 SWS Pump in service until 1-SWS-126 (13 SWS PP DISCHARGE VENT) is replaced (CR-2012-007257).
2. **IF**11 SGFP B/U Lube Oil Pump spurious auto start occurs, notify I&C to retrieve data from the recorder during the next business day.
3. 12 AFW Pump OOS for past 4 hours for governor work
4. 13 Cond Booster PP OOS for vibration inspection

Facility: **Calvert Cliffs Nuclear Power Plant** Scenario #: **4** OP-Test #: **CCNPP 2014**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: **Unit-1 is at 100% power, MOC. Unit-2 is at 100% power.**

Turnover: **12 CS Pump OOS for last hour for pump coupling Inspection (back in 2 hours). 11 BA Pump OOS for last 6 hours (bearing seized) (back in 1 day). 23 Aux Feed Pump is OOS for motor bearing repair and is expected back in 10 hours.**

| Event # | Malfunction # | Event Type* | Event Description |
|---|---|---|---|
| 1 | **480v002_01** | C - ALL<br>T - SRO | Loss of MCC-104 (AOP-7I) |
| 2 | **ms002_01** | C - BOP/SRO<br>R - ATC<br>T - SRO | 11 S/G Tube Leak (AOP-2A) |
| 3 | **ms010_01** | M - ALL | 11 S/G MSLB in Cntmt (EOP-8) |
| 4 | **esfa010_01**<br>**esfa010_02** | C - BOP | CIS "A" and "B" Failure |
| 5 | **1-SI-428 @ 12%** | C - ATC/SRO | 11 HPSI Discharge valve 12% open |
| * (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (T)ech Spec | | | |

Critical Tasks: (shaded)

1. Recognizes failure of CIS "A" and CIS "B". Manually actuates CIS "A" and CIS "B" (prior to exiting EOP-0).
2. Trips all RCP's after CIS actuates and within 10 minutes of Component Cooling isolation to Containment.
3. Notes insufficient flow from 11 HPSI pump and starts 12 HPSI pump prior to RVLMS 3rd light lit

| | |
|---|---|
| Rev. 1 | Incorporated comments from NRC validation of Scenario |

OP-Test #: **2014** **Scenario #: 4**

## SCENARIO OVERVIEW

### Loss MCC-104, S/G Tube Leak, Steam Line Break in Containment

Initial Conditions: Unit-1 & Unit 2 are at 100% power. U-1 is MOC 10,885 MWD/MTU, U-2 is EOC 17,800 MWD/MTU. 12 CS Pump for last hour for pump coupling Inspection (back in 2 hours). 11 BA Pump OOS for last 6 hours (bearing seized, back in 1 day), 23 Aux Feed Pump is OOS for motor bearing repair (expected back in 10 hours).

First a loss of MCC 104 occurs. After the crew has stabilized the plant they should realize they have no operable BA Pumps.

A Steam Generator tube leak begins in 11 S/G. The crew should attempt to borate the unit to a Tave of <537°F using the RWT. The leak size is such that the crew may reach 537°F Tave or they may reach 101" in the PZR, either of which prompts the Reactor Trip.

The reactor will be tripped and EOP-0 implemented. During EOP-0 (approx. 6 min after trip) the steam line break into the containment manifests. CIS A fails to actuate requiring manual actuation. After the crew recognizes the CIS, all RCP's should be secured. The crew is expected to implement EOP-8.

In EOP-8 the crew should identify RLEC-2 is not met and worked immediately (which directs working HR-2). When crew works HR-2 they should isolate 11 S/G IAW HR-2. When ATC is performing PIC-4 the low flow from 11 HPSI must be recognized and 12 HPSI started. The crew will also isolate 11 S/G IAW HR-2.

**INSTRUCTOR SCENARIO INFORMATION**

_____ 1. Reset to IC-24

_____ 2. Perform "Switch Check"

_____ 3. Place simulator in CONTINUE, advance charts and clear alarm display.

_____ 4. Place simulator in FREEZE

_____ 5. Enter Malfunctions:

_____ a. Event Triggers:

_____ 1. None

_____ b. #12 CS Pump Tripped: **si004_02** at **time zero**

_____ c. #11 BA Pump Tripped: **cvcs014_01** at **time zero**

_____ d. CIS Channel A Auto Failure: **esfa010_01** at **time zero**

_____ e. CIS Channel B Auto Failure: **esfa010_02** at **time zero**

_____ f. Loss of MCC-104: **480v002_01** on **Event 1**

_____ g. 11 S/G Tube Leak: **ms002_01** from **0.1 to 0.4** over a **5 min ramp** on **Event 2**

_____ h. 11 S/G Rupture in Cntmt: **ms010_01** from **30% to 100%** over a **5 min ramp** on **Event 3**

_____ 6. Enter Panel Overrides:

_____ a. Alarm window H-30: **P1C09_H30_LTON** (12CONTPP CSAS BLCKDAUTO) to **OFF** at **time zero.**

_____ b. 11 BA PP green light: **P1C07_1HS226X_LTGREE** to **OFF** at **time zero.**

_____ c. Alarm window F-26: **P1C07_F26_LTON** (11BA PP SIAS BLCKD AUTO) to **OFF** at **time zero.**

_____ d. 11 HPSI discharge valve **1-SI-428 at 12% open** on **Event 4**

_____ 7. Enter Remote Functions / Administrative:

_____ a. 12 CS Pp breaker: **152-1407_B** to **RACKOUT** at **time zero.**

_____ b. Tying 1Y10 to 1Y09 with **1SY09 to 1Y09** on **Event 5**

_____ c. 11 S/G ATM DUMP VALVE XFER: **1-MS-3938-HV** to **1C43** on **Event 6.**

_____ d. Yellow Tag 12 Containment Spray Pump in PTL.

_____ e. Yellow Tag 11 Boric Acid Pump in PTL.

_____ f. Place Red Dots on alarm windows F-26 and H-30.

_____ g. Check ALL magnetic plaques are correct.

_____ 8. Independently verify correct completion of the following:

_____ a. Malfunctions and Event Triggers correctly entered

_____ b. Panel Overrides correctly entered

_____ c. Remote Functions / Administrative actions correctly entered/performed

_____ 9. Select "**Clock**" time and ensure "**Horn On**" for annunciators.

_____ 10. Place simulator in **RUN** and reset/acknowledge panel and plant computer alarms.

_____ 11. Brief the Crew:

| | |
|---|---|
| 1. Present plant conditions: | U-1 @ 100% power MOC 10,885 MWD/MTU<br>U-2 @ 100% power EOC 17,800 MWD/MTU |
| 2. Power history: | U1 @ 100% for previous 100 days |
| 3. Equipment out of service: | • 12 CS Pump for last hour for pump coupling Inspection expected back in 2 hours<br>• 11 BA Pump for last 6 hours (bearing seized) expected back in 1 day<br>• 23 AFW Pump OOS for motor bearing replacement, expected back in 10 hours |
| 4. Abnormal conditions: | None |
| 5. Surveillances due: | None |
| 6. Instructions for shift: | Maintain 100% Power |

_____ 12. Allow crew 3-5 minutes to acclimate themselves with their positions.

_____ 13. Instructions for the Booth Operator:

_____ a. Activate **Event 1**, Loss of MCC-104, on lead evaluator's cue.

_____ b. Activate **Event 2**, 11 S/G tube leak, approximately 10 minutes after loss of MCC-104, on lead evaluator's cue.

_____ c. Activate **Event 3** (11 S/G Rupture in Containment) 6 minutes after trip

_____ d. Activate **Event 4** (11 HPSI discharge valve 15% open) after crew completes RAT in EOP-8

**RESPONSES TO CREW REQUESTS**

If a request and response is not listed, delay the response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

Allow 2-3 minutes to perform requests from or to give reports to the Control Room unless otherwise specified.

| REQUEST | RESPONSE |
|---|---|
| 1. PWS/E&C investigate the loss of MCC-104. | After three minutes report MCC-104 is grounded and putting together a troubleshooting plan to locate problem. |
| 2. TBO tie 1Y10 to 1Y09. | After two minutes use **Event 5** to tie 1Y10 to 1Y09. |
| 3. Chemistry sample both S/Gs for activity and Boron. | After approximately 15 minutes, report that there is activity in 11 S/G and none in 12 S/G. |
| 4. TBO shift 11 ADV to 1C43. | After 2-3 minutes activate **Event 6** to shift 11 ADV control to 1C43. |
| 5. ABO/OSO verify no steam coming from the safeties on the Auxiliary Building roof. | After 2-3 minutes report no steam coming from any safeties from Auxiliary Building roof. |

| Op-Test #: **2014** | Scenario #: **4** | Event #: **1** | Page **6** of 20 |
|---|---|---|---|
| Event Description: **Loss of MCC-104** | | Event Type: **C – All, T - SRO** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Recognizes multiple alarm(s) and reports to SRO. Checks RPS not calling for a trip. |
| | SRO | ❑ Implements AOP-7I, directs immediate actions per plaque. Shift Chg Pp suction back to VCT |
| | ATC | ❑ Places 2 charging pumps in PTL, Opens CVC-501 VCT Outlet, Shuts CVC-504 RWT Outlet |
| | BOP | ❑ Adjust Turbine Load to maintain $T_{COLD}$ on program |
| | SRO/ATC | ❑ Operate Charging pumps as necessary to maintain within 15" of programmed level NOT to exceed 225" |
| | BOP | ❑ Directs OWC to have E&C investigate loss of MCC-104 |
| | SRO | ❑ Directs OWC to tie 1Y10 to 1Y09 IAW AOP-7I. |
| | ATC | ❑ ATC recognizes and reports to SRO that no BA Pumps are available |
| | SRO | ❑ References Tech Specs and determines LCO 3.8.9, Condition A is applicable due to loss of MCC-104 and TNC 15.1.2, Nonconformance B is applicable due to the loss of 11 Boric Acid Pump. |
| | ATC | ❑ After 1Y09 & 1Y10 are tied, Place CVC-501 & CVC-504 Handswitches in Auto |
| | ATC | ❑ Restore Letdown to service IAW OI-2A |

Examiner notes:

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, 11 S/G Tube Leak, when restoration of Letdown is directed**

**Event concludes when indications of S/G tube leakage.**
**If SRO's understanding of Tech Specs and Technical Requirements Manual applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.**

| Op-Test #: **2014** | Scenario #: **4** | Event #: **2** | Page **7** of 20 |
|---|---|---|---|
| Event Description: **11 S/G Tube Leak** | | Event Type: **C – BOP/SRO**<br>**R – ATC, T - SRO** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Recognizes RMS alarms and reports to SRO |
| | BOP | ❑ Determines N-16 RMS readings are increasing |
| | ATC | ❑ Notes PZR level lowering with no L/D and reports RCS leakage is in excess of 1 charging pump |
| | SRO | ❑ Implement AOP-2A Section VI for RCS leakage exceeding capacity of 1 charging pump |
| | BOP | ❑ Determine and report a S/G Tube Leak exists, isolates Blowdown |
| | SRO | ❑ Direct downpower IAW AOP-2A to reduce $T_{AVE}$ to <537°F |
| | SRO | ❑ Give trip criteria of PZR level <101", $T_{AVE}$ <537°, PZR Press reaches TM/LP pre-trip setpoint |
| | ATC | ❑ Borate using Gravity Feed MOV's:<br>o Start **ALL** available Charging Pumps<br>o Open at least **ONE** Gravity Feed Valve (CVC-508 & 509-MOV's)<br>o Shut CVC-501-MOV VCT Outlet for approximately 1 minute, then re-open<br>o Verify **BOTH** Gravity Feed Valve (CVC-508 & 509-MOV's) are shut<br>o Open CVC-504-MOV (RWT Outlet) and shut CVC-501-MOV (VCT Outlet)<br>o Obtain desired rate of power reduction by using ANY of the following methods:<br>▪ Adjust boration rate<br>▪ Use CEA's |
| | BOP | ❑ Reduce Turbine Load as necessary to maintain S/G Pressure approximately 800-825 PSIA |

Examiner notes:

| Op-Test #: **2014** | Scenario #: **4** | Event #: **2 Continued** | Page **8** of 20 |
|---|---|---|---|
| Event Description: **11 S/G Tube Leak** | | Event Type: **C – BOP/SRO**<br>**R – ATC, T - SRO** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Verify LPFW's High Level Dumps are Open |
| | BOP | ❑ Monitor Feedwater System and adjust SGFP BIAS as necessary to maintain S/G Levels |
| | ATC | ❑ When Trip Criteria met with CRS permission, TRIP Reactor. |
| | SRO | ❑ Determine Tech Spec applicability. LCO 3.4.13.B Primary to Secondary Leakage >100 GPD |

Examiner notes:

**Event concludes when Reactor is tripped.**
**If SRO's understanding of Tech Spec applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.**

| Op-Test #: **2014** | Scenario #: **4** | Event #: **3** | Page **9** of 20 |
|---|---|---|---|
| Event Description: **Reactor Trip (EOP-0)** | | Event Type: **M - ALL** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | ❑ Orders Reactor Trip prior to Auto Trip. Implements EOP-0 |
| | ATC | ❑ Performs Reactivity Control Safety Function<br>❑ Depress Manual Reactor Trip Pushbutton on 1C05<br>❑ Check Reactor tripped using NI power indications on 1C05<br>❑ Verifies all CEAs fully inserted<br>❑ Verify DI Water Makeup is secured<br>❑ Check 11 & 12 RC makeup Pumps secured on 1C07<br>❑ Check VCT M/U 1-CVC-512-CV is shut on 1C07<br>❑ If aligned for direct makeup to RCS then shut RWT Charging Pump Suction 1-CVC-504-MOV on 1C07<br>❑ Reports Reactivity Control Safety Function **Complete** |
| | BOP | ❑ Performs Turbine Trip<br>❑ Checks Reactor tripped then:<br>❑ Depresses both Turbine Trip Pushbuttons on 1C02<br>❑ Checks Main Turbine stop Valves shut on MK VI screen<br>❑ Checks Turbine Speed drops on MK VI screen<br>❑ Checks Turbine Generator Output Breakers open<br>❑ 11 GEN BUS BKR 0-CS-552-22 on 1C01<br>❑ 11 GEN TIE BKR 0-CS-552-23 on 1C01<br>❑ Checks Generator Field Breaker open on 1C01<br>❑ Checks Generator Exciter Field breaker open on 1C01<br>❑ Ensures MSR 2nd Stage Steam source Valves are shut<br>❑ Reports Turbine Trip **Complete** |
| Examiner notes: | | |

| Op-Test #: **2014** | Scenario #: **4** | Event #: **3 Continued** | Page **10** of 20 |
|---|---|---|---|
| Event Description: | **Reactor Trip (EOP-0)** | Event Type: | **M - All** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Performs Vital Auxiliaries Safety Function<br>❑ Checks 11 or 14 4KV bus energized.<br>❑ Checks **ALL** 125V DC BUS VOLTS greater than 105 volts on 1C24: (notes failed voltmeter for 11 125V DC Bus)<br>☐ 11 ☐ 12 ☐ 21 ☐ 22<br>❑ Checks at least THREE 120V AC Vital Buses are energized on 1C24:<br>☐ 11 ☐ 12 ☐ 21 ☐ 22<br>❑ Checks EITHER 1Y09 OR 1Y10 energized on 1C24.<br>❑ Verifies Component Cooling Flow to the RCP's<br>❑ Reports Vital Auxiliaries Safety Function **Complete** |
| | ATC | ❑ Performs Pressure & Inventory Control Safety Function, including alternate actions<br>❑ Operates heaters and spray to restore pressurizer pressure between 1850 and 2300 PSIA **AND** is trending to 2250 PSIA.<br>❑ **IF** PZR Press drops to 1725 psia, **THEN** verify SIAS<br>❑ Perform RCP trip strategy:<br>o **IF** RCS Press <1725 psia **THEN** trip 2 RCP's (inner or outer pair)<br>o **IF** subcooling < 20°F **THEN** trip all RCP's<br>o **IF** pressure drops below ATT. 1 Limits, **THEN** trip all RCP's<br>❑ Operates charging and letdown to restore PZR level between 80 and 180 inches<br>❑ Ensures RCS subcooling >30°F<br>❑ Reports Pressure and Inventory Safety Function **Not Met due to negative trends on PZR level and pressure** |
| Examiner notes: | | |

| Op-Test #: **2014** | Scenario #: **4** | Event #: **3 Continued** | Page 11 of 20 |
|---|---|---|---|
| Event Description: | **Reactor Trip (EOP-0)** | Event Type: | **M - All** |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Performs Core & RCS Heat Removal Safety Function<br>❑ Checks TBVs/ADVs controlling S/G pressure 850-920 PSIA and $T_{COLD}$ 525-535°F<br>❑ Shuts both MSIVs if S/G pressure drops to 800 PSIA<br>❑ Verifies SGIS actuated if S/G pressure drops below 685 PSIA<br>❑ Checks S/G level (-)170" to (+) 50" on 1C03<br>❑ **IF** Feedwater flow is lost **OR** excessive, **THEN** perform the following actions:<br>❑ Start an AFW PP<br>❑ Trip the SGFPs<br>❑ Shut the SG FW ISOL valves<br>❑ Operate the AFW System to restore S/G levels to between (-)170 and (+)30 inches<br>❑ Checks at least one RCP is in a loop with a S/G available for heat removal (on 1C06)<br>❑ Checks $T_{HOT}$ minus $T_{COLD}$ is less than 10°F by checking indicators on 1C06<br>❑ Reports Core & RCS Heat Removal Safety Function **Complete.** |

Examiner notes:

**Event concludes when the Main Steam Line Break in Containment occurs**

**NOTE TO EXAMINER**

**Cue Booth Operator to insert next malfunction, Main Steam Line Break, when BOP reports Core and RCS Heat Removal Safety Function Complete**

| Op-Test #: **2014** **Scenario #: 4** | Event #: **4 & 5** | Page **12** of 20 |
|---|---|---|
| Event Description: **Main Steam Line Break in Containment and CIS Failure** | Event Type: **C – ALL** **C - BOP** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | ❑ Recognize $T_{COLD}$ lowering and PZR level and pressure trends changing and report to SRO |
| | BOP | ❑ Re-Assess Core & RCS Heat Removal Safety Function<br>❑ Checks TBVs/ADVs controlling S/G pressure 850-920 PSIA and $T_{COLD}$ 525-535°F<br>❑ Shuts both MSIVs when S/G pressure drops to 800 PSIA<br>❑ Verifies SGIS actuated when S/G pressure drops below 685 PSIA (reports SGIS failure to SRO when recognized)<br>❑ Verifies AFAS Block when 115 PSID between 11 & 12 S/G's<br>❑ **IF** Feedwater flow is lost **OR** excessive, **THEN** perform the following actions:<br>❑ Start an AFW PP, Trip the SGFPs, Shut the SG FW ISOL valves<br>❑ Operate the AFW System to restore S/G levels to between (-)170 and (+)30 inches<br>❑ Checks at least one RCP is in a loop with a S/G available for heat removal (on 1C06)<br>❑ Checks $T_{HOT}$ minus $T_{COLD}$ is less than 10°F by checking indicators on 1C06<br>❑ Reports Core & RCS Heat Removal Safety Function **Cannot be Met** due to Low $T_{COLD}$, Low S/G pressure and level and no RCP's. |

Examiners notes:

| Op-Test #: **2014** | **Scenario #: 4** | Event #: **4 & 5** | Page **13** of 20 |
|---|---|---|---|
| Event Description: **Main Steam Line Break in Containment and CIS Failure** | | Event Type: **C – ALL**<br>**C - BOP** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Performs Containment Environment Safety Function<br>❑ Checks Containment Pressure < 0.7 PSIG<br>❑ Verifies all CAC's operating with Emergency Outlet valves open<br>❑ Verifies SIAS and CIS when pressure >2.8 psig |
| | BOP (CT) | ❑ Recognizes failure of CIS "A" and CIS "B". Manually actuates CIS "A" and CIS "B" (prior to exiting EOP-0). |
| | BOP/ATC (CT) | ❑ Trips all RCP's after CIS actuates and within 10 minutes of Component Cooling isolation to the Containment. |
| | BOP | ❑ Verifies CSAS when pressure >4.25 psig<br>❑ Checks Containment Temperature, verifies CAC's operating<br>❑ Checks Containment Gaseous RMS at 1C22 not in alarm with no abnormal rising trend.<br>❑ Reports Containment Environment Safety Function **Cannot be Met** due to high containment pressure and temperature |

Examiner's notes:

| Op-Test #: **2014** | **Scenario #: 4** | Event #: **4 & 5** | Page **14** of 20 |
|---|---|---|---|
| Event Description: **Main Steam Line Break in Containment and CIS Failure** | | Event Type: **C - ALL** **C - BOP** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Perform Rad Levels External to Containment Safety Function<br>❑ Check the following RMS alarms are clear with no unexplained rise:<br>❑ U-1 Wide Range Noble Gas Monitor<br>❑ U-1 Condenser Off Gas @ 1C22<br>❑ U-1 S/G Blowdown @ 1C22<br>❑ U-1 Main Vent Gaseous @ 1C22<br>❑ Perform Alternate Action to secure B/D due to Condenser Off-Gas and U-1 S/G B/D RMS alarms<br>❑ Reports Rad Levels External to Containment Safety Function **Cannot be Met** due to RMS alarms |
| | SRO | ❑ Perform EOP-0 brief<br>❑ Ensures all are attentive<br>❑ Reviews Safety Functions not met<br>❑ PIC not met due to low PZR level and pressure<br>❑ HR not met due low S/G press and level and no operating RCP's<br>❑ CE due to high Containment pressure and temperature<br>❑ RLEC not met due to RMS alarms<br>❑ Reviews Safety system Actuations<br>❑ SGIS, SIAS, CIS (failed), CSAS, AFAS, AFAS Block<br>❑ Solicits Input<br>❑ Concludes the brief directing the crew to continue to monitor Safety Functions while the event is diagnosed. |
| | SRO | ❑ Refers to EOP-0 flowchart<br>❑ Implements EOP-8 |
| Examiner notes: | | |

| Op-Test #: **2014** **Scenario #: 4** | Event #: **6** | Page **15** of 20 |
|---|---|---|
| Event Description: **EOP-8 & HPSI discharge** | Event Type: **C – ATC & SRO** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | ❑ Identify Success Paths for Safety Functions performed in EOP-0<br>o RC-1 Met<br>o PIC-4 Met |
| | BOP | ❑ Identify Success Paths for Safety Functions performed in EOP-0<br>o VA-1 Met<br>o HR-2 Met<br>o CE-3 Met<br>o RLEC-2 Not Met, starts working RLEC-2 immediately |
| | SRO | ❑ Identifies Success Paths for all Safety Functions and determines Priority (CRS must perform CE & RLEC since ATC & BOP did not)<br>o RLEC-2 Not Met<br>o PIC-4 Met<br>o HR-2 Met<br>o CE-3 Met<br>o RC-1 Met<br>o VA-1 Met |
| | SRO | ❑ Assigns BOP to perform RLEC-2<br>❑ Assigns ATC to perform PIC-4 |

Examiner's notes:

| Op-Test #: **2014** | **Scenario #: 4** | Event #: **6** | Page **16** of 20 |
|---|---|---|---|
| Event Description: **EOP-8 & HPSI discharge** | | Event Type: **C – ATC & SRO** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC<br>(CT) | ❑ Performs PIC-4<br>o Verifies SIAS Actuation<br>o Verifies HPSI Flow meets Attachment 10 and determines flow is inadequate (11 & 13 running but Aux HPSI Hdr valves still shut due to loss of MCC-104)<br>o Determines 11 HPSI pump failed due to inadequate flow<br>o Starts 12 HPSI Pump |
| | BOP | ❑ Performs RLEC-2<br>o Verifies B/D isolations valves shut<br>o Verifies no leakage into CC System<br>o Verifies SIAS, CIS, and CSAS<br>o Implements HR-2 to isolate 11 S/G |

Examiner notes:

| Op-Test #: **2014** **Scenario #: 4** | Event #: **6** | Page **17** of 20 |
|---|---|---|
| Event Description: **EOP-8 & HPSI discharge** | Event Type: : **C – ATC & SRO** | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ❑ Performs HR-2<br>o Ensures ATC is verifying SIAS flow IAW Att. 10<br>o Ensures ATC has commenced boration<br>o Commences C/D of RCS using ADV's (100% Manual)<br>o Verifies Natural Circulation in at least 1 RCS loop<br>o Ensures ATC maintaining RCS Subcooling<br>o When $T_{HOT}$ is <515°F then isolates 11 S/G<br>▪ Directs TBO shut 11 ADV in 45' SWGR Room<br>▪ Verifies 11 MSIV Shut<br>▪ Verifies 11 MSIV Bypass Shut<br>▪ Verifies 11 SG FW Isolation FW-4516-MOV Shut<br>▪ Shuts 11 S/G AFW Steam Supplies Valves MS-4070 & 4070A-CV's<br>▪ Shuts 11 S/G AFW Block Valves AFW-4520, 4521, 4522, 4523-CV<br>▪ Verifies 11 S/G B/D Valves BD-4010 7 4011-CV's<br>▪ Closes MS Upstream Drain Isolation 1-HS-6622<br>▪ Directs OSO to check no 11 S/G Safety Valves leaking |
| | ATC | ❑ Maintains RCS subcooling between 25°F and 140°F |
| | SRO | ❑ Directs ATC to maintain subcooling low in band to lower RCS leak rate |

**The scenario will end when 11 S/G is isolated, and crew has evaluated HPSI flow IAW HR-2**

After scenario ends ask SRO for ERPIP call. The correct Emergency Action Level declaration for this scenario is:

**ALERT**, per F.A.1.1 for RCS Barrier loss (RCS subcooling < 25° F) or potential loss (unisolable RCS leakage > 50 GPM)

# SHIFT TURNOVER INFORMATION SHEET [B0459]

DATE: **Today** **ON-COMING SHIFT: DAYS**

| *UNIT STATUS* | | | | |
|---|---|---|---|---|
| PARAMETER | UNIT 1 | | UNIT 2 | |
| **MODE OF OPERATION** | 1 | | 1 | |
| **REACTOR POWER (%)** | 100 | | 100 | |
| **GENERATION NET (MWe)** | 920 | | 930 | |
| **RCS LEAKAGE (gpm)** | 0.01 (net) | | 0.02 (net) | |
| **RCS BORON (ppm)** | 949 | | 413 | |
| **UNIT RISK (HIGHEST FOR DAY)** | **CDF: MED** | **LERF: MED** | **CDF: LOW** | **LERF: LOW** |
| **BULK POWER NOTIFICATIONS** | Normal | | | |

| *NON-ROUTINE SURVEILLANCE REQUIREMENTS and ACTION STATEMENTS [B0125]* | | |
|---|---|---|
| List action statements expiring during the oncoming shift, non-routine, conditional, & mode dependent surveillances (e.g. chemistry samples, operability verifications, ETPs, <7 day STPs) | | |
| | | |
| | | |

| ***OD's/RECO's/FA's and REF's requested by OPS*** | | | | | |
|---|---|---|---|---|---|
| **Unit** | **Description** | **Date Requested** | **Type Requested** | **Resp. Group** | **ECD** |
| | | | | | |
| | | | | | |

| *Surveillances coming Due* | | | |
|---|---|---|---|
| Unit 1 | | Unit 2 | |
| DATE | STP | DATE | STP |
| | | | |

*J. S. Heiska*

Shift Manager

# SHIFT TURNOVER INFORMATION SHEET [B0459]

| EQUIPMENT AVAILABILITY | | |
|---|---|---|
| **ELECTRICAL SYSTEM** | **UNIT 1** | **UNIT 2** |
| 500KV High Lines | ☒**5051** ☒**5072** ☒**5052** | |
| 500KV Buses | ☒ **BLACK** | ☒**RED** |
| 13KV Supplies | ☒ **P-13000-1** | ☒ **P-13000-2** |
| SMECO Bkr Status | ☒ **252-2301** ☐**0SH301** | ☒ **0SH302** |
| Site Self Power Feeders | ☐ **252-1106** | ☐ **252-2106** |
| 13KV Buses | ☒**11** ☒**12** ☒**23** ☒**21** ☒**22** | |
| Voltage Regulators | **Auto** 1102 **Auto** 2102 **Auto** 1101 | **Auto** 1103 **Auto** 2103 **Auto** 2101 |
| 4KV Transformers | ☒**U-4000-11** ☒**U-4000-21** ☒**U-4000-13** | ☒**U-4000-12** ☒**U-4000-22** ☒**U-4000-23** |
| 4KV Buses | ☒**11** ☒**12** ☒**13** ☒**14** | ☒**21** ☒**22** ☒**23** ☒**24** |
| Diesel Generators | ☐**1A** ☐**1B** ☐**0C** | ☐**2A** ☐**2B** ☐**0C** |
| 480V Buses | ☒**11A** ☒**11B** ☒**14A** ☒ **14B** | ☒**21A** ☒**21B** ☒**24A** ☒**24B** |
| 125VDC Battery Chargers | ☒**11** ☒**23** ☒**12** ☒**24** | ☒**14** ☒**22** ☒**13** ☒**21** |
| 125VDC Buses | ☒**11** ☒**12** | ☒**22** ☒**21** |
| 120VAC Vital Buses | ☒**11** ☒**21** ☒**13** ☒**23** | ☒**14** ☒**24** ☒**12** ☒**22** |

| OOS SR EQUIPMENT | | OOS NSR EQUIPMENT | |
|---|---|---|---|
| **UNIT 1 & COMMON** | **UNIT 2** | **UNIT 1 & COMMON** | **UNIT 2** |
| 11 BA Pump | 23 AFW Pp | | |
| 12 CS Pump | | | |

# SHIFT TURNOVER INFORMATION SHEET [B0459]

| *GENERAL INFORMATION* | | | | |
|---|---|---|---|---|
| **UNIT 1** | | | | |
| | | | 11 HEADER | 12 HEADER |
| Max Header Pressure PE1-12-21-O-M | SW PUMP | 11 | 33 psig (yesterday) | |
| | | 12 | | 32 psig (yesterday) |
| | | 13 | 32.5 psig yesterday) | 30 psig (yesterday) |

***LONG TERM NOTES***

1. IAW OD-09-005, maintain Containment pressure less than 1.0 PSIG in order to ensure the Containment response to a Design Basis Loss Of Coolant Accident inside the Containment remains within design limits

***SHORT TERM NOTES***

1. 12 CS Pump for last hour for pump coupling Inspection expected back in 2 hours
2. 11 BA Pump for last 6 hours (bearing seized) expected back in 1 day
3. 23 AFW Pump OOS for motor bearing replacement, expected back in 10 hours