

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM A  
Rev 0**

Establishing RCS Cold Shutdown Boron Concentration

<b>Concurred By:</b>	<u>Pat Lathrop</u> Operations	<b>Date:</b> <u>5/15/13</u>
<b>Approved By:</b>	<u>James Conder</u> Superintendent/Supervisor - Training	<b>Date:</b> <u>6/5/13</u>

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**Task:** 01093127904, Respond to a Steam Generator Tube Leak IAW AOP-035.

**Alternate Path:**

NO

**JPM #:**

ILC-13 NRC JPM A

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

004 A4.18                      4.3 / 4.1

004 A4.04                      3.2 / 3.6

**Task Standard:**

Required amount of Boric Acid added to establish RCS Cold Shutdown Boron Concentration.

**Preferred Evaluation Location:**

Simulator   X      In-Plant       

**Preferred Evaluation Method:**

Perform   X      Simulate       

**References:**

AOP-035, S/G Tube Leak

**Validation Time:** 15 Minutes **Time Critical:** NO **Time Critical Time:** N/A

**Candidate:**

(N/A if not time  
critical)

Name \_\_\_\_\_

SSN       -       -       \_\_\_\_\_

**Overall  
Time**

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

**Critical  
Time**

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

**Performance Rating:**       SAT       UNSAT  
circle one

**Performance  
Time (min):** \_\_\_\_\_

**Examiner:**

Print Name

Signature

Date

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

## COMMENTS

**Step 2** Critical because step has the candidate open MOV-350 to align a boric acid flow path.

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**Step 3** Critical because step will start a Boric Acid pump to provide motive force for the boric acid.

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**Step 6** Critical to calculate the appropriate time that the boric acid flow may be secure. If the time is calculated incorrectly then adequate shutdown margin may not be obtained.

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**Step 8** Critical to close MOV-350 after the appropriate amount of boric acid has been added.

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**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Initialize the simulator to IC-913
2. Go to RUN ensure plant conditions are stable.
3. Place simulator in FREEZE until candidate is ready to begin the JPM.
4. An extra instructor will be needed to acknowledge alarms that do not apply to this JPM.

**Tools/Equipment/Procedures Needed:**

AOP-035, S/G Tube Leak, Attachment 3, Establishing RCS Cold Shutdown Boron Concentration

Calculator

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. You are the Unit 2 Control Operator.
2. Crew is implementing AOP-035, S/G Tube Leak, for a 20 gpm leak in "A" S/G.
3. The plant has been shutdown IAW AOP-038, Rapid Downpower, from 100% RTP.
4. No equipment is out of service.
5. The first three steps of AOP-035, Attachment 3, Establishing RCS Cold Shutdown Boron Concentration, has been completed and determined that 700 gallons of boric acid needs to be added to the RCS.

**INITIATING CUES:**

The CRS directs you to borate the RCS to the Mode 5 Shutdown Requirement using Attachment 3, Establishing RCS Cold Shutdown Boron Concentration (AOP-035 step 35). A copy of AOP-035, Attachment 3, with steps 1 – 3 completed has been provided.

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

<p><b>EXAMINER'S CUE:</b> Candidate is given a copy of AOP-035, Attachment 3, with steps 1 – 3 completed.</p>	
<p><b><u>STEP 1:</u></b> IF the MOV-350, BA TO CHARGING PMP SUCT Valve flowpath is unavailable, THEN Borate the RCS using OP-301, Chemical and Volume Control System (CVCS) Section "RCS Boration Quick Checklist" (Step 4)</p> <p><b><u>STANDARD:</u></b> Candidate determines that MOV-350 is AVAILABLE based on information given in the cue sheet and N/A's this step.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 2:</u></b> IF the MOV-350, BA TO CHARGING PMP SUCT Valve flowpath will be used, THEN open MOV-350, BA TO CHARGING PMP SUCT Valve. (Step 5)</p> <p><b><u>STANDARD:</u></b> Candidate opens MOV-350 and verifies open by observing the RED open light illuminated and the GREEN closed light extinguished.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 3:</u></b> Start Boric Acid Pump aligned for Blended Makeup. (Step 6)</p> <p><b><u>STANDARD:</u></b> Candidate starts “A” Boric Acid Pump and verifies pump started by observing the RED on light illuminated and the GREEN off light extinguished.</p> <p><b>EXAMINER’S CUE:</b> NONE</p> <p><b>EXAMINER’S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 4:</u></b> Record time boration commenced. (Step 7)</p> <p><b><u>STANDARD:</u></b> Candidate determines and records the time in blank provided.</p> <p><b>EXAMINER’S CUE:</b> NONE</p> <p><b>EXAMINER’S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 5:</u></b> Record Flowrate indicated on FI-110, BORIC ACID BYPASS FLOW. _____ gpm</p> <p>(Step 8)</p> <p><b><u>STANDARD:</u></b> Candidate observes flow indication on FI-110 and records flow of 60 to 70 gpm.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 6:</u></b> Determine time required to establish CSD boron concentration.</p> <p><u>Boric Acid Volume Required (gal)</u> = _____ minutes FI-110 Flowrate (gpm)</p> <p>(Step 9)</p> <p><b><u>STANDARD:</u></b> @ 70 gpm: Candidate determines that 700 gal/70 gpm equates to <b>10 min.</b></p> <p>@ 65 gpm: Candidate determines that 700 gal/65 gpm equates to <b>10.8 min.</b></p> <p>@ 60 gpm: Candidate determines that 700 gal/60 gpm equates to <b>11.7 min.</b></p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>MOV-350 may be stroked three times per hour (EE 89-076). A stroke is defined as complete travel of a valve from either the fully open to the fully closed position or vice versa.</p>	

**STEP 7:** IF any RCP #1 Seal Leakoff temperature approaches 170°F as indicated by TR-448, THEN cycle MOV-350 to maintain RCP#1 Seal Leakoff temperature less than 170°F (Step 10)

\_\_\_ SAT

**STANDARD:** Candidate checks TR-448 and determines that RCP#1 Seal Leakoff temperatures are not approaching 170°F. (Checks Points 1 (TE-132), 8 (TE-129) and 15 (TE-126))

\_\_\_ UNSAT

**EXAMINER'S NOTE:** Candidate may decide to utilize ERFIS RCP parameter indication to monitor RCP parameters.

**COMMENTS:**

**STEP 8:** WHEN required amount of boric acid has been added, THEN close MOV-350. (Step 11)

**CRITICAL  
STEP**

**STANDARD:** When 10 minutes has elapsed OR informed by Examiner that 10 minutes has elapsed the candidate closes MOV-350 and observes the GREEN closed light illuminated and the RED open light extinguished.

\_\_\_ SAT

**EXAMINER'S NOTE:** Only use time compression if calculated time is correct AND has been verbalized by the candidate AND is greater than 10 minutes.

\_\_\_ UNSAT

**EXAMINER'S CUE:** After candidate has demonstrated that they are monitoring RCP #1 Seal Leakoff temperature and time remaining inform the candidate that time compression has occurred and the calculated time has elapsed.

**COMMENTS:**

**NOTE**

If the Boric Acid Pump aligned for blend was in START to prevent exceeding starting duty limitation, then the Boric Acid Pump should remain in START.

<p><b><u>STEP 9:</u></b> Restore the Boric Acid Pump aligned for blend as follows:</p> <ul style="list-style-type: none"> <li>• Check Boric Acid Pump aligned for blend in START <u>OR</u></li> <li>• Place Boric Acid Pump aligned for blend in AUTO</li> </ul> <p>(Step 12)</p> <p><b><u>STANDARD:</u></b> Candidate places “A” Boric Acid Pump control switch in AUTO.</p> <p><b>EXAMINER’S CUE:</b> NONE</p> <p><b>EXAMINER’S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 10:</u></b> Notify Chemistry personnel to sample the RCS for boron concentration. (Step 13)</p> <p><b><u>STANDARD:</u></b> Candidate notifies Chemistry personnel to sample the RCS for boron.</p> <p><b>EXAMINER’S CUE:</b> Inform the candidate that this concludes the JPM.</p> <p><b>EXAMINER’S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;"><b><u>END OF TASK</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**Terminating Cue:** When boric acid addition has been terminated.

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. You are the Unit 2 Control Operator.
2. Crew is implementing AOP-035, S/G Tube Leak, for a 20 gpm leak in "A" S/G.
3. The plant has been shutdown IAW AOP-038, Rapid Downpower, from 100% RTP.
4. No equipment is out of service.
5. The first three steps of AOP-035, Attachment 3, Establishing RCS Cold Shutdown Boron Concentration, has been completed and determined that 700 gallons of boric acid needs to be added to the RCS.

**INITIATING CUES:**

The CRS directs you to borate the RCS to the Mode 5 Shutdown Requirement using Attachment 3, Establishing RCS Cold Shutdown Boron Concentration (AOP-035 step 35).



## CONTINUOUS USE

ATTACHMENT 3ESTABLISHING RCS COLD SHUTDOWN BORON CONCENTRATION

(Page 1 of 3)

1. Record the minimum required Mode 5 Boron concentration.  
1302 ppm
2. Determine RCS boron concentration change required to establish CSD boron concentration.  
$$\frac{1302}{\text{Required CSD Boron Concentration}} - \frac{1000}{\text{Latest RCS Boron Sample}} = \frac{302}{\text{ppm}}$$
3. Determine volume of boric acid to be added using Station Curve Book.  
700 gallons
4. IF the MOV-350, BA TO CHARGING PMP SUCT Valve flowpath is unavailable, THEN Borate the RCS using OP-301, Chemical and Volume Control System (CVCS) Section "RCS Boration Quick Checklist"
- a. WHEN Boration is complete, THEN Go To Step 13.
5. IF the MOV-350, BA TO CHARGING PMP SUCT Valve flowpath will be used, THEN open MOV-350, BA TO CHARGING PMP SUCT Valve.
6. Start Boric Acid Pump aligned for Blended Makeup.
7. Record time boration commenced.  
\_\_\_\_\_
8. Record flowrate indicated on FI-110, BORIC ACID BYPASS FLOW.  
\_\_\_\_\_ gpm
9. Determine time required to establish CSD boron concentration.  
$$\frac{\text{Boric Acid Volume Required (gal)}}{\text{FI-110 Flowrate (gpm)}} = \text{_____ minutes}$$

**CONTINUOUS USE**ATTACHMENT 3ESTABLISHING RCS COLD SHUTDOWN BORON CONCENTRATION

(Page 2 of 3)

NOTE

MOV-350 may be stroked three times per hour (EE 89-076). A stroke is defined as complete travel of a valve from either the fully open to the fully closed position or vice versa.

10. IF any RCP #1 Seal Leakoff temperature approaches 170°F as indicated by TR-448, THEN cycle MOV-350, BA TO CHARGING PMP SUCT. to maintain RCP #1 Seal Leakoff temperature less than 170°F.
11. WHEN required amount of boric acid has been added, THEN close MOV-350, BA TO CHARGING PMP SUCT.

NOTE

If the Boric Acid Pump aligned for blend was in START to prevent exceeding starting duty limitations, then the Boric Acid Pump should remain in START.

12. Restore the Boric Acid Pump aligned for blend as follows:

- Check Boric Acid Pump aligned for blend in START

OR

- Place Boric Acid Pump aligned for blend in AUTO

13. Notify Chemistry personnel to sample the RCS for boron concentration.

**CONTINUOUS USE**ATTACHMENT 3ESTABLISHING RCS COLD SHUTDOWN BORON CONCENTRATION

(Page 3 of 3)

14. Adjust RCS makeup controls for blended flow at CSD boron concentration as follows:
  - a. Determine setpoint for FCV-113A, BORIC ACID FLOW Controller, using Station Curve Book.
  - b. Adjust FCV-113A potentiometer to required setpoint.
  - c. Verify RCS MAKEUP MODE Switch in AUTO.
  - d. Momentarily place RCS MAKEUP SYSTEM Switch to START.
15. Return to procedure and step in effect.

- END -

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM B  
Rev 0**

Place LTOP in Service

**Concurred By:** Kirk Schauer **Date:** 5/15/13  
Operations

**Approved By:** James Conder **Date:** 6/5/13  
Superintendent/Supervisor - Training

Date \_\_\_\_\_

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

COMMENTS

**Step 1** Critical because RCS pressure must be lowered to within the specified pressure band prior to placing LTOP in service.

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**Step 2** Critical because the step places the PZR PORVs in LOW PRESSURE operation.

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**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Initialize the simulator to IC-917
2. Go to RUN ensure plant conditions are stable.
3. Pull up cooldown plot on RO ERFIS screen (QP GP-007)
4. Place simulator in FREEZE until candidate is ready to begin the JPM.
5. An extra instructor will be needed to acknowledge alarms that do not apply to this JPM



**Tools/Equipment/Procedures Needed:**

GP-007

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. You are the Unit 2 Operator at Controls
2. Cooldown to Cold Shutdown is in progress.

**INITIATING CUES:**

The CRS directs you to place LTOP in service IAW GP-007, continuing at step 8.3.10.b.

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

**NOTE:** The RCS cooldown may be continued below 350 degrees F when the requirements of ITS LCO 3.5.2 and 3.4.12 are met. These requirements are met upon completion of Step 8.3.10 below.

**CAUTION**

RCS temperature shall **NOT** be allowed to lower below 350 degrees F until the requirements of ITS LCO 3.5.2 and 3.4.12 are met.

**STEP 1:**

**WHEN** RCS temperature is between 350°F and 360°F, **THEN** perform the following:

- a. While continuing with this step, the SM shall VERIFY that the Plant Equipment Status Review started in step 8.3.2 is complete AND the plant is ready to enter MODE 4. (SOER 09-1, Recommendation3)
- b. **SLOWLY ADJUST** PC-444J, PZR PRESS 444J, **OR** Pressurizer Spray Valves in Manual to reduce RCS pressure to between 350 psig and 375 psig without exceeding 180°F/hr cooldown rate on the PZR. (Step 8.3.10.b)

**CRITICAL STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Places PC-444J in Manual and raises output to lower RCS pressure **OR** places PZR Spray Valve Controller(s) in manual and raises output to lower RCS pressure without exceeding 180°F/hr cooldown rate on the PZR. Maintains pressure within band of 350 psig to 375 psig. Pressure may be allowed to drift out of the band but CANNOT reach the LTOP setpoint of 400 psig.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** An Auto-Makeup will occur during this JPM. Inform the candidate that another operator will monitor the makeup.

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**NOTE:** ITS LCO 3.4.12 contains a Note which amplifies when SI Accumulators are required to be isolated. The following step is a simplified method to ensure compliance and eliminates the need to use ITS LCO 3.4.3 curves.

**STEP 2:** IF any SI Accumulator is pressurized, THEN VERIFY each SI Accumulator isolation valve is closed and deenergized. (ITS LCO 3.4.12)

- SI Accumulator "A", SI-865A      CLOSED
- MCC-5(14F)                              OPEN
- SI Accumulator "B", SI-865B      CLOSED
- MCC-6(10J)                              OPEN
- SI Accumulator "C", SI-865C      CLOSED
- MCC-5(9F)                              OPEN

(Step 8.3.10.c)

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Candidate determines that the SI Accumulators are NOT pressurized by observing the SI Accumulators Pressure indications on the RTGB (PI-921A, 923, 925, 927, 929, 931) or ERFIS and N/As this step.

**EXAMINER'S CUE:** If the candidate requests an AO check breaker status, report that all requested breakers are open.

**EXAMINER'S NOTE:**              NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**NOTE:** ITS LCO 3.5.2 is applicable in MODE 3 and above. A Note in this LCO identifies that operation is allowed in MODE 3 with one SI Pump declared inoperable, due to the need to meet ITS LCO 3.4.12, for up to 4 hours.

The following step ensures an SI Pump can be restored if required by AOP-020 following a loss of RHR.

**STEP 3:**      **VERIFY** a maximum of one SI Pump is capable of injecting into the RCS by performing the following: (ITS LCO 3.4.12.a.2)

1. **DEENERGIZE** SI Pump being removed from service by pulling pump fuses (do NOT rack breaker). Circle SI Pump deenergized:

SI Pump "A" / SI Pump "B" / SI Pump "C"

(Step 8.3.10.d(1))

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Verifies breaker indication for only "A" SI pump is illuminated.

**EXAMINER'S CUE:**            NONE

**EXAMINER'S NOTE:**        NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**STEP 4:**

**VERIFY** a maximum of one SI Pump is capable of injecting into the RCS by performing the following: (ITS LCO 3.4.12.a.2)

2. **VERIFY** each flowpath to the RCS is ISOLATD as follows:

- SI-870A (BIT OUTLET)                      CLOSED
- SI-870B (BIT OUTLET)                      CLOSED
- SI-869 (LOOPS B/C HOT LEG  
INJECTIONS SHUTOFF)                      CLOSED
- SI-895T (BIT BYPASS)                      LOCKED CLOSED
- SI-883L (SI-868A,B,C TEST  
LINE ISOLATION)                      LOCKED CLOSED

(Step 8.3.10.d(2))

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Candidate verifies that SI-870A/B and SI-869 are closed by observing their GREEN closed indication illuminated. Candidate may use the Safety Injection status lights or SPDS Containment Status which will indicate that SI-870A/B and SI-869 are closed.

Candidate will contact AO to determine the status of SI-895T and SI-883L.

**EXAMINER'S NOTE:**              NONE

**BOOTH OPERATOR CUE:** When candidate contacts AO, inform candidate that SI-895T and SI-883L are in the LOCKED CLOSED position and have been Verified.

**COMMENTS:**

**STEP 5:**      **VERIFY** a maximum of one SI Pump is capable of injecting into the RCS by performing the following: (ITS LCO 3.4.12.a.2)

3. PLACE Caution Tags/Caps on the following components stating:  
“Manipulating or installing this component may require entry into ITS LCO 3.4.12.a.”

(Step 8.3.10.d(3))

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:**    Candidate recognizes need to install Caution Tags/Caps

**EXAMINER’S CUE:** Inform the candidate that the CRS has assigned this task to another operator and requests that you continue on in GP-007 with the assigned task.

**EXAMINER’S NOTE:**        NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**CAUTION**

The Low Temperature Overpressure Protection System shall be operable in MODES 4, 5, and 6 when the RCS is not vented to containment in accordance with ITS LCO 3.4.12. If one or both PZR PORV's become inoperable, then refer to ITS LCO 3.4.12.

**STEP 6:** ALIGN the PZR PORVs and Block Valves as follows:

- |                                                      |              |
|------------------------------------------------------|--------------|
| • MCC-6(7J), RC-535, PZR PORV PCV-456 BLOCK breaker  | CLOSED       |
| • RC-535, PORV BLOCK                                 | OPEN         |
| • MCC-6(8J), RC-536, PZR PORV PCV-455C BLOCK breaker | CLOSED       |
| • RC-536, PORV BLOCK                                 | OPEN         |
| • PZR PCV-455C Overpressure Selector Switch (CS)     | LOW PRESSURE |
| • PCV-455C, PZR PORV                                 | AUTO         |
| • PCV-455C Position Indication                       | CLOSED       |
| • PZR PCV-456 Overpressure Selector Switch (CS)      | LOW PRESSURE |
| • PCV-456, PZR PORV                                  | AUTO         |
| • PCV-456 Position Indication                        | CLOSED       |

(Step 8.3.10.e)

- STANDARD:**
- Verifies RC-535 and 536 breakers closed by observing control board indicating lights
  - Verifies RC 535 and 536 RED open indication on control board
  - Places PCV-455C Overpressure selector switch in LOW PRESURE (CS)
  - Places PCV-456 Overpressure selector switch in LOW PRESSURE (CS)
  - Verifies PCV-455C and PCV-456 GREEN closed indication and in AUTO on control board

**EXAMINER'S NOTE:** (CS) – Critical Step

**COMMENTS:**

**END OF TASK****CRITICAL STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**Terminating Cue:** When the Pressurizer PORVs are placed in LTOP mode with RCS pressure between 350 psig and 375 psig and RCS temperature greater than 350°F.

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. You are the Unit 2 Control Operator.
2. Cooldown to Cold Shutdown is in progress.

**INITIATING CUES:**

The CRS directs you to place LTOP in service IAW GP-007, continuing at step 8.3.10.b.



INIT

**NOTE:** The RCS cooldown may be continued below 350 degrees F when the requirements of ITS LCO 3.5.2 and 3.4.12 are met. These requirements are met upon completion of Step 8.3.10 below.

**CAUTION**

RCS temperature shall **NOT** be allowed to lower below 350 degrees F until the requirements of ITS LCO 3.5.2 and 3.4.12 are met.

10. **WHEN** RCS temperature is between 350°F and 360°F, **THEN** perform the following:

a. While continuing with this step, the SM shall **VERIFY** that the Plant Equipment Status Review started in step 8.3.2 is complete **AND** the plant is ready to enter MODE 4.  
(SOER 09-1, Recommendation 3)

  
/SM

b. **SLOWLY ADJUST** PC-444J, PZR PRESS 444J, **OR** Pressurizer Spray Valves in Manual to reduce RCS pressure to between 350 psig and 375 psig without exceeding 180°F/hr cooldown rate on the PZR.

\_\_\_\_\_

8.3.10 (Continued)

INIT

**NOTE:** ITS LCO 3.4.12 contains a Note which amplifies when SI Accumulators are required to be isolated. The following step is a simplified method to ensure compliance and eliminates the need to use ITS LCO 3.4.3 curves.

- c. **IF** any SI Accumulator is pressurized, **THEN VERIFY** each SI Accumulator isolation valve is closed and deenergized. (ITS LCO 3.4.12)
- SI Accumulator “A”
    - SI-865A CLOSED \_\_\_\_\_
    - MCC-5(14F) OPEN \_\_\_\_\_
  - SI Accumulator “B”
    - SI-865B CLOSED \_\_\_\_\_
    - MCC-6(10J) OPEN \_\_\_\_\_
  - SI Accumulator “C”
    - SI-865C CLOSED \_\_\_\_\_
    - MCC-5(9F) OPEN \_\_\_\_\_

**NOTE:** ITS LCO 3.5.2 is applicable in MODE 3 and above. A Note in this LCO identifies that operation is allowed in MODE 3 with one SI Pump declared inoperable, due to the need to meet ITS LCO 3.4.12, for up to 4 hours.

The following step ensures an SI Pump can be restored if required by AOP-020 following a loss of RHR.

- d. **VERIFY** a maximum of one SI Pump is capable of injecting into the RCS by performing the following:  
(ITS LCO 3.4.12.a.2)

- (1) **DEENERGIZE** SI Pump being removed from service by pulling pump fuses (do **NOT** rack out breaker). Circle SI Pump deenergized:

SI Pump “A” / SI Pump “B” / SI Pump “C” \_\_\_\_\_

8.3.10.d (Continued)

INIT VERI

- (2) **VERIFY** each flowpath to the RCS is ISOLATED as follows:

- SI-870A (BIT OUTLET) **CLOSED** \_\_\_\_\_
- SI-870B (BIT OUTLET) **CLOSED** \_\_\_\_\_
- SI-869 (LOOPS “B” AND “C” HOT LEG INJECTIONS SHUTOFF) **CLOSED** \_\_\_\_\_
- SI-895T (BIT BYPASS) **LOCKED CLOSED** \_\_\_\_\_
- SI-883L (SI-868A, B, & C TEST LINE ISOLATION) **LOCKED CLOSED** \_\_\_\_\_

- (3) **PLACE** Caution Tags/Caps on the following components stating: “Manipulating or installing this component may require entry into ITS LCO 3.4.12.a.”

CAUTION TAG # _____	INIT
SI-870A - BIT OUTLET, handwheel	
SI-870B - BIT OUTLET, handwheel	
SI-870A - BIT OUTLET, control switch	
SI-870B - BIT OUTLET, control switch	
SI-869 - LOOPS “B” AND “C” HOT LEG INJECTIONS SHUTOFF, handwheel	
SI-869 - LOOPS “B” AND “C” HOT LEG INJECTIONS SHUTOFF, control switch	
SI-895T - BIT BYPASS	
SI-883L - SI-868A, B, & C TEST LINE ISOLATION	
SI Pump fuses pulled in Step 8.3.10.d(1)	
Control switch for SI Pump in Step 8.3.10.d(1)	

8.3.10 (Continued)

INIT

**CAUTION**

The Low Temperature Overpressure Protection System shall be operable in MODES 4, 5, and 6 when the RCS is not vented to containment in accordance with ITS LCO 3.4.12. If one or both PZR PORV's become inoperable, then refer to ITS LCO 3.4.12.

e. **ALIGN** the PZR PORVs and Block Valves as follows:

- MCC-6(7J), RC-535, PRESSURIZER PORV PCV-456  
BLOCK breaker CLOSED \_\_\_\_
- RC-535, PORV BLOCK OPEN \_\_\_\_
- MCC-6(8J), RC-536, PRESSURIZER PORV PCV-455C  
BLOCK breaker CLOSED \_\_\_\_
- RC-536, PORV BLOCK OPEN \_\_\_\_
- PZR PCV-455C Overpressure Selector Switch  
LOW PRESSURE \_\_\_\_
- PCV-455C, PZR PORV AUTO \_\_\_\_
- PCV-455C Position Indication CLOSED \_\_\_\_
- PZR PCV-456 Overpressure Selector Switch  
LOW PRESSURE \_\_\_\_
- PCV-456, PZR PORV AUTO \_\_\_\_
- PCV-456 Position Indication CLOSED \_\_\_\_

INIT

**CAUTION**

PPP-007, Feedwater Leakage Test, allows a Feed Regulating Valve to leak by at rates up to 735 gpm. Feedwater Regulating Valve leakage can lead to violation of RCS cooldown rates and overfilling of Steam Generators.

The RCS cooldown rate shall not exceed the limits shown in ITS Figure 3.4.3-2.

The ADMINISTRATIVE limits for RCS and PZR heatup and cooldown are:

- RCS Heatup Rate: 50°F/hr
- RCS Cooldown Rate: 80°F/hr
- PZR Heatup Rate: 80°F/hr
- PZR Cooldown Rate: 180°F/hr

Refer to Precaution & Limitation 5.4.e if these limits must be exceeded

11. **WHEN** Step 8.3.10 is complete **AND** RCS temperature has lowered to 350°F, **THEN PERFORM** the following:

- a. **STATION** an Operator locally at the Feedwater Header Section Valves to monitor the cycling of the valves. \_\_\_\_\_

- b. **CYCLE** the Feedwater Header Section Valves OPEN and then CLOSED to prevent the possibility of thermal binding during cooldown of the valves (EE 89-96).

- |                         |              |
|-------------------------|--------------|
| – V2-6A, FW HDR SECTION | OPEN _____   |
| – V2-6A, FW HDR SECTION | CLOSED _____ |
| – V2-6B, FW HDR SECTION | OPEN _____   |
| – V2-6B, FW HDR SECTION | CLOSED _____ |
| – V2-6C, FW HDR SECTION | OPEN _____   |
| – V2-6C, FW HDR SECTION | CLOSED _____ |

# **LICENSE EXAMINATION JOB PERFORMANCE MEASURE**

## **ILC-13 NRC JPM C Rev 0**

Establish RCS Bleed and Feed

<b>Concurred By:</b>	<u>Kirk Schauer</u> Operations	<b>Date:</b> <u>5/15/13</u>
<b>Approved By:</b>	<u>James Conder</u> Superintendent/Supervisor - Training	<b>Date:</b> <u>6/5/13</u>

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**Task:** 01113107905, Respond to Loss of Secondary Heat Sink IAW FRP-H.1

**Alternate Path:**

YES

**JPM #:**

ILC-13 NRC JPM C

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

002.A2.04                      4.3 / 4.6

074.EA2.02                      4.3 / 4.6

**Task Standard:**

RCS bleed and feed has been established by completion of FRP-H.1 up through and including establishing an RCS bleed path by opening the RCS head vents and depressurizing at least one S/G.

**Preferred Evaluation Location:**

Simulator   X      In-Plant       

**Preferred Evaluation Method:**

Perform   X      Simulate       

**References:**

FRP-H.1

**Validation Time:** 5 Minutes **Time Critical:** Yes **Time Critical Time:** 8 Minutes

**Candidate:**

Name \_\_\_\_\_

SSN       -       -       \_\_\_\_\_

(N/A if not time critical)

**Overall  
Time**

**Critical  
Time**

Start: \_\_\_\_\_

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

Finish: \_\_\_\_\_

**Performance Rating:**       SAT       UNSAT  
circle one

**Performance  
Time (min):** \_\_\_\_\_

**Examiner:**

Print Name

Signature

Date

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:



## COMMENTS

**Step 5** Critical because if RCPs are not secured then they will provide additional heat input to the RCS.

---

**Step 6** Critical because safety injection pumps are utilized as the feed source for the RCS and PZR once the vent (bleed) path is established.

---

**Step 8** Critical because IA is needed to operate the PZR PORVs.

---

**Step 9** Critical because vent path for PZR must be established to lower RCS pressure below shutoff head of SI Pumps.

---

**Step 11** Critical because additional vent path must be established since both PORVs cannot be verified open and are needed to lower RCS pressure to below the shutoff head of the SI pumps.

---

JPM is Time Critical because Heat Sink must be established in a timely manner to prevent core damage.

---

**Time Critical Steps** are steps 1 through 11 and the time for them is 8 minutes

---

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Initialize the simulator to IC-912
2. Go to RUN ensure plant conditions are stable.
3. Open SCN File 009\_ILC\_13\_NRC\_CR\_JPM\_C and execute.
4. Place simulator in FREEZE until candidate is ready to begin JPM.
5. An extra instructor will be needed to acknowledge alarms that do not apply to this JPM

1. If IC-912 is unavailable, reset simulator to IC-5 and perform the following:
2. Insert malfunction RPS01A and RPS01B failure to trip – Auto and Manually (BOTH)
3. Activate IMF CFW-19 (total loss of feedwater).
4. When SG WR levels <18% then manually trip the reactor
5. Verify 2 charging pumps Running
6. Freeze the simulator after SG WR levels are less than 10%

**Tools/Equipment/Procedures Needed:**

FRP-H.1

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there **ARE** time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. Plant was initially at 100% power.
2. A terrorist attack on the plant has resulted in a loss of all feedwater capability.
3. The reactor failed to trip automatically and from the RTGB.
4. EOP-E-0 was entered and transitioned to FRP-S.1.
5. Upon resetting SPDS, a RED terminus exists on Heat Sink due to all S/G <8% and AFW <300 gpm
6. The crew has transitioned to FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
7. You are the Reactor Operator.

**INITIATING CUES:**

The CRS directs you to respond to a loss of secondary heat sink IAW FRP-H.1.

**TIME CRITICAL**

START TIME: \_\_\_\_\_ TIME CRITICAL START TIME \_\_\_\_\_

<p><b><u>STEP 1:</u></b> Obtain a copy of the appropriate procedure</p> <p><b><u>STANDARD:</u></b> Operator obtains a copy of FRP-H.1 from the bookcase</p> <p><b>EXAMINER'S CUE:</b> The controlled copy from the bookcase will be replaced after the JPM</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p style="text-align: center;">Feed flow is not re-established to any faulted S/G if an intact S/G is available.</p>	
<p><b><u>STEP 2:</u></b> Check total feed flow - LESS THAN 300 gpm due to operator action. (Step 1)</p> <p><b><u>STANDARD:</u></b> Candidate <b>CHECKS</b> total feed flow &lt; 300 gpm and no operator action taken and, IAW RNO, goes to step 3.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**STEP 3:**

Determine If Secondary Heat Sink Is Required As Follows:

- a. Check RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE.
- b. Check RCS temperature - GREATER THAN 350°F [310°F] (Step 3)

\_\_\_ SAT

**STANDARD:**Using available indications, Candidate **DETERMINES**

- a. RCS pressure is greater than all non-faulted S/G pressures by observing RCS pressure on the ICCM monitor and individual S/G pressures on the RTGB edge meters or ERFIS computer.
- b. RCS temperature is greater than 350°F by observing TR-408 for Tave or TR-410 and/or TR-413 for RCS Tcold and Thot temperatures.

\_\_\_ UNSAT

**EXAMINER'S CUE:**

NONE

**EXAMINER'S NOTE:**

Candidate checks RCS pressure, S/G pressure, and RCS temperature. Candidate determines that Secondary Heat Sink is required and proceeds to Step 4.

**BOOTH OPERATOR CUE:** NONE**COMMENTS:****STEP 4:**

Check Any Two S/G Wide Range Levels - LESS THAN 10% [19%].  
(Step 4)

**STANDARD:**

Candidate **DETERMINES** that all 3 S/Gs levels are less than 10% wide range level by observing levels on LR-477.

\_\_\_ SAT

**EXAMINER'S CUE:**

NONE

**EXAMINER'S NOTE:**

NONE

**BOOTH OPERATOR CUE:** NONE**COMMENTS:**

\_\_\_ UNSAT

**STEP 5:**

Perform The Following:

- a. Stop all RCPs
- b. Observe CAUTION prior to Step 31 and Go To Step 31 (Step 5)

**STANDARD:**Candidate **PERFORMS** the following actions:

- a. PLACES control switches for A, B, and C RCPs to STOP and observing the GREEN off indication illuminated.
- b. OBSERVES CAUTION prior to Step 31 and PROCEEDS to Step 31.

**EXAMINER'S CUE:** NONE**EXAMINER'S NOTE:** NONE**BOOTH OPERATOR CUE:** NONECOMMENTS:**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**CAUTION**

Steps 31 through 35 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.

**STEP 6:**

Depress the INITIATE SAFETY INJECTION Pushbutton (Step 31)

**STANDARD:**Candidate **DEPRESSES** **either** of the two INITIATE SAFETY INJECTION Pushbuttons. Only depressing one of the Initiate Safety Injection Pushbuttons is required to meet the Critical Step.**EXAMINER'S CUE:** NONE**EXAMINER'S NOTE:** NONE**BOOTH OPERATOR CUE:** NONECOMMENTS:**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 7:**

Verify RCS Injection Path As Follows:

- a. Verify SI Pumps - AT LEAST ONE RUNNING
- b. Verify SI Valves for at least one flow path - ALIGNED FOR COLD LEG INJECTION  
(Step 32)

\_\_\_ SAT

**STANDARD:** Candidate Verifies at least one SI pump is running by observing the RED on indication illuminated for either A or C SI pump.

\_\_\_ UNSAT

Candidate determines that one flow path to the core from the SI pumps is aligned by observing that valves SI-867A or B and SI-870A or B are open by observing the RED open indication illuminated.

Candidate may use the Safety Injection status lights which will indicate that all of the SI valves are properly aligned for core injection, with the exception of the SI Accumulator Discharge valves SI-865A, B and C which have their breakers open.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**STEP 8:**

Establish Instrument Air To CV As Follows:

- a. Verify APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED
- b. Place IA-1716, INSTRUMENT AIR ISO TO CV Control Switch to the OVERRIDE position **(CS)**  
(Step 33)

**STANDARD:**

Candidate Verifies APP-002-F7, INSTR AIR HDR LO PRESS is Extinguished and Places IA-1716, INSTRUMENT AIR ISO TO CV Control Switch to the OVERRIDE position **(CS)** and observes that the INST AIR VALVE TO CONT PCV-1716 SHUT status light on the Containment Isolation Phase A status panel is extinguished.

**EXAMINER'S CUE:**

NONE

**EXAMINER'S NOTE:**

PCV-1716 valve position may also be determined using the SPDS display on the ERFIS computer for Containment Phase A Status Panel display. **(CS) – Critical Step**

**BOOTH OPERATOR CUE:** NONE**COMMENTS:****CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT



**STEP 9:**

Establish RCS Bleed Path As Follows:

- a. Verify power to PZR PORV Block Valves - AVAILABLE.
- b. Place all PZR Heater Control Switches to the OFF position (CS)
- c. Verify PZR PORV Block Valves - BOTH OPEN
- d. Open both PZR PORVs (CS – for PCV-456)  
(Step 34)

**CRITICAL  
STEP**

\_\_\_ SAT

**STANDARD:**

Candidate PERFORMS the following:

- a. Candidate determines that power is available to PZR PORV block valves RC-535 and RC-536 by observing that indication is available on the RTGB valve indication.
- b. Candidate places the control switches for the PZR Control Group Heaters, Backup Group A and Backup Group B to the OFF position and observes the GREEN off indication illuminated. (CS)
- c. Candidate verifies that both PZR PORV block valves are open by observing the RED open indication illuminated for each valve.
- d. Candidate opens the PZR PORVs PCV-455C and PCV-456 (CS for PCV-456 only) by placing the control switches to the open position and observing the RED open indication illuminate for PCV-456. PCV-455C will indicate failed at mid-position and will have both the RED and GREEN indicators illuminated.

\_\_\_ UNSAT

**EXAMINER'S CUE:** NONE**EXAMINER'S NOTE:** (CS) – Critical Step**BOOTH OPERATOR CUE:** NONE**COMMENTS:**

**STEP 10:** Verify Adequate RCS Bleed Path As Follows:

- PZR PORVs - BOTH OPEN
- PZR PORV Block Valves - BOTH OPEN  
(Step 35)

**STANDARD:** Candidate determines that both PZR PORVs are NOT OPEN by observing the RED and GREEN mid-position indication illuminated for PCV-455C. The candidate proceeds to the RNO step, which directs transition to Step 37.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 11:**

Place the Key Switches for the following Vent Valves to the OPEN Position:

- RC-568, HEAD VENT
  - RC-570, PZR VENT
  - RC-572, CV ATMOS
  - RC-567, HEAD VENT
  - RC-569, PZR VENT
  - RC-571, PTR ISO
- (Step 37)

**CRITICAL STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:**

Candidate places the key switches for valves RC-568, 570, 572, 567, 569 and 571 to the OPEN position and observes that the RED open indication for each valve is illuminated.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** Blank keys are inserted into the key switches. The blanks will have to be removed and the keys inserted into the switches to operate the valves.

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**Time Critical Stop Time** \_\_\_\_\_

**STEP 12:** Depressurize At Least One Intact S/G To Atmospheric Pressure Using Steam Line PORVs.  
(Step 38)

**STANDARD:** Candidate depressurizes at least one of the S/Gs by opening the selected Steam Line PORV by rotating the valve control potentiometer in the clockwise direction and observing RED open indication for the PORV illuminated. Minimal steam noise will be heard since all steam generators are already at very low steam pressure.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**END OF TASK**

**Terminating Cue:** When selected S/G depressurization has commenced, evaluation on the JPM is complete.

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there **ARE** time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. Plant was initially at 100% power.
2. A terrorist attack on the plant has resulted in a loss of all feedwater capability.
3. The reactor failed to trip automatically and from the RTGB.
4. EOP-E-0 was entered and transitioned to FRP-S.1.
5. Upon resetting SPDS, a RED terminus exists on Heat Sink due to all S/G <8% and AFW <300 gpm
6. The crew has transitioned to FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
7. You are the Reactor Operator.

**INITIATING CUES:**

The CRS directs you to respond to a loss of secondary heat sink IAW FRP-H.1.

**TIME CRITICAL**

**CONTINUOUS USE**

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3

PART 4

FUNCTION RESTORATION PROCEDURE

FRP-H.1

RESPONSE TO LOSS OF SECONDARY HEAT SINK

REVISION 25

Purpose and Entry Conditions

(Page 1 of 1)

1. PURPOSE

This procedure provides actions to respond to a loss of secondary heat sink in all Steam Generators.

2. ENTRY CONDITIONS

- a. EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, Step 9, when minimum AFW flow is not verified AND narrow range level in all S/Gs is less than 8% [18%].
- b. CSF-3, Heat Sink Critical Safety Function Status Tree on a RED condition.

- END -

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*\*\*\*\*

CAUTION

Feed flow is not re-established to any faulted S/G if an intact S/G is available.

\*\*\*\*\*

- |                                                                     |                                                                                                                             |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 1. Check Total Feed Flow - LESS THAN 300 GPM DUE TO OPERATOR ACTION | Go To Step 3.                                                                                                               |
|                                                                     |                                                                                                                             |
| 2. Reset SPDS And Return To Procedure And Step In Effect            |                                                                                                                             |
|                                                                     |                                                                                                                             |
| 3. Determine If Secondary Heat Sink Is Required As Follows:         |                                                                                                                             |
| a. Check RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE   | a. Reset SPDS and return to procedure and step in effect.                                                                   |
| b. Check RCS temperature - GREATER THAN 350°F [310°F]               | b. Perform the following:                                                                                                   |
|                                                                     | 1) Place RHR System in service using Supplement I.                                                                          |
|                                                                     | 2) <u>WHEN</u> adequate cooling with RHR is established, <u>THEN</u> reset SPDS and return to procedure and step in effect. |
|                                                                     |                                                                                                                             |
| * 4. Check Any Two S/G Wide Range Levels - LESS THAN 10% [19%]      | <u>IF</u> any two S/G Wide Range Levels lower to less than 10% [19%], <u>THEN</u> Go To Step 5.                             |
|                                                                     | Go To Step 6.                                                                                                               |
|                                                                     |                                                                                                                             |
| 5. Perform The Following:                                           |                                                                                                                             |
| a. Stop all RCPs                                                    |                                                                                                                             |
| b. Observe <u>CAUTION</u> prior to Step 31 and Go To Step 31        |                                                                                                                             |



## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

- \* 6. Check CST level - GREATER THAN 10%

Align SW backup to the AFW Pumps using OP-402, Auxiliary Feedwater System, while continuing with this procedure.

IF the CST is low due to catastrophic failure AND is inaccessible, THEN align SW backup to the MDAFW Pumps using Attachment 2, SW Backup To MDAFW Pumps.

Go To Step 14.

7. Verify All S/G Blowdown AND Sample Isolation Valves - CLOSED

8. Check AFW Lines - INTACT

Isolate break.

IF the break is isolated, THEN Go To Step 9.

IF the break can NOT be isolated, THEN Go To Step 14.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

9. Try To Establish Motor Driven  
AFW Flow To At Least One S/G As  
Follows:

a. Check AFW Pump Breakers -  
TRIPPED

a. Go To Step 9.c.

b. Attempt to reclose any  
tripped breakers as follows:

1) Position the MDAFW Pump  
Control Switch to the STOP  
position

2) Reset SI

3) Position the MDAFW Pump  
Control Switch to the  
START position

4) Check MDAFW Pump - RUNNING

4) IF the tripped breaker  
will NOT reclose, THEN  
contact I&C to investigate.

Go To Step 10.

c. Verify AFW HDR DISCH Valves -  
OPEN:

- V2-16A
- V2-16B
- V2-16C

d. Check AFW flow to S/Gs -  
GREATER THAN 300 GPM

d. Go To Step 10.

e. Reset SPDS and return to  
procedure and step in effect

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 10. Attempt To Start SDAFW Pump As Follows:

a. Verify STEAM DRIVEN AFW PUMP  
STM SHUTOFF Valves - OPEN

- V1-8A
- V1-8B
- V1-8C

b. Verify STEAM DRIVEN AFW PUMP  
DISCH Valves - OPEN

- V2-14A
- V2-14B
- V2-14C

c. Check AFW flow to S/Gs -  
GREATER THAN 300 GPMd. Reset SPDS and return to  
procedure and step in effecta. IF the steam supply valves  
can NOT be opened, THEN Go To  
Step 11.

c. Go To Step 11.

11. Locally Investigate AND Attempt  
To Restore AFW Flow As Follows:a. Verify AFW Pump suction  
supply is availableb. Position the MDAFW Pump  
LOCAL/REMOTE Switch to LOCALc. Attempt to start a MDAFW Pump  
as follows:

- 1) Depress the MDAFW Pump  
local STOP Pushbutton
- 2) Depress the MDAFW Pump  
local START Pushbutton
- 3) Check MDAFW Pump - STARTED

3) Place the LOCAL/REMOTE  
Switch to REMOTE.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

- \*12. Check AFW Flow To S/Gs - GREATER THAN 300 GPM

IF feed flow to at least one S/G verified, THEN perform the following:

- a. Maintain flow to restore narrow range level to greater than 8% [18%].
- b. WHEN narrow range level is greater than 8% [18%], THEN reset SPDS AND return to procedure and step in effect.

Go To Step 14.

13. Reset SPDS And Return To Procedure And Step In Effect

14. Stop All RCPs

15. Check Condensate System - IN SERVICE

Place the Condensate System in service as follows:

- a. IF the Condensate System is NOT available, THEN Go To Step 30.
- b. Open QCV-10426, COND POL SEC BYP.
- c. Close V5-3, COND PUMP DISCH.
- d. Momentarily place V5-3 to OPEN.
- e. Start one Condensate Pump.
- f. WHEN feedwater pressure is greater than 300 psig, THEN verify V5-3 full open.
- g. Open HCV-1459, LP HEATERS BYP.

IF at least one Condensate Pump can NOT be started, THEN Go To Step 30.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

The subsequent step will defeat all FW Isolation signals which is necessary to allow starting of a Main Feedwater Pump. Manual Operator action will be required to initiate a FW Isolation.

16. Place ALL The FEEDWATER ISOLATION Key Switches In The OVRD/RESET Position

- STM GEN A
- STM GEN B
- STM GEN C

NOTE

Local operation of the FRV and B/P valves below is via reverse acting handwheels.

17. Attempt To Establish Feedwater Flow As Follows:

- a. Verify the FW HDR SECTION Valves - CLOSED

- V2-6A
- V2-6B
- V2-6C

- b. Start one Main FW Pump

- c. Open the FRV Bypass Valves:

- FCV-479
- FCV-489
- FCV-499

- d. Check FW Flow - ESTABLISHED

- b. Go To Step 20.

- c. Locally open the FRV Bypass Valve using the Manual Handwheel. (Requires small Locked Valve Key.)

- d. Go To Step 20.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18. **Check S/G Levels As Follows:**

- a. Level In At Least One S/G -  
GREATER THAN 8% [18%]
- b. Reset SPDS And Return To  
Procedure And Step In Effect

a. Go To Step 19.

19. **Determine If Feedwater Flow Is Adequate:**

- a. Check the following:
  - Core Exit T/C Temperature  
- LOWERING

OR

  - S/G Wide Range Level -  
RISING IN AT LEAST ONE S/G
- b. Maintain FW flow to restore  
S/G Level to greater than 8%  
[18%]
- c. Reset SPDS And Return To  
Procedure And Step In Effect

a. Go To Step 20.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

Supplement K is available for optimizing Auxiliary Spray below.

**20. Depressurize The RCS As Follows:**

- a. Check letdown - IN SERVICE
  - a. IF a PZR PORV is available, THEN Go To Step 20.e.  
  
IF a PZR PORV is NOT available, THEN Go To Step 20.b.
- b. Open CVC-311, AUX SPRAY
- c. WHEN RCS pressure is less than 1950 psig, THEN close CVC-311
- d. Observe the CAUTION prior to step 21 and Go To Step 21
- e. Open one PZR PORV to depressurize the RCS to less than 1950 psig.
- f. WHEN pressure is less than 1950 psig, THEN close the PORV.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*\*\*\*\*

CAUTION

Following block of automatic SI initiation, manual SI initiation may be required if conditions degrade.

\*\*\*\*\*

**\*21. Block SAFETY INJECTION As  
Follows:**

a. Momentarily Place the PZR  
PRESS/HI STM LINE DP Switch  
to the BLOCK position

b. Check Tavg - LESS THAN 543°F

b. WHEN Tavg is less than 543°F,  
THEN perform Step 21.c.

Observe the CAUTION prior to  
Step 22 and Go To Step 22.

c. Momentarily Place the T-AVG  
Switch to the BLOCK position

**22. Identify S/G With Lowest Level  
To Select For Depressurization**

**23. Verify Closed MSIVs For  
Remaining S/Gs With Higher Levels**



STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*\*\*\*\*

CAUTION

The SI Accumulator Discharge Valves must be closed when S/G pressure is less than 240 psig to prevent nitrogen injection into the RCS.

\*\*\*\*\*

24. Depressurize Selected S/G With  
The Lowest Level To Less Than  
600 PSIG By Dumping Steam At  
Maximum Rate Using One Of The  
Following Methods Listed In  
Order Of Preference:

- Steam Dump to condenser via  
the pressure control mode

OR

- Steam Line PORVs controlled  
by Instrument Air

OR

- Steam Line PORVs controlled  
by Nitrogen per Attachment 2  
of AOP-017, Loss of  
Instrument Air

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

25. Check Selected S/G Pressure -  
GREATER THAN 240 PSIG

Isolate SI Accumulators as follows:

a. Locally close the breakers for the following valves:

- SI-865C, ACCUMULATOR C DISCHARGE (MCC-5, CMPT 9F)
- SI-865A, ACCUMULATOR A DISCHARGE (MCC-5, CMPT 14F)
- SI-865B, ACCUMULATOR B DISCHARGE (MCC-6, CMPT 10J)

b. Verify CLOSED all ACCUMULATOR DISCHs

- SI-865A
- SI-865B
- SI-865C

Vent any unisolated accumulator as follows:

- 1) Verify SI-855, ACC NITROGEN ISO, is closed.
- 2) Open the appropriate ACCUM VENT Valves:
  - SI-853A
  - SI-853B
  - SI-853C
- 3) Open HIC-936, ACC VENT HDR FLOW.

26. Maintain Selected S/G pressure -  
BETWEEN 240 PSIG AND 600 PSIG

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

**27. Try To Establish Feed Flow From Condensate System As Follows:**

- a. Check Condensate Pump status  
- AT LEAST ONE RUNNING

- a. Start one Condensate Pump as follows:

- 1) Open QCV-10426, COND POL SEC BYP.
- 2) Close V5-3, COND PUMP DISCH.
- 3) Momentarily place V5-3 control switch to OPEN.
- 4) Start one Condensate Pump.
- 5) WHEN feedwater pressure is greater than 300 psig, THEN verify V5-3 goes full open.
- 6) Open HCV-1459, LP HEATERS BYP.

IF at least one Condensate Pump can NOT be started, THEN Go To Step 30.

- b. Open the FRV Bypass Valves

- FCV-479
- FCV-489
- FCV-499

- b. Locally open the FRV Bypass Valve using the Manual Handwheel. (Requires small Locked Valve Key.)

- c. Check Condensate flow -  
ESTABLISHED

- c. Go To Step 30.

**28. Check S/G Levels As Follows:**

- a. Level in at least one S/G -  
GREATER THAN 8% [18%]
- b. Reset SPDS And Return To  
Procedure And Step In Effect

- a. Go To Step 29.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

29. Determine If Condensate Flow Is Adequate:

a. Check the following:

- Core Exit T/C temperature  
- LOWERING

OR

- S/G Wide Range level -  
RISING IN AT LEAST ONE S/G

b. Maintain FW flow to restore  
S/G level to greater than 8%  
[18%]

c. Reset SPDS And Return To  
Procedure And Step In Effect

\*30. Any Two S/G Wide Range Levels -  
LESS THAN 10% [19%]

a. Go To Step 30.

IF FW flow is restored during  
steps prior to step 31, THEN Go  
To Step 28.

Go To Step 3.

\*\*\*\*\*  
CAUTION

Steps 31 through 35 must be performed quickly in order to establish RCS  
heat removal by RCS bleed and feed.

\*\*\*\*\*  
31. Depress the INITIATE SAFETY  
INJECTION Pushbutton

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

**32. Verify RCS Injection Path As Follows:**

- a. Verify SI Pumps - AT LEAST ONE RUNNING
- b. At the RTGB, verify SI Valves for at least one flow path - ALIGNED FOR COLD LEG INJECTION

- a. Go To Step 6.
- b. Perform the following:
  - 1) Locally align valves.
  - 2) Continue efforts to establish feed flow.
  - 3) IF Cold Leg Injection can NOT be verified, THEN Go To Step 6.

**33. Establish Instrument Air To CV As Follows:**

- a. Verify APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED

- a. Start Instrument Air Compressors as required to extinguish APP-002-F7.

IF instrument air header pressure can NOT be established, THEN Go To Step 34.

- b. Place IA PCV-1716, INSTRUMENT AIR ISO TO CV Control Switch to the OVERRIDE position

**34. Establish RCS Bleed Path As Follows:**

- a. Verify power to PZR PORV Block Valves - AVAILABLE
- b. Place all PZR Heater Control Switches to the OFF position
- c. Verify PZR PORV Block Valves - BOTH OPEN
- d. Open both PZR PORVs

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

35. **Verify Adequate RCS Bleed Path  
As Follows:**

- PZR PORVs - BOTH OPEN
- PZR PORV Block Valves - BOTH  
OPEN

Go To Step 37.

36. **Go To Step 41**

37. **Place the Key Switches for the  
following Vent Valves to the  
OPEN Position:**

- RC-568, HEAD VENT
- RC-570, PZR VENT
- RC-572, CV ATMOS
- RC-567, HEAD VENT
- RC-569, PZR VENT
- RC-571, PRT ISO

38. **Depressurize At Least One Intact  
S/G To Atmospheric Pressure  
Using Steam Line PORVs**

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 39. Isolate SI Accumulators As Follows:

## a. Locally close the breakers for the following valves:

- SI-865C, ACCUMULATOR C DISCHARGE (MCC-5, CMPT 9F)
- SI-865A, ACCUMULATOR A DISCHARGE (MCC-5, CMPT 14F)
- SI-865B, ACCUMULATOR B DISCHARGE (MCC-6, CMPT 10J)

## b. Verify CLOSED all ACCUMULATOR DISCHs

- SI-865A
- SI-865B
- SI-865C

## b. Vent any unisolated accumulator as follows:

- 1) Verify SI-855, ACC NITROGEN ISO, is closed.
- 2) Open the appropriate ACCUM VENT Valves:
  - SI-853A
  - SI-853B
  - SI-853C
- 3) Open HIC-936, ACC VENT HDR FLOW.

## 40. Align Fire Water To The Depressurized S/G Using Attachment 1, While Continuing With This Procedure

## 41. Verify Auto Start Of All SI Equipment Using Supplement L, While Continuing With This Procedure

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*\*\*\*\*

CAUTION

The RCS bleed path must be maintained even if RCS pressure remains greater than SI Pump shutoff head.

\*\*\*\*\*

42. **Maintain RCS Heat Removal As Follows:**

- Maintain Safety Injection flow
- Maintain PZR PORVs - BOTH OPEN

NOTE

The Safeguards System requires 2 min between SI initiation and reset.

43. **Perform The Following:**

- a. Reset SAFETY INJECTION
- b. Momentarily place the CONTAINMENT SPRAY Key Switch to the OVRD/RESET position AND return to the NORMAL position

44. **Reset The Following Containment Isolations:**

- a. PHASE A
- b. PHASE B



## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

45. **Establish Instrument Air To CV  
As Follows:**

a. Check Status of PCV-1716,  
INSTRUMENT AIR ISO TO CV - IN  
OVERRIDE POSITION

a. IF APP-002-F7, INSTR AIR HDR  
LO PRESS is illuminated, THEN  
Start Instrument Air  
Compressors as required to  
extinguish APP-002-F7 AND Go  
To Step 45.b.

IF instrument air header  
pressure can NOT be  
established, THEN observe the  
NOTE prior to Step 46 and Go  
To Step 46.

b. Momentarily place IA  
PCV-1716, INSTRUMENT AIR ISO  
TO CV Switch, to RESET AND  
return to AUTO

NOTE

Supplement F, EDG Capability Load List, provides a listing of power  
requirements of loads that will be started.

46. **Check Charging Pump Power Supply  
As Follows:**

a. Check E-1 OR E-2 - ENERGIZED  
BY EDG

a. Go To Step 47.

b. Check EDG capacity -  
AVAILABLE FOR EACH CHARGING  
PUMP TO BE STARTED

b. Perform the following:

1) Determine Supplement F  
loads to shed in order to  
achieve EDG capacity.

2) Shed loads.

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM D  
Rev. 0**

**REACTOR TRIP RESPONSE - EXCESSIVE RCS  
COOLDOWN**

<b>Concurred By:</b>	<u>Kirk Schauer</u> Operations	<b>Date:</b> <u>5/15/13</u>
<b>Approved By:</b>	<u>James Conder</u> Superintendent/Supervisor - Training	<b>Date:</b> <u>6/5/13</u>

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**Task:**

01118102605, Perform Actions for Post Reactor Trip Stabilization without SI Actuation IAW  
EOP-ES-0.1

**Alternate Path:**

YES

**JPM #:**

ILC-13 NRC JPM D

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

039 A1.05                      3.2 / 3.3

**Task Standard:**

MSIV's are shut to stop the RCS cooldown AND RCS temperature controlled via S/G PORVs.

**Preferred Evaluation Location:**

Simulator   X      In-Plant       

**Preferred Evaluation Method:**

Perform   X      Simulate       

**References:**

EOP-ES-0.1

**Validation Time:** 15 Minutes. **Time Critical:** No **Time Critical Time:** N/A

**Candidate:**

(N/A if not time  
critical)

Name

**Overall  
Time**

**Critical  
Time**

SSN

-

-

Start:

Start:

Finish:

Finish:

**Performance Rating:**

circle one

SAT

UNSAT

**Performance**

**Time (min):**

**Examiner:**

Print Name

Signature

Date

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

**COMMENTS**

**Step 6** is critical because closing the MSIVs and MSIV bypass valves ends the overcooling

---

**Step 8** is critical because the RCS temperature must be controlled by operating the S/G PORVs

---

**Step 21** is critical because RCS will be stabilized using the S/G PORVs prior to lifting a S/G Safety Valve.

---

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Reset to IC-910
2. Place Simulator in Run, acknowledge alarms, and then place in FREEZE.
3. Open SCN 009\_ILC\_13\_CR\_NRC\_JPM\_D and follow instructions

**Tools/Equipment/Procedures Needed:**

Marked up EOP-E-0  
EOP-ES-0.1

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

- Inform the candidate there are NO time critical steps in this JPM.
- Provide with a marked up copy of EOP-E-0 (Steps 1-4 marked)

**INITIAL CONDITIONS:**

1. The plant was initially at 100% power.
2. A manual reactor trip was initiated due to loss of both feed pumps.
3. EOP-E-0 complete through step 4 RNO
4. You are the BOP.

**INITIATING CUE:**

The CRS has directed you to stabilize the plant by performing EOP-ES-0.1 steps 1 through 11.

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

**CAUTION**

If SI actuation occurs during this procedure, EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, should be performed.

**STEP 1:** NOTE: FOLDOUT for EOP-ES-0.1 is in effect  
(EOP-ES-0.1 NOTE prior to step 1)

\_\_\_ SAT

**1. SI ACTUATION CRITERIA**

IF either condition listed below occurs, THEN manually actuate BOTH trains of SI AND Go To EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1:

- RCS subcooling based on core exit TCs - LESS THAN 35°F  
OR
- PZR level - CANNOT BE MAINTAINED GREATER THAN 7%

\_\_\_ UNSAT

**2. LOSS OF POWER CRITERIA**

IF power is lost, THEN perform the following:

- a. IF NO charging pumps are running, THEN isolate letdown.
- b. Locally reset and load instrument air compressor(s) as necessary:
  - Compressor A (MCC-5 CMPT 7M)
  - Compressor B (MCC-6 CMPT 3G)
- c. Restore affected controls to automatic as necessary.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 7, DC Bus Or Instrument Bus Failure.

**5. LOSS OF ULTIMATE HEAT SINK CRITERIA**

IF attack on RNP Site is in progress AND either condition listed below occurs, THEN Go To EPP-28, LOSS OF ULTIMATE HEAT SINK, Step 1:

- Total Loss Of SW  
OR
- Loss Of Lake Robinson Dam integrity

**STANDARD:** Candidate determines that **NONE** of the EOP-ES-0.1 FOLDOUT CRITERIA are applicable.

**BOOTH OPERATOR CUE:** Place Simulator in RUN at Examiners CUE

**COMMENTS:**



<p><b><u>STEP 2:</u></b>      <b>Check RCS Temperatures: (Continuous Action Step)</b></p> <ul style="list-style-type: none"> <li>• With any RCP running, RCS average temperature - STABLE AT OR TRENDING TO 547°F (EOP-ES-0.1 Step 1)</li> </ul> <p><b><u>STANDARD:</u></b>    Candidate checks RCS temperature on any of the following: ERFIS computer, ICCM, TR-408, or RTGB loop Tavg indication and determines that RCS average temperature is NOT stable or trending to 547°F and goes to Step 1 RNO</p> <p><b>EXAMINER'S NOTE:</b>      NONE</p> <p><b>BOOTH OPERATOR CUE:</b> Place Simulator in RUN at Examiners CUE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 3:</u></b>      IF temperature is less than 547°F AND lowering, THEN perform the following: a. Stop dumping steam. (Step 1.a RNO)</p> <p><b><u>STANDARD:</u></b>    Candidate determines Condenser Steam dumps and Steam Line PORV's are closed by the GREEN closed indication illuminated on RTGB</p> <p><b>EXAMINER'S NOTE:</b>      NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 4:</u></b> Verify S/G blowdown isolation valves are closed:</p> <ul style="list-style-type: none"> <li>• FCV-1930 A &amp; B</li> <li>• FCV-1931 A &amp; B</li> <li>• FCV-1932 A &amp; B (Step 1.b RNO)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate determines S/G Blowdown Isolations are Closed by observing the valve positions on the SPTOP ERFIS screen.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> If AO is called to investigate the steam leak, report back that a leak is on the main steam header. Wait 5 minutes after request to make report.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 5:</u></b> IF cooldown continues, THEN reduce total feed flow to minimum for decay heat removal:</p> <ul style="list-style-type: none"> <li>• Maintain total feed flow greater than 300 gpm (0.2x10<sup>6</sup> pph) until narrow range level is greater than 8% in at least one S/G. (Step 1.c RNO)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate lowers or isolates AFW flow to Steam Generators. Maintains minimum required flow (&gt; 300 gpm) until one S/G level is greater than 8 percent.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 6:</u></b> IF cooldown continues, THEN close MSIV and bypass valves. (Step 1.d RNO)</p> <p><b><u>STANDARD:</u></b> Candidate locates control switches for MSIV's and takes them to CLOSE and verifies closed by observing the GREEN closed indication.</p> <p><b>EXAMINER'S NOTE:</b> Candidate may have taken a prompt and prudent action to close the MSIVs when told to "Stop Dumping Steam" in Step 1.a RNO.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 7:</u></b> IF temperature lowers to less than 530°F, THEN borate RCS to cold shutdown boron concentration while continuing with this procedure. (Step 1.e RNO)</p> <p><b><u>STANDARD:</u></b> Candidate determines RCS temperature is greater than 530°F and maintains RCS temperature greater than 530°F.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 8:</u></b> IF temperature is greater than 547°F AND rising, THEN perform the following: (<b>Continuous Action Step</b>)</p> <ul style="list-style-type: none"> <li>• Dump steam to condenser: <ul style="list-style-type: none"> <li>a. Place steam dump mode switch in Steam Pressure mode.</li> <li>b. Adjust steam pressure controller as necessary.</li> </ul> </li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• Dump steam using S/G steam line PORVs. (Step 1.e RNO)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate recognizes that steam dump to condenser is NOT available and <b>manually</b> controls the Steam Line PORV controllers to control RCS temperature such that an S/G Safety Valve does not lift. Temperature must be maintained above 530°F (or borate to cold shutdown iaw RNO step 1.e) and below the RCS temperature that correlates to the lowest S/G Safety Valve Lift Setpoint.</p> <p><b>EXAMINER'S NOTE:</b> Temperature will initially be less than 547°F but will rise until S/G PORVs are <b>manually adjusted</b> to control RCS Temperature. <b>This is a Continuous Action Step.</b></p> <p style="text-align: center;"><b>The S/G PORV setpoints have been mis-calibrated and will not open automatically below the S/G Safety Valve Lift Setpoint.</b></p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b> Candidate will recognize the need to establish higher AFW flows to allow for controlling RCS Temperatures</p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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<p><b><u>STEP 9:</u></b>      <b>Check Feedwater Status</b>  a. RCS average temperatures - LESS THAN 554°F  (Step 2.a)</p> <p><b><u>STANDARD:</u></b>    Candidate recognizes RCS average temperature is less than 554°F</p> <p><b>EXAMINER'S CUE:</b>        NONE</p> <p><b>EXAMINER'S NOTE:</b>      NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 10:</u></b>      <b>Check Feedwater Status</b>  b. Main feedwater reg valves – CLOSED  c. Total feed flow to S/Gs - GREATER THAN 300 GPM (0.2x106 PPH)  (Steps 2.b &amp; c)</p> <p><b><u>STANDARD:</u></b>    Candidate recognizes feedwater reg valves are closed and the feedwater flow is &gt;300gpm</p> <p><b>EXAMINER'S CUE:</b>        NONE</p> <p><b>EXAMINER'S NOTE:</b>      NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 11:</u></b>      <b>Check S/G Levels: (Continuous Action Step)</b></p> <p>a. Narrow range levels – GREATER Than 8%  RNO - Maintain total feed flow THAN 8% greater than 300 gpm  (0.2x106 pph) until narrow range level is greater than 8% in at least one  S/G.  (Step 3.a RNO)</p> <p><b><u>STANDARD:</u></b>    Candidate recognizes need to adjust AFW flow to raise S/G levels and  control between 8% and 50%</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 12:</u></b>      <b>Check S/G Levels:</b></p> <p>b. Control feed flow to maintain narrow range levels – Between 8% and  50%.  (Step 3.b)</p> <p><b><u>STANDARD:</u></b>    Candidate recognizes need to adjust AFW flow to raise S/G levels and  control between 8% and 50%</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 13:</u></b>      <b>Check All AC Busses – Energized by Offsite Power (Continuous Action Step)</b> (Step 4)</p> <p><b><u>STANDARD:</u></b>    Candidate determines that ALL AC Busses are energized by Offsite Power by observing that the Startup Transformer is energized and Breakers 52/12 and 52/17 are closed. Also, both “A” and “B” EDGs are secured.</p> <p><b>EXAMINER’S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b>    NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 14:</u></b>      <b>Check PZR Level Control</b></p> <ul style="list-style-type: none"><li>a.    PZR Level – Greater Than 14%</li><li>b.    Charging – In Service</li><li>c.    Letdown – In Service</li><li>d.    PZR Level – Trending to 22%</li></ul> <p>(Step 5.a-d)</p> <p><b><u>STANDARD:</u></b>    Candidate determines that PZR Level is greater than 14%, Charging and Letdown is In Service and PZR Level is Trending to 22%.</p> <p><b>EXAMINER’S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b>    NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 15:</u></b>      <b>Check ALL Control Rods – Fully Inserted</b> (Step 6)</p> <p><b><u>STANDARD:</u></b>    Candidate determines that all rods are fully inserted by observing the Rod Position Indications at zero and all Rod Bottom Lights are Illuminated.</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 16:</u></b>      <b>Check PZR Pressure Control:</b> a.    Pressure – Greater Than 1715 psig b.    Pressure – Stable at or Trending to 2235 psig (Step 7)</p> <p><b><u>STANDARD:</u></b>    Candidate determines PZR Pressure is greater than 1715 psig and is stable at or trending to 2235 psig by observing RTGB pressure indications.</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



<p><b><u>STEP 17:</u></b>      <b>Transfer Condenser Steam Dump to Pressure Control Mode:</b> a.    Check Condenser – Available       (Step 8.a)</p> <p><b><u>STANDARD:</u></b>    Candidate determines that the condenser is NOT available due to the MSIVs being closed in an earlier step.</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b>    NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 18:</u></b>      <b>Transfer Condenser Steam Dump to Pressure Control Mode:</b> Step 8.a RNO: IF condenser steam dumps are NOT available, THEN set S/G steam line PORV controllers to maintain existing S/G pressure.</p> <p><b><u>STANDARD:</u></b>    Candidate adjusts the S/G steam line PORV controllers such that they just begin to open at the current RCS temperature / S/G pressure.</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b>    NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**NOTE**

RCPs should be run in order of priority to provide normal PZR spray. (C, B+A, B)

**STEP 19:**      **Check RCP C- Running**  
(Step 9)

**STANDARD:**    Candidate determines that RCP C is Running by observing the RED light is illuminated on the RTGB.

**EXAMINER'S NOTE:**      NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 20:**      **Check If Source Range Detectors Should be Energized:**

- a.    Intermediate Range flux – Less than 10E-10 AMPS
- b.    Source Range Detectors – Energized
- c.    Monitor Highest Source Range Channel  
(Step 10)

**STANDARD:**    Candidate determines that IR Flux is less than 10E-10 AMPS and that SR Detectors are energized by observing indication at the NI Cabinets and NR-45 on the RTGB. Observes that both Source Range Channels are displayed on NR-45.

**EXAMINER'S NOTE:**      NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 21:****Maintain Stable Plant Conditions:**

- a. PZR Pressure – At 2235 psig
- b. PZR Level – At 22%
- c. S/G Narrow Range Levels – Between 8% and 50%
- d. RCS temperature:
  - With any RCP running, RCS average temperature – Stable at or Trending to 547°F
- e. Check DC busses A and B – Energized.

(Step 11)

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Candidate determines that PZR Pressure is at 2235 psig, PZR Level is at 22%, S/G Narrow Range Levels are between 8% and 50% and DC Busses A and B are energized.

Candidate will adjust the S/G PORV controllers to lower RCS temperature and stabilize RCS temperature to between 542°F and 552°F without lifting an S/G Safety Valve. **(Critical Step)**

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**END OF TASK**

**Terminating Cue: When Candidate has taken manual action(s) to stabilize RCS Average temperature between 542°F and 552°F using the S/G PORVs without lifting an S/G Safety Valve.**

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

- Inform the candidate there are NO time critical steps in this JPM.
- Provide with a marked up copy of EOP-E-0 (Steps 1-4 marked)

**INITIAL CONDITIONS:**

5. The plant was initially at 100% power.
6. A manual reactor trip was initiated due to loss of both feed pumps.
7. EOP-E-0 complete through step 4 RNO
8. You are the BOP.

**INITIATING CUE:**

The CRS has directed you to stabilize the plant by performing EOP-ES-0.1 steps 1 through 11.

# **CONTINUOUS USE**

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3

PART 4

EMERGENCY OPERATING PROCEDURE

EOP-ES-0.1

REACTOR TRIP RESPONSE

REVISION 4

Purpose and Entry Conditions

(Page 1 of 1)

1. PURPOSE

This procedure provides instructions to stabilize and control the plant following a reactor trip without a safety injection.

2. ENTRY CONDITIONS

This procedure is entered from EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, Step 4, when SI is neither actuated nor required.

- END -

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*\*\*\*\*

CAUTION

If SI actuation occurs during this procedure, EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, should be performed.

\*\*\*\*\*

NOTE

FOLDOUT for EOP-ES-0.1 is in effect.

\* 1. Check RCS Temperatures:

- With any RCP running,  
RCS average temperature -  
STABLE AT OR TRENDING TO  
547°F

OR

- With NO RCP running,  
RCS cold leg temperatures -  
STABLE AT OR TRENDING TO  
547°F

IF temperature is less than  
547°F AND lowering, THEN perform  
the following:

- a. Stop dumping steam.
- b. Verify S/G blowdown isolation  
valves are closed:

- FCV-1930 A & B
- FCV-1931 A & B
- FCV-1932 A & B

- c. IF cooldown continues, THEN  
reduce total feed flow to  
minimum for decay heat  
removal:

- Maintain total feed flow  
greater than 300 gpm  
(0.2x10<sup>6</sup> pph)  
until narrow range level  
is greater than 8% in at  
least one S/G.

- d. IF cooldown continues, THEN  
close MSIV and bypass valves.

- e. IF temperature lowers to less  
than 530°F, THEN borate RCS  
to cold shutdown boron  
concentration while  
continuing with this  
procedure.

(CONTINUED NEXT PAGE)

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 1. (CONTINUED)

IF temperature is greater than 547°F AND rising, THEN perform the following:

- Dump steam to condenser:
  - a. Place steam dump mode switch in Steam Pressure mode.
  - b. Adjust steam pressure controller as necessary.

OR

- Dump steam using S/G steam line PORVs.

## 2. Check Feedwater Status

- a. RCS average temperatures - LESS THAN 554°F

- a. WHEN temperature is less than 554°F, THEN do Steps 2.b through 2.c.

Continue With Step 3.

- b. Main feedwater reg valves - CLOSED

- b. Manually close valve(s).

IF any valve(s) can NOT be closed, THEN manually close associated feedwater header section valve(s).

- c. Total feed flow to S/Gs - GREATER THAN 300 GPM (0.2x10<sup>6</sup> PPH)

- c. Establish feed flow to S/Gs as necessary:

- AFW

OR

- Main feedwater on bypass



## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## \* 3. Check S/G Levels:

a. Narrow range levels - GREATER THAN 8%

a. Maintain total feed flow greater than 300 gpm ( $0.2 \times 10^6$  pph) until narrow range level is greater than 8% in at least one S/G.

b. Control feed flow to maintain narrow range levels - BETWEEN 8% AND 50%

b. IF narrow range level in any S/G continues to rise, THEN stop feed flow to that S/G.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

- \* 4. Check All AC Busses - ENERGIZED  
BY OFFSITE POWER

Perform the following:

- a. IF any AC emergency buss(es) are NOT energized by offsite power, THEN perform the following:
- 1) Verify EDG(s) running.
  - 2) Verify EDG(s) have assumed the following loads:
    - MDAFW pump
    - CCW pump
    - SW pump
  - 3) Perform Attachment 2, EDG Support Verification, while continuing with this procedure.
- b. Try to restore offsite power to AC busses, using the following resources as necessary, while continuing with this procedure:
- Load Dispatcher
  - IC Turbines and Unit One
  - Backfeed using auxiliary transformer
  - OP-603, Electrical Distribution
- c. IF any AC emergency bus is NOT energized, THEN try to restore power to affected bus from EDG.

(CONTINUED NEXT PAGE)

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

4. (CONTINUED)

d. Locally load the following equipment on AC emergency buss(es) as necessary:

- 150 KW of PZR heaters using EPP-21, ENERGIZING PRESSURIZER HEATERS FROM EMERGENCY BUSES
- Instrument air compressor(s) after reset:
  - Compressor A (MCC-5 CMPT 7M)
  - Compressor B (MCC-6 CMPT 3G)
- Battery chargers (within 30 minutes of power loss) using OP-601, DC Supply System.

e. Periodically check status of spent fuel pool until SFP cooling is restored:

- Fuel pool level
- Fuel pool temperature

f. IF DS bus is NOT energized, THEN place DSDG in service within one hour of the power loss, as time and manpower permit, using EPP-25, ENERGIZING SUPPLEMENTAL PLANT EQUIPMENT USING THE DSDG:

- IF EPP-21 is NOT in effect to load PZR heaters, THEN restore power to PZR heaters using EPP-25, ENERGIZING SUPPLEMENTAL PLANT EQUIPMENT USING THE DSDG.

g. Verify emergency oil pump is running.

(CONTINUED NEXT PAGE)

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4. (CONTINUED)

h. Locally verify air side seal  
oil backup pump is running.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 5. Check PZR Level Control:

a. PZR Level - GREATER THAN 14%

a. Perform the following:

1) Verify letdown is isolated:

- Letdown line isolation valves closed:
  - CVC-204A
  - CVC-204B
- Letdown orifice valves closed:
  - CVC-200A
  - CVC-200B
  - CVC-200C
- Excess letdown stop valve closed:
  - CVC-387

2) Verify all PZR heaters are off.

3) WHEN charging is available, THEN control charging to restore PZR level to greater than 14%.4) WHEN PZR level is greater than 14% AND power is available, THEN reenergize PZR heaters as necessary.

(CONTINUED NEXT PAGE)

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 5. (CONTINUED)

## b. Charging - IN SERVICE

## b. Place charging in service:

- 1) Start at least one charging pump.
- 2) Adjust charging pump speed controllers as necessary to establish desired charging flow.
- 3) Adjust HIC-121, charging flow control valve, as necessary to maintain seal injection flow between 8 gpm and 13 gpm per RCP.
- 4) WHEN VCT automatic makeup is available, THEN verify makeup is set for automatic control:
  - a) RCS makeup mode switch in auto.
  - b) RCS makeup system switch in start.

## c. Letdown - IN SERVICE

- c. WHEN PZR level is greater than 14%, THEN place letdown in service using Attachment 4, Establishing Letdown.

IF letdown can NOT be established, THEN establish excess letdown using Attachment 5, Establishing Excess Letdown.

## d. PZR Level - TRENDING TO 22%

- d. Control charging and letdown to maintain PZR level at 22%.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 6. Check All Control Rods - FULLY INSERTED

IF two or more control rods are NOT fully inserted, THEN emergency borate to cold shutdown boron concentration:

- Use BAST:
  - a. Open boric acid to charging pump suction, MOV-350.
  - b. Start boric acid pump aligned for blend.
  - c. Verify boric acid flow on FI-110.
  - d. Verify total charging flow is greater than boric acid flow.

OR

- Use RWST:
  - a. Open emergency makeup to charging suction, LCV-115B.  
  
IF LCV-115B can NOT be opened, THEN locally open CVC-358, RWST to charging pump suction.
  - b. Close VCT outlet, LCV-115C.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 7. Check PZR Pressure Control:

a. Pressure - GREATER THAN  
1715 PSIG

a. Perform the following:

1) Check for SI actuation.

IF SI is NOT actuated,  
THEN manually actuate BOTH  
trains of SI.

2) Go To EOP-E-0, REACTOR  
TRIP OR SAFETY INJECTION,  
Step 1.

b. Pressure - STABLE AT OR  
TRENDING TO 2235 PSIG

b. IF pressure is less than  
2235 psig AND lowering, THEN  
perform the following:

1) Verify PZR PORVs are  
closed.

IF any valve can NOT be  
closed, THEN manually  
close its block valve.

2) Verify PZR spray valves  
are closed.

IF valve(s) can NOT be  
closed, THEN stop RCP(s)  
as necessary to stop spray  
flow:

- IF PCV-455A can NOT be  
closed, THEN stop  
RCP B and RCP C.

OR

- IF PCV-455B can NOT be  
closed, THEN stop  
RCP C.

3) WHEN power is available,  
THEN verify PZR heaters  
are on.

(CONTINUED NEXT PAGE)



## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

7. (CONTINUED)

IF pressure is greater than 2235 psig AND rising, THEN perform the following:

- 1) Verify PZR heaters are off.
- 2) Control pressure using normal PZR spray:

- PCV-455A, loop B
- PCV-455B, loop C

IF normal PZR spray is NOT available AND letdown is in service, THEN use aux spray:

- Refer to Attachment 6, Establishing Aux Spray Without SI, as necessary.

IF auxiliary spray is NOT available or effective, THEN use PZR PORV(s).

8. Transfer Condenser Steam Dump To Pressure Control Mode:

- a. Check condenser - AVAILABLE
- b. Place steam dump mode switch in Steam Pressure mode
- c. Set steam pressure controller to maintain existing S/G pressure

IF condenser steam dumps are NOT available, THEN set S/G steam line PORV controllers to maintain existing S/G pressure.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

RCPs should be run in order of priority to provide normal PZR spray.  
(C, B+A, B)

## 9. Check RCP C - RUNNING

Try to start RCP(s) to provide normal PZR spray:

- a. IF offsite power is available, THEN establish conditions for starting RCP(s) using OP-101, Reactor Coolant System And Reactor Coolant Pump Startup And Operation.
- b. IF conditions are established for RCP C, THEN start RCP C.  
  
IF RCP C can NOT be started AND conditions are established for other RCP(s), THEN try to start other RCP(s) as necessary to provide normal PZR spray (or forced flow).

IF NO RCP can be started, THEN verify natural circulation using Attachment 1, Natural Circulation Verification.

IF natural circulation can NOT be verified, THEN dump more steam.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

10. Check If Source Range Detectors  
Should Be Energized:a. Intermediate Range flux -  
LESS THAN  $10^{-10}$  AMPSa. WHEN flux is less than  
 $10^{-10}$  amps, THEN do Steps  
10.b and 10.c.

Continue With Step 11.

b. Source Range Detectors -  
ENERGIZEDb. Energize Source Range  
Detectors by depressing both  
PERMISSIVE P-6 DEFEAT  
Pushbuttons.c. Monitor Highest Source Range  
Channel

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 11. Maintain Stable Plant Conditions:

- a. PZR pressure - AT 2235 PSIG
- b. PZR level - AT 22%
- c. S/G narrow range levels -  
BETWEEN 8% AND 50%
- d. RCS temperature:
  - With any RCP running,  
RCS average temperature -  
STABLE AT OR TRENDING TO  
547°F

OR

- With NO RCP running,  
RCS cold leg  
temperatures - STABLE AT  
OR TRENDING TO 547°F
- e. Check DC busses A and B -  
ENERGIZED

## e. Perform the following:

- If DC bus A is NOT  
energized, THEN perform  
EPP-26, LOSS OF DC BUS  
"A", while continuing  
with this procedure.
- If DC bus B is NOT  
energized, THEN perform  
EPP-27, LOSS OF DC BUS  
"B", while continuing  
with this procedure.

12. Perform Attachment 8, Aligning  
Balance Of Plant, As Time  
Permits While Continuing With  
This Procedure

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

13. Determine If Natural Circulation  
Cooldown Is Required:

## a. Check both the following:

- RCPs - NONE RUNNING
- Plant cooldown - REQUIRED

a. Go To appropriate plant  
procedure:

- GP-004, Post Trip  
Stabilization

OR

- As determined by Shift  
Manager

b. Go To EPP-5, NATURAL  
CIRCULATION COOLDOWN, Step 1

- END -

Attachment 1Natural Circulation Verification

(Page 1 of 1)

**1. The Following Conditions Support Or Indicate Natural Circulation Flow:**

- RCS subcooling based on core exit TCs - GREATER THAN 35°F
  - S/G pressures - STABLE OR LOWERING
  - RCS hot leg temperatures - STABLE OR LOWERING
  - Core exit TCs - STABLE OR LOWERING
  - RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE
- END -

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 2EDG Support Verification

(Page 1 of 5)

\*\*\*\*\*

CAUTION

If only one SW Pump is running, it is subject to runout until the following step is completed.

\*\*\*\*\*

1. Check SW Header Pressure And  
Transition To Applicable Step  
From Table Below:

SW PRESSURE CONDITION	STEP
LESS THAN 40 PSIG	2
GREATER THAN 50 PSIG	3
BETWEEN 40 PSIG <u>AND</u> 50 PSIG	4

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 2EDG Support Verification

(Page 2 of 5)

NOTE

Supplement Q, Local Manual Isolation of Turbine Building Service Water, is available for use.

**2. Raise SW Pressure:**

- a. Start additional SW pumps as necessary to obtain at least 40 psig SW header pressure

- a. IF all available SW pumps are running AND at least 40 psig can NOT be obtained, THEN isolate SW to the Turbine Building by closing:

- V6-16C, SW TURB BLDG ISO

OR

- V6-16A AND V6-16B, SW TURB BLDG SUPPLY

Perform Supplement M, Component Alignment For Loss Of SW To Turbine Building, while continuing with this procedure.

- b. Check SW header pressure - GREATER THAN 50 PSIG

- b. Go To Step 4.



STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 2EDG Support Verification

(Page 3 of 5)

## 3. Reduce SW Pressure:

- a. Check number of SW pumps running - GREATER THAN 2

- a. WHEN personnel are available, THEN locally perform Attachment 3, Throttling CCW Heat Exchanger SW Valves, while continuing with this procedure.

Go To Step 4.

- b. Stop 1 SW pump

- c. Check SW header pressure - GREATER THAN 50 PSIG

- c. Go To Step 3.e.

- d. Return To Step 3.a

- e. Check SW header pressure - GREATER THAN 40 PSIG

- e. WHEN personnel are available, THEN locally perform Attachment 3, Throttling CCW Heat Exchanger SW Valves, while continuing with this procedure.

Go To Step 4.

\* 4. Check The Following EDG Cooling Annunciators - EXTINGUISHED

- APP-010-E2,  
EDG A LUBE OIL  
HI/LO TEMP
- APP-010-E3,  
EDG B LUBE OIL  
HI/LO TEMP
- APP-010-F2,  
EDG A COOL WTR  
HI/LO TEMP
- APP-010-F3,  
EDG B COOL WTR  
HI/LO TEMP

Perform the following:

- a. Locally determine if a high temperature condition exists.
- b. IF a high temperature condition exists, THEN locally shutdown affected EDG by pressing EMERGENCY STOP button.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 2EDG Support Verification

(Page 4 of 5)

## 5. Check EDG Fuel Oil Supplies:

a. Check EMERG DG FUEL OIL PUMP  
for the running EDG(s) -  
RUNNING

a. Perform the following:

1) IF either fuel oil pump  
has tripped, THEN locally  
inspect the pump and  
wiring for damage.

2) IF required, THEN initiate  
emergency repairs to  
prevent loss of fuel to  
the EDG(s).

b. Check loss of AC power - DUE  
TO HIGH WIND

b. Go To Step 6.

c. Dispatch an operator to  
inspect the EDG FOST and  
Transfer Pumps for damage

6. Determine If A SW Booster Pump  
Should Be Started:

a. Check SW booster pumps - ALL  
STOPPED

a. Go To Step 7.

b. Check power available to  
start a SW booster pump

b. WHEN power is available, THEN  
do Step 6.c.

Go To Step 7.

SWBP A	MCC-16
SWBP B	MCC-18

c. Start one SW Booster Pump

7. Implement Supplement S.  
Emergency Diesel Generator  
Monitoring, While Continuing  
With This Procedure

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 2EDG Support Verification

(Page 5 of 5)

8. Notify The CRS Of EDG Support Status.

- END -

Attachment 3Throttling CCW Heat Exchanger SW Valves

(Page 1 of 2)

NOTE

Throttling of SW-739, CCW HEAT EXCHANGER "A" RETURN, and SW-740, CCW HEAT EXCHANGER "B" RETURN, shall be limited to position 1 (POS 1) with 2 CCW heat exchangers in service, and position 2 (POS 2) with one heat exchanger in service. This is to prevent exceeding the capability of 2 pumps during a 2 SW pump accident response. These valve positions will permit approximately 5000 gpm flow with 2 heat exchangers in operation (POS 1) and 10,000 gpm flow with 1 heat exchanger in operation (POS 2).

1. **Go To Appropriate Step For Heat Exchangers In Service:**
  - a. IF both CCW heat exchangers are in service, THEN Go To Step 2.
  - b. IF only "A" CCW heat exchanger is in service, THEN Go To Step 3.
  - c. IF only "B" CCW heat exchanger is in service, THEN Go To Step 4.
2. **Perform The Following To Restore SW Header Pressure To Between 40 PSIG And 50 PSIG:**
  - a. Throttle both of the following valves in 1/2 turn increments to establish SW pressure between 40 psig and 50 psig as indicated by PI-1619A:
    - SW-739, CCW HEAT EXCHANGER "A" RETURN
    - SW-740, CCW HEAT EXCHANGER "B" RETURN
  - b. Go To Step 5.
3. **Perform The Following To Restore SW Header Pressure To Between 40 PSIG And 50 PSIG:**
  - a. Throttle SW-739, CCW HEAT EXCHANGER "A" RETURN, to establish SW pressure between 40 psig and 50 psig as indicated by PI-1619A.
  - b. Go To Step 5.

Attachment 3Throttling CCW Heat Exchanger SW Valves

(Page 2 of 2)

4. Perform The Following To Restore SW Header Pressure To Between 40 PSIG And 50 PSIG:
  - a. Throttle SW-740, CCW HEAT EXCHANGER "B" RETURN, to establish SW pressure between 40 psig and 50 psig as indicated by PI-1619B.
5. Notify The CRS That SW Pressure Has Been Restored To Between 40 PSIG And 50 PSIG.

- END -

Attachment 4Establishing Letdown

(Page 1 of 1)

1. **Establish Letdown:**

## a. Close Letdown Orifice Valves:

- CVC-200A
- CVC-200B
- CVC-200C

## b. Open Letdown Line Isolation Valves:

- CVC-204A
- CVC-204B

## c. Open Letdown Line Stop Valves and return to AUTO:

- LCV-460A
- LCV-460B

## d. Place TC-144, Non-regen Heat Exchanger Outlet Temperature Controller, in AUTO

## e. Maintain adequate charging flow to Regen Heat Exchanger:

- Start additional Charging Pump(s) and adjust Speed Controllers as necessary.
- Adjust HIC-121, Charging Flow Control Valve, as necessary to maintain seal injection flow between 6 gpm and 20 gpm per RCP.

## f. Place PCV-145, Low Pressure Letdown Controller, in MANUAL and adjust to 45% to 55% open to limit pressure spike when opening letdown orifice isolation valves.

## g. Open Letdown Orifice Valve(s) to establish desired letdown flow:

- CVC-200A
- CVC-200B
- CVC-200C

h. WHEN Low Pressure Letdown pressure, as indicated on PI-145, is stable, THEN place PCV-145 in AUTO.

- END -

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 5Establishing Excess Letdown

(Page 1 of 2)

1. **Establish Excess Letdown:**

- a. Open CCW from excess letdown heat exchanger, CC-739
  - b. Close excess letdown flow control valve, HCV-137
  - c. Place excess letdown divert valve, CVC-389, to RCDT
  - d. Check if seal return flow - ESTABLISHED
  - d. WHEN seal return flow is established, THEN excess letdown divert valve, CVC-389, may be placed to VCT if desired.
- Continue With Step 1.f.
- e. Place excess letdown divert valve, CVC-389, to VCT if desired
  - f. Slowly open excess letdown flow control valve, HCV-137
  - g. Close excess letdown flow control valve, HCV-137
  - h. Open excess letdown stop valve, CVC-387
  - i. Slowly open excess letdown flow controller, HCV-137
  - j. Maintain excess letdown heat exchanger outlet temperature, TI-139 - LESS THAN 195°F

(CONTINUED NEXT PAGE)

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 5Establishing Excess Letdown

(Page 2 of 2)

## 1. (CONTINUED)

k. Check if normal letdown -  
ESTABLISHED

k. Perform the following:

- 1) Continue efforts to  
establish normal letdown.

WHEN normal letdown is  
established, THEN stop  
excess letdown:

- a) Close excess letdown  
flow control valve,  
HCV-137.

- b) Close excess letdown  
stop valve, CVC-387

- 2) Return To procedure and  
step in effect.

## 1. Stop excess letdown:

- 1) Close excess letdown flow  
control valve, HCV-137
- 2) Close excess letdown stop  
valve, CVC-387

- END -



STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 6Establishing Aux Spray Without SI

(Page 1 of 2)

1. Check Charging Pumps - At LEAST ONE RUNNING      Start at least one charging pump.
2. Open Aux Spray Valve, CVC-311
3. Close Loop Charging Valves:
  - CVC-310A
  - CVC-310B
4. Adjust Charging Pump Speed As Necessary To Maintain Proper Seal Injection Flow
5. Open HIC-121, Charging Flow Control Valve, As Necessary To Lower RCS Pressure

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 6Establishing Aux Spray Without SI

(Page 2 of 2)

NOTE

Supplement K, Auxiliary Spray Enhancement, may be used for optimizing Auxiliary Spray.

**6. Control RCS Pressure:**

- a. Perform the following to terminate aux spray:

1) Open loop charging valve,  
CVC-310B or CVC-310A

2) Close aux spray valve,  
CVC-311

2) Isolate aux spray line:

a) Minimize charging.

b) Close HIC-121, charging  
flow control valve.

c) Adjust charging pump  
speed to maintain  
proper seal injection  
flow.

d) Go To Step 6.b.

3) Adjust charging pump speed  
and charging flow control  
valve, HIC-121, as  
necessary to maintain  
proper seal injection and  
charging flow

- b. Return To Step 2 to  
reinitiate aux spray as  
desired

- END -

Attachment 7DC Bus Or Instrument Bus Failure

(Page 1 of 2)

1. IF DC Bus failure has occurred, THEN perform the following:
  - a. IF DC Bus A fails, THEN perform the following:
    - 1) In the Charging Pump Room, open CVC-358, RWST TO CHARGING PUMP SUCTION.
    - 2) WHEN CVC-358 is open, THEN close LCV-115C, VCT Outlet from RTGB.
    - 3) In the E-1/E-2 Room, transfer Instrument Bus 2 to MCC-8.
    - 4) In the 4160V Bus Room, trip the Exciter Field Breaker.
    - 5) In EDG A Room perform the following:
      - Trip EDG A Fuel Racks.
      - Close DA-21A AND DA-25A, DG "A" AIR START OUTLET ISOLATION valves.
  - b. IF DC Bus B fails, THEN perform the following:
    - 1) In the E-1/E-2 Room, transfer Instrument Bus 3 to MCC-8.
    - 2) In EDG B Room, perform the following:
      - Trip EDG B Fuel Racks.
      - Close DA-21B AND DA-25B, DG "B" AIR START OUTLET ISOLATION valves.
    - 3) Close LCV-460 A & B, LTDN LINE STOPs.
2. IF MCC-5 is NOT energized, THEN perform the following:
  - a. Verify DS bus is energized.
  - b. Transfer power source to DS Bus using the posted instructions at the Kirk Key Interlocked Breakers.
  - c. Locally reset and load instrument air compressor A (MCC-5 CMPT 7M).

Attachment 7DC Bus Or Instrument Bus Failure

(Page 2 of 2)

3. IF Instrument Bus failure has occurred, THEN perform the following:
- a. IF Instrument Bus 4 fails, THEN maintain Steam Dump in the Tavg Mode.
  - b. IF a failure of only ONE of the below Instrument Busses occurs, THEN transfer the failed bus to MCC-8.
    - Instrument Bus 1
    - Instrument Bus 2
    - Instrument Bus 3
    - Instrument Bus 4
  - c. IF more than ONE Instrument Bus requires transfer to MCC-8 for Nuclear Safety Concerns, THEN strip the affected Busses using the applicable Attachment, Load Shed Listing For Instrument Buses, of AOP-024, Loss of Instrument Bus, prior to transferring the Buss(es) to MCC-8.

- END -

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 8Aligning Balance Of Plant

(Page 1 of 2)

**1. Shutdown Unnecessary Plant Equipment:**

- a. Stop all but one main feed pump
- b. Stop all heater drain pumps
- c. Stop all but one condensate pump
- d. Stop circulating water pump(s) as desired

**2. Check Main Turbine Status:****a. Check the following valves - OPEN:**

- DV-1, DV-2, DV-3, and DV-4, main steam drain valves
- DV-5, first stage drain valve
- DV-6, moisture separator A drain valve
- DV-7, moisture separator B drain valve

**a. Manually open valve(s) as necessary.****b. Check the following pumps - RUNNING**

- Turning gear pump
- Seal oil backup pump

**b. Manually start pump(s) as necessary.****IF any pump can NOT be started, THEN start emergency oil pump.****c. Place both EH oil pumps in the PULL-TO-LOCK:**

- Gov fluid pump A
- Gov fluid pump B

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

Attachment 8Aligning Balance Of Plant

(Page 2 of 2)

\* 3. Check Bearing Oil Lift Pump  
Status:

a. Check turbine speed - LESS  
THAN 600 RPM

a. WHEN turbine speed is less  
than 600 rpm, THEN do  
Step 3.b.

Go To Step 4.

b. Check bearing oil lift pump -  
RUNNING

b. Manually start pump.

\* 4. Check The Turbine Goes On The  
Turning Gear ONE MINUTE After  
Zero Speed Alarm Is Received

IF bearing oil pressure  
(PI-2096A) is greater than  
6 psig AND the bearing oil lift  
pump is running, THEN manually  
engage the Turning Gear:

a. Place the turning gear switch  
in the OFF position.

b. Locally place the TURNING  
GEAR ENG/DISENG LEVER in the  
ENGAGED position.

c. Place the turning gear switch  
in MANUAL.

IF the turning gear and bearing  
oil lift pumps are NOT running,  
THEN contact Engineering for  
instructions for placing the  
turbine on turning gear.

- END -

**EOP-ES-0.1, Revision 4**  
**PRR 556380**  
**Summary Of Changes**

Foldout Step 1	Corrected typo in PZR level setpoint from 21% to 7%.
-------------------	------------------------------------------------------

**CONTINUOUS ACTION SUMMARY FOR EOP-ES-0.1****1. Check RCS Temperatures: (while in this procedure)**

- With any RCP running, RCS average temperature -  
STABLE AT OR TRENDING TO 547°F
- OR
- With NO RCPs running, RCS cold leg temperatures -  
STABLE AT OR TRENDING TO 547°F

**3. Check S/G Levels:**

Maintain total feed flow greater than 300 gpm  
until narrow range level is greater than 8% in  
at least one S/G.

Control feed flow to maintain narrow range levels -  
BETWEEN 8% AND 50%

**4. Check All AC Busses - ENERGIZED BY OFFSITE POWER**

IF any AC emergency buss(es) are NOT energized by  
offsite power, THEN perform the following:

Verify EDG(s) running and loaded with proper cooling.

Try to restore offsite power.

Locally load equipment as necessary.

Periodically check status of spent fuel pool until  
SFP cooling is restored:

- Fuel pool level
- Fuel pool temperature



**CONTINUOUS ACTION SUMMARY FOR EOP-ES-0.1****1. Check RCS Temperatures: (while in this procedure)**

- With any RCP running, RCS average temperature -  
STABLE AT OR TRENDING TO 547°F
- OR
- With NO RCPs running, RCS cold leg temperatures -  
STABLE AT OR TRENDING TO 547°F

**3. Check S/G Levels:**

Maintain total feed flow greater than 300 gpm  
until narrow range level is greater than 8% in  
at least one S/G.

Control feed flow to maintain narrow range levels -  
BETWEEN 8% AND 50%

**4. Check All AC Busses - ENERGIZED BY OFFSITE POWER**

IF any AC emergency buss(es) are NOT energized by  
offsite power, THEN perform the following:

Verify EDG(s) running and loaded with proper cooling.

Try to restore offsite power.

Locally load equipment as necessary.

Periodically check status of spent fuel pool until  
SFP cooling is restored:

- Fuel pool level
- Fuel pool temperature

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM E  
Rev 0**

**Verify Phase B Containment Isolation and CV Spray Alignment**

**Concurred By:** Patrick Lathrop **Date:** 5/15/13  
Operations

**Approved By:** James Conder **Date:** 6/5/13  
Superintendent/Supervisor - Training

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**Task:** 01000151705, Perform Auto Action Verification IAW EOP-E-0.

**Alternate Path:**

YES

**JPM #:**

ILC-13 NRC JPM E

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

026 A4.01                      4.5 / 4.3

103 A3.01                      3.9 / 4.2

**Task Standard:**

Align Phase B Isolation Valves and CV Spray Valves IAW EOP-E-0.

**Preferred Evaluation Location:**

Simulator   X      In-Plant       

**Preferred Evaluation Method:**

Perform   X      Simulate       

**References:**

EOP-E-0

**Validation Time:** 6 Minutes **Time Critical:** No **Time Critical Time:** N/A

---

**Candidate:**

\_\_\_\_\_  
Name

SSN

-

-

(N/A if not time  
critical)

\_\_\_\_\_  
**Overall  
Time**

\_\_\_\_\_  
**Critical  
Time**

Start: \_\_\_\_\_

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

Finish: \_\_\_\_\_

**Performance Rating:**  
circle one

SAT

UNSAT

**Performance  
Time (min):** \_\_\_\_\_

**Examiner:**

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

COMMENTS

**Step 3** Critical since at least one SI-880 valve per train must be opened to provide spray flow.

---

**Step 5** Critical since manual action is required to obtain the desired SAT flow.

---

**Step 6** Critical since manual actions are required to close the Phase B valves that should have automatically closed.

---

**Step 7** Critical since stopping the RCPs is required due to component cooling water being isolated to all RCPs.

---

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Initialize the simulator to IC-915
2. Go to RUN ensure plant conditions are stable, acknowledge alarms and FREEZE.
3. An extra instructor will be needed to acknowledge alarms that do not apply to this JPM.
4. Place simulator in RUN when directed by the examiner.

**Tools/Equipment/Procedures Needed:**

Markup of EOP-E-0 up to step 9

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. Plant was initially at 100% RTP when a Large Break LOCA occurred.
2. Automatic Reactor Trip and Safety Injection actuated.
3. EOP-E-0 has been implemented.
4. EOP-E-0, Step 9.a "CV pressure – HAS REMAINED LESS THAN 10 PSIG" has been answered as "NO."

**INITIATING CUES:**

The CRS has directed you to perform the RNO steps of EOP-E-0, Step 9.a.

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

<p><b><u>STEP 1:</u></b> Check CV spray actuated. (RNO Step 9.a.1)</p> <p><b><u>STANDARD:</u></b> Candidate observes that the CV Spray signal has initiated by observing annunciator APP-002-D1, SPRAY ACTUATION and bistables for the CV High-High Pressure are illuminated.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> Candidate may observe that neither CV Spray Pump is running and take action to start both pumps at this time,</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 2:</u></b> Verify the following: a) Both CV Spray pumps are running. (RNO Step 9.a.2.a)</p> <p><b><u>STANDARD:</u></b> Candidate determines that both CV Spray Pumps are operating by observing the RED on light illuminated and the GREEN off light extinguished.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> Candidate may note that FI-958A/B, Spray Header Flow, is reading zero flow.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



**CRITICAL**  
**STEP**

- SAT

- \_\_\_ UNSAT

**STANDARD:** Candidate observes that all SI-880 valves are closed as indicated by the RED open light extinguished and GREEN shut light illuminated. Candidate takes manual action to open all SI-880 valves by placing the individual valve control switches momentarily to the OPEN position. Candidate monitors valves and verifies they are all open as indicated by the RED open lights illuminated and the GREEN shut lights extinguished.

COMMENTS:

NONE

<p><b><u>STEP 4:</u></b> Verify the following:              c) CV spray additive tank discharge valves are open:                  • SI-845A                  • SI-845B          (RNO Step 9.a.2.c)</p> <p><b><u>STANDARD:</u></b> Candidate observes that SI-845A and SI-845B are open as indicated by the RED light illuminated and GREEN light extinguished.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 5:</u></b> Verify the following:              d) Spray additive tank flow is approximately 12 gpm:                  • Adjust SI-845C, SAT throttling valve, as necessary.          (RNO Step 9.a.2.d)</p> <p><b><u>STANDARD:</u></b> Candidate observes flow indicator FI-949, Spray Additive Flow, and throttles valve SI-845C to reduce flow to approximately 12 gpm.          (Tolerance 8 – 16 gpm)</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> SI-845C is a throttle valve and will have to be manipulated to reduce the Spray Additive Tank flow to ~ 12 gpm.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 6:</u></b> Verify Containment Isolation Phase B valves are closed. (RNO Step 9.a.3)</p> <p><b><u>STANDARD:</u></b> Candidate observes that the following Phase B isolation valves are Open:  CCW-716A, CCW-716B, CCW-730, CCW-735, FCV-626, CVC-381.</p> <p>This observation can be made by the individual valve(s) indication on the RTGB, the Containment Phase B status panel, SPDS Containment status or by use of Supplement B for Phase B and CV Spray Component Alignment.</p> <p>The candidate will close the following valves :</p> <p>CCW-716A, CCW-716B, CCW-730, CCW-735, FCV-626, CVC-381 by positioning the control switches for each valve to the Close position and observing the GREEN closed indication illuminated and the RED open indication extinguished.</p> <p>The candidate can verify the Phase B isolation by observing the Phase B Status Panel on the RTGB or SPDS Containment status.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------

<p><b><u>STEP 7:</u></b> Stop all RCPs. (RNO Step 9.a.4)</p> <p><b><u>STANDARD:</u></b> Candidate observes all of the RCPs operating and secures each RCP by placing the control switches for RCP A, B and C to the Stop position and observing the GREEN stop indication illuminated and the RED Start indication extinguished.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> Candidate may note earlier in the JPM that the RCPs need to be stopped and secure them prior to reaching this step in EOP-E-0 due to meeting EOP-E-0 Foldout RCP trip criteria.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 8:</u></b> Observe CAUTION prior to Step 10 and Go to Step 10 (RNO Step 9.a.5)</p> <p><b><u>STANDARD:</u></b> Candidate reads step and determines that Step 9 is complete.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b><u>END OF TASK</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>Terminating Cue:</b> When CV Spray properly aligned, all Containment Phase B valves manually closed and all RCPs secured.</p>	

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. Plant was initially at 100% RTP when a Large Break LOCA occurred.
2. Automatic Reactor Trip and Safety Injection actuated.
3. EOP-E-0 has been implemented.
4. EOP-E-0, Step 9.a "CV pressure – HAS REMAINED LESS THAN 10 PSIG" has been answered as "NO."

**INITIATING CUES:**

The CRS has directed you to perform the RNO steps of EOP-E-O, Step 9.a.

# **CONTINUOUS USE**

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3

PART 4

EMERGENCY OPERATING PROCEDURE

EOP-E-0

REACTOR TRIP OR SAFETY INJECTION

REVISION 2

Purpose and Entry Conditions

(Page 1 of 4)

1. PURPOSE

This procedure provides actions to verify the proper response of the automatic protection systems following the manual or automatic actuation of a reactor trip or safety injection, to assess plant conditions, and to identify the appropriate recovery procedure.

Purpose and Entry Conditions

(Page 2 of 4)

**2. SYMPTOMS AND ENTRY CONDITIONS**

- a. The following are symptoms that require a reactor trip, if one has not occurred:

REACTOR TRIP SIGNAL	LOGIC (INTERLOCK)	SETPOINT
SR High Flux	1/2 (P-6 and P-10)	10 <sup>5</sup> CPS
IR High Flux	1/2 (P-10)	Current equal to 25%
PR High Flux Low Range	2/4 (P-10)	24%
PR High Flux High Range	2/4	108%
PZR High Pressure	2/3	2376 psig
PZR Low Pressure	2/3 (P-7)	1844 psig
PZR High Level	2/3 (P-7)	91%
Low RCS Flow	2/3 on 2/3 (P-7) 1/3 (P-8)	94.68% rated flow
RCP Breaker	1/1 on 2/3 (P-7) 1/3 (P-8)	Open
RCP Bus Undervoltage	2/3 busses (P-7)	75% (3120 volts)
Over Temperature $\Delta T$	2/3	Variable
Over Power $\Delta T$	2/3	Variable
Safety Injection	Auto or Manual	N/A
Turbine Trip	2/2 SV or 2/3 AST (P-8)	N/A
Low-Low S/G Level	2/3 on 1/3	16%
Low S/G Level With Steam Flow > Feed Flow	1/2 on 1/3 1/2 on 1/3	30% 0.64 x 10 <sup>6</sup> lbm/hr

(CONTINUED NEXT PAGE)



Purpose and Entry Conditions

(Page 3 of 4)

## 2. (CONTINUED)

b. The following are symptoms of a reactor trip:

- o Any valid reactor trip annunciator illuminated.
- o Rapid reduction in neutron level indicated by nuclear instrumentation.
- o All shutdown and control rods fully inserted.
- o Rod bottom lights illuminated.

c. The following are symptoms that require a reactor trip and safety injection, if one has not occurred:

SAFETY INJECTION SIGNAL	LOGIC	SETPOINT
Low PZR Pressure	2/3	1715 psig
High Containment Pressure	2/3	4 psig
High Steam Line $\Delta P$	2/3 on 1/3	100 psid
High Steam Flow With: <ul style="list-style-type: none"> <li>• Low S/G Pressure</li> <li><u>OR</u></li> <li>• Low Tavg</li> </ul>	1/2 on 2/3 2/3 lines <u>OR</u> 2/3 loops	Variable 614 psig <u>OR</u> 543°F

d. The following are symptoms of a reactor trip and safety injection:

- o Any valid SI annunciator illuminated.
- o SI pumps running.
- o RHR pumps running.

(CONTINUED NEXT PAGE)

Purpose and Entry Conditions

(Page 4 of 4)

## 2. (CONTINUED)

e. This procedure should also be entered:

- Anytime a manual reactor trip or safety injection is actuated.

OR

- Anytime an SI is actuated or required while in Mode 3.

- END -

**1. RCP TRIP CRITERIA**

IF either condition listed below occurs, THEN trip all RCPs:

- Containment Isolation Phase B - ACTUATED  
OR
- BOTH of the following satisfied:
  - SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW  
AND
  - RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F]

**2. FAULTED S/G AFW ISOLATION CRITERIA**

IF both conditions listed below are met,

- Any S/G pressure is lowering in an uncontrolled manner  
OR has completely depressurized  
AND

- Any S/G is NOT faulted

THEN perform the following:

- a. Reset SI.
- b. Close steam driven AFW pump discharge valve for faulted S/G(s):
  - V2-14A (S/G A)
  - V2-14B (S/G B)
  - V2-14C (S/G C)
- c. Close AFW header discharge valve for faulted S/G(s):
  - V2-16A (S/G A)
  - V2-16B (S/G B)
  - V2-16C (S/G C)
- d. Perform Attachment 2, Deenergizing AFW Valves For Faulted S/G(s).
- e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 3, DC Bus Or Instrument Bus Failure.

**5. SPENT FUEL POOL COOLING CRITERIA**

IF offsite power is lost, THEN periodically monitor spent fuel pool level and temperature until SFP cooling is restored.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

Steps 1 through 4 are IMMEDIATE ACTION steps.

~~1.~~**Check Reactor Trip:**

Manually trip reactor.

~~1.~~Reactor trip and bypass  
breakers - OPENIF reactor power is greater than  
or equal to 5% OR intermediate  
range SUR is positive, THEN Go  
To FRP-S.1, Response To Nuclear  
Power Generation/ATWS, Step 1.~~1.~~Rod position indicators - AT  
ZERO~~1.~~Rod Bottom lights -  
ILLUMINATED~~1.~~

Neutron flux - LOWERING

~~2.~~**Check Turbine Trip:**~~a.~~Both turbine stop valves -  
CLOSED

a. Manually trip turbine.

IF turbine will NOT trip,  
THEN manually run back  
turbine at maximum rate until  
all governor valves are  
closed.IF turbine can NOT be run  
back, THEN manually close  
MSIVs and MSIV bypass valves.~~b.~~Close MSR purge and shutoff  
valvesb. IF loss of power prevents MSR  
isolation, THEN manually  
close MSIV and MSIV bypass  
valves.

**1. RCP TRIP CRITERIA**

IF either condition listed below occurs, THEN trip all RCPs:

- Containment Isolation Phase B - ACTUATED  
OR
- BOTH of the following satisfied:
  - SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW  
AND
  - RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F]

**2. FAULTED S/G AFW ISOLATION CRITERIA**

IF both conditions listed below are met,

- Any S/G pressure is lowering in an uncontrolled manner  
OR has completely depressurized

AND

- Any S/G is NOT faulted

THEN perform the following:

- a. Reset SI.
- b. Close steam driven AFW pump discharge valve for faulted S/G(s):
  - V2-14A (S/G A)
  - V2-14B (S/G B)
  - V2-14C (S/G C)
- c. Close AFW header discharge valve for faulted S/G(s):
  - V2-16A (S/G A)
  - V2-16B (S/G B)
  - V2-16C (S/G C)
- d. Perform Attachment 2, Deenergizing AFW Valves For Faulted S/G(s).
- e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 3, DC Bus Or Instrument Bus Failure.

**5. SPENT FUEL POOL COOLING CRITERIA**

IF offsite power is lost, THEN periodically monitor spent fuel pool level and temperature until SFP cooling is restored.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

~~3.~~

Check Power To AC Emergency  
Busses:

~~a.~~

E-1 or E-2 - AT LEAST ONE  
ENERGIZED

a. Go To EPP-1, Loss Of All AC  
Power, Step 1.

~~b.~~

E-1 and E-2 - BOTH ENERGIZED

b. WHEN time permits, THEN try  
to restore power to  
deenergized AC emergency bus.

Continue With Step 4.

**1. RCP TRIP CRITERIA**

IF either condition listed below occurs, THEN trip all RCPs:

- Containment Isolation Phase B - ACTUATED  
OR
- BOTH of the following satisfied:
  - SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW  
AND
  - RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F]

**2. FAULTED S/G AFW ISOLATION CRITERIA**

IF both conditions listed below are met,

- Any S/G pressure is lowering in an uncontrolled manner  
OR has completely depressurized

AND

- Any S/G is NOT faulted

THEN perform the following:

- a. Reset SI.
- b. Close steam driven AFW pump discharge valve for faulted S/G(s):
  - V2-14A (S/G A)
  - V2-14B (S/G B)
  - V2-14C (S/G C)
- c. Close AFW header discharge valve for faulted S/G(s):
  - V2-16A (S/G A)
  - V2-16B (S/G B)
  - V2-16C (S/G C)
- d. Perform Attachment 2, Deenergizing AFW Valves For Faulted S/G(s).
- e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 3, DC Bus Or Instrument Bus Failure.

**5. SPENT FUEL POOL COOLING CRITERIA**

IF offsite power is lost, THEN periodically monitor spent fuel pool level and temperature until SFP cooling is restored.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

~~4.~~ Check SI Status:~~a.~~ Check if SI is actuated:~~SI annunciators - ANY  
ILLUMINATED~~OR~~SI equipment - AUTO  
STARTED~~

a. Check if SI is required:

- PZR pressure less than 1715 psig

OR

- Containment pressure greater than 4 psig

OR

- Steam line  $\Delta P$  bistables illuminated

OR

- High steam flow with low Tavg or low steam pressure bistables illuminated

IF SI is required, THEN  
manually actuate BOTH trains  
of SI.

IF SI is NOT required, THEN  
perform the following:

- 1) Reset SPDS and initiate monitoring of Critical Safety Functions Status Trees.
- 2) Go To EOP-ES-0.1, Reactor Trip Response, Step 1.

b. Manually actuate BOTH trains of SI.

~~b.~~ Check BOTH trains of SI -  
ACTUATED~~SI pumps - BOTH RUNNING~~~~RHR pumps - BOTH RUNNING~~



**1. RCP TRIP CRITERIA**

IF either condition listed below occurs, THEN trip all RCPs:

- Containment Isolation Phase B - ACTUATED  
OR
- BOTH of the following satisfied:
  - SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW  
AND
  - RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F]

**2. FAULTED S/G AFW ISOLATION CRITERIA**

IF both conditions listed below are met,

- Any S/G pressure is lowering in an uncontrolled manner  
OR has completely depressurized

AND

- Any S/G is NOT faulted

THEN perform the following:

- a. Reset SI.
- b. Close steam driven AFW pump discharge valve for faulted S/G(s):
  - V2-14A (S/G A)
  - V2-14B (S/G B)
  - V2-14C (S/G C)
- c. Close AFW header discharge valve for faulted S/G(s):
  - V2-16A (S/G A)
  - V2-16B (S/G B)
  - V2-16C (S/G C)
- d. Perform Attachment 2, Deenergizing AFW Valves For Faulted S/G(s).
- e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 3, DC Bus Or Instrument Bus Failure.

**5. SPENT FUEL POOL COOLING CRITERIA**

IF offsite power is lost, THEN periodically monitor spent fuel pool level and temperature until SFP cooling is restored.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

FOLDOUT for EOP-E-0 is in effect.

5. Perform Attachment 1, Auto  
Action Verification, While  
Continuing With This Procedure

6. Check AFW Pumps - RUNNING

a. Motor driven AFW pumps - BOTH  
RUNNING

b. S/G levels - TWO S/Gs LESS  
THAN 16%

a. Manually start pump(s) as  
necessary.

b. IF two S/G levels lower to  
less than 16%, THEN do  
Step 6.c.

Continue With Step 7.

c. Steam driven AFW pump steam  
shutoff valves - ALL OPEN

c. Manually open valve(s) as  
necessary.

7. Check AFW Valves - PROPER  
EMERGENCY ALIGNMENT

Manually align valve(s) as  
necessary.

AFW header discharge  
valves - FULL OPEN

AFW header section valves -  
FULL OPEN

Steam driven AFW pump  
discharge valves - FULL OPEN  
IF PUMP RUNNING

**1. RCP TRIP CRITERIA**

IF either condition listed below occurs, THEN trip all RCPs:

- Containment Isolation Phase B - ACTUATED  
OR
- BOTH of the following satisfied:
  - SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW  
AND
  - RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F]

**2. FAULTED S/G AFW ISOLATION CRITERIA**

IF both conditions listed below are met,

- Any S/G pressure is lowering in an uncontrolled manner  
OR has completely depressurized  
AND

- Any S/G is NOT faulted

THEN perform the following:

- a. Reset SI.
- b. Close steam driven AFW pump discharge valve for faulted S/G(s):
  - V2-14A (S/G A)
  - V2-14B (S/G B)
  - V2-14C (S/G C)
- c. Close AFW header discharge valve for faulted S/G(s):
  - V2-16A (S/G A)
  - V2-16B (S/G B)
  - V2-16C (S/G C)
- d. Perform Attachment 2, Deenergizing AFW Valves For Faulted S/G(s).
- e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 3, DC Bus Or Instrument Bus Failure.

**5. SPENT FUEL POOL COOLING CRITERIA**

IF offsite power is lost, THEN periodically monitor spent fuel pool level and temperature until SFP cooling is restored.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*\*\*\*\*

CAUTION

\*\*\*\*\*

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

\*\*\*\*\*

~~8.~~ Check Total AFW Flow:

~~a.~~ Reset SI

~~b.~~ Control feed flow to maintain  
NON-faulted S/G(s) narrow  
range level - BETWEEN  
8% [18%] AND 50%

~~c.~~ Check total AFW flow -  
GREATER THAN 300 GPM

c. IF S/G narrow range level is  
greater than 8% [18%] in any  
S/G, THEN control feed flow  
to maintain narrow range  
level.

IF narrow range level is less  
than 8% [18%] in all S/Gs,  
THEN perform the following:

1) Manually start pumps and  
align valves as necessary.

2) IF AFW flow greater than  
300 gpm can NOT be  
established, THEN perform  
the following:

a) Reset SPDS and initiate  
monitoring of Critical  
Safety Functions Status  
Trees.

b) Go To FRP-H.1, Response  
To Loss Of Secondary  
Heat Sink, Step 1.

**1. RCP TRIP CRITERIA**

IF either condition listed below occurs, THEN trip all RCPs:

- Containment Isolation Phase B - ACTUATED  
OR
- BOTH of the following satisfied:
  - SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW  
AND
  - RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F]

**2. FAULTED S/G AFW ISOLATION CRITERIA**

IF both conditions listed below are met,

- Any S/G pressure is lowering in an uncontrolled manner  
OR has completely depressurized

AND

- Any S/G is NOT faulted

THEN perform the following:

- a. Reset SI.
- b. Close steam driven AFW pump discharge valve for faulted S/G(s):
  - V2-14A (S/G A)
  - V2-14B (S/G B)
  - V2-14C (S/G C)
- c. Close AFW header discharge valve for faulted S/G(s):
  - V2-16A (S/G A)
  - V2-16B (S/G B)
  - V2-16C (S/G C)
- d. Perform Attachment 2, Deenergizing AFW Valves For Faulted S/G(s).
- e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 3, DC Bus Or Instrument Bus Failure.

**5. SPENT FUEL POOL COOLING CRITERIA**

IF offsite power is lost, THEN periodically monitor spent fuel pool level and temperature until SFP cooling is restored.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

\* 9. Check CV Spray NOT Required:

a. CV pressure - HAS REMAINED  
LESS THAN 10 PSIG

a. Perform the following:

1) Check CV spray actuated.

IF CV spray is NOT  
actuated, THEN manually  
actuate BOTH trains of CV  
spray.

2) Verify the following:

a) Both CV spray pumps are  
running.

b) CV spray pump discharge  
valves are open:

- SI-880A
- SI-880B
- SI-880C
- SI-880D

c) CV spray additive tank  
discharge valves are  
open:

- SI-845A
- SI-845B

d) Spray additive tank  
flow is approximately  
12 gpm:

- Adjust SI-845C, SAT  
throttling valve,  
as necessary.

3) Verify Containment  
Isolation Phase B valves  
are closed.

4) Stop all RCPs.

5) Observe CAUTION prior to  
Step 10 and Go To Step 10.

(CONTINUED NEXT PAGE)

**1. RCP TRIP CRITERIA**

IF either condition listed below occurs, THEN trip all RCPs:

- Containment Isolation Phase B - ACTUATED  
OR
- BOTH of the following satisfied:
  - SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW  
AND
  - RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F]

**2. FAULTED S/G AFW ISOLATION CRITERIA**

IF both conditions listed below are met,

- Any S/G pressure is lowering in an uncontrolled manner  
OR has completely depressurized  
AND

- Any S/G is NOT faulted

THEN perform the following:

- a. Reset SI.
- b. Close steam driven AFW pump discharge valve for faulted S/G(s):
  - V2-14A (S/G A)
  - V2-14B (S/G B)
  - V2-14C (S/G C)
- c. Close AFW header discharge valve for faulted S/G(s):
  - V2-16A (S/G A)
  - V2-16B (S/G B)
  - V2-16C (S/G C)
- d. Perform Attachment 2. Deenergizing AFW Valves For Faulted S/G(s).
- e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.

**3. AFW SUPPLY SWITCHOVER CRITERIA**

IF CST level lowers to less than 10%, THEN switch to backup water supply using OP-402, Auxiliary Feedwater System.

**4. DC BUS, INSTRUMENT BUS, OR MCC-5 FAILURE CRITERIA**

IF DC bus A, DC bus B, any instrument bus, or MCC-5 is deenergized, THEN perform Attachment 3, DC Bus Or Instrument Bus Failure.

**5. SPENT FUEL POOL COOLING CRITERIA**

IF offsite power is lost, THEN periodically monitor spent fuel pool level and temperature until SFP cooling is restored.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. (CONTINUED)

b. CV spray - NOT ACTUATEDb. IF CV spray inadvertently actuated, THEN perform the following:

- 1) Stop all RCPs.
- 2) Override containment spray signal:
  - Place Containment Spray key switch to OVRD/RESET.
- 3) Reset containment isolation Phase B.
- 4) Stop CV spray pumps.
- 5) Close CV spray pump discharge valves:
  - SI-880A
  - SI-880B
  - SI-880C
  - SI-880D
- 6) Close CV spray additive tank discharge valves:
  - SI-845A
  - SI-845B



# **LICENSE EXAMINATION JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM F  
Rev. 0**

Operation with High Switchyard Voltage

<b>Concurred By:</b>	<u>Kirk Schauer</u> Operations	<b>Date:</b> <u>5/15/13</u>
<b>Approved By:</b>	<u>James Conder</u> Superintendent/Supervisor - Training	<b>Date:</b> <u>6/5/13</u>

Date \_\_\_\_\_

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

## COMMENTS

**Step 21** is critical because the Synchroscope Key must be placed in the proper switch.

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**Step 22** is critical because the Synchroscope Key Switch must be selected to Bus 3 & 4 position.

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**Step 24** is critical because closing BKR 52/19 will transfer load to the SUT in an attempt to lower voltage on Bus E-2.

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**Step 27** is critical because BKR 52/20 should have AUTO-OPENED when BKR 52/19 was CLOSED. Manual action by the operator is required to unparallel the SUT and UAT.

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**SIMULATOR OPERATOR INSTRUCTIONS:**

1. IC 916
2. SCN: 009\_ILC\_13\_NRC\_CR\_JPM\_F (Not needed. All malfunctions snapped into IC.)
3. AOP-031 performed and marked up to step 21.
4. Reset to IC 916 and place in Run, clear alarms and then place in Freeze.
5. Bring up QP E1E2 at the BOP Desk.
6. Place simulator to Run when Candidate assumes the watch.

**Tools/Equipment/Procedures Needed:**

AOP-031 marked up to step 21

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. Plant is at 100% power.
2. Due to abnormal conditions on the Grid, 480V Bus E-2 currently exceeds 505 Volts.
3. AOP-031, Operation with High Switchyard Voltage, has been completed up to step 21.
4. You are the BOP.
5. "D" IAC is in service with "A" and "B" IACs in AUTO.
6. The DSDG is secured and aligned for AUTO.
7. The Load on Emergency Bus E-1 has NOT been altered since entering this AOP.

**INITIATING CUES:**

The CRS has directed you to continue with AOP-031 until 480V Bus E-2 voltage is restored to less than 505 Volts.

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

<p><b><u>STEP 1:</u></b> Check Emergency Bus E-2 Voltage – Greater than 505 Volts (Step 21).</p> <p><b><u>STANDARD:</u></b> Candidate Determines that Bus E-2 Voltage is approximately 506.4 volts as indicated on ERFIS.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>NOTE:</u></b> Transferring the following safety related components will cause voltage to rise. This step is designed to protect components.</p>	
<p><b><u>STEP 2:</u></b> Check Instrument Air as follows:</p> <p>a. Check Instrument Air Compressor B – Running in Manual (Step 22.a.) RNO: Go to Step 23</p> <p><b><u>STANDARD:</u></b> Candidate determines that Instrument Air Compressor B is in AUTO as stated in the Cue. Candidate progresses to RNO: Go to Step 23.</p> <p><b>EXAMINER'S CUE:</b> If candidate request status of IAC B, remind the candidate that the Cue sheet stated that IACs "A" and "B" were in AUTO.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 3:</u></b> Check EDG "B" Status as Follows:  a. Check Main Generator – ON LINE  (Step 23.a.)</p> <p><b><u>STANDARD:</u></b> Candidate determines that the Main Generator is ON Line based on Plant Conditions and Cue Sheet.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 4:</u></b> Check EDG "B" Status as Follows:  b. Check EMERGENCY DIESEL GENERATOR B - RUNNING  (Step 23.b.)</p> <p><b><u>STANDARD:</u></b> Determines that "B" EDG is NOT running</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



<p><b><u>STEP 5:</u></b> Check EDG "B" Status as Follows:</p> <p>b. RNO: Postpone EDG "B" testing while in the AOP. Go to Step 24. Check EMERGENCY DIESEL GENERATOR B - RUNNING (Step 23.b. RNO)</p> <p><b><u>STANDARD:</u></b> Candidate transitions to Step 24.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 6:</u></b> Log the Time That Any of the Following Equipment Is OR Was Running Above 505 Volts.</p> <ul style="list-style-type: none"> <li>• INSTRUMENT AIR COMPRESSOR B</li> <li>• EDG B PRE-LUBE OIL PUMP</li> <li>• Fuel Oil Transfer Pump B (Step 24)</li> </ul> <p><b><u>STANDARD:</u></b> Determines that NONE of these components are running.</p> <p><b>EXAMINER'S CUE:</b> Inform candidate that another candidate will track the run times.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 7:</u></b> Check Load On Emergency Bus E-1 – HAS BEEN RAISED USING STEP 18. (Step 25) Go to Step 27 (Step 25 RNO)</p> <p><b><u>STANDARD:</u></b> Candidate determines that load on Emergency Bus E-1 has NOT been raised based on information given in the Cue.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 8:</u></b> Raise Load On Emergency BUS E-2 As Follows: a. Check Charging Pump C - Running (Step 27.a)</p> <p><b><u>STANDARD:</u></b> Candidate determines that Charging Pump C is running.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 9:</u></b> Raise Load On Emergency BUS E-2 As Follows:</p> <p>b. Verify CV RECIRC FANS – RUNNING</p> <ul style="list-style-type: none"><li>- HVH-3</li><li>- HVH-4</li></ul> <p>(Step 27.b)</p> <p><b><u>STANDARD:</u></b> Determines that HVH-3 and HVH-4 are running.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 10:</u></b> Check CONT RM AIR HANDLING HVA-1B - RUNNING (Step 27.c)</p> <p><b><u>STANDARD:</u></b> Determines that HVA-1B is running.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 11:</u></b> Check CRDM COOLING FAN, HVH-5B – RUNNING (Step 27.d)</p> <p><b><u>STANDARD:</u></b> Candidate Determines that HVH-5B is NOT RUNNING. Go to Step 27.d RNO.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 12:</u></b> Transfer CRDM COOLING FANS as follows:</p> <ol style="list-style-type: none"><li>1. Start HVH-5B</li><li>2. Stop HVH-5A (Step 27.d RNO)</li></ol> <p><b><u>STANDARD:</u></b> Candidate starts HVH-5B and stops HVH-5A.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> E-2 Voltage should lower to approx. 505.9 Volts.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 13:</u></b> Check AUX BLDG EXH FAN, HVE-2B - RUNNING (Step 27.e)</p> <p><b><u>STANDARD:</u></b> Candidate determines that HVE-2B is NOT running. Go to Step 27.e RNO.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 14:</u></b> Transfer AUX BLDG EXH FANs as follows: 1) Start HVE-2B 2) Stop HVE-2A (Step 27.e RNO)</p> <p><b><u>STANDARD:</u></b> Candidate starts HVE-2B and stops HVE-2A.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> E-2 Voltage should lower to approx. 505.4 Volts.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 15:</u></b> Check RHR – IN SERVICE. (Step 27. f)</p> <p><b><u>STANDARD:</u></b> Candidate determines that RHR is NOT is IN SERVICE. Go to Step 27.f RNO which directs Candidate to Step 28.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 16:</u></b> Check Emergency BUS E-2 Voltage – GREATER THAN 505 VOLTS (Step 28)</p> <p><b><u>STANDARD:</u></b> Candidate determines that Bus E-2 Voltage IS greater than 505 Volts.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 17:</u></b> Check DSDG Status As Follows:</p> <p>a. Check Main Generator – ON LINE (Step 29.a)</p> <p><b><u>STANDARD:</u></b> Candidate determines that the Main Generator is ON LINE.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 18:</u></b> Check DSDG Status As Follows:</p> <p>b. Check DSDG - RUNNING (Step 29.b)</p> <p><b><u>STANDARD:</u></b> Candidate determines that the DSDG is NOT running base on Cue. Go to Step 29.b RNO.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 19:</u></b> Check DSDG Status As Follows:  b. RNO: Postpone DSDG testing while in this AOP. Go to Step 30.  (Step 29.b RNO)</p> <p><b><u>STANDARD:</u></b> Candidate transitions to step 30.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 20:</u></b> Check 4KV BUS 3-4 TIE, BKR 52-19 - OPEN  (Step 30)</p> <p><b><u>STANDARD:</u></b> Candidate determines that 4KV BUS 3-4 TIE, BKR 52-19 IS OPEN.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> BKR 52-19 indicates OPEN (TRIP) by GREEN light lit.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



<p><b><u>STEP 21:</u></b>      Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows:  a. Insert the Synchroscope Key into 4 KV TIES Synchroscope Key Switch  (Step 31.a)</p> <p><b><u>STANDARD:</u></b>    Candidate insets the synchroscope key into 4 KV TIES Synchroscope Key Switch.</p> <p><b>EXAMINER'S CUE:</b>            NONE</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b>    NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 22:</u></b>      Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows:  b. Place the Synchroscope Switch to the BUS 3 &amp; 4 position  (Step 31.b)</p> <p><b><u>STANDARD:</u></b>    Candidate places the Synchroscope Switch to the BUS 3 &amp; 4 position.</p> <p><b>EXAMINER'S CUE:</b>            NONE</p> <p><b>EXAMINER'S NOTE:</b>        NONE</p> <p><b>BOOTH OPERATOR CUE:</b>    NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 23:</u></b> Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows: c. Verify the Synchroscope comes to approximately the 12 o'clock position. (Step 31.c)</p> <p><b><u>STANDARD:</u></b> Candidate verifies that the Synchroscope is pointing to the 12 o'clock position.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 24:</u></b> Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows: d. Momentarily place the Control Switch for 4KV BUS 3-4 TIE, BKR 52/19 to the CLOSE position. (Step 31.d)</p> <p><b><u>STANDARD:</u></b> Candidate momentarily places the control switch for BKR 52/19 to the CLOSE position.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 25:</u></b> Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows: e. Check BKR 52/19 - CLOSED (Step 31.e)</p> <p><b><u>STANDARD:</u></b> Candidate confirms that BKR 52/19 is CLOSED as indicated on RTGB.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> BKR 52-19 indicates CLOSED with RED light lit.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 26:</u></b> Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows: f. Check UNIT AUX TO 4 KV BUS 4 BKR, 52/20 - OPEN (Step 31.f)</p> <p><b><u>STANDARD:</u></b> Candidate identifies that BKR 52/20 has remained in the CLOSED position. Transitions to Step 31.f RNO</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> BKR 52-20 indicates CLOSED with RED light lit.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 27:</u></b> Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows:</p> <p>f. RNO: Perform the following</p> <ul style="list-style-type: none"> <li>• Simultaneously depress the THINK pushbutton AND place the control switch for BKR 52/20 to the OPEN position.</li> </ul> <p>(Step 31.f RNO)</p> <p><b><u>STANDARD:</u></b> Candidate locates and depresses the THINK pushbutton and places the control switch for BKR 52/20 to the OPEN (TRIP) position. Identifies that BKR 52/20 is now OPEN.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> BKR 52/20 indicates OPEN (TRIP) with GREEN light lit.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 28:</u></b> Place the 4 KV TIES Synchroscope Key Switch to the mid position.</p> <p>(Step 31.g)</p> <p><b><u>STANDARD:</u></b> Candidate places the 4KV TIES Synchroscope Key Switch to the mid position.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<b><u>STEP 29:</u></b>	Check the following: <ul style="list-style-type: none"> <li>Emergency BUS E-1 Voltage - LESS THAN 505 VOLTS <u>AND</u></li> <li>Emergency BUS E-2 Voltage - LESS THAN 505 VOLTS (Step 32)</li> </ul>	___ SAT
<b><u>STANDARD:</u></b>	Candidate determines that BOTH Emergency BUS E-1 and E-2 are LESS THAN 505 VOLTS	___ UNSAT
<b>EXAMINER'S CUE:</b>	When candidate identifies that BOTH Bus E-1 and E-2 are less than 505 VOLTS inform the candidate that this completes the JPM.	
<b>EXAMINER'S NOTE:</b>	Bus E-2 Voltage should be approx. 496.5 Volts.	
<b><u>COMMENTS:</u></b>		
<b><u>STEP 30:</u></b>	Check Voltage as Follows: ( <b>Continuous Action Step</b> ) <ul style="list-style-type: none"> <li>APP-036-E3, SUT PRI OVER/UNDER VOLTAGE – EXTINGUISHED <u>AND</u></li> <li>WEST 115KV BUS VOLTAGE – LESS THAN 119 KV <u>AND</u></li> <li>Emergency BUS E-1 Voltage – LESS THAN 502 VOLTS <u>AND</u></li> <li>Emergency BUS E-2 Voltage – LESS THAN 502 VOLTS (Step 33)</li> </ul>	___ SAT
<b><u>STANDARD:</u></b>	Candidate determines that BOTH Emergency BUS E-1 and E-2 are LESS THAN 502 VOLTS	___ UNSAT
<b>EXAMINER'S CUE:</b>	When candidate identifies that BOTH Bus E-1 and E-2 are less than 502 VOLTS inform the candidate that this completes the JPM.	
<b>EXAMINER'S NOTE:</b>	Bus E-2 Voltage should be approx. 496.5 Volts.	
<b><u>COMMENTS:</u></b>		
<b><u>END OF TASK</u></b>		
<b>Terminating Cue: Voltage on 480V Bus E-2 lowered to less than 505 Volts.</b>		

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. Plant is at 100% power.
2. Due to abnormal conditions on the Grid, 480V Bus E-2 currently exceeds 505 Volts.
3. AOP-031, Operation with High Switchyard Voltage, has been completed up to step 21.
4. You are the BOP.
5. "D" IAC is in service with "A" and "B" IACs in AUTO.
6. The DSDG is secured and aligned for AUTO.
7. The Load on Emergency Bus E-1 has NOT been altered since entering this AOP.

**INITIATING CUES:**

The CRS has directed you to continue with AOP-031 until 480V Bus E-2 voltage is restored to less than 505 Volts.

## **CONTINUOUS USE**

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL  
VOLUME 3  
PART 5  
ABNORMAL OPERATING PROCEDURE

AOP-031

OPERATION WITH HIGH SWITCHYARD VOLTAGE

REVISION 14

Purpose and Entry Conditions

(Page 1 of 1)

1. PURPOSE

- a. This procedure provides instructions in the event of high switchyard or Emergency Bus voltage. The intent of the procedure is to protect safety related loads with 440 volt motor nameplate ratings from extended operation above design voltage.

NOTE

Entry to this procedure is NOT required for momentary spikes in system voltage caused by instability problems OR due to momentary spikes caused by starting an EDG.

2. ENTRY CONDITIONS

- a. High alarm on APP-036-E3, SUT PRI OVER/UNDER VOLTAGE
- b. ERFIS readings for Emergency Bus E-1 OR E-2 exceed 505 volts.
- c. WEST 115KV BUS VOLTAGE indication greater than 119 KV.

- END -



STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<del>1.</del>	Make PA Announcement For Procedure Entry.	
<del>2.</del>	Check Main Generator - IN SERVICE	Go To Step 4.
<del>3.</del>	Check Generator Reactive Load - At 35 MVARs	Position the VOLTAGE ADJUSTER Switch, as necessary to maintain reactive load at 35 MVARs.
<del>4.</del>	Contact The Load Dispatcher To Take Action To Lower Grid Voltage	
<del>5.</del>	Check Load Dispatcher Actions - COMPLETE	<u>WHEN</u> the Load Dispatcher has completed actions to lower voltage, <u>THEN</u> Go To Step 6
<del>6.</del>	Check Voltage As Follows:	Return to procedure and step in effect.
<del>•</del>	APP-036-E3, SUT PRI OVER/UNDER VOLTAGE - ILLUMINATED	
	<u>OR</u>	
<del>•</del>	WEST 115KV BUS VOLTAGE - GREATER THAN 119 KV	
	<u>OR</u>	
<del>•</del>	Emergency BUS E-1 Voltage - GREATER THAN 505 VOLTS	
	<u>OR</u>	
<del>•</del>	Emergency BUS E-2 Voltage - GREATER THAN 505 VOLTS	

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

- The order of preference for monitoring voltage is ERFIS, Attachment 1, then local indication.
- The following points are found on QP E1E2.

\* 7 Check The Following ERFIS  
Points And Plots- AVAILABLE

- ELV3020A - E-1
- ELV3021A - E-2
- QP E1E2 - Plot

Perform the following:

- a. Contact I&C personnel to obtain voltage for the unavailable ERFIS points using Attachment 1.
- b. Direct an Operator to obtain Emergency Bus voltage for the unavailable ERFIS points using local indication at 1 hour intervals:
  - EI-213 - 480V BUS E-1
  - EI-214 - 480V BUS E-2
- c. WHEN I&C has commenced obtaining voltage with Attachment 1, THEN discontinue use of local indication.

Go To Step 9.

8 Monitor Emergency Bus Voltage  
Using ERFIS

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

~~9.~~ Implement The EALs~~\*10.~~ Check Emergency BUS E-1 Voltage  
- GREATER THAN 505 VOLTS →

IF Emergency BUS E-1 voltage exceeds 505 volts, THEN observe the NOTE prior to Step 11 and Go To Step 11.

Go To Step ~~21~~NOTE

Transferring the following safety related components will cause voltage to rise. This step is designed to protect the components.

## 11. Check CCW Pumps as follows:

- |                                                                |                   |
|----------------------------------------------------------------|-------------------|
| a. Check CCW PUMP B - RUNNING                                  | a. Go To Step 12. |
| b. Check CCW PUMP A - AVAILABLE                                | b. Go To Step 12. |
| c. Perform the following using<br>OP-306, Operating CCW Pumps: |                   |
| 1) Start CCW PUMP A                                            |                   |
| 2) Stop CCW PUMP B                                             |                   |

## 12. Check Instrument Air As Follows:

- |                                                                                                                    |                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| a. Check INSTRUMENT AIR<br>COMPRESSOR A - RUNNING IN<br>MANUAL                                                     | a. Go To Step 13.                                                                                                  |
| b. Check One Of The Following<br>Compressors - IN SERVICE<br>Using OP 905, Instrument And<br>Station Air System    | b. Place One Of The Following<br>Compressors - IN SERVICE<br>Using OP 905, Instrument And<br>Station Air System    |
| <ul style="list-style-type: none"><li>• INSTRUMENT AIR<br/>COMPRESSOR D</li><li>• PRIMARY AIR COMPRESSOR</li></ul> | <ul style="list-style-type: none"><li>• INSTRUMENT AIR<br/>COMPRESSOR D</li><li>• PRIMARY AIR COMPRESSOR</li></ul> |
| c. Place INSTRUMENT AIR<br>COMPRESSOR A In AUTO                                                                    |                                                                                                                    |

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 13. Check EDG "A" Status As Follows:

a. Check Main Generator - ON LINE

a. IF EDG "A" is Paralleled to Emergency Bus E-1, THEN Go To Step 13.c.

Go To Step 14.

b. Check EMERGENCY DIESEL GENERATOR A - RUNNING

b. Postpone EMERGENCY DIESEL GENERATOR A testing while in this AOP.

Go To Step 14.

c. Shutdown EMERGENCY DIESEL GENERATOR A, Using Applicable In-Progress Procedure

14. Log The Time That Any Of The Following Equipment Is OR Was Running Above 505 VOLTS:

- INSTRUMENT AIR COMPRESSOR A
- EDG A PRE-LUBE OIL PUMP
- Fuel Oil Transfer Pump A
- CCW PUMP B

## 15. Check Emergency BUS E-1 Voltage - GREATER THAN EMERGENCY BUS E-2 VOLTAGE

Go To Step 21.

## 16. Check Load On Emergency Bus E-2 - HAS BEEN RAISED USING STEP 27

Go To Step 18.

## 17. Go To Step 32.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

18. Raise Load On Emergency Bus E-1  
As Follows:

a. Check CHARGING PUMP B RUNNING

a. Perform the following:

- 1) Start CHARGING PUMP B.
- 2) Stop CHARGING PUMP A OR C.

b. Verify CV RECIRC FANS -  
RUNNING

- HVH-1
- HVH-2

c. Check CONT RM AIR HANDLING,  
HVA-1A - RUNNINGc. Switch Control Room  
Ventilation to Train A using  
OP-906, Heating, Ventilation,  
and Air Conditioning,  
Switching Control Room  
Ventilation System Unit in  
Service.d. Check CRDM COOLING FAN,  
HVH-5A - RUNNINGd. Transfer CRDM COOLING FANS as  
follows:

- 1) Start HVH-5A
- 2) Stop HVH-5B

e. Check AUX BLDG EXH FAN,  
HVE-2A - RUNNINGe. Transfer AUX BLDG EXH FANS as  
follows:

- 1) Start HVE-2A
- 2) Stop HVE-2B

f. Check RHR - IN SERVICE

f. Go To Step 19.

g. Check RHR PUMP A - RUNNING

g. Start RHR Pump A by  
performing OP-201, Residual  
heat Removal System,  
Switching RHR Pumps In The  
Core Cooling Mode.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

- \*19. Check Emergency BUS E-1 Voltage  
- GREATER THAN 505 VOLTS

IF Emergency BUS E-1 voltage rises to greater than 505 volts, THEN Go To Step 32.

Go To Step 21.

20. Go To Step 32

- \*21. Check Emergency BUS E-2 Voltage  
- GREATER THAN 505 VOLTS

IF Emergency BUS E-2 voltage exceeds 505 volts, THEN Observe the NOTE prior to Step 22 and Go To Step 22.

Go To Step 33.

NOTE

Transferring the following safety related components will cause voltage to rise. This step is designed to protect the components.

22. Check Instrument Air As Follows:

- a. Check INSTRUMENT AIR  
COMPRESSOR B - RUNNING IN  
MANUAL

- a. Go To Step 23.

- b. Check One Of The Following  
Compressors - IN SERVICE  
Using OP 905, Instrument And  
Station Air System

- b. Place One Of The Following  
Compressors - IN SERVICE  
Using OP 905, Instrument And  
Station Air System

- INSTRUMENT AIR  
COMPRESSOR D
- PRIMARY AIR COMPRESSOR

- INSTRUMENT AIR  
COMPRESSOR D
- PRIMARY AIR COMPRESSOR

- c. Place INSTRUMENT AIR  
COMPRESSOR B in AUTO

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 23. Check EDG "B" Status As Follows:

a. Check Main Generator - ON LINE

a. IF EDG "B" is Paralleled to  
Emergency Bus E-2, THEN Go To  
Step 23.c

Go To Step 24.

b. Check EMERGENCY DIESEL  
GENERATOR B - RUNNINGb. Postpone EMERGENCY DIESEL  
GENERATOR B testing while in  
this AOP.

Go To Step 24.

c. Perform An Orderly Shutdown  
Of EMERGENCY DIESEL GENERATOR  
B, Using Applicable  
In-Progress Procedure24. Log The Time That Any Of The  
Following Equipment Is OR Was  
Running Above 505 VOLTS

- INSTRUMENT AIR COMPRESSOR B
- EDG B PRE-LUBE OIL PUMP
- Fuel Oil Transfer Pump B

25. Check Load On Emergency Bus E-1  
- HAS BEEN RAISED USING STEP 18

Go To Step 27.

## 26. Go To Step 28.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

27. Raise Load On Emergency BUS E-2  
As Follows:a. Check CHARGING PUMP C -  
RUNNING

a. Perform the following:

- 1) Start CHARGING PUMP C.
- 2) Stop CHARGING PUMP A OR B.

b. Verify CV RECIRC FANS -  
RUNNING

- HVH-3
- HVH-4

c. Check CONT RM AIR HANDLING,  
HVA-1B - RUNNINGc. Switch Control Room  
Ventilation to Train B using  
OP-906, Heating, Ventilation,  
and Air Conditioning,  
Switching Control Room  
Ventilation System Unit in  
Service.d. Check CRDM COOLING FAN,  
HVH-5B - RUNNINGd. Transfer CRDM COOLING FANS as  
follows:

- 1) Start HVH-5B.
- 2) Stop HVH-5A.

e. Check AUX BLDG EXH FAN,  
HVE-2B - RUNNNGe. Transfer AUX BLDG EXH FANS as  
follows:

- 1) Start HVE-2B.
- 2) Stop HVE-2A.

f. Check RHR - IN SERVICE

f. Go To Step 28.

g. Check RHR PUMP B - RUNNING

g. Start RHR Pump B by  
performing OP-201, Residual  
Heat Removal System,  
Switching RHR Pumps In The  
Core Cooling Mode.



## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

- \*28. Check Emergency BUS E-2 Voltage  
- GREATER THAN 505 VOLTS

IF Emergency BUS E-2 voltage  
rises to greater than 505 volts,  
THEN Go To Step 29.

Go To Step 33.

29. Check DSDG Status As Follows:

a. Check Main Generator - ON LINE

a. Go To Step 30.

b. Check DSDG - RUNNING

b. Postpone DSDG testing while  
in this AOP.

Go To Step 30.

c. Stop the DSDG, using  
Applicable In-Progress  
Procedure

30. Check 4KV BUS 3-4 TIE, BKR 52/19  
- OPEN

Go To Step 32.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

31. Transfer 4160V BUS 4 To The  
STARTUP TRANSFORMER As Follows:

- a. Insert the Synchroscope Key into 4 KV TIES Synchroscope Key Switch
- b. Place the Synchroscope Switch to the BUS 3 & 4 position
- c. Verify the Synchroscope comes to approximately the 12 o'clock position
- d. Momentarily place the Control Switch for 4KV BUS 3-4 TIE, BKR 52/19 to the CLOSE position

e. Check BKR 52/19 - CLOSED

f. Check UNIT AUX TO 4KV BUS 4 BKR, 52/20 - OPEN

e. Contact I&C to check BKR 52/19.

Go To Step 31.g.

f. Perform the following:

- Simultaneously depress the THINK pushbutton AND place the control switch for BKR 52/20 to the OPEN position.

OR

- Using the Control Switch At 4160V BUS 4, open BKR 52/20, UNIT AUX TO 4KV BUS 4.

OR

- Inside Cubicle 20 trip BKR 52/20 by lifting the trip tab at the bottom of the breaker.

g. Place the 4 KV TIES Synchroscope Key Switch to the mid position

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32.	<b>Check The Following:</b> <ul style="list-style-type: none"><li>Emergency BUS E-1 Voltage - LESS THAN 505 VOLTS</li></ul> <p style="text-align: center;"><u>AND</u></p> <ul style="list-style-type: none"><li>Emergency BUS E-2 Voltage - LESS THAN 505 VOLTS</li></ul>	Start additional plant loads as follows: <ul style="list-style-type: none"><li>a. Evaluate present plant conditions for idle loads.</li><li>b. Balance loads started such that voltage on BUSES E-1 <u>AND</u> E-2 are equalized.</li><li>c. Minimize the run time of the components listed below:<ul style="list-style-type: none"><li>INSTRUMENT AIR COMPRESSOR A <u>AND</u> B</li><li>CCW PUMP B</li></ul></li><li>d. Using the applicable plant procedure, start idle loads.</li></ul>
*33.	<b>Check Voltage As Follows:</b> <ul style="list-style-type: none"><li>APP-036-E3, SUT PRI OVER/UNDER VOLTAGE - EXTINGUISHED</li></ul> <p style="text-align: center;"><u>AND</u></p> <ul style="list-style-type: none"><li>WEST 115KV BUS VOLTAGE - LESS THAN 119 KV</li></ul> <p style="text-align: center;"><u>AND</u></p> <ul style="list-style-type: none"><li>Emergency BUS E-1 Voltage - LESS THAN 502 VOLTS</li></ul> <p style="text-align: center;"><u>AND</u></p> <ul style="list-style-type: none"><li>Emergency BUS E-2 Voltage - LESS THAN 502 VOLTS</li></ul>	<p><u>WHEN</u> APP-036-E3 is Extinguished, West 115KV Bus voltage is less than 119 KV, and Emergency BUS E-1 <u>AND</u> Emergency BUS E-2 voltage are less than 502 volts, <u>THEN</u> Go To Step 34.</p> <p>Go To Step 10.</p>
34.	<b>Terminate Monitoring Of Emergency BUS E-1 <u>AND</u> E-2 Voltage</b>	
35.	<b>Record In The Control Operators Log The Duration That Each Emergency Bus Was Greater Than 505 VOLTS</b>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36.	Determine If Auxiliaries Should Be Transferred As Follows:	
	a. Check UNIT AUXILIARY TRANSFORMER - AVAILABLE	a. Go To Step 38.
	b. Check 4KV BUS 3-4 TIE, BKR 52/19 - CLOSED	b. Go To Step 38.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>SAF NGCC, Electrical Safety and Arc Flash Protection, Must be reviewed for operation of breakers locally.</p> <p>*****</p>		
37.	<p>Transfer 4160V BUS 4 To The UNIT AUXILIARY TRANSFORMER As Follows:</p> <ol style="list-style-type: none"> <li>a. Insert the Synchroscope Key into UNIT AUX TRANSF Synchroscope Key Switch</li> <li>b. Place the Synchroscope Switch to the UNIT AUX BUS 4 position</li> <li>c. Verify the synchroscope comes to approximately the 12 o'clock position</li> <li>d. Momentarily place the Control Switch for UNIT AUX TO 4KV BUS 4, BKR 52/20 to the CLOSE position</li> <li>e. Check BKR 52/20 - CLOSED</li> </ol>	<p>e. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Contact I&amp;C to check BKR 52/20.</li> <li>2) Initiate an Operability Determination due to 4KV BUS 4 being powered from the SUT.</li> <li>3) When BKR 52/20 is closed, <u>THEN</u> Go To Step 37.f.</li> </ol>
(CONTINUED NEXT PAGE)		

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

37. (CONTINUED)

f. Check 4KV BUS 3-4 TIE BKR,  
52/19 - OPEN

f. Perform the following:

- Simultaneously depress the THINK pushbutton AND place the Control Switch for BKR 52/19 to the OPEN position.

OR

- Using the Control Switch At 4160V BUS 4, open BKR 52/19, 4KV BUS 3-4 TIE.

OR

- Inside Cubicle 19 trip BKR 52/19 by lifting the trip tab at the bottom of the breaker.

g. Place the UNIT AUX TRANSF  
Synchroscope Key Switch to  
the mid position

38. Restore The Following Electrical  
Lineups As Directed By The SM

- CCW Pumps A and B,
- Instrument Air Compressors A & B
- Any loads started or shifted as part of Steps 11 - 13, 22 - 23, AND 32

39. Restore Routine Testing Of The  
Emergency Diesel Generators AND  
The DS Diesel Generator

40. Return To Procedure And Step In  
Effect

- END -

**CONTINUOUS USE**ATTACHMENT 1OBTAINING EMERGENCY BUS VOLTAGE USING A VOLTMETER

(Page 1 of 3)

\*\*\*\*\*

CAUTION

Circuits inside Emergency BUS E-1 AND E-2 are energized and exposed. Proper precautions shall be followed when working on or near energized circuits.

\*\*\*\*\*

NOTE

- This attachment is written to be used by an I&C Technician locally at Emergency Bus E-1 AND E-2.
- Steps 1 through 6 give the directions for obtaining voltage on Emergency BUS E-1. Steps 9 through 13 are for Emergency BUS E-2.

1. Obtain a Fluke 8520A Digital Voltmeter (or similar meter with an accuracy of  $\pm 1.75$  volts @ 100 volts).
2. IF obtaining voltage on Emergency BUS E-1 is unnecessary, THEN Go To Step 9.
3. Open the door of Metering Cubicle 17A on Emergency BUS E-1.
4. Select the appropriate range on the multimeter to allow reading at least 125 volts AC.
5. Clamp or lug the multimeter probes to the input terminals of the local voltmeter (EI-213), inside Cubicle 17A.
6. Notify the Control Room that Emergency BUS E-1 voltage readings may now be taken.

**CONTINUOUS USE**ATTACHMENT 1OBTAINING EMERGENCY BUS VOLTAGE USING A VOLTMETER

(Page 2 of 3)

7. Take voltage readings at hourly intervals or as directed by the Control Room as follows:
  - a. Use the BUS E-1 VOLTMETER SWITCH on the front of Cubicle 17A to select one of the three phases.
  - b. Multiply the multimeter reading by 4 and report the voltage to the Control Room.
  - c. Repeat Step 7.a and 7.b for each of the three phases.
    - MULTIMETER READING X 4 = VOLTAGE
8. WHEN notified by the Control Room that voltage monitoring is no longer required, THEN restore as follows:
  - a. Remove the multimeter probes from the local voltmeter (EI-213).
  - b. Close the door on Cubicle 17A.
  - c. Read each phase on the installed bus voltmeter (EI-213) to ensure circuit operability.
  - d. Notify the Control Room that Bus E-1 has been restored to normal and that this Attachment is complete.
9. Obtain a Fluke 8520A Digital Voltmeter (or similar meter with an accuracy of  $\pm 1.75$  volts @ 100 volts).
10. Open the door of Metering Cubicle 27A on Emergency BUS E-2.
11. Select the appropriate range on the multimeter to allow reading at least 125 volts AC.
12. Clamp or lug the multimeter probes to the input terminals of the local voltmeter (EI-214), inside Cubicle 27A.
13. Notify the Control Room that Emergency BUS E-2 voltage readings may now be taken.



**CONTINUOUS USE**ATTACHMENT 1OBTAINING EMERGENCY BUS VOLTAGE USING A VOLTMETER

(Page 3 of 3)

14. Take voltage readings at hourly intervals or as directed by the Control Room as follows:
  - a. Use the BUS E-2 VOLTMETER SWITCH on the front of Cubicle 27A to select one of the three phases.
  - b. Multiply the multimeter reading by 4 and report the voltage to the Control Room.
  - c. Repeat Step 14.a and 14.b for each of the three phases.
    - MULTIMETER READING X 4 = VOLTAGE
15. WHEN notified by the Control Room that voltage monitoring is no longer required, THEN restore as follows:
  - a. Remove the multimeter probes from the local voltmeter (EI-214).
  - b. Close the door on Cubicle 27A.
  - c. Read each phase on the installed bus voltmeter (EI-214) to ensure circuit operability.
  - d. Notify the Control Room that Bus E-2 has been restored to normal and that this attachment is complete.

- END -

**CONTINUOUS USE**ATTACHMENT 2AContinuous Action Steps

(Page 1 of 1)

7. WHEN I&C has commenced obtaining voltage with Attachment 1, THEN discontinue use of local indication.
10. IF Emergency BUS E-1 voltage exceeds 505 volts, THEN observe the NOTE prior to Step 11 and Go To Step 11.
19. IF Emergency BUS E-1 voltage rises to greater than 505 volts, THEN Go To Step 32.
21. IF Emergency BUS E-2 voltage exceeds 505 volts, THEN Observe the NOTE prior to Step 22 and Go To Step 22.
28. IF Emergency BUS E-2 voltage rises to greater than 505 volts, THEN Go To Step 29.
33. WHEN APP-036-E3 is Extinguished, West 115KV Bus voltage is less than 119 KV, and 480V BUS E-1 AND 480V BUS E-2 voltage are less than 502 volts, THEN Go To Step 34.

**CONTINUOUS USE**ATTACHMENT 2BContinuous Action Steps

(Page 1 of 1)

7. WHEN I&C has commenced obtaining voltage with Attachment 1, THEN discontinue use of local indication.
10. IF Emergency BUS E-1 voltage exceeds 505 volts, THEN observe the NOTE prior to Step 11 and Go To Step 11.
19. IF Emergency BUS E-1 voltage rises to greater than 505 volts, THEN Go To Step 32.
21. IF Emergency BUS E-2 voltage exceeds 505 volts, THEN Observe the NOTE prior to Step 22 and Go To Step 22.
28. IF Emergency BUS E-2 voltage rises to greater than 505 volts, THEN Go To Step 29.
33. WHEN APP-036-E3 is Extinguished, West 115KV Bus voltage is less than 119 KV, and 480V BUS E-1 AND 480V BUS E-2 voltage are less than 502 volts, THEN Go To Step 34.

AOP-031, Revision 14  
Summary of Changes (PRR 512566)

Main Body

- Step 12.b      Reworded this step to allow for equalizing run time between Instrument Air Compressor D and the Primary Air Compressor. This is consistent with the operating procedure, OP-905. (PRR 512566)
- Step 13.a      Added this guidance to address the possibility that  
RNO            Emergency Diesel Generator "A" is paralleled to Emergency Bus E-1 with the Main Generator off line. (PRR 463792)
- Step 15        This step is being added to prioritize the sequence of steps being performed.
- Steps 16      Steps added to direct procedure flow path based on the  
and 17        possibility that Emergency Bus E-2 Load has already been raised per step 27.
- Steps 18,      Added these steps to provide guidance for raising load on  
19 and 20      Emergency Bus E-1 in the event that E-1 voltage is greater than 505 volts. This guidance is similar to steps already in the procedure for raising load on Emergency Bus E-2. (PRR 512566)
- Step 22.b      Reworded this step to allow for equalizing run time between Instrument Air Compressor D and the Primary Air Compressor. This is consistent with the operating procedure, OP-905. (PRR 512566)
- Step 23.a      Added this guidance to address the possibility that  
RNO            Emergency Diesel Generator "B" is paralleled to Emergency Bus E-2 with the Main Generator off line. (PRR 463792)
- Steps 25      Steps added to direct procedure flow path based on the  
and 26        possibility that Emergency Bus E-1 Load has already been raised per step 18.

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM G  
Rev 0**

**Respond to a Loss of CCW IAW AOP-014**

**Concurred By:** Kirk Schauer **Date:** 5/15/13  
Operations

**Approved By:** James Conder **Date:** 6/5/13  
Superintendent/Supervisor - Training

Date \_\_\_\_\_

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

## COMMENTS

**Step 7** Critical in order to prevent challenging a safety function prior to securing the RCPs.

---

**Step 8** Critical in order to prevent over-heating of pump motor bearing.

---

**Step 10** Critical to prevent the CCW pumps for auto-starting due to low pressure.

---

**Step 22** Critical since this will isolate the CCW break in containment.

---



**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Initialize the simulator to IC-13
2. Go to RUN ensure plant conditions are stable.
3. Place simulator in FREEZE until candidate is ready to begin the JPM.
4. Open SCN File: 009\_ILC\_13\_NRC\_CR\_JPM\_G
5. An extra instructor will be needed to acknowledge alarms that do not apply to this JPM and to assist with locking out the CCW Pumps (if assistance requested).

**Tools/Equipment/Procedures Needed:**

APP-001-A4

AOP-014, COMPONENT COOLING WATER SYSTEM MALFUNCTION

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. The plant is operating at 100% power.
2. No equipment is out of service.
3. You are the Reactor Operator.

**INITIATING CUES:**

Respond to plant conditions.

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

<p><b><u>STEP 1:</u></b>      Candidate refers to APP-001-A4</p> <p><b><u>STANDARD:</u></b>    Candidate observes rapidly lowering CCW Surge Tank Level</p> <p>                         Candidate takes recommended action from APP-001-A4 and enters AOP-014, CCW System Malfunction.</p> <p><b>EXAMINER'S CUE:</b>        NONE</p> <p><b>EXAMINER'S NOTE:</b>      NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>____ SAT</p> <p>____ UNSAT</p>
<p><b><u>STEP 2:</u></b>      Implement the EALs                          (Main Body Step 1)</p> <p><b><u>STANDARD:</u></b>    Candidate notifies supervision of EAL implementation.</p> <p><b>EXAMINER'S CUE:</b>        NONE</p> <p><b>EXAMINER'S NOTE:</b>      NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>____ SAT</p> <p>____ UNSAT</p>

NOTE

- A loss of inventory may be indicated by a report of leakage or lowering of surge tank level.
- CCW Pump discharge pressure less than 78 psig will cause an alarm.
- CCW low flow is defined as less than 2200 gal per pump.
- CCW high temperature is defined as greater than 105°F or greater than 125°F if in Mode 3.

**STEP 3:** Make PA Announcement for Procedure Entry.  
(Main Body Step 2)

**STANDARD:** Candidate makes announcement for AOP-014 entry using the PA system.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

COMMENTS:

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 4:** Go to Appropriate Section for Indicated Malfunction.  
(Main Body Step 3)

**STANDARD:** Candidate determines that the appropriate section is Section A based on loss of CCW inventory.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

COMMENTS:

\_\_\_ SAT

\_\_\_ UNSAT

<p><b><u>STEP 5:</u></b> Determine if pump cavitation is Occurring <u>OR</u> Imminent:</p> <ul style="list-style-type: none"><li>• Check Surge Tank Level – Less Than 5%. <u>OR</u></li><li>• Check CCW Pump Discharge Pressure (Local) <u>AND</u> Flow -WIDE OSCILLATIONS. (Section A Step 1)</li></ul> <p><b><u>STANDARD:</u></b> Candidate determines that CCW Surge Tank is less than 5% level and that pump cavitation is imminent.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 6:</u></b> Check Reactor - CRITICAL (Section A Step 2)</p> <p><b><u>STANDARD:</u></b> Candidate determines that the Reactor is critical.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 7:</u></b>      Verify Reactor - TRIPPED                          (Section A Step 3)</p> <p><b><u>STANDARD:</u></b>   Candidate depresses the Reactor Trip pushbutton to trip the Reactor and                          verifies the Reactor is tripped.</p> <p><b>EXAMINER'S CUE:</b>                NONE</p> <p><b>EXAMINER'S NOTE:</b>            NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 8:</u></b>      Stop ALL RCPs                          (Section A Step 4)</p> <p><b><u>STANDARD:</u></b>   Candidate stops ALL Reactor Coolant Pumps using the Control Switches                          on the RTGB and verifies they are stopped by observing the GREEN off                          light is illuminated.</p> <p><b>EXAMINER'S CUE:</b>                NONE</p> <p><b>EXAMINER'S NOTE:</b>            NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 9:</u></b> Go to EOP-E-0, Reactor Trip or Safety Injection, while Continuing with this Procedure. (Section A Step 5)</p> <p><b><u>STANDARD:</u></b> Candidate informs CRS to enter EOP-E-0 while the Candidate continues in AOP-014.</p> <p><b>EXAMINER'S CUE:</b> Cue or acknowledge the candidate that the CRS and the BOP will continue in EOP-E-0 and the RO will continue in AOP-014.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 10:</u></b> Lockout CCW Pumps As Follows:</p> <ol style="list-style-type: none"> <li>Place AND hold all CCW Pump switches in STOP position.</li> <li>Check APP-001-F5, CCW PMP LO PRESS – ILLUMINATED</li> <li>Release CCW Pump Switches.</li> <li>Go to Step 13 (Section A Step 6)</li> </ol> <p><b><u>STANDARD:</u></b> Candidate places ALL CCW pump switches to STOP and holds them while verifying APP-001-F5 is illuminated.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> Inform the Candidate that he may ask and receive assistance from the BOP to hold one of the CCW Pump Switches, if desired.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 11:</u></b> Dispatch Operator to Perform Attachment 3, CCW Leak Search, While Continuing With Procedure. (Section A Step 13)</p> <p><b><u>STANDARD:</u></b> Candidate contacts the AO to perform Attachment 3 to identify the source of the leak.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> Acknowledge direction to perform Attachment 3.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 12:</u></b> Determine if RHR Must be Stopped as Follows:</p> <ul style="list-style-type: none"> <li>a. Check CCW Pumps – ALL STOPPED</li> <li>b. Check RHR Pump status – ANY PUMP RUNNING IN CORE COOLING MODE</li> </ul> <p>RNO: Observe the <u>NOTE</u> prior to Step 18 and Go to Step 18. (Section A Step 14)</p> <p><b><u>STANDARD:</u></b> Candidate recognizes that all CCW pumps are stopped (from previous step) and determines that the RHR pumps are not in Core Cooling Mode.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



NOTE

IF the location of the leak is known AND isolation is possible, THEN leak isolation may be commenced immediately.

**STEP 13:** Check CV for CCW Break Using Control Room Indications As Follows:

a. Monitor the following CV indications:

- ERFIS CV SUMP LEVEL
- CV WATER LEVEL (White Sump Lights)
- LI-801, CHANNEL I CV WATER LEVEL
- LI-802, CHANNEL II CV WATER LEVEL
- RCP Abnormal Conditions
- Check APP-001-F5, CCW PMP LO PRESS – ILLUMINATED (Section A Step 18.a)

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Candidate monitors ERFIS trends and CV WATER LEVEL (White Sump Lights) and determines that CV water level has increased.

**EXAMINER'S NOTE:** CV Water level rises from ~ 4.00 inches and stabilizes at a higher value.  
Bottom white lights for CV Keyway Sump are illuminated.

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**STEP 14:** Check CV for CCW Break Using Control Room Indications As Follows:

b. Check CV – LOCATION OF CCW BREAK  
(Section A Step 18.b)

\_\_\_ SAT

**STANDARD:** Candidate determines that CCW leak is in the CV.

**EXAMINER'S NOTE:** NONE

\_\_\_ UNSAT

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

<p><b><u>STEP 15:</u></b> Check CV for CCW Break Using Control Room Indications As Follows: c. Inform personnel performing leak search that the leak location is in CV. (Section A Step 18.c)</p> <p><b><u>STANDARD:</u></b> Candidate informs AO performing leak search of leak in CV.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 16:</u></b> Determine RCP Alarm Status: a. Check APP-001-B1, RCP BRG COOL WTR LO FLOW - ILLUMINATED (Section A Step 19.a)</p> <p><b><u>STANDARD:</u></b> Candidate determines that APP-001-B1 is illuminated.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**STEP 17:**

Determine RCP Alarm Status:

b. Check ANY RCP BEARING HI TEMP Alarm – ILLUMINATED

- APP-001-B3

OR

- APP-001-D3

OR

- APP-001-F3.

RNO:

IF makeup capacity to the CCW Surge Tank is sufficient to maintain level, THEN Go to Step 64.

IF makeup capacity to the CCW Surge Tank is NOT sufficient to maintain level, THEN Go to Step 20.

(Section A Step 19.b)

**STANDARD:** Candidate recognizes that NO RCP BEARING HI TEMP Alarm is illuminated and that makeup capacity to CCW Surge Tank is not sufficient. Transitions to Step 20.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

\_\_\_ SAT

\_\_\_ UNSAT

<p><b><u>STEP 18:</u></b> Check Reactor Critical: (Section A Step 20)</p> <p><b><u>STANDARD:</u></b> Candidate determines that the reactor is NOT critical.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 19:</u></b> Perform the following: a. Verify Control Rods - Tripped. (Section A RNO Step 20.a)</p> <p><b><u>STANDARD:</u></b> Candidate verifies that ALL Control Rods are inserted.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 20:</u></b> Perform the following: b. Stop ALL RCPs. (Section A RNO Step 20.b)</p> <p><b><u>STANDARD:</u></b> Candidate verifies that ALL Reactor Coolant Pumps are stopped.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 21:</u></b> Perform the following: c. <u>IF</u> Control Rods were inserted on the trip, <u>THEN</u> perform the following: 1) <u>IF</u> RCS temperature is greater than <u>OR</u> equal to 350°F, <u>THEN</u> Go to Step 23. 2) <u>IF</u> RCS temperature is less than 350°F, <u>THEN</u> Go to Step 24. d. <u>IF</u> Control Rods were already inserted, <u>THEN</u> Go to Step 24. (Section A RNO Step 20.c and d)</p> <p><b><u>STANDARD:</u></b> Candidate determines that the Control Rods were already inserted and transitions to Step 24.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> If candidate mis-reads the step and transitions to Step 23 acknowledge the report to go to EOP-E-0 and inform candidate that the CRS and BOP are continuing in EOP-E-0. Direct candidate to continue in AOP-014.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 22:</u></b> Close the Following Valves to Isolate CCW to the RCPs:</p> <ul style="list-style-type: none"> <li>• CC-716A, CCW TO RCP ISO</li> <li>• CC-716B, CCW TO RCP ISO</li> <li>• CC-730, BRG OUTLET ISO</li> <li>• CC-735, THERM BAR OUT ISO</li> <li>• FCV-626, THERM BAR FLOW CONT (Section A Step 24)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate uses RTGB switches to close the following valves:</p> <ul style="list-style-type: none"> <li>• CC-716A, CCW TO RCP ISO</li> <li>• CC-716B, CCW TO RCP ISO</li> <li>• CC-730, BRG OUTLET ISO</li> <li>• CC-735, THERM BAR OUT ISO</li> <li>• FCV-626, THERM BAR FLOW CONT</li> </ul> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b><u>END OF TASK</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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**Terminating Cue: When CCW valves are closed to isolate CCW piping rupture in CV**

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. The plant is operating at 100% power.
2. No equipment is out of service.
3. You are the Reactor Operator.

**INITIATING CUES:**

Respond to plant conditions.

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM H  
Rev 0**

Fill a Safety Injection Accumulator IAW OP-202

**Concurred By:** Pat Lathrop **Date:** 5/15/13  
Operations

**Approved By:** James Conder **Date:** 6/5/13  
Superintendent/Supervisor - Training



**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**Task:** 01006100301 Fill the SI Accumulators IAW OP-202

**Alternate Path:**

NO

**JPM #:**

ILC-13 NRC JPM H

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

006 A4.01	4.1 / 3.9
006 A4.02	4.0 / 3.8
006 A1.07	3.3 / 3.6
006 A1.13	3.5 / 3.7

**Task Standard:**

SI Accumulator "C" filled to reset the low level alarm without exceeding specified limits.

**Preferred Evaluation Location:**

Simulator   X      In-Plant       

**Preferred Evaluation Method:**

Perform   X      Simulate       

**References:**

OP-202, Section 8.2.1, Filling the Safety Injection Accumulators

**Validation Time:** 12 Minutes **Time Critical:** NO **Time Critical Time:** N/A

**Candidate:**

\_\_\_\_\_  
Name

SSN    -    -  
\_\_\_\_\_  
\_\_\_\_\_

(N/A if not time  
critical)

**Overall  
Time**

**Critical  
Time**

Start: \_\_\_\_\_

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

Finish: \_\_\_\_\_

**Performance Rating:**      SAT      UNSAT  
circle one

**Performance  
Time (min):** \_\_\_\_\_

**Examiner:**

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

## COMMENTS

**Step 2** Critical because control power must be aligned to the valve to allow for RTGB operation.

---

**Step 4** Critical to open valve to align flowpath to SI Accumulator.

---

**Step 5** Critical to start pump to provide adequate flow and pressure to fill the SI Accumulator.

---

**Step 7** Critical to align fill path to appropriate accumulator and to secure filling at desired level without exceeding specified limits.

---

**Step 8** Critical to secure fill source and prevent operating on recirculation for an extended period.

---

**Step 10** Critical to realign SI-869 to its normal Mode 1 alignment.

---

**Step 11** Critical to properly align SI-869 Control Power Defeat Switch as required for Mode 1.

---

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Initialize the simulator to IC-918
2. Go to RUN ensure plant conditions are stable.
3. No SCN required.
4. Place simulator in FREEZE until candidate is ready to begin the JPM.
5. Marked up copy of OP-202, Section 8.2.1, with Initial Conditions 8.2.1.1.a through 8.2.1.1.f.2 completed.

**Tools/Equipment/Procedures Needed:**

OP-202, Section 8.2.1

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. The plant is operating at 100% RTP.
2. SI ACCUM C HI/LO LVL (APP-002-E4) alarm has been received and actions have been reviewed by the RO.
3. OP-202, Section 8.2.1.1 Initial Conditions have been completed.
4. Refueling Water Purification is NOT in progress.
5. You are the Licensed Dedicated Operator referred to in OP-202.
6. Safety Injection Pump "A" has been walked down and pre-start checks are complete.

**INITIATING CUES:**

The CRS has briefed and directed you to fill SI Accumulator "C" to reset the low level alarm IAW OP-202, Section 8.2.1.

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

<p><b><u>STEP 1:</u></b> Check open SI-856A, SI PUMP RECIRC and SI-856B, SI PUMP RECIRC (Steps 8.2.1.2.a and b).</p> <p><b><u>STANDARD:</u></b> Valves SI-856A and B checked OPEN by observing the RED open indication on the RTGB.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The candidate may use ERFIS to monitor SI Accumulator "C" level. (ERFIS: QP ACCUM C)</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
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<p><b><u>STEP 2:</u></b> Verify the Control Power Defeat Switch for SI-869 is in the NORMAL position. (Step 8.2.1.c)</p> <p><b><u>STANDARD:</u></b> Locates NORMAL / DEFEAT key switch behind the RTGB for SI-869 and places the switch in the NORMAL position and identifies the amber light above the key switch is illuminated.</p> <p><b>EXAMINER'S CUE:</b> If the candidate requests an AO check breaker status, report that all requested breakers are open.</p> <p><b>EXAMINER'S NOTE:</b> Key switch for SI-869 is located in the rear of the RTGB on the ECCS VALVES CONTROL POWER DEFEAT PANEL.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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**NOTE:** Based upon the numerous indications available to the Dedicated Operator of an SI actuation at the RTGB and the immediate response to isolate the SI Accumulator flowpath, an LCO declaration for SI Pump **OR** SI Flowpath Operability is **NOT** required.

The following step is a continuous action step which shall be performed when the stated condition is met.

**STEP 3:** IF an SI actuation is received during filling, **THEN IMMEDIATELY CLOSE** the applicable SI Accumulator makeup valve **AND PERFORM** Step 8.2.1.2.m to restore the SI System lineup. (Step 8.2.1.d)

**STANDARD:** Candidate reads step and acknowledges continuous actions step in the event of an SI actuation.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 4:** Open SI-869, SI HOT LEG HDR. (Step 8.2.1.2.e)

**STANDARD:** Valve SI-869 opened by placing the control switch to the OPEN position and noting GREEN closed light extinguished and RED open light illuminated.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT



<p><b><u>STEP 5:</u></b> Start an SI Pump. (Step 8.2.1.2.f)</p> <p><b><u>STANDARD:</u></b> SI Pump "A" started by placing the control switch to the START position and observing the RED operating light illuminated and the GREEN stopped light extinguished.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b>NOTE:</b> If the cooling unit for the train of the SI pump started is <b>NOT</b> operable, the opposite train unit can be started by placing its AUTO/RUN switch on the power supply breaker to RUN.</p>	
<p><b><u>STEP 6:</u></b> Verify at least one SI Pump Area Cooling unit (HVH-6A OR HVH-6B OR both) is operating. (Step 8.2.1.2.g)</p> <p><b><u>STANDARD:</u></b> HVH-6A and/or 6B verified operating by noting RED operating light illuminated on the HVAC display panel and the GREEN off light extinguished.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**NOTE:** The following are pressure and level limits/alarms for the SI Accumulators:

- High Pressure Alarm 646 psig
- Normal Operating Pressure 630 psig
- High Level Alarm 75 percent
- Low Level Alarm 67 percent

**CAUTION**

Filling the SI Accumulators can result in rapid indicated level changes due to the narrow span (approx. 14 inches) associated with the SI Accumulator level instruments and should be closely monitored.

**STEP 7:**

IF SI Accumulator "C" is to be filled, THEN perform the following:  
(Step 8.2.1.2.j)

- 1) Open SI-851C, MAKEUP.
- 2) Monitor the level and pressure of SI Accumulator "C".
- 3) When desired level is obtained, then close SI-851C.

**STANDARD:**

- 1) Valve SI-851C opened by placing the control switch to the OPEN position and observing the RED open light illuminated and the GREEN closed light extinguished.
- 2) Maintained > 614 psig and < 646 psig pressure limits as indicated on PI-929/931 and refills accumulator to > 67% and < 75% level limits as indicated on LI-928/930.
- 3) Valve SI-851C closed by placing the control switch to the CLOSED position.

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:**

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

<p><b><u>STEP 8:</u></b> Stop the operating SI Pump. (Step 8.2.1.2.k)</p> <p><b><u>STANDARD:</u></b> Operating SI Pump stopped by placing the control switch to STOP and switch returned to the MID position.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 9:</u></b> Verify both SI Pump Area Cooling units are OFF. (Step 8.2.1.2.l)</p> <p>1) HVH-6A</p> <p>2) HVH-6B</p> <p><b><u>STANDARD:</u></b> Verifies HVH-6A and 6B are OFF by noting RED operating light extinguished on the HVAC display panel and the GREEN off light illuminated.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 10:</u></b> Close SI-869, SI HOT LEG HDR. (Step 8.2.1.2.m)</p> <p><b><u>STANDARD:</u></b> Valve SI-869 closed by placing the control switch to the CLOSED position and observing the GREEN closed light illuminated and the RED open light extinguished.</p> <p><b>EXAMINER'S CUE:</b> IF an independent verification of valve SI-869 is requested, inform the candidate that the valve has been independently verified.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b>NOTE:</b> In Mode 1, 2 <b>OR</b> 3 the Control Power Defeat switch for SI-869 should be in the DEFEAT position. In Mode 5 <b>OR</b> 6 the Control Power Defeat switch for SI-869 should be in the NORMAL position. In Mode 4 the position of the Control Power Defeat switch for SI-869 is determined by GP-002 <b>OR</b> GP-007.</p>	
<p><b><u>STEP 11:</u></b> Verify the Control Power Defeat switch for SI-869 in the position determined by plant status. (Step 8.2.1.2.n)</p> <p><b><u>STANDARD:</u></b> With the plant in Mode 1, valve SI-869 control power switch positioned to DEFEAT and identify the amber light above the switch is extinguished. Candidate will circle the word DEFEAT as the restored position.</p> <p><b>EXAMINER'S CUE:</b> IF an independent verification of valve SI-869 Control Power switch is requested, inform the candidate that the switch has been independently verified.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 6:</u></b> IF the Refueling Water Purification Pump was stopped in Step 8.2.1.1.f, THEN perform the following: (Step 8.2.1.2.o)</p> <ol style="list-style-type: none"> <li>1) Open SFPC-805B, RWST RETURN.</li> <li>2) Start the Refueling Water Purification Pump.</li> </ol> <p><b><u>STANDARD:</u></b> Candidate determines that the RWST purification was NOT in progress from the initial conditions and places N/As in these steps.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b><u>END OF TASK</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
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<p><b>Terminating Cue: SI Accumulator "C" has been filled to clear the low level alarm.</b></p>
-------------------------------------------------------------------------------------------------

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. The plant is operating at 100% RTP.
2. SI ACCUM C HI/LO LVL (APP-002-E4) alarm has been received and actions have been reviewed by the RO.
3. OP-202, Section 8.2.1.1 Initial Conditions have been completed.
4. Refueling Water Purification is NOT in progress.
5. You are the Licensed Dedicated Operator referred to in OP-202.
6. Safety Injection Pump "A" has been walked down and pre-start checks are complete.

**INITIATING CUES:**

The CRS has briefed and directed you to fill SI Accumulator "C" to reset the low level alarm IAW OP-202, Section 8.2.1.

## CONTINUOUS USE

Section 8.2.1

Page 1 of 5

INIT

### 8.2 Normal Operation

#### 8.2.1 Filling the Safety Injection Accumulators

##### 1. Initial Conditions

- a. This revision has been verified to be the latest revision available. TODAY  
Date gn
- b. A Safety Injection Pump is available for filling the SI Accumulator(s). gn
- c. An SI Accumulator needs to be refilled **OR** the level raised to restore or maintain the TECH SPECS limit of 61.5 percent. gn
- d. **IF** RCS pressure is less than 650 psig, **THEN** **VERIFY** the accumulator discharge valve(s) (SI-865A/B/C, DISCH) of the accumulator(s) to be filled are **CLOSED**. gn
- e. A licensed Dedicated Operator is available to fill the SI Accumulator(s) and isolate the accumulator(s) makeup flowpath if a Safety Injection actuation occurs. gn
- f. **IF** Refueling Water Purification is in progress, **THEN** **PERFORM** the following:
  - 1) **STOP** the Refueling Water Purification Pump. N/A
  - 2) **CLOSE** SFPC-805B, RWST RETURN. N/A

8.2.1 (continued)

INIT

2. Instructions

- a. **CHECK OPEN** SI-856A, SI PUMP RECIRC. \_\_\_\_\_
- b. **CHECK OPEN** SI-856B, SI PUMP RECIRC. \_\_\_\_\_
- c. **VERIFY** the Control Power Defeat switch for SI-869 is in the NORMAL position. \_\_\_\_\_

**NOTE:** Based upon the numerous indications available to the Dedicated Operator of an SI actuation at the RTGB and the immediate response to isolate the SI Accumulator flowpath, an LCO declaration for SI Pump **OR** SI Flowpath Operability is **NOT** required.

The following step is a continuous action step which shall be performed when the stated condition is met.

- d. **IF** an SI actuation is received during filling, **THEN IMMEDIATELY CLOSE** the applicable SI Accumulator makeup valve **AND PERFORM** Step 8.2.1.2.m to restore the SI System lineup. \_\_\_\_\_
- e. **OPEN** SI-869, SI HOT LEG HDR. \_\_\_\_\_
- f. **START** an SI Pump. \_\_\_\_\_

**NOTE:** If the cooling unit for the train of the SI pump started is **NOT** operable, the opposite train unit can be started by placing its AUTO/RUN switch on the power supply breaker to RUN.

- g. **VERIFY** at least one SI Pump Area Cooling unit (HVH-6A **OR** HVH-6B **OR** both) is operating. \_\_\_\_\_



8.2.1.2 (Continued)

INIT

**NOTE:** The following are pressure and level limits/alarms for the SI Accumulators:

- High Pressure Alarm            646 psig
- Normal Operating Pressure   630 psig
- High Level Alarm               75 percent
- Low Level Alarm                67 percent

**CAUTION**

Filling the SI Accumulators can result in rapid indicated level changes due to the narrow span (approx. 14 inches) associated with the SI Accumulator level instruments and should be closely monitored.

h.    **IF** SI Accumulator "A" is to be filled, **THEN**  
      **PERFORM** the following:

- 1)    **OPEN** SI-851A, MAKEUP. \_\_\_\_\_
- 2)    **MONITOR** the level and pressure of SI  
      Accumulator "A". \_\_\_\_\_
- 3)    **WHEN** desired level is obtained, **THEN**  
      **CLOSE** SI-851A. \_\_\_\_\_

i.    **IF** SI Accumulator "B" is to be filled, **THEN**  
      **PERFORM** the following:

- 1)    **OPEN** SI-851B, MAKEUP. \_\_\_\_\_
- 2)    **MONITOR** the level and pressure of SI  
      Accumulator "B". \_\_\_\_\_
- 3)    **WHEN** desired level is obtained, **THEN**  
      **CLOSE** SI-851B. \_\_\_\_\_

8.2.1.2 (Continued)

INIT VERI

- j. IF SI Accumulator "C" is to be filled, **THEN**  
**PERFORM** the following:
  - 1) **OPEN** SI-851C, MAKEUP. \_\_\_\_\_
  - 2) **MONITOR** the level and pressure of SI Accumulator "C". \_\_\_\_\_
  - 3) **WHEN** desired level is obtained,  
**THEN CLOSE** SI-851C. \_\_\_\_\_
- k. **STOP** the operating SI Pump. \_\_\_\_\_
- l. **VERIFY** both SI Pump Area Cooling units are OFF:
  - 1) HVH-6A \_\_\_\_\_
  - 2) HVH-6B \_\_\_\_\_
- m. **CLOSE** SI-869, SI HOT LEG HDR. \_\_\_\_\_

**NOTE:** In Mode 1, 2 **OR** 3 the Control Power Defeat switch for SI-869 should be in the DEFEAT position. In Mode 5 **OR** 6 the Control Power Defeat switch for SI-869 should be in the NORMAL position. In Mode 4 the position of the Control Power Defeat switch for SI-869 is determined by GP-002 **OR** GP-007.

- n. **VERIFY** the Control Power Defeat switch for SI-869 in the position determined by plant status:

DEFEAT / NORMAL \_\_\_\_\_  
(Circle one)

8.2.1.2 (Continued)

INIT

- o. **IF** the Refueling Water Purification Pump was stopped in Step 8.2.1.1.f, **THEN PERFORM** the following:

- 1) **OPEN** SFPC-805B, RWST RETURN. \_\_\_\_\_
- 2) **START** the Refueling Water Purification Pump. \_\_\_\_\_

**CAUTION**

If any SI Accumulator level rises by 10% (70 gal) when the RCS pressure is greater than 1000 psig, then the affected accumulator is required to be sampled to verify boron concentration is greater than or equal to 2000 ppm and less than or equal to 2400 ppm within the next 6 hours. (ITS SR 3.5.1.4 and Bases)

- p. **IF** the RCS pressure is greater than 1000 psig **AND** any SI Accumulator level was raised by 10% (70 gal.), **THEN REQUEST** E&C to sample the affected SI Accumulator(s) for boron concentration. \_\_\_\_\_

- q. **IF** SI Accumulator sample(s) were required in the previous step, **THEN RECORD** the affected SI Accumulator(s) boron sample results below:  
(N/A those **NOT** required to be sampled)

SI Accum "A" boron concentration \_\_\_\_\_ ppm \_\_\_\_\_

SI Accum "B" boron concentration \_\_\_\_\_ ppm \_\_\_\_\_

SI Accum "C" boron concentration \_\_\_\_\_ ppm \_\_\_\_\_

	<u>Initials</u>	<u>Name (Print)</u>	<u>Date</u>
Performed By:	<i>JH</i>	<i>Jeff Smith</i>	<i>Today</i>
	_____	_____	_____
	_____	_____	_____

Approved By:	_____	_____
	Shift Manager	Date

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM I  
Rev 0**

Auxiliary Building Operator Actions IAW DSP-002, Att. 3

**Concurred By:** Patrick Lathrop **Date:** 5/15/13  
Operations

**Approved By:** James Conder **Date:** 6/5/13  
Superintendent/Supervisor - Training

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**Task:** 01104100905, Perform the Actions of the Auxiliary Building Operator IAW DSP-002

**Alternate Path:**

YES

**JPM #:**

ILC-13 NRC JPM I

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

004 G2.1.30              4.4/4.0

004 A1.11                3.0/3.0

**Task Standard:**

Charging flow has been established to the RCS and seal injection aligned to the RCPs.

**Preferred Evaluation Location:**

Simulator \_\_\_\_\_ In-Plant   X  

**Preferred Evaluation Method:**

Perform \_\_\_\_\_ Simulate   X  

**References:**

DSP-002, Att. 3

**Validation Time:** 14 Minutes **Time Critical:** YES **Time Critical Time:** 13 min. to xfer to RWST  
15 min. to est. seal inj.

**Candidate:** \_\_\_\_\_  
Name

SSN       -       -  
\_\_\_\_\_

**Overall  
Time**

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

**Critical  
Time**

Start: \_\_\_\_\_

Finish:       /      

**Performance Rating:**       SAT       UNSAT  
circle one

**Performance  
Time (min):** \_\_\_\_\_

\_\_\_\_\_ / \_\_\_\_\_

**Examiner:**

Print Name

Signature

Date

**NOTE:** The time critical times are based on times from the event initiation. The JPM begins with 2 minutes already elapsed.

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

## COMMENTS

**Step 3** Critical because the charging pump must be in LOCAL for operator control.

---

**Step 4** Critical to provide flowpath around HCV-121.

---

**Step 5** Critical to isolate the flowpath through HCV-121.

---

**Step 6** Critical to align RWST to Charging Pump Suction.

---

**Step 8** Critical to isolate the VCT from the Charging Pump Suction.

---

**Step 12** Critical to provide makeup to the RCS and RCP seal injection flow.

---

**Step 13** Critical to allow the charging pump speed to be controlled locally.

---

**Step 14** Critical to extend the time until the PZR approaches full to greater than one hour.

---

**Step 17** Critical to establish adequate RCP seal injection flows.

---

**Tools/Equipment/Procedures Needed:**

DSP-002, Attachment 3

**READ TO OPERATOR****DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Operator Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there **ARE** time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. At 1200, the Control Room was evacuated due to a fire on the RTGB.
2. At the time the Control Room was evacuated, Charging Pumps "B" and "C" were running.
3. DSP-002, Hot Shutdown Using the Dedicated / Alternate Shutdown System, has been implemented.

**INITIATING CUES:**

**You have been assigned to perform DSP-002, Attachment 3. Enter the Auxiliary Building through the normal Auxiliary Building RCS Entrance. Assume that you have all of the equipment required by Attachment 3, Step 1. Inform the Shift Manager when a Charging Pump is running at minimum speed and adequate seal injection flow is being supplied to the RCPs.**

**The time now is 1202.**

# **Time Critical**



START TIME: \_\_\_\_\_ TIME CRITICAL START TIME:

**EXAMINER'S NOTE: PROVIDE THE CANDIDATE WITH THE JPM CUE SHEET AND COPY OF DSP-002, ATT. 3 AT A LOCATION OUTSIDE OF THE RCA.**

**NOTE**

- Time Critical Action: Transfer Charging Pump Suction to the RWST within 13 minutes of event initiation per step 5.
- Time Critical Action: Re-establish Charging/Seal Injection within 15 minutes of event initiation per step 7.
- Time Critical Action: Establish CCW to RCPs within 93 minutes of event initiation per step 19.

**STEP 1:** Obtain the Following Prior to Leaving the Old Fire Equipment Building

- Two – way radio
  - Flahsight
  - Locked valve keys (Keys 1, 1a or 1b)
  - Locked high rad area key (in holder near door)
- (Att. 3 Step 1)

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** N/A

**As Found:** N/A

**EXAMINER'S NOTE:** NONE

**EXAMINER'S CUE:** Remind the candidate that the cue stated to assume that all equipment required for step 1 has been obtained.

**COMMENTS:**

<p><b><u>STEP 2:</u></b> Check Fire Location – In E1/E2 ROOM (AREA A5) (Att. 3 Step 2)</p> <p><b><u>STANDARD:</u></b> Candidate determines, from the initial conditions, that the fire is NOT in the E1/E2 Room and takes RNO path to Step 4.</p> <p><b>As Found:</b> N/A</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>Access to the Charging Pump Room can be gained via the Nonregenerative and Seal Water Return Heat Exchanger Room on the second level of the Aux Bldg in the event of a fire in the Aux Bldg hallway.</p> <p>CVC-309A is located near HCV-121 on the West Wall of the Charging Pump Room.</p>	
<p><b><u>STEP 3:</u></b> Place Transfer Switch for Charging Pump A to LOCAL (Att. 3 Step 4.a)</p> <p><b><u>STANDARD:</u></b> Candidate simulates placing Charging Pump A Transfer Switch to LOCAL</p> <p><b>As Found:</b> Charging Pump A Transfer Switch in REMOTE.</p> <p><b>EXAMINER'S CUE:</b> Charging Pump A Transfer Switch is in LOCAL and the GREEN stop light is illuminated</p> <p><b>EXAMINER'S NOTE:</b> If candidate requests status of Charging Pumps inform the candidate that there is no motor or pump noise in the Charging Pump room. No charging pumps are operating.</p> <p><b><u>COMMENTS:</u></b></p>	<p style="text-align: center;"><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 4:</u></b> Open CVC-309A, HCV-121 BYPASS (Att. 3 Step 4.b)</p> <p><b><u>STANDARD:</u></b> Candidate simulates opening CVC-309A by rotating the handwheel in the CCW direction.</p> <p><b>As Found:</b> CVC-309A is closed.</p> <p><b>EXAMINER'S CUE:</b> CVC-309A handwheel has stopped rotating and the stem is full out.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 5:</u></b> Close CVC-202B, HCV-121 INLET ISOL (Att. 3 Step 4.c)</p> <p><b><u>STANDARD:</u></b> Candidate simulates closing CVC-202B by rotating the handwheel in the CW direction.</p> <p><b>As Found:</b> CVC-202B is open.</p> <p><b>EXAMINER'S CUE:</b> CVC-202B handwheel has stopped rotating and the stem is fully inserted.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p style="text-align: center;"><b><u>NOTE</u></b></p> <ul style="list-style-type: none"> <li>• CVC-358 is located in the overhead West of Charging Pump B.</li> <li>• LCV-115C is located in the overhead between Charging Pumps B &amp; C</li> </ul>	

<p><b><u>STEP 6:</u></b> Open CVC-358, RWST TO CHARGING PUMP SUCTION (Att. 3 Step 5.a)</p> <p><b><u>STANDARD:</u></b> Candidate simulates opening CVC-358 by rotating handle 90 degrees CCW to align the valve handle with the pipe.</p> <p><b>As Found:</b> CVC-358 is closed with handle perpendicular with pipe.</p> <p><b>EXAMINER'S CUE:</b> CVC-358 handle is aligned with the pipe.</p> <p><b>EXAMINER'S NOTE:</b> Ladder is located in the SE corner of the Charging Pump Room next to the Charging Pump Room DS Control Panel.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 7:</u></b> Obtain verification from the SM that the emergency buses are deenergized. (Att. 3 Step 5.b)</p> <p><b><u>STANDARD:</u></b> Candidate simulates using the radio to contact the SM for the status of the emergency buses.</p> <p><b>As Found:</b> N/A</p> <p><b>EXAMINER'S CUE:</b> SM reports that both emergency buses are deenergized.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 8:</u></b> Close LCV-115C, VCT OUTLET ISOLATION (Att. 3 Step 5.c)</p> <p><b><u>STANDARD:</u></b> Candidate simulates closing valve LCV-115C by declutching the motor by downward motion of the lever and then rotating the handwheel in the CW direction.</p> <p><b>As Found:</b> LCV-115C is open.</p> <p><b>EXAMINER'S CUE:</b> The motor is de-clutched and LCV-115C handwheel has stopped rotating and the valve stem is fully inserted.</p> <p><b>EXAMINER'S NOTE:</b> For safety purposes the candidate is allowed to point to the valve from the floor and discuss how the valve is operated.</p> <p><u>COMMENTS:</u></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b>TIME CRITICAL TIME STOP:</b> _____ (Aligned to RWST: 11 min. from start of JPM)</p>	
<p><b><u>STEP 9:</u></b> Check Charging Pump "A" - STOPPED (Att. 3 Step 6)</p> <p><b><u>STANDARD:</u></b> Candidate determines from initial conditions and / or observations in Charging Pump Room that Charging Pump "A" is stopped.</p> <p><b>As Found:</b> Depends on actual plant conditions.</p> <p><b>EXAMINER'S CUE:</b> If requested, report that the charging pump room is quiet. There is no movement on any of the pumps. Charging Pump "A" GREEN stop light is illuminated.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p style="text-align: center;"><b><u>NOTE</u></b></p> <p>A ladder is located to the left of the Charging Pump Room Control Panel if closure of the CVC-297 valves is required.</p>	

<p><b><u>STEP 10:</u></b> Obtain verification from the SM that the DS Bus is energized AND elapsed time since Seal Injection was lost. (Att. 3 Step 7.a)</p> <p><b><u>STANDARD:</u></b> Candidate simulates using radio to contact the SM.</p> <p><b>As Found:</b> N/A</p> <p><b>EXAMINER'S CUE:</b> SM reports that the DS Bus is energized and that seal injection has been lost for 12 minutes.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 11:</u></b> Check elapsed time since Seal Injection Lost – Less than 15 minutes. (Att. 3 Step 7.b)</p> <p><b><u>STANDARD:</u></b> Candidate determines that seal injection has been lost for 12 minutes.</p> <p><b>As Found:</b> N/A</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 12:</u></b> Locally Start Charging Pump A (Att. 3 Step 7.c)</p> <p><b><u>STANDARD:</u></b> Candidate simulates starting Charging Pump A by pushing the START pushbutton. Verifies pump start, visually and audibly.</p> <p><b>As Found:</b> Depend on actual plant conditions.</p> <p><b>EXAMINER'S CUE:</b> - The RED run light is illuminated and Charging Pump A is running.  - All post-start conditions are normal.  - If the candidate checks charging flow on FI-122B, state that charging flow is 35 gpm.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b>TIME CRITICAL TIME STOP:</b> _____ (Re-est. seal inj. flow: 13 min. from start of JPM)</p>	
<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>Attempt to minimize Charging Pump starts/stops while maintaining the PZR level band in the following steps to avoid exceeding the pump start limitation of four starts per hour. However, maintaining the PZR level band overrides concerns with pump start limitations.</p>	
<p><b><u>STEP 13:</u></b> Place the local speed control station AUTO/MAN Selector Switch to the MAN position. (Att. 3 Step 8.a)</p> <p><b><u>STANDARD:</u></b> Candidate simulates rotating the AUTO/MAN selector switch for "A" Charging Pump Speed Controller to MAN position.</p> <p><b>As Found:</b> AUTO/MAN selector switch in AUTO for "A" CCP</p> <p><b>EXAMINER'S CUE:</b> AUTO/MAN station for "A" Charging Pump has been placed in MAN.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 14:</u></b> Rotate the speed controller COUNTER-CLOCKWISE to manually lower Charging Pump Speed to the minimum. (Att. 3 Step 8.b)</p> <p><b><u>STANDARD:</u></b> Candidate simulates rotating the speed controller knurled knob in the CCW direction to reduce charging pump speed to minimum. Audible is available to verify that pump speed has been lowered.</p> <p><b>As Found: Condition based on actual plant status.</b></p> <p><b>EXAMINER'S CUE:</b> Speed controller has been rotated in the CCW direction and pump speed has lowered.</p> <p><b>EXAMINER'S NOTE:</b> Charging Pump speed controller has an arrow that indicates increasing speed in the CW direction, and visa-versa.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 15:</u></b> Check Seal Injection - Aligned (Att. 3 Step 9)</p> <p><b><u>STANDARD:</u></b> Candidate determines that seal injection is aligned based on information to the contrary given in cue and also observes seal injection flow at local indicators.</p> <p><b>As Found: Seal injection flow will be 8 – 12 gpm based on actual plant status.</b></p> <p><b>EXAMINER'S CUE:</b> If requested or if local seal injection flow observed, inform the candidate that all seal injection flows indicate approximately 4 gpm each.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



<p><b><u>STEP 16:</u></b> Check RCP Seal Injection Flow – Between 6 GPM AND 20 GPM (Att. 3 Step 10)</p> <p><b><u>STANDARD:</u></b> Candidate observes the local seal injection flow meters and determines that flow is NOT within the specified band.</p> <p><b>As Found:</b> Seal injection flow will be 8 – 12 gpm based on actual plant status.</p> <p><b>EXAMINER'S CUE:</b> When local seal injection flow observed, inform the candidate that all seal injection flows indicate approximately 4 gpm each.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 17:</u></b> Locally throttle RCP SEAL WATER FLOW CONTROL VALVES to obtain flow to each RCP between 6 gpm and 20 gpm.</p> <ul style="list-style-type: none"> <li>• CVC-297A</li> <li>• CVC-297B</li> <li>• CVC-297C</li> </ul> <p>(Att. 3 Step 10 RNO)</p> <p><b><u>STANDARD:</u></b> Candidate simulates throttling open CVC-297A/B/C by rotating the handwheels in the CCW direction while periodically checking the seal injection flows.</p> <p><b>As Found:</b> Seal injection flow will be 8 – 12 gpm based on actual plant status.</p> <p><b>EXAMINER'S CUE:</b> As the candidate throttles open the valve(s), inform the candidate that the seal injection flows are slowly rising and are slightly greater than 6 gpm as the applicable CVC-297 valve is fully opened. When all CVC-297 valves are fully open inform the candidate that all seal injection flows indicate 6.2 gpm.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

<p><b><u>STEP 18:</u></b> IF required to maintain minimum flow, THEN throttle CVC-309A, HCV-121 BYPASS, valve while maintaining Charging Pump Discharge pressure less than 2500 psig. (Att. 3 Step 10 RNO)</p> <p><b><u>STANDARD:</u></b> Candidate determines that performance of this step is not necessary.</p> <p><b>As Found:</b> CVC-309A was opened in a previous step.</p> <p><b>EXAMINER'S CUE:</b> If requested, inform candidate that all seal injection flows remain steady at 6.2 gpm.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 19:</u></b> Notify the SM that Charging Flow has been established AND the status of seal injection. (Step 11)</p> <p><b><u>STANDARD:</u></b> Candidate simulates using the radio to contact the SM and reports that charging flow has been established to the RCS and that seal injection flow is within the desired range.</p> <p><b>As Found:</b> N/A</p> <p><b>EXAMINER'S CUE:</b> Acknowledge report as the SM.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b><u>END OF TASK</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>Terminating Cue:</b> After the SM has been notified that charging flow has been established and that seal injection flows are in the normal range.</p>	

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

**CANDIDATE CUE SHEET  
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there **ARE** time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. At 1200, the Control Room was evacuated due to a fire on the RTGB.
2. At the time the Control Room was evacuated, Charging Pumps "B" and "C" were running.
3. DSP-002, Hot Shutdown Using the Dedicated / Alternate Shutdown System, has been implemented.

**INITIATING CUES:**

**You have been assigned to perform DSP-002, Attachment 3. Enter the Auxiliary Building through the normal Auxiliary Building RCS Entrance. Assume that you have all of the equipment required by Attachment 3, Step 1.**

**Inform the Shift Manager when a Charging Pump is running at minimum speed and adequate seal injection flow is being supplied to the RCPs.**

**The time now is 1202.**

**Time Critical**

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**CONTINUOUS USE**ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 1 of 14)

NOTE

- Time Critical Action: Transfer Charging Pump Suction to the RWST within 13 minutes of event initiation per step 5.
- Time Critical Action: Re-establish Charging / Seal Injection within 15 minutes of event initiation per step 7.
- Time Critical Action: Establish CCW to RCPs within 93 minutes of event initiation per step 19.

1. Obtain The Following Prior To Leaving The Old Fire Equipment Building:

- Two-way radio
- Flashlight
- Locked valve keys (Keys 1, 1a, or 1b)
- Locked high rad area key (in holder near door)

2. Check Fire Location - IN E-1/E-2 ROOM (AREA A5)

Observe the NOTE prior to Step 4 and Go To Step 4.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**CONTINUOUS USE**ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 2 of 14)

## 3. Shutdown The EDGs As Follows:

a. At EDG A Perform the  
following:

- Trip the Fuel Racks by  
depressing the EMERGENCY  
STOP Pushbutton
- Unlock AND close DA-21A,  
DG "A" UPPER AIR START  
OUTLET ISOLATION
- Unlock AND close DA-25A,  
DG "A" LOWER AIR START  
OUTLET ISOLATION

b. At EDG B Perform the  
following:

- Trip the Fuel Racks by  
depressing the EMERGENCY  
STOP Pushbutton
- Unlock AND close DA-21B,  
DG "B" UPPER AIR START  
OUTLET ISOLATION
- Unlock AND close DA-25B,  
DG "B" LOWER AIR START  
OUTLET ISOLATION

c. Notify the SM that BOTH EDGs  
have been tripped

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**CONTINUOUS USE**ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 3 of 14)

NOTE

- Access to the Charging Pump Room can be gained via the Nonregenerative and Seal Water Return Heat Exchanger Room on the second level of the Aux Bldg in the event of a fire in the Aux Bldg hallway.
- CVC-309A is located near HCV-121 on the West Wall of the Charging Pump Room.

4. Locally Align Charging Flow As  
Follows:

- a. Place Transfer Switch for  
CHARGING PUMP A to LOCAL
- b. Open CVC-309A, HCV-121 BYPASS
- c. Close CVC-202B, HCV-121 INLET  
ISOL

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**CONTINUOUS USE**ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 4 of 14)

NOTE

- CVC-358 is located in the overhead West of Charging Pump B.
- LCV-115C is located in the overhead between Charging Pumps B & C.

5. Locally Align RWST To Charging  
Pump Suction As Follows:

a. Open CVC-358, RWST TO  
CHARGING PUMP SUCTION

b. Obtain verification from the  
SM that the emergency buses  
are deenergized

b. WHEN verification received,  
THEN Go To Step 5.c.

c. Close LCV-115C, VCT OUTLET  
ISOLATION

6. Check Charging Pump "A" - STOPPED      Go To Step 8.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 5 of 14)

NOTE

A ladder is located to the left of the Charging Pump Room Control Panel if closure of the CVC-297 valves is required.

- \* 7. At the Charging Pump Room  
Control Panel Start Charging  
Pump A As Follows:

a. Obtain verification from the  
SM that the DS Bus is  
energized AND elapsed time  
since Seal Injection was lost

b. Check elapsed time since Seal  
Injection Lost - LESS THAN  
15 MINUTES

a. WHEN verification is  
received, THEN Go To Step 7.b.

b. Perform the following:

1) Close the RCP SEAL WATER  
FLOW CONTROL VALVES:

- CVC-297A
- CVC-297B
- CVC-297C

2) WHEN Pipe Alley is  
accessible, THEN Locally  
close ONE of the below  
valves:

- FCV-626, THERM BARRIER  
OUTLET

OR

- CC-736, CC FROM RCP  
"A", "B", "C" THERMAL  
BARRIER

3) Go To Step 7.c.

c. Locally Start CHARGING PUMP A



STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;"><b>CONTINUOUS USE</b> <u>ATTACHMENT 3</u>  <u>AUXILIARY BUILDING OPERATOR ACTIONS</u>  (Page 6 of 14) ***** <u>CAUTION</u>  Attempt to minimize Charging Pump starts/stops while maintaining the PZR level band in the following steps to avoid exceeding the pump start limitation of four starts per hour. However, maintaining the PZR level band overrides concerns with pump start limitations.  *****</p>		
8.	Establish Local Speed Control Of The Running Charging Pump As Follows:  a. Place the local speed control station AUTO/MAN Selector Switch to the MAN position  b. Rotate the speed controller COUNTER-CLOCKWISE to manually lower Charging Pump Speed to the minimum	
9.	Check Seal Injection - ALIGNED	Go To Step 11.
10.	Check RCP Seal Injection Flow - BETWEEN 6 GPM <u>AND</u> 20 GPM	Locally throttle RCP SEAL WATER FLOW CONTROL VALVES to obtain flow to each RCP between 6 gpm and 20 gpm.  • CVC-297A  • CVC-297B  • CVC-297C  <u>IF</u> required to maintain minimum flow, <u>THEN</u> throttle CVC-309A, HCV-121 BYPASS valve while maintaining Charging Pump Discharge pressure less than 2500 psig.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 7 of 14)

11. Notify The SM That Charging Flow  
Has Been Established AND The  
Status Of Seal Injection

NOTE

Attachment 11, Credited Instrumentation Available, provides a list of  
the credited instrumentation not affected by the fire based on the  
fire location.

12. At the Charging Pump Control  
Panel Perform the following:

a. Verify Transfer Switch for  
CCW PUMP A in LOCAL position.

b. Check CCW PUMP A Status -  
STOPPED.

b. IF RCP Seal Injection has  
been established, THEN notify  
SM that CCW has been  
established AND Go To Step 15.

IF RCP Seal Injection has NOT  
been established, THEN  
Locally Stop CCW Pump A.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 8 of 14)

NOTE

When dumping steam from the secondary a cooldown rate of 10°F/Hr is the maximum rate allowed.

13. At the Charging Pump Control  
Panel Start CCW PUMP A As  
Follows:

- a. Check RCP Seal Injection -  
ESTABLISHED

- a. Perform the following:

- 1) Locally Raise speed on the  
Charging Pump to 100%.
- 2) IF required to maintain  
PZR level stable, THEN  
coordinate with the  
Turbine Building Operator  
to dump steam from the  
secondary.
- 3) WHEN FCV-626 OR CC-736 is  
closed, THEN Go To Step 14.

- b. Start CCW PUMP A

- c. Locally Check CCW flow on  
FI-660, CHARGING PUMP OIL  
COOLER RETURN FLOW - FLOW  
INDICATED

- c. Locally Verify Charging Pump  
A CCW alignment correct:

- CC-825C, CC TO CHG PUMP  
"A" OIL COOL - OPEN
- CC-825F, CC FROM CHG PUMP  
A OIL COOL - OPEN

- d. Notify the SM that CCW flow  
has been established

- e. Go To Step 15

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 9 of 14)

\*14. Perform The Following:

- a. At the Charging Pump Room  
Control Panel Start CCW PUMP A
- b. Notify the SM that CCW flow  
has been established
- c. Check CCW flow on FI-660,  
CHARGING PUMP OIL COOLER  
RETURN FLOW - FLOW INDICATED
- c. Verify Charging Pump A CCW  
alignment correct:
  - CC-825C, CC TO CHG PUMP  
"A" OIL COOL - OPEN
  - CC-825F, CC FROM CHG PUMP  
A OIL COOL - OPEN
- d. Maintain PZR Level between  
15% and 25% by a combination  
of the following:
  - Local control of Charging  
Pump speed
  - Dumping steam on the  
secondary
  - Starting and stopping  
Charging Pump A as  
required

15. Go To The Appropriate Step Based  
On Fire Location:

FIRE LOCATION	STEP
E-1/E-2 ROOM	17
AUX BLDG HALL	21
ANYWHERE ELSE	16

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 10 of 14)

\*16. Shutdown The EDGs As Follows:

a. At EDG A Perform the  
following:

- Trip the Fuel Racks by  
depressing the EMERGENCY  
STOP Pushbutton
- Unlock AND close DA-21A,  
DG "A" UPPER AIR START  
OUTLET ISOLATION
- Unlock AND close DA-25A,  
DG "A" LOWER AIR START  
OUTLET ISOLATION

b. At EDG B Perform the  
following:

- Trip the Fuel Racks by  
depressing the EMERGENCY  
STOP Pushbutton
- Unlock AND close DA-21B,  
DG "B" UPPER AIR START  
OUTLET ISOLATION
- Unlock AND close DA-25B,  
DG "B" LOWER AIR START  
OUTLET ISOLATION

c. Notify the SM that BOTH EDGs  
have been tripped17. Check RCP Seal Injection Status  
- ALIGNED

Go To Step 24.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 11 of 14)

- \*18. Check CCW Flow From The Thermal  
Barrier On FIC-626 - GREATER  
THAN 50 GPM

WHEN Pipe Alley is accessible,  
THEN check flow.

IF flow is less than 50 gpm,  
THEN locally UNLOCK AND OPEN  
CC-932, "FCV-626 and CC-735  
BYPASS ISOLATION". (Pipe Alley,  
middle penetrations, sleeve 16)

IF flow remains below 50 gpm,  
THEN locally verify OPEN the  
following valves:

- CC-716A, COOLING WATER INLET  
(Located 20 feet in overhead  
near Sleeve 8)
- CC-716B, COOLING WATER INLET  
(Located 20 feet in overhead  
near sleeve 8.)

19. Notify The SM That CCW Flow To  
The RCPs Has Been Established
20. Go To Step 24
21. Direct The Electrical Operator  
To Locally Trip Both Emergency  
Diesel Generators AND Isolate  
The Air Start Outlet Isolation  
Valves When The Fire Is Out  
(Step 16)

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 12 of 14)

\*22. Check Fire - EXTINGUISHED

WHEN the fire has been  
extinguished, THEN perform ONE  
of the below Steps:

- IF Seal Injection has been  
established, THEN perform  
Steps 17 through 19.

OR

- IF Seal Injection has NOT  
been established, THEN leave  
FCV-626 OR CC-736 closed AND  
Go To Step 24.

Go To Step 24.

23. Check Seal Injection Status -  
ISOLATED

Go To Step 17.

\*24. Check PZR Level - GREATER THAN  
90%

IF PZR Level rises to 90%, THEN  
perform Steps 25 AND 26.

Observe the NOTE prior to  
Step 26 and Go To Step 26.

25. Stop CHARGING PUMP A

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**CONTINUOUS USE**ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 13 of 14)

NOTE

PZR level control may be assisted by dumping steam from the secondary as long as a cooldown rate of 10°F/Hr is NOT exceeded.

**\*26. Maintain PZR Level As Follows:**

- |                                        |                     |
|----------------------------------------|---------------------|
| a. Check RCP Seal Cooling -<br>ALIGNED | a. Go To Step 26.d. |
|----------------------------------------|---------------------|
- b. Maintain PZR Level between  
27% And 73% by a combination  
of the following:
- Local control of Charging  
Pump speed
  - Dumping steam on the  
secondary
  - Starting and stopping  
Charging Pump A as  
required
- c. Go To Step 27
- d. Maintain PZR Level between  
15% And 25% by a combination  
of the following:
- Local control of Charging  
Pump speed
  - Dumping steam on the  
secondary
  - Starting and stopping  
Charging Pump A as  
required



STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## CONTINUOUS USE

ATTACHMENT 3AUXILIARY BUILDING OPERATOR ACTIONS

(Page 14 of 14)

- \*27. Periodically Monitor Charging Pump "A" Seal Lubricating Tank - Level Normal      Perform the following:
- a. Open PW-48.
  - b. WHEN tank level is in the normal range, THEN close PW-48.
- \*28. Check RWST Level Using LIC-947 - LESS THAN 50%      WHEN RWST level is less than 50%, THEN notify the SM to contact the TSC to determine RWST makeup options.
- Observe the NOTE prior to Step 30 and Go To Step 30.
- \*29. Notify The SM To Contact The TSC To Determine RWST Makeup Options

NOTE

Portable generators and blowers are available in a cabinet on the 2nd level of the Turbine Building.

30. Notify The SM To Have Portable Cooling Powered From Portable Generators Installed In The Charging Pump Room As Additional Personnel Become Available

- END -

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM J  
Rev 0**

**ALIGNING SW BACKUP TO SDAFW PUMP SUCTION  
IAW DSP-007, Attachment 7**

<b>Concurred By:</b>	<u>Kirk Schauer</u> Operations	<b>Date:</b> <u>5/15/13</u>
<b>Approved By:</b>	<u>James Conder</u> Superintendent/Supervisor - Training	<b>Date:</b> <u>6/5/13</u>

# **LICENSE EXAMINATION JOB PERFORMANCE MEASURE**

**Task:** 04061101001, Aligning SW Backup to SDAFW Pump Suction  
01104104205, Perform Cooldown to CSD Using the Dedicated/Alternate Shutdown  
System IAW DSP-007.

**Alternate Path:**

YES

**JPM #:**

ILC-13 NRC JPM J

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

061 G2.1.30	4.4 / 4.0
061 K1.01	4.1 / 4.1
061 K4.01	4.1 / 4.2
076 K1.20	3.4 / 3.4

**Task Standard:**

SW Backup Aligned to Supply Suction to SDAFW Pump IAW DSP-007, Att. 7

**Preferred Evaluation Location:**

Simulator \_\_\_\_\_ In-Plant   X  

**Preferred Evaluation Method:**

Perform \_\_\_\_\_ Simulate   X  

**References:**

DSP-007, Att. 7

**Validation Time:** 15 Minutes **Time Critical:** NO **Time Critical Time:** N/A

**Candidate:**

Name \_\_\_\_\_

SSN       -       -

**Overall  
Time**

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

**Performance  
Time (min):** \_\_\_\_\_

(N/A if not time  
critical)

**Critical  
Time**

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

**Performance Rating:**  
circle one

SAT

UNSAT

**Examiner:**

Print Name

Signature

Date

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

## COMMENTS

- 
- Step 1** Critical because these actions will ensure the SDAFW pump is NOT in service while swapping the supply from CST to SW.
- 
- Step 2** Critical because the supply from the CST must be isolated to prevent SW flow back to the CST. Also because actions ensure the drain is closed and opens the supply from SW to SDAFW pump.
- 
- Step 3** Critical because the pump must be vented to ensure water is up to the pump.
- 
- Step 6** Critical because a steam supply valve must be opened to start the pump, the initial valve chose by the CRS is stuck closed and the operator must open another steam supply valve to start the pump.
- 
- Step 7** Critical because venting the pump casing ensures there is not trapped air that may not have vented using the SW supply line in a previous step.
-

**Tools/Equipment/Procedures Needed:**

DSP-007, Attachment 7

**READ TO OPERATOR****DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Operator Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. DSP-007, Cold Shutdown Using the Dedicated / Alternate Shutdown System, has been implemented and the CRS has determined the need to initiate cool down to cold shutdown.
2. The CRS has determined it is necessary to align SW to the suction of SDAFW pump.
3. You have all equipment and tools necessary to complete this assignment.
4. Due to plant conditions, all communications outside the Control Room will be via radio.

**INITIATING CUES:**

The CRS directs you to complete DSP-007, Attachment 7 to align SW to the suction of the SDAFW pump. When SW is aligned to supply the pump, start it by opening the steam supply valve from "C" S/G.

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

**NOTE**

The maximum allowable flow rate for the SDAFW Pump is 345 gpm. This total includes 90 gpm seal leak off and 165 gpm flow to prevent exceeding the 600 gpm maximum designed flow with the SW System as a backup source of water to AFW.

**STEP 1:** Verify CLOSED, Steam Supply to SDAFW Pump Valves:

- V1-8A, SG "A" Stm Supply to SDAFW Pump
  - V1-8B, SG "B" Stm Supply to SDAFW Pump
  - V1-8C, SG "C" Stm Supply to SDAFW Pump
- (Step 1)

**CRITICAL  
STEP**

\_\_\_\_ SAT

**STANDARD:** Simulates declutching the motor by pushing the lever down, and closing the valve by rotating the handwheel in the CW direction.

**As Found:** N/A

\_\_\_\_ UNSAT

**EXAMINER'S CUE:** Motor declutch lever lowered, handwheel turned in the CW direction and will no longer move.

Once the operator has demonstrated manipulation of one of the valves, tell him the other two valves are closed.

**EXAMINER'S NOTE:** If necessary, inform the operator that the Control Room is evacuated and local actions are necessary. All 3 valves operate the same and are in the same area.

**COMMENTS:**

**STEP 2:**

Locally align the following valves:

- a. Unlock and close AFW-1, AFW Pumps suction from CST
- b. Unlock and close AFW-104, AFW Pumps suction from CST
- c. Close AFW-24A, AFW Suction From SW Emergency B/U Tell-Tail Drain
- d. Unlock and OPEN AFW-24, AFW Suction Isolation From SW Emergency Backup
- e. Unlock and OPEN SW-118, SW Emergency Backup to AFW Suction. (Step 2)

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Simulates unlocking and closing AFW-1 and AFW-104.  
Simulates closing AFW-24A.  
Simulates unlocking and opening AFW-24 and SW-118.

**As Found:** Both AFW-1 and AFW-104 are open, stem extended. There is one chain and lock shared between the valve handwheels.  
Tell-tail drain AFW-24A is open.  
AFW-24 and SW-118 are locked closed.

**EXAMINER'S CUE:** - Lock is removed; AFW-1 and AFW-104 handwheels turned in the CW direction until it will not move anymore, the stem is inserted.  
- AFW-24A tell-tail handwheel is turned in the CW direction until it will not move anymore, the stem is inserted.  
- The lock is removed from AFW-24; the handwheel is turned in the CCW direction until it will not move anymore and the stem is extended.  
- The lock is removed from SW-118; the handwheel turned in the CCW direction until it will not move anymore and the stem is extended.

**EXAMINER'S NOTE:** NONE

**COMMENTS:**



**STEP 3:**

Vent the SDAFW Pump by performing the following:

- a. Remove cap from AFW-7, SDAFW Pump Suction Vent (10 ft in overhead, above TCV-1902A)
- b. OPEN AFW-7, SDAFW Pump Suction Vent
- c. WHEN a solid stream of water issues from AFW-7, THEN Close AFW-7
- d. Install cap on AFW-7  
(Step 3)

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** Simulates venting the SDAFW Pump as follows:

- Removes cap from AFW-7 tail pipe.
- Turns handwheel in the CCW direction until water issues.
- Monitors the flow until a solid stream is observed, THEN turns handwheel in the CW direction until it stops moving and observes NO flow of water.
- Installs the cap on AFW-7 tail pipe.

**As Found:** AFW-7 closed with cap installed.

**EXAMINER'S CUE:**

- Cap is removed from AFW-7 tail pipe.
- Handwheel is turned in the CCW direction until water issues.
- Flow begins to issue and is now a solid stream, THEN handwheel turns in the CW direction until stops and no flow of water.
- The cap is installed on AFW-7 tail pipe.

**EXAMINER'S NOTE:**

If candidate attempts to go to WCC for a pipe wrench inform the candidate that all tools were provided as stated in the JPM CUE.

AFW-7 is 10 feet overhead above the TCV-1902A. It will suffice for the Operator to point at the valve, preferably with a flashlight and describe where he would obtain a ladder and describe his actions.

**COMMENTS:**

**STEP 4:** Notify Shift Manager that the SDAFW Pump is ready to be started.  
(Step 4)

**STANDARD:** Simulates contacting SM / CRS and reports the SW has been aligned to supply the SDAFW pump, and the pump has been vented and is ready to start.

**As Found:** N/A

**EXAMINER'S CUE:** Acknowledge the report and direct starting the pump using the "C" S/G steam supply.

**EXAMINER'S NOTE:** NONE

**COMMENTS:**

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 5:**

Locally WHEN directed by the Shift Manager start the SDAFW Pump by opening one of the following valves:

- V1-8A, SG "A" Stm Supply to SDAFW Pump
- V1-8B, SG "B" Stm Supply to SDAFW Pump
- **V1-8C, SG "C" Stm Supply to SDAFW Pump**

(Step 5)

\_\_\_ SAT

**STANDARD:**

Candidate simulates opening V1-8C. Recognizes / reports V1-8C will not open.

\_\_\_ UNSAT

**As Found:** The valves were verified closed in Step 1, the motor clutch is disengaged.

**EXAMINER'S CUE:**

**Direct the Operator to start the SDAFW pump by opening the steam supply valve from the "C" S/G.**

**V1-8C handwheel did NOT move in the CCW direction.**

**When contacted, respond as CRS/SM and direct candidate use the steam supply valve from "B" S/G.**

**EXAMINER'S NOTE:**

**The Operator may NOT push the clutch lever, it was disengaged in the first step and remains disengaged until the motor is actuated.**

**V1-8C valve is STUCK in the closed position, the Operator must contact the Control Room to inform them and choose a different S/G for steam supply.**

**COMMENTS:**

**STEP 6:**

Locally WHEN directed by the Shift Manager start the SDAFW Pump by opening on of the following valves:

- V1-8A, SG "A" Stm Supply to SDAFW Pump
- **V1-8B, SG "B" Stm Supply to SDAFW Pump**
- V1-8C, SG "C" Stm Supply to SDAFW Pump

(Step 5 continued)

**STANDARD:**

Candidate simulates opening V1-8B by rotating the MOV handwheel in the CCW direction until it will not turn anymore and is taken ¼ turn off its backseat.

**As Found: The valves were verified closed in Step 1, the motor clutch is disengaged.**

**EXAMINER'S CUE: V1-8B MOV handwheel is turned in the CCW direction until it will not turn anymore.**

**EXAMINER'S NOTE: The operator may decide NOT to push the clutch level since it was disengaged in the first step and remains disengaged until the motor is actuated.**

**COMMENTS:****CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

- STEP 7:** Locally Vent SDAFW Pump by performing the following:
- Open AFW-18, SDAFW pump vent.
  - WHEN the SDAFW Pump is vented, THEN close AFW-18.  
(Step 6)

**CRITICAL  
STEP**

\_\_\_ SAT

- STANDARD:** Candidate simulates venting the SDAFW Pump as follows:
- Turns AFW-18 handwheel in the CCW direction until water issues from the vent.
  - When a solid stream of water is observed, candidate closes AFW-18 by turning the handwheel in the CW direction until the flow stops and the handwheel will not move anymore.
  - Candidate contacts the Control Room to inform them the SDAFW Pump is running and has been vented.

\_\_\_ UNSAT

**As Found:** AFW-18 closed.

**EXAMINER'S CUE:** When located:

- AFW-18 handwheel is turned in the CCW direction and water begins to issue.
- A solid stream of water is observed, the handwheel is then turned in the CW direction until flow is stopped and the handwheel will not move anymore.
- Acknowledge the report that the SDAFW Pump is running and has been vented.

**EXAMINER'S NOTE:** NONE

**COMMENTS:**

**END OF TASK**

**Terminating Cue:** When the SDAFW Pump has been started and vented.

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. DSP-007, Cold Shutdown Using the Dedicated / Alternate Shutdown System, has been implemented and the CRS has determined the need to initiate cool down to cold shutdown.
2. The CRS has determined it is necessary to align SW to the suction of SDAFW pump.
3. You have all equipment and tools necessary to complete this assignment.
4. Due to plant conditions, all communications outside the Control Room will be via radio.

**INITIATING CUES:**

**The CRS directs you to complete DSP-007, Attachment 7 to align SW to the suction of the SDAFW pump. When SW is aligned to supply the pump, start it by opening the steam supply valve from "C" S/G.**

## CONTINUOUS USE

ATTACHMENT 7ALIGNING SW BACKUP TO SDAFW PUMP SUCTION

(Page 1 of 2)

NOTE

The maximum allowable flow rate for the SDAFW Pump is 345 gpm. This total includes 90 gpm seal leak off and 165 gpm recirc flow to prevent exceeding the 600 gpm maximum designed flow with the SW System as a backup source of water to AFW.

1. Locally Verify CLOSED, Steam Supply to SDAFW Pump Valves:
  - V1-8A, SG "A" STM SUPPLY TO STM DRIVEN AFW PUMP
  - V1-8B, SG "B" STM SUPPLY TO STM DRIVEN AFW PUMP
  - V1-8C, SG "C" STM SUPPLY TO STM DRIVEN AFW PUMP
2. Locally Align the following valves:
  - a. Unlock and close AFW-1, AFW PUMPS SUCTION FROM CST.
  - b. Unlock and close AFW-104, AFW PUMPS SUCTION FROM CST.
  - c. Close AFW-24A, AFW SUCTION FROM SW EMERGENCY B/U TELL-TAIL DRAIN
  - d. Unlock and open AFW-24, AFW SUCTION ISOLATION FROM SW EMERGENCY BACKUP.
  - e. Unlock and open SW-118, SW EMERGENCY BACKUP TO AFW SUCTION.
3. Locally Vent the SDAFW Pump by performing the following:
  - a. Remove cap from AFW-7, SDAFW PUMP SUCTION VENT (10 ft in overhead, above TCV-1902A).
  - b. Open AFW-7, SDAFW PUMP SUCTION VENT.
  - c. WHEN a solid stream of water issues from AFW-7, THEN close AFW-7.
  - d. Install cap on AFW-7, SDAFW PUMP SUCTION VENT.
4. Notify Shift Manager that the SDAFW Pump is ready to be started.

**CONTINUOUS USE**ATTACHMENT 7ALIGNING SW BACKUP TO SDAFW PUMP SUCTION

(Page 2 of 2)

5. Locally WHEN directed by the Shift Manager start the SDAFW Pump by opening one of the following valves:
  - V1-8A, SG "A" STM SUPPLY TO STM DRIVEN AFW PUMP
  - V1-8B, SG "B" STM SUPPLY TO STM DRIVEN AFW PUMP
  - V1-8C, SG "C" STM SUPPLY TO STM DRIVEN AFW PUMP
6. Locally Vent SDAFW Pump by performing the following:
  - a. Open AFW-18, SDAFW PUMP VENT.
  - b. WHEN the SDAFW PUMP is vented, THEN close AFW-18.

- END -



**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**ILC-13 NRC JPM K  
Rev 0**

**ALIGN BACKUP FUEL OIL TO THE “B” EDG IAW EPP-  
28, ATTACHMENT 5**

**Concurred By:** Patrick Lathrop **Date:** 5/15/13  
Operations

**Approved By:** James Conder **Date:** 6/5/13  
Superintendent/Supervisor - Training

**LICENSE EXAMINATION  
JOB PERFORMANCE MEASURE**

**Task:** 04118117205, Perform the Local Actions to Align Backup Fuel Oil from the Alternate Fuel Oil Storage Tanks to the EDGs Day Tanks IAW EPP-28 (Commitment)

01118115705, Respond to EPP-28 Loss of Ultimate Heat Sink (Commitment)

**Alternate Path:**

NO

**JPM #:**

ILC-13 NRC JPM K

**Candidate**

RO/SRO

**K/A**                      **Rating (RO/SRO):**

062.AK3.03	4.0/4.2
064.K1.03	3.6/4.0
064.K6.08	3.2/3.3

**Task Standard:**

Backup fuel oil is aligned to the "B" EDG IAW EPP-28 Attachment 5

**Preferred Evaluation Location:**

Simulator \_\_\_\_\_ In-Plant   X  

**Preferred Evaluation Method:**

Perform \_\_\_\_\_ Simulate   X  

**References:**

EPP-28, Attachment 5

**Validation Time:** 15 Minutes **Time Critical:** NO **Time Critical Time:** N/A

**Candidate:**

(N/A if not time critical)

\_\_\_\_\_  
Name

**Overall  
Time**

**Critical  
Time**

SSN      -      -  
\_\_\_\_\_

Start: \_\_\_\_\_

Start: \_\_\_\_\_

Finish: \_\_\_\_\_

Finish: \_\_\_\_\_

**Performance Rating:**      SAT      UNSAT  
circle one

**Performance  
Time (min):** \_\_\_\_\_

\_\_\_\_\_

**Examiner:**

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**COMMENTS:**

**QUESTION DOCUMENTATION:**

Question:

Response:

## COMMENTS

**Steps 2, 3 & 4** Critical to establish a flowpath from the AFOST to the EDG Day Tank.

---

**Step 5 & 6** Critical to control EDG Day Tank Level.

---

**Tools/Equipment/Procedures Needed:**

EPP-28, Attachment 5

**READ TO OPERATOR**

**DIRECTIONS TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To facilitate the examination and better enable me to assess your level of understanding, verbalize your actions and observations while performing the JPM. To indicate that you have completed your assigned task return the Operator Cue Sheet I provided you.

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. You are the Inside Auxiliary Operator.
2. A hostile action has resulted in a loss of off-site power and severely damaged the intake, with a subsequent loss of the ability to move water from the lake to cool plant equipment.
3. The Security Event has been terminated.
4. EPP-28 (Loss of Ultimate Heat Sink) has been implemented.
5. The "B" EDG is running and "A" EDG is secured.

**INITIATING CUES:**

**The CRS has directed you to Align Back Up Fuel Oil in accordance with EPP-28 Attachment 5.**

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

<p><b><u>STEP 1:</u></b> Obtain a copy of the appropriate procedure (Step 1)</p> <p><b><u>STANDARD:</u></b> Candidate obtains and verifies current copy of EPP-28.</p> <p><b>As Found:</b> N/A</p> <p><b>EXAMINER'S CUE:</b> After Candidate locates and verifies the revision of the procedure, hand the candidate a copy of EPP-28, Attachment 5.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------

**NOTE**

- The Alternate Fuel Oil Storage Tanks (AFOSTs) should only be used to supply the EDG Day Tanks during a design basis threat. The use of the AFOSTs for any other reason may constitute a violation of the renewed operating license. Reference RNP-L/LR-0009 Section 3.4.3.1.
- Operators are NOT required for performance of this attachment.
- A fill rate from the Alternate Fuel Oil Tanks of 30 gpm is expected.
- The intent of the two C/A steps is to open and close the fill valve to maintain level between 1/4 and 3/4 full.

<p><b><u>STEP 2:</u></b> Close the normal EDG Day Tank header isolation valve for the running EDG(s):</p> <ul style="list-style-type: none"> <li>• "A" EDG - FO-25A, DIESEL OIL DAY TANK "A" HEADER ISOLATION</li> <li>• "B" EDG - FO-25B, DIESEL OIL DAY TANK "B" HEADER ISOLATION (Step 1)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate Simulates closing FO-25B by rotating the handwheel in the CW direction.</p> <p><b>AS FOUND:</b> Open</p> <p><b>EXAMINER'S CUE:</b> FO-25B is turned in the CW direction until it will not move anymore, the stem is inserted.</p> <p><b>EXAMINER'S NOTE:</b> Valve is located at the Day Tank</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>Critical Step</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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<p><b><u>STEP 3:</u></b> Open the EDG Day Tank Fill valve for the running EDG(s):</p> <ul style="list-style-type: none"> <li>• "A" EDG - FO-26A, ALT / EMERG SUPPLY TO FUEL OIL DAY TANK "A"</li> <li>• "B" EDG - FO-26B, ALT / EMERG SUPPLY TO FUEL OIL DAY TANK "B" (Step 2)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate Simulates opening FO-26B by rotating the handwheel fully CCW.</p> <p><b>AS FOUND:</b> Closed</p> <p><b>EXAMINER'S CUE:</b> FO-26B has been rotated fully counter-clockwise and placed approximately ¼ turn off its backseat. (stem fully withdrawn)</p> <p><b>EXAMINER'S NOTE:</b> Valve is located at the Day Tank</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>Critical Step</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 4:</u></b> Open the EDG Day Tank Solenoid Bypass valve for the tank(s) being filled:</p> <ul style="list-style-type: none"> <li>• "A" EDG - FO-28A, DIESEL OIL DAY TANK "A" SOLENOID BYPASS</li> <li>• "B" EDG - FO-28B, DIESEL OIL DAY TANK "B" SOLENOID BYPASS (Step 3)</li> </ul> <p><b><u>STANDARD:</u></b> Candidate Simulates Opening FO-28B by rotating the handwheel fully CCW.</p> <p><b>AS FOUND:</b> Closed</p> <p><b>EXAMINER'S CUE:</b> FO-28B has been rotated fully counter-clockwise and placed approximately ¼ turn off its backseat. (stem fully withdrawn)</p> <p><b>EXAMINER'S NOTE:</b> Valve is located at the Day Tank</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>Critical Step</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>



**NOTE**

Only one tank should be filled at a time.

**STEP 5:**

WHEN day tank level reaches 1/4 full, THEN open the AFOST SUPPLY TO FUEL OIL DAY TANK for the day tank to be filled:

- FO-231, AFOST SUPPLY TO FUEL OIL DAY TANK "A"

OR

- **FO-236, AFOST SUPPLY TO FUEL OIL DAY TANK "B"**  
(Step 4)

**STANDARD:**

Candidate locates Day Tank Level indication and simulates reading level and then simulates opening FO-236 by rotating the valve handle until it is in line with the pipe.

**AS FOUND:** Closed

**EXAMINER'S CUE:**

**Inform Candidate the Day Tank level is at 1/4 full**

**FO-236 valve handle has been rotated in line with the pipe and is open.**

**EXAMINER'S NOTE:**

**Valve is located at the Day Tank**

**COMMENTS:****Critical Step**

\_\_\_ SAT

\_\_\_ UNSAT

<p><b><u>STEP 6:</u></b> WHEN the day tank reaches 3/4 full, THEN close the AFOST SUPPLY TO FUEL OIL DAY TANK for the day tank filled:</p> <ul style="list-style-type: none"> <li>FO-236, AFOST SUPPLY TO FUEL OIL DAY TANK "B"</li> </ul> <p><b><u>STANDARD:</u></b> Candidate Simulates monitoring the Day Tank Level and then closing FO-236 by rotating the valve handle until it is perpendicular with the pipe.</p> <p><b>AS FOUND:</b> Open</p> <p><b>EXAMINER'S CUE:</b> Inform Candidate that time compression has occurred. Inform Candidate the Day Tank level is now ¾ full FO-236 handle has been rotated perpendicular to the pipe and is closed.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>Critical Step</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 7:</u></b> Inform the Control Room the EDG(s) is being filled from Alternate Fuel. (Step 6)</p> <p><b><u>STANDARD:</u></b> Candidate Simulates contacting the Control Room to report EDG Day Tank refilled</p> <p><b>AS FOUND:</b> N/A</p> <p><b>EXAMINER'S CUE:</b> When CRS or SM notified, respond as the CRS or SM and acknowledge the report</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p> <p style="text-align: center;"><b><u>END OF TASK</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>Terminating Cue:</b> When CRS or SM notified that the EDG Day Tank has been refilled.</p>	

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

**CANDIDATE CUE SHEET**  
**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)**

**CANDIDATE INFORMATION:**

Inform the candidate there are NO time critical steps in this JPM.

**INITIAL CONDITIONS:**

1. You are the Inside Auxiliary Operator.
2. A hostile action has resulted in a loss of off-site power and severely damaged the intake, with a subsequent loss of the ability to move water from the lake to cool plant equipment.
3. The Security Event has been terminated.
4. EPP-28 (Loss of Ultimate Heat Sink) has been implemented.
5. The "B" EDG is running and "A" EDG is secured.

**INITIATING CUES:**

**The CRS has directed you to Align Back Up Fuel Oil in accordance with EPP-28 Attachment 5.**

ATTACHMENT 5Backup Fuel Oil Alignment

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NOTE

- The Alternate Fuel Oil Storage Tanks (AFOSTs) should only be used to supply the EDG Day Tanks during a design basis threat. The use of the AFOSTs for any other reason may constitute a violation of the renewed operating license. Reference RNP-L/LR-0009 Section 3.4.3.1.
- Operators are NOT required for performance of this attachment.
- A fill rate from the Alternate Fuel Oil Tanks of 30 gpm is expected.
- The intent of the two C/A steps is to open and close the fill valve to maintain level between 1/4 and 3/4 full.

1. Close the normal EDG Day Tank header isolation valve for the running EDG(s):
  - "A" EDG - FO-25A, DIESEL OIL DAY TANK "A" HEADER ISOLATION
  - "B" EDG - FO-25B, DIESEL OIL DAY TANK "B" HEADER ISOLATION
2. Open the EDG Day Tank Fill valve for the running EDG(s):
  - "A" EDG - FO-26A, ALT / EMERG SUPPLY TO FUEL OIL DAY TANK "A"
  - "B" EDG - FO-26B, ALT / EMERG SUPPLY TO FUEL OIL DAY TANK "B"
3. Open the EDG Day Tank Solenoid Bypass valve for the tank(s) being filled:
  - "A" EDG - FO-28A, DIESEL OIL DAY TANK "A" SOLENOID BYPASS
  - "B" EDG - FO-28B, DIESEL OIL DAY TANK "B" SOLENOID BYPASS

ATTACHMENT 5Backup Fuel Oil Alignment

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NOTE

Only one tank should be filled at a time.

- \* 4. WHEN day tank level reaches 1/4 full, THEN open the AFOST SUPPLY TO FUEL OIL DAY TANK for the day tank to be filled:

o FO-231, AFOST SUPPLY TO FUEL OIL DAY TANK "A"

OR

o FO-236, AFOST SUPPLY TO FUEL OIL DAY TANK "B"

- \* 5. WHEN the day tank reaches 3/4 full, THEN close the AFOST SUPPLY TO FUEL OIL DAY TANK for the day tank filled:

o FO-231, AFOST SUPPLY TO FUEL OIL DAY TANK "A"

OR

o FO-236, AFOST SUPPLY TO FUEL OIL DAY TANK "B"

6. Inform the Control Room the EDG(s) is being filled from Alternate Fuel.

- END -