

# **SIM JPM A**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Operation With High Switchyard VoltageJPM No.: 2016 Systems - Control Room JPM A (Alternate Path)

K/A Reference: 062 A2.08 (2.7/3.0)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

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

## Job Performance Measure Worksheet

**Task Standard:** The operator will transfer 4KV Bus 4 & 5 from the UAT to the SUT (via 4KV Bus 3) in an effort to lower Switchyard Voltage; and when Breaker 50/20 fails to automatically OPEN, the operator will manually open it per AOP-31. Ultimately, the voltage on 480V Bus E-2 will be lowered to less than 502 volts.

**Required Materials:** None

**General References:** AOP-031 (Operation with High Switchyard Voltage), Rev 15  
OMM-022 (Emergency Operating Procedures User's Guide), Rev 45

**Handouts:** Handout 1: Control Room Copy of AOP-031 marked up for this JPM to Step 21.

**Time Critical Task:** NO

**Validation Time:** 11 minutes

<b><u>Critical Step Justification</u></b>	
Step 21	This step is critical because inserting the synchroscope key into 4 KV TIES Synchroscope Key Switch is necessary to transfer 4KV Bus 4 & 5 from the UAT to the SUT (via 4KV Bus 3).
Step 22	This step is critical because placing the Synchroscope Switch to the BUS 3 & 4 position is necessary to transfer 4KV Bus 4 & 5 from the UAT to the SUT (via 4KV Bus 3).
Step 24	This step is critical because momentarily placing the Control Switch for 4KV BUS 3-4 TIE, BKR 52/19 to the CLOSE position is necessary to transfer 4KV Bus 4 & 5 from the UAT to the SUT (via 4KV Bus 3).
<b><u>Alternate Path Critical Step Justification</u></b>	
Step 27	This step is critical because depressing the THINK pushbutton and placing the control switch for BKR 52/20 to the OPEN (TRIP) position is necessary to manually open Breaker 52/20.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Construct Scenario File 006\_JPM\_A as follows:
  - ICO V4160B4BRK20 f:TRIP\_FAIL, (Breaker 52/20 Fails to Auto OPEN)
  - IMF EPS09 f:239.25, (Overvoltage on Bus E-2; > 506 Volts, due to High Switchyard Voltage)
  - (Conditional) \$006\_52\_20\_TRIP DCO V4160B4BRK20 (Remove Breaker 52/20 failure on Control Switch to TRIP)
2. Reset simulator to IC-5, 100% Power.
3. Place in RUN and allow time to stabilize.
4. Execute Scenario File 006\_JPM\_A
5. Ensure that the following components are aligned:
  - C Charging Pump is RUNNING
  - HVH-3 and HVH-4 are RUNNING
  - HVA-1B is RUNNING
  - HVH-5B is OFF
  - HVE-2B is OFF
6. Call up QP E1E2 at the BOP Desk.
7. Perform the actions of AOP-31 up to Step 21.
8. Stabilize the plant.
9. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-600 (July, 2015).
2. Perform Attachment 2 (Simulator Setup For Exams) of TAP-411.
3. Call up QP E1E2 at the BOP Desk.
4. Place Simulator in Run when Operator assumes the watch.

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

Provide operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

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> The operator observes ERFIS (QP E1E2) and recognizes that Bus E-2 Voltage is approximately 506.5 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>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> The operator reads the Note, and proceeds. The operator recognizes that Instrument Air Compressor “B” is in AUTO as stated in the Initial Cue. The operator addresses the RNO.</p> <p><b>EXAMINER’S CUE:</b> If the operator requests status of IAC “B”, remind the operator 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> If the operator contacts the AO, as the AO, report that IAC “A” and “B” are in AUTO.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

**NOTE:** For conditions where it may not be possible to reduce emergency bus voltages below 505 volts AND running of the EDG is required to ensure that the EDG is operable, testing of the EDG may be performed with concurrence from the system engineer if the system engineer determines that such testing does not constitute a long term degradation risk.

**STEP 3:** Check EDG "B" Status as Follows:  
a. Check Main Generator – ON LINE  
(Step 23.a.)

**STANDARD:** The operator reads the Note, and proceeds.  
The operator observes the 52/8 and 52/9 Red status lights are LIT and Green status lights are OFF (or equivalent), and concludes that the Main Generator is ON Line.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

COMMENTS:

\_\_\_ SAT

\_\_\_ UNSAT

**STEP 4:** Check EDG "B" Status as Follows:  
b. Check EMERGENCY DIESEL GENERATOR B - RUNNING  
(Step 23.b.)

**STANDARD:** The operator observes the "B" EDG Green OFF status light is LIT and concludes that the "B" EDG is NOT running.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

COMMENTS:

\_\_\_ SAT

\_\_\_ UNSAT

## PERFORMANCE INFORMATION

<p><b><u>STEP 5:</u></b> Check EDG "B" Status as Follows:  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> The operator proceeds to Step 24.</p> <p><b>EXAMINER'S CUE:</b> If the operator informs the CRS to postpone EMERGENCY DIESEL GENERATOR "B" testing while in this procedure, acknowledge as the CRS.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> If the operator contacts the System Engineer to postpone EMERGENCY DIESEL GENERATOR "B" testing while in this procedure, acknowledge as the System Engineer.</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> The operator recognizes that NONE of these components are running.</p> <p><b>EXAMINER'S CUE:</b> Inform operator that another operator will track the run times.</p> <p><b>EXAMINER'S NOTE:</b> The "B" IAC is in AUTO and the "B" EDG is NOT RUNNING.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<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> The operator recognizes that load on Emergency Bus E-1 has NOT been raised based on information given in the Initial Cue.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> This would have been completed in Step 18 of AOP-031, which was bypassed.</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> The operator observes the "C" Charging Pump Red status light is LIT and the Green status light is OFF (Or equivalent) and concludes 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>



## PERFORMANCE INFORMATION

<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> The operator observes the HVH-3 Red ON status light is LIT and concludes that HVH-3 is running.</p> <p>The operator observes the HVH-4 Red ON status light is LIT and concludes that HVH-4 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><u>COMMENTS:</u></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> The operator observes the HVA-1B Red ON status light is LIT and concludes that HVH-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><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 11:</u></b> Check CRDM COOLING FAN, HVH-5B – RUNNING (Step 27.d)</p> <p><b><u>STANDARD:</u></b> The operator observes the HVH-5B Green OFF status light is LIT and concludes that HVH-5B is NOT RUNNING, and proceeds to the 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> The operator places the HVH-5B control switch to START and observes the Red status light is LIT and the Green status light is OFF.</p> <p>The operator places the HVH-5A control switch to STOP and observes the Green status light is LIT and the Red status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> E-2 Voltage should lower to approx. 506.3 Volts.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<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> The operator observes the HVE-2B Green OFF status light is LIT and concludes that HVE-2B is NOT running, and proceeds to the 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 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> The operator places the HVE-2B control switch to START and observes the Red status light is LIT and the Green status light is OFF.</p> <p>The operator places the HVE-2A control switch to STOP and observes the Green status light is LIT and the Red status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> E-2 Voltage should lower to approx. 506.2 Volts.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 15:</u></b> Check RHR – IN SERVICE. (Step 27. f)</p> <p><b><u>STANDARD:</u></b> The operator recognizes that the plant is in Mode 1 and determines that RHR is NOT is IN SERVICE. The operator addresses the RNO and proceeds 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><u>COMMENTS:</u></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> The operator observes Bus E-2 Voltage on ERFIS to be greater than 505 Volts (506.2 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><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 17:</u></b> Check DSDG Status As Follows:  a. Check Main Generator – ON LINE  (Step 29.a)</p> <p><b><u>STANDARD:</u></b> The operator observes the 52/8 and 52/9 Red status lights are LIT and Green status lights are OFF (or equivalent), and concludes 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><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 18:</u></b> Check DSDG Status As Follows:  b. Check DSDG - RUNNING  (Step 29.b)</p> <p><b><u>STANDARD:</u></b> The operator recognizes that DSDG is secured and aligned for AUTO as stated in the Initial Cue. The operator addresses the RNO.</p> <p><b>EXAMINER'S CUE:</b> If the operator requests status of the DSDG, remind the operator that the Cue sheet stated that the DSDG was secured and aligned for AUTO.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> If the operator contacts the AO, as the AO, report that the DSDG is secured and aligned for AUTO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<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> The operator proceeds to step 30.</p> <p><b>EXAMINER'S CUE:</b> If operator informs the CRS to postpone DSDG testing while in this procedure, acknowledge as the CRS.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> If the operator contacts the System Engineer to postpone DSDG testing while in this procedure, acknowledge as the System Engineer.</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> The operator observes 4KV BUS 3-4 TIE, BKR 52-19 Green status light is LIT and Red status light is OFF, and determines that 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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 21:</u></b> Transfer 4160V BUS 4 to the STARTUP TRANSFORMER as follows:</p> <p>a. Insert the Synchroscope Key into 4 KV TIES Synchroscope Key Switch (Step 31.a)</p> <p><b><u>STANDARD:</u></b> The operator inserts 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:</p> <p>b. Place the Synchroscope Switch to the BUS 3 &amp; 4 position (Step 31.b)</p> <p><b><u>STANDARD:</u></b> The operator rotates the Synchroscope Switch clockwise 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>

## PERFORMANCE INFORMATION

<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> The operator observes 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> The operator 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>



## PERFORMANCE INFORMATION

<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> The operator observes that the BKR 52/19 Red status light is LIT and the Green status light is OFF.</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> The operator observes that the BKR 52/20 Red status light has remained LIT and the Green status light has remained OFF; and concludes that BKR 52/20 has remained in the CLOSED position (<b>Alternate Path</b>). The operator will address the 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. BKR 52/20 should have automatically opened when BKR 52/19 was CLOSED (A failure has prevented it from doing so).</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<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> The operator simultaneously depresses the THINK pushbutton and places the control switch for BKR 52/20 to the OPEN (TRIP) position, and observes that the Green status light is LIT and the Red status light is OFF.</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. When this occurs Bus E-2 voltage will drop to 484.8 volts.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</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>
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## PERFORMANCE INFORMATION

<p><b><u>STEP 28:</u></b> Place the 4 KV TIES Synchroscope Key Switch to the mid position. (Step 31.g)</p> <p><b><u>STANDARD:</u></b> The operator rotates the Synchroscope Switch counter-clockwise 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><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 29:</u></b> Check the following:</p> <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> <p><b><u>STANDARD:</u></b> The operator observes that Bus E-1 voltage is 488.9 volts.  The operator observes that Bus E-2 voltage is 484.8 volts.</p> <p><b>EXAMINER'S CUE:</b> When operator identifies that BOTH Bus E-1 and E-2 are less than 505 VOLTS inform the operator that this completes 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>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 30:</u></b> Check Voltage as Follows: <b>(Continuous Action Step)</b></p> <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> <p><b><u>STANDARD:</u></b> The operator observes that APP-036-E3 is DARK.</p> <p>The operator observes that WEST 115KV BUS VOLTAGE is 18.8 KV.</p> <p>The operator observes that Bus E-1 voltage is 488.9 volts.</p> <p>The operator observes that Bus E-2 voltage is 484.8 volts.</p> <p><b>EXAMINER'S CUE:</b> When operator identifies that BOTH Bus E-1 and E-2 are less than 502 VOLTS inform the operator that this completes 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>
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Terminating Cue:

Evaluation on this JPM is complete.

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

VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2016 Systems - Control Room JPM A

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

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

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

JPM CUE SHEET

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## INITIAL CONDITIONS:

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

## INITIATING CUE:

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

# **SIM JPM B**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Transfer From the FRV Bypass Valves to the FRVsJPM No.: 2016 Systems - Control Room JPM B (Alternate Path)

K/A Reference: 059 A4.08 (3.2/2.9)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

- Initial Conditions:
- A plant startup is in progress with reactor power approximately 19%.
  - "A" and "B" S/G levels are being controlled with the Feed Reg Valves operating in AUTO.
  - The "C" S/G level is being controlled manually on both the Feed Reg Valve and the Feed Reg Bypass Valve.
  - The Turbine is at 1800 RPM (Not synched to the Grid).
  - You are the operator assigned to control S/G water level.
  - Annunciator APP-003-D4, TAVE/TREF DEV, is an expected alarm.

Initiating Cue: The CRS has directed you to transfer the "C" S/G level control to the Main Feedwater Regulating Valve in accordance with Step 6.4.12 of GP-005, Power Operation.

Task Standard: The operator will place the "C" Feed Reg Valve in AUTO, and then take manual control of the "B" Feed Reg Valve and stabilize the "B" S/G level when it is determined that the "B" Feed Reg Valve has failed to control the "B" S/G level in AUTO.



## Job Performance Measure Worksheet

Required Materials: None

General References: GP-005 (Power Operation), Rev 128  
AOP-010 (Main Feedwater/Condensate Malfunction), Rev 33

Handouts: Handout 1: Section 6.4 of GP-005 marked up for this JPM through Step 6.12.d for "A" and "B" FRVs.  
Handout 2: Blank copy of AOP-010

Time Critical Task: NO

Validation Time: 12 minutes

NOTE: This JPM should be pre-briefed in the Briefing Room.

<b><u>Critical Step Justification</u></b>	
Step 2	This step is critical because adjusting the output of the FCV-499 controller is necessary to place the "C" Feed Reg Valve in AUTO.
Step 3	This step is critical because depressing the AUTO pushbutton on the FCV-498 controller is necessary to place the "C" Feed Reg Valve in AUTO.
Step 4	This step is critical because rotating the FCV-499 controller adjust knob counter-clockwise until the controller is at 0% is necessary to place the "C" Feed Reg Valve in AUTO.
<b><u>Alternate Path Critical Step Justification</u></b>	
Step 5 or 7	This step is critical because placing the FCV-488 controller in MANUAL and stabilizing the "B" S/G level is necessary to take manual control of the "B" Feed Reg Valve and stabilize the "B" S/G level.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset simulator to IC-3, ≈16% Power, Turbine Ready for Synch
2. Place in RUN.
3. Perform the following:
  - Raise power to 18-20% by withdrawing control rods.
  - Adjust FRV Bypasses to 60-90% OPEN.
  - Override CLOSED FCV-1446 (1CFW094 f:normal)
4. Ensure the following:
  - Rx power is between 17-20%
  - Tavg is between 551-555°F
  - The "C" FRV Bypass Valve OPEN with 60-90% output demand
  - The "C" S/G level is within 2-4% of programmed level (39%)
  - The "A" and "B" FRV Controllers are in AUTO
  - The "C" FRV Controller is in MANUAL
  - FCV-1446 indicates SHUT
5. Insert \$006\_FRV\_BYPASS IMF CFW17B d:5 r:90 f:0 (5 seconds after FCV-499 ("C" Feed Reg Bypass Valve) OPEN indication extinguishes)
6. Identify APP-003-D4, TAVE/TREF DEV, and an expected alarm (Green Dot)
7. Place Green Dots on all other LIT annunciators (Expected alarms)
8. Acknowledge alarms and stabilize plant.
9. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-601 (January, 2016).
2. Open Scenario File 006\_JPM\_B.
3. Perform Attachment 2 (Simulator Setup For Exams) of TAP-411.
4. Place Simulator in Run when Operator assumes the watch.

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

Provide operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

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

**NOTE**

Section 6.4 Step 12 is a continuous action step that should be performed whenever plant conditions require Feedwater flow through the FRVs and conditions are suitable or automatic S/G water level control.

Feedwater Regulating Valves should be transferred to automatic control one at a time.

FCV-1446 (Condensate Recirc) is controlled by FS-1446 (Cond Pmp Recirc VLV Flow Switch). FS-1446 is set to open FCV-1446 at a flow of 1050 gpm with the valve closing at a Condensate System flow of 4200 gpm flow through the GS Condenser and SGBD Heat Exchangers.

The Push Button to reset FS-1446 is located in the same enclosure as FS-1446 which is located approximately 15 feet northwest of FCV-1446 on a concrete column.

**STEP 1:**

WHEN Reactor Power is 15% to 20%, OR the Feedwater Regulating Bypass Valves are 60% to 90% demand signal, THEN shift each Feedwater Regulating Valve to AUTO as follows:

- IF FCV-1446 (Condenser Recirc) does NOT indicate SHUT, THEN.....

(Step 12/12.a).

\_\_\_ SAT

**STANDARD:**

The operator reads the Notes, and proceeds.

The operator observes reactor power on NR-45 (or equivalent) to be 18%, and proceeds.

The operator observes that FCV-499 Controller output to be between 60-90%, and proceeds.

The operator observes the FCV-1446 Green status light is LIT and Red status light is OFF, and recognizes that this Step is NOT Applicable, and proceeds.

\_\_\_ UNSAT

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

## PERFORMANCE INFORMATION

**NOTE**

With the Turbine not yet loaded, S/G Program Level will be approximately 39% based on First Stage Pressure.

**STEP 2:** Ensure Feed Flow is trending with Steam Flow and S/G Levels are within 1% of program level.  
(Step 12.b).

**STANDARD:** The operator reads the Note, and proceeds.

The operator observes "C" S/G Feed Flow is trending with Steam Flow, and that "C" S/G level is NOT within 1% of programmed level.

The operator adjusts the output of the FCV-499 controller as needed to adjust the feed flow trend and/or "C" S/G level within 1% of programmed level.

**EXAMINER'S CUE:** APP-003-D4, which is an expected alarm, may alarm during this time. If so, state that the OATC will address this alarm.

It may be necessary to provide this cue throughout the JPM.

**EXAMINER'S NOTE:** S/G programmed level is 39%.

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

## PERFORMANCE INFORMATION

<b><u>STEP 3:</u></b>	Depress the Auto pushbutton on the FRV controller. (Step 12.c)	<b><u>CRITICAL STEP</u></b>
<b><u>STANDARD:</u></b>	The operator observes that "C" S/G level is within 1% of programmed level.	___ SAT
	The operator depresses the AUTO pushbutton on the FCV-498 controller, and observes the White AUTO light is LIT.	___ UNSAT
<b>EXAMINER'S CUE:</b>	NONE	
<b>EXAMINER'S NOTE:</b>	NONE	
<b>BOOTH OPERATOR CUE:</b>	NONE	
<b><u>COMMENTS:</u></b>		

## PERFORMANCE INFORMATION

<p><b><u>STEP 4:</u></b> IF ANY Feedwater Regulating Bypass Valve is NOT closed, THEN slowly close it (Step 12.c.1)</p> <p><b><u>STANDARD:</u></b> The operator observes FCV-499 to be OPEN, and rotates the controller adjust knob counter-clockwise, and observes the controller output move toward 0%.</p> <p>The operator observes the FCV-498 Red and Green status light is LIT, and the controller output start to rise from 0%.</p> <p><b><u>EXAMINER'S CUE:</u></b> S/G level may drop as much as 5% while the FRV adjusts automatically, and this may result in an APP-006 deviation alarm (This is normal and expected). However, the operator may take action per AOP-010, and place the FRV controller in MANUAL.</p> <p>If so, when the "C" S/G level is under the operator's control, report as I&amp;C that troubleshooting has been conducted (Using time compression), and it has been determined that the FCV-498 controller is operating properly.</p> <p><b><u>EXAMINER'S NOTE:</u></b> NONE</p> <p><b><u>BOOTH OPERATOR CUE:</u></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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## PERFORMANCE INFORMATION

<p><b><u>STEP 5:</u></b></p>	<p>Ensure each FRV in AUTO is maintaining programmed S/G level. (Step 12.d)</p>	<p><b><u>CRITICAL STEP</u></b></p>
<p><b><u>STANDARD:</u></b></p>	<p>The operator observes that “C” S/G level is stabilized and concludes that the “C” FRV (FCV-498) is maintaining programmed S/G level in AUTO.</p> <p>The operator observes one or more of the following:</p> <ul style="list-style-type: none"> <li>• “B” Feed flow as indicated on FR-488 starts to lower</li> <li>• “B” S/G level as indicated on FR-488 starts to lower</li> <li>• FCV-488 controller output starts to lower</li> <li>• FCV-488 Green status light is LIT, Red status light is OFF</li> <li>• APP-006-E1, S/G B NAR RANGE LO/LO-LO LEVEL</li> </ul> <p><b>(Alternate Path)</b></p> <p>The operator depresses the MANUAL pushbutton on the FCV-488 controller, and observes the White AUTO light is Extinguished; and the “B” S/G is stabilized (i.e. under the operator control). (If so, Terminate JPM)</p> <p>OR</p> <p>The operator addresses AOP-010. (If so, continue to subsequent Steps)</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>EXAMINER’S CUE:</b></p>	<p>If the operator addresses AOP-010, provide the operator with a copy of Handout 2, and continue.</p>	
<p><b>EXAMINER’S NOTE:</b></p>	<p>5 seconds after the “C” FRBV is closed the “B” FRV controller will fail causing FCV-488 to CLOSE.</p> <p>The operator is expected to take manual control of FCV-488 using the guidance for Prompt and Prudent actions in OMM-022, Step 5.3.1.c. (Prompt action is necessary to prevent the deterioration of plant conditions or components to a possibly unsafe or unstable level. If time permits, approval from the SM/CRS shall be obtained. Factors to consider include: complexity of action, potential for damage from common cause, etc. Examples include: Failure of automatic systems to perform or respond correctly.); or by entering AOP-010. If the operator addresses AOP-010, continue.</p>	
<p><b>BOOTH OPERATOR CUE:</b></p>	<p>NONE</p>	
<p><b><u>COMMENTS:</u></b></p>		

## PERFORMANCE INFORMATION

<p><b><u>STEP 6:</u></b> CHECK FRVs - OPERATING PROPERLY (MANUAL OR AUTO): FCV-478 FCV-488 FCV-498 (AOP-010 Step 1)</p> <p><b><u>STANDARD:</u></b> The operator observes one or more of the following:</p> <ul style="list-style-type: none"> <li>• “B” Feed flow as indicated on FR-488 starts to lower</li> <li>• “B” S/G level as indicated on FR-488 starts to lower</li> <li>• FCV-488 controller output starts to lower</li> <li>• FCV-488 Green status light is LIT, Red status light is OFF</li> <li>• APP-006-E1, S/G B NAR RANGE LO/LO-LO LEVEL</li> </ul> <p>The operator proceeds to Step 1 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 7:</u></b> PERFORM the following: ENSURE FRV for affected S/G(s) in manual control. ATTEMPT to stabilize S/G level using FRV and/or FRV Bypass Valves by matching steam flow with feed flow. STOP any load change in progress. If unable to control S/G level, THEN TRIP the reactor and GO TO EOP-E-0, Reactor Trip Or Safety Injection. (AOP-010 Step 1 RNO)</p> <p><b><u>STANDARD:</u></b> The operator places FCV-498 controller in MANUAL and stabilizes the “B” S/G level.</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>



## PERFORMANCE INFORMATION

<p><b><u>STEP 8:</u></b> CHECK Reactor Trip Setpoint - BEING APPROACHED (AOP-010 Step 2)</p> <p><b><u>STANDARD:</u></b> The operator observes that the "B" S/G level is stabilized.</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> IF a reactor trip setpoint is approached, THEN TRIP the reactor and GO TO EOP-E-0, Reactor Trip Or Safety Injection. GO TO Step 4. (AOP-010 Step 2 RNO)</p> <p><b><u>STANDARD:</u></b> The operator observes that the "B" S/G level is stabilized.</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>

Terminating Cue:

Evaluation on this JPM is complete.

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

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2016 Systems - Control Room JPM B

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

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

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

## JPM CUE SHEET

- INITIAL CONDITIONS:
- A plant startup is in progress with reactor power approximately 19%.
  - “A” and “B” S/G levels are being controlled with the Feed Reg Valves operating in AUTO.
  - The “C” S/G level is being controlled manually on both the Feed Reg Valve and the Feed Reg Bypass Valve.
  - The Turbine is at 1800 RPM (Not synched to the Grid).
  - You are the operator assigned to control S/G water level.
  - Annunciator APP-003-D4, TAVE/TREF DEV, is an expected alarm.

INITIATING CUE: The CRS has directed you to transfer the “C” S/G level control to the Main Feedwater Regulating Valve in accordance with Step 6.4.12 of GP-005, Power Operation.

# **SIM JPM C**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Restore PRT to Normal Operating ConditionsJPM No.: 2016 Systems - Control Room JPM C (Alternate Path)

K/A Reference: 007 A1.01 (2.9/3.1)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.**

- Initial Conditions:
- The plant is at 100% power.
  - APP-003-D3, PRT HI/LO LEVEL, has alarmed.
  - The cause of the low level is known leakage from the PRT to the RCDT.
  - PRT level is stable at 67%.

- Initiating Cue:
- The CRS has directed you to restore PRT level to normal IAW OP-103, Pressurizer Relief Tank Control System.
  - All of the prerequisites of Section 4.0 are complete.

Task Standard: The operator will refill the PRT in accordance with Section 8.2.2 of OP-103; and then diagnose and relieve the hydraulic lock on RC-519B in accordance with Section 8.4.1 of OP-103.

Required Materials: None

General References: OP-103 (Pressurizer Relief Tank Control System), Rev 21

2016 Systems - Control Room JPM C

NUREG 1021, Revision 10

## Job Performance Measure Worksheet

Handouts: Handout 1: Blank Copy of OP-103

Time Critical Task: NO

Validation Time: 10 minutes

NOTE: This JPM should be pre-briefed in the briefing room.

<b><u>Critical Step Justification</u></b>	
Step 2	This step is critical because placing a PW Pump control switch to START is necessary to refill the PRT in accordance with Section 8.2.2 of OP-103.
Step 3	This step is critical because placing the RC-519C control switch to OPEN is necessary to refill the PRT in accordance with Section 8.2.2 of OP-103.
Step 4	This step is critical because placing the RC-519A and B control switch to OPEN is necessary to refill the PRT in accordance with Section 8.2.2 of OP-103.
Step 9	This step is critical because placing the RC-519A and B control switch to CLOSE is necessary to refill the PRT in accordance with Section 8.2.2 of OP-103.
Step 10	This step is critical because placing the RC-519C control switch to CLOSE is necessary to refill the PRT in accordance with Section 8.2.2 of OP-103.
<b><u>Alternate Path Critical Step Justification</u></b>	
Step 15	This step is critical because cycling RC-519C open and closed is necessary to relieve the hydraulic lock on RC-519B in accordance with Section 8.4.1 of OP-103.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Construct Scenario File 006\_JPM\_C as follows:

- IOR doRCSAAO212d e:006\_RC\_519AB\_OPEN f:ON (Over-Ride RC-519B to OPEN when Switch taken to OPEN)
- IOR doCNMAOO086J e:006\_519AB\_OPEN f:OFF (Over-Ride RC-519A/B CIV Indication to OFF)

To be inserted after RC-519C is CLOSED during Initial Fill of PRT (JPM Step 12)

- \$006\_RC\_519C\_OPEN DOR doRCSAAO212D (Removes Over-Ride for RC-519B when RC-519C is OPEN)
- \$600\_RC\_519C\_OPEN DOR doCNMAOO086J (Removes Over-Ride on RC-519A/B CIV Indication)

2. Reset simulator to IC-5, 100% Power.
3. Place in RUN, execute Scenario File 006\_JPM\_C and allow time to stabilize.
4. Drain PRT to ≈67% (Open RC-523 until PRT level 67% and Close RC-523.
5. Verify PRT conditions as follows: 103°F temperature, 67% level and 3 psig pressure.
6. Stabilize the plant.
7. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-602 (July, 2015).
2. Scenario File 006\_JPM\_C

**NOTE:** Booth Instructor verify that two additional overrides are available to be inserted at Step 11 of this JPM.

3. Perform Attachment 2 (Simulator Setup For Exams) of TAP-411.
4. Place Simulator in Run when Operator assumes the watch.

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.**

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

**NOTE:**

PRT temperatures of greater than 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)

Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

<p><b><u>STEP 1:</u></b> Verify the following initial conditions are satisfied:</p> <ul style="list-style-type: none"> <li>a. All prerequisites of Section 4.0 are complete</li> <li>b. Pressurizer Relief Tank level is less than 80%.</li> <li>c. Draining the PRT is NOT in progress. (Step 8.2.2.1)</li> </ul> <p><b><u>STANDARD:</u></b> The operator reads the Notes, and proceeds.</p> <p>The operator Verifies all initial conditions satisfied (Initial Cue).</p> <p><b>EXAMINER'S CUE:</b> If asked, section 4.0 prerequisites are complete.</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>
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## PERFORMANCE INFORMATION

**CAUTION**

Operating two Primary Water Pumps can cause inadvertent filling of the RCS if the RCS is depressurized and vented through a PORV when two Primary Water Pumps are operating. Water may makeup to the RCS via the PRT spargers if the PRT is filled faster than it can vent.

**STEP 2:** Verify a Primary Water Pump is OPERATING.  
(Step 8.2.2.2)

**STANDARD:** The operator reads the Caution, and proceeds.

The operator observes the "A" and "B" Primary Water Pump Green status lights are LIT and the Red status lights are OFF, and determines that neither PW Pump is RUNNING.

The operator places the "A" Primary Water Pump Control Switch to START and observes the Red status light is LIT and the Green status light is OFF.

OR

The operator places the "B" Primary Water Pump Control Switch to START and observes the Red status light is LIT and the Green status light is OFF.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** The "A" Primary Water Pump is in AUTO, set-up for Auto Makeup.

The operator may start either the "A" or the "B" Primary Water Pump.

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

## PERFORMANCE INFORMATION

<p><b><u>STEP 3:</u></b> Open RC-519C, PW TO PRT ISO (Step 8.2.2.3)</p> <p><b><u>STANDARD:</u></b> The operator places the RC-519C Control Switch to OPEN and observes the Red status light is LIT and the Green status light is OFF.</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 4:</u></b> Open RC-519A &amp; B, PW TO CV ISO (Step 8.2.2.4)</p> <p><b><u>STANDARD:</u></b> The operator places and HOLDS the RC-519A &amp; B Control Switch to OPEN and observes the Red status lights are LIT and the Green status lights are OFF.</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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 5:</u></b> Monitor PRT for rising level (Step 8.2.2.5)</p> <p><b><u>STANDARD:</u></b> The operator observes rising PRT level on LI-470 or ERFIS.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The normal PRT Level band is 70-80%.  It is expected that APP-003-C3, PRT HI PRESS, is an expected alarm during this evolution.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 6:</u></b> IF the expected rise in level does NOT occur, THEN stop filling AND investigate. (Step 8.2.2.6)</p> <p><b><u>STANDARD:</u></b> The operator observes rising PRT level on LI-470 or ERFIS.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The normal PRT Level band is 70-80%.  It is expected that APP-003-C3, PRT HI PRESS, is an expected alarm during this evolution.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

**NOTE:** Increasing PRT level will cause PRT pressure to rise, possibly to the high pressure alarm setpoint of 5 psig.

**STEP 7:** Recognize/report PRT Hi Pressure alarm (APP-003 C3) received. Monitors PRT pressure and reports value and that it is an expected alarm due to filling

\_\_\_ SAT

**STANDARD:** The operator reads the Note, and proceeds.

The operator checks PRT pressure >5 psig due to filling, informs the CRS it is an expected alarm

\_\_\_ UNSAT

**EXAMINER'S CUE:** As CRS, acknowledge report

**EXAMINER'S NOTE:** This is an expected alarm as the procedure note states. It is not expected that the operator will address the alarm and/or condition until after filling is completed. If the operator does address this alarm, if it decided to vent the PRT to reduce pressure, state that "Another Operator will address this alarm."

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

## PERFORMANCE INFORMATION

<p><b><u>STEP 8:</u></b> WHEN PRT level is between 70% and 80%, THEN perform the following:</p> <ol style="list-style-type: none"> <li>Stop the Primary Water Pump</li> <li>Verify one Primary Water pump is in AUTO. (Step 8.2.2.7a&amp;b)</li> </ol> <p><b><u>STANDARD:</u></b> If the "A" Primary Water Pump was previously started, the operator places the "A" Primary Water Pump Control Switch to STOP and observes the Green status light is LIT and the Red status light is OFF.</p> <p>The operator places the "A" Primary Water Pump Control Switch to AUTO.</p> <p>OR</p> <p>If the "B" Primary Water Pump was previously started, the operator places the "B" Primary Water Pump Control Switch to STOP and observes the Green status light is LIT and the Red status light is OFF.</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>
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## PERFORMANCE INFORMATION

<p><b><u>STEP 9:</u></b> Close RC-519A &amp; B (Step 8.2.2.7c)</p> <p><b><u>STANDARD:</u></b> The operator places and holds the RC-519A &amp; B Control Switch to CLOSE and observes the RC-519A Green status light is LIT and the Red status light is OFF.</p> <p>The operator observes that the RC-519B Red and Green status lights are LIT <b>(Alternate Path – Mitigated in a later Step)</b>.</p> <p>The operator reports to the CRS that RC-519B has not fully CLOSED.</p> <p><b>EXAMINER'S CUE:</b> As CRS, acknowledge report</p> <p>If a request is made to cycle RC-519A &amp; B to attempt to verify RC-519B operation, as CRS then respond no do not cycle the valve</p> <p><b>EXAMINER'S NOTE:</b> A single Control Switch controls both valves</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 10:</u></b> Close RC-519C (Step 8.2.2.7d)</p> <p><b><u>STANDARD:</u></b> The operator places the RC-519C Control Switch to CLOSE and observes the Green status light is LIT and the Red status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> <b>Insert the last two commands IAW 006_JPM_C File to remove over-rides once RC-519C is closed.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 11:</u></b> IF PRT level is greater than or equal to 83% OR PRT temperature is greater than 120°F, THEN lower the PRT level in accordance with the appropriate Section of this procedure, Draining the PRT When Pressurizer Temperature is Greater Than Or Equal to 200°F OR Draining the PRT When Pressurizer Temperature is Less Than 200°F. (Step 8.2.2.8)</p> <p><b><u>STANDARD:</u></b> The operator observes PRT level on LI-470 (or ERFIS) is &lt;83% and PRT temperature on TI-471 (or ERFIS) is &lt;120°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><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 12:</u></b> IF RC-519A or RC-519B do NOT fully close, THEN relieve the hydraulic lock in accordance with the Relieving Hydraulic Lock on RC-519A AND RC-519B Section of this procedure (<b>Alternate Path – RC-519B Hydraulic Lock has previously occurred and is Mitigated Here</b>). (Step 8.2.2.9)</p> <p><b><u>STANDARD:</u></b> The operator reviews the OP-103 Table Of Contents and determines that Section 8.4.1 is required, and proceeds to this section.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> If the operator addresses APP-003-C3 prior to addressing the hydraulic lock, when it decided to vent the PRT to reduce pressure, state that "Another Operator will address this alarm."</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

**NOTE:** The RCS System Engineer WILL need to be NOTIFIED WHEN the following section is PERFORMED to relieve hydraulic lock on RC-519A AND RC-519B for Engineering Trending Purposes.

**STEP 13:** Relieving Hydraulic Lock on RC-519A AND RC-519B:  
Verify the following initial conditions are satisfied:  
a. RC-519A & B, PW TO CV ISO, control switch is in the CLOSE position and one OR both valves indicate in mid position.  
(Step 8.4.1.a)

\_\_\_ SAT

**STANDARD:** The operator reads the Note, and proceeds.

The operator observes the RC-519A Green status light is LIT and the Red status light is OFF.

\_\_\_ UNSAT

The operator observes the RC-519B Red and Green status lights are LIT.

**EXAMINER'S CUE:** If the operator notifies the CRS or the System Engineer, acknowledge as the CRS.

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**



## PERFORMANCE INFORMATION

<p><b><u>STEP 14:</u></b> Verify the Post Accident Sampling System is NOT in operation. (Step 8.4.1.b)</p> <p><b><u>STANDARD:</u></b> Operator verifies PASS is not operating</p> <p><b>EXAMINER'S CUE:</b> If asked about the status of this system, ask the operator what they would expect the status to be in the current plant condition. THEN, indicate that the system is as expected.</p> <p><b>EXAMINER'S NOTE:</b> The PASS is ONLY operated under accident conditions, which do NOT exist.</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> IF RC-519B is indicating in mid position, THEN cycle RC-519C, PW TO PRT ISO (Step 8.4.2)</p> <p><b><u>STANDARD:</u></b> The operator places the RC-519C Control Switch to OPEN and observes the Red status light is LIT and the Green status light is OFF.</p> <p>The operator places the RC-519C Control Switch to CLOSE and observes the Green status light is LIT and the Red status light is OFF.</p> <p>The operator observes the RC-519B Green status light is LIT and the Red status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> If the operator informs the CRS of the valve position change, acknowledge as the CRS.</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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 16:</u></b> IF RC-519A is indicating in mid position, THEN perform the following:</p> <ol style="list-style-type: none"> <li>Verify neither Primary Water Pump is OPERATING.</li> <li>Close breaker 15 on Power Panel 27.</li> <li>Open HCV-4176, CDT ISOLATION.</li> <li>Open HCV-4174, PZR RELIEF TANK ISOLATION.</li> <li>Close HCV-4176, CDT ISOLATION.</li> <li>Close HCV-4174, PZR RELIEF TANK ISOLATION.</li> <li>Open breaker 15 on Power Panel 27. (Step 8.4.1.3)</li> </ol> <p><b><u>STANDARD:</u></b> The operator recognizes the sub-steps under Section 8.4.1.3 are not applicable and annotates the steps with "N/A"</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>NOTE:</b> Power Panel 27 is located on the west side of the PASS panel.</p>	
<p><b><u>STEP 17:</u></b> IF RC-519A OR RC-519B is still indicating mid position, THEN declare the valve out of service AND refer to ITS LCO 3.6.3. (Step 8.4.1.4)</p> <p><b><u>STANDARD:</u></b> The operator reads the Note, and proceeds.</p> <p>The operator recognizes this step is N/A and marks it N/A</p> <p><b>EXAMINER'S CUE:</b> Inform the operator you will have another operator restore PRT pressure to normal</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>

Terminating Cue:

Evaluation on this JPM is complete.

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

VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2016 Systems - Control Room JPM C

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

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

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

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- The plant is at 100% power.
- APP-003-D3, PRT HI/LO LEVEL, has alarmed.
- The cause of the low level is known leakage from the PRT to the RCDT.
- PRT level is stable at 67%.

## INITIATING CUE:

- The CRS has directed you to restore PRT level to normal IAW OP-103, Pressurizer Relief Tank Control System.
- All of the prerequisites of Section 4.0 are complete.

# **SIM JPM D**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Reactor Startup with Ejected Control Rod JPM No.: 2016 Systems - Control Room JPM D (Alternate Path)

K/A Reference: 001 A1.06 (4.1/4.4)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

- Initial Conditions:
- The plant is stabilized at 2% power.
  - The RCS is at normal operating temperature and pressure.
  - A plant startup is in progress IAW GP-003, Normal Plant Startup From Hot Shutdown to Critical, and complete through Step 8.4.7.
  - You are the OATC.
  - The BOP is temporarily outside the Control Room.

Initiating Cue: The CRS has directed you to pull control rods to stabilize reactor power between 3-5% by continuing with Step 8.4.8 of GP-003.

Task Standard: The operator will start to raise reactor power to 3-5%. Then, the operator will manually trip the reactor, attempt to manually actuate Safety Injection and manually start SI Pumps in response to an ejected rod.

Required Materials: None

General References: GP-003 (Normal Plant Startup From Hot Shutdown to Critical), Rev 105  
 2016 Systems - Control Room JPM D NUREG 1021, Revision 10

## Job Performance Measure Worksheet

APP-004 (First Out Reactor Trips), Rev 18  
 EOP-E-0 (Reactor Trip or Safety Injection), Rev 6  
 AOP-001 (Malfunction of Reactor Control System), Rev 33  
 AOP-016 (Excessive Primary Plant Leakage), Rev 23  
 AOP-019 (Malfunction of RCS Pressure Control), Rev 20  
 EOP-E-0 (Reactor Trip or Safety Injection), Rev 6  
 OMM-022 (Emergency Operating Procedures User's Guide), Rev 45

Handouts: Handout 1: Section 8.4 of GP-003 marked up for this JPM to Step 8.4.7.

Time Critical Task: NO

Validation Time: 5 minutes

NOTE: This JPM should be pre-briefed in the Briefing Room.

<b><u>Critical Step Justification</u></b>	
Step 1	This step is critical because placing the Manual Rod Control Switch to the OUT position is necessary to raise and then stabilize power between 3-5%.
Step 2	This step is critical because pressing one of two Rx Trip pushbuttons is necessary to manually trip the reactor.
Step 8	This step is critical because pressing BOTH SI pushbuttons is necessary to manually attempt to actuate SI.
<b><u>Alternate Path Critical Step Justification</u></b>	
Step 9	This step is critical because placing the "A" and the "C" SI Pump Control Switches to START is necessary to manually start SI Pumps in response to an ejected rod.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Construct Scenario File 006\_JPM\_D as follows:
  - IMF SIS01A, f:FAIL\_TO\_INITIATE, (SI Train "A" Fails to AUTO/MANUAL actuate)
  - IMF SIS01B, f:FAIL\_TO\_INITIATE, (SI Train "A" Fails to AUTO/MANUAL actuate)
  - IMF RPS01A f:FAILURE\_TO\_OPEN, AUTO
  - IMF RPS01B f:FAILURE\_TO\_OPEN, AUTO
  
  - Event 1: \$006\_ROD\_OUT\_ARMED IMF CRF05A d:5 f:2000, H-8 (Ejected Control Rod)
2. Reset simulator to IC-1,  $10^{-8}$ amps IR and raise power to 2% and stabilize.
3. Place in RUN, execute Scenario File 006\_JPM\_D and allow time to stabilize.
4. Ensure actions of GP-003 up to Step 8.4.7 are complete.
5. Stabilize the plant.
6. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-603 (August, 2015).
2. Scenario File 006\_JPM\_D
3. Perform Attachment 2 (Simulator Setup For Exams) of TAP-411.
4. Place Simulator in Run when Operator assumes the watch.



## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

<p><b><u>STEP 1:</u></b> ADJUST control rods as necessary to achieve the following while continuing with this procedure:</p> <p>RCS Tavg between 547°F and 551°F Reactor Power 3% to less than or equal to 5%. (Step 8.4.8).</p> <p><b><u>STANDARD:</u></b> The operator places the Manual Rod Control Switch to the OUT position to raise reactor power between 3-5%, and Tavg between 547°F and 551°F.</p> <p>The operator will observe that an event unrelated to the reactor startup is occurring.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> An Ejected Rod will occur shortly after the rod withdrawal has commenced.</p> <p>Shortly afterwards, the following indications will be available to the operator:</p> <ul style="list-style-type: none"> <li>• Several RTGB Annunciators alarm</li> <li>• Rod Bottom light for Control Rod H-8 is LIT</li> <li>• SUR is positive and rising</li> <li>• Neutron flux is rising</li> <li>• RCS pressure is lowering</li> <li>• Pzr level is lowering</li> <li>• Charging Pump speed is rising</li> </ul> <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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## PERFORMANCE INFORMATION

<p><b><u>STEP 2:</u></b> Diagnose LOCA and manually trip Rx</p> <p><b><u>STANDARD:</u></b> The operator observes RTGB alarms and indications and manually trips the Rx by pressing one of two Rx Trip pushbuttons.</p> <p>The operator proceeds to EOP-E-0.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The operator may address one or more APPs, enter AOP-001, AOP-016, or AOP-019.</p> <p>The operator may manually trip the reactor based on Attachment 3, Control Band and Trip Limit Guidance, of OMM-022, Emergency Operating Procedures User's Guide.</p> <p>Since the first four actions of EOP-E-0 are Immediate Actions, the operator will likely NOT address the procedure (EOP-E-0) until the Immediate Actions are complete.</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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## PERFORMANCE INFORMATION

<p><b><u>STEP 3:</u></b> CHECK Reactor Trip:  Reactor Trip AND Bypass Breakers - OPEN  Rod position indicators - FULLY INSERTED  Rod Bottom Lights - ILLUMINATED  Neutron Flux - LOWERING  (EOP-E-0 Step 1)</p> <p><b><u>STANDARD:</u></b> The operator observes parameters and determines that the Rx 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><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 4:</u></b> CHECK Turbine Trip:  Both Turbine Stop Valves - CLOSED  All MSR Purge AND Shutoff Valves - CLOSED  (EOP-E-0 Step 2)</p> <p><b><u>STANDARD:</u></b> The operator observes parameters and determines that the Turbine 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><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 5:</u></b> CHECK Power To AC EMERGENCY BUSES: CHECK Bus E-1 OR E-2 - AT LEAST ONE ENERGIZED CHECK Bus E-1 AND E-2 - BOTH ENERGIZED (EOP-E-0 Step 3)</p> <p><b><u>STANDARD:</u></b> The operator observes E-1/E-2 bus voltage and determines that both E-1 and E-2 are energized.</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 SI Status:</p> <p>CHECK if SI is actuated: SI annunciators - ANY ILLUMINATED OR SI equipment - AUTO STARTED (EOP-E-0 Step 4/4.a)</p> <p><b><u>STANDARD:</u></b> The operator observes SI annunciators are LIT, and proceeds.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> If the SI annunciators are not lit, the operator will perform the step 4.a RNO (It is expected that the criteria to automatically actuate safety injection will either occur or be close to occurring during the performance of this step).</p> <p>SI equipment will NOT auto start.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 7:</u></b> CHECK BOTH trains of SI actuated: SI Pumps - TWO RUNNING RHR Pumps - BOTH RUNNING (EOP-E-0 Step 4.b)</p> <p><b><u>STANDARD:</u></b> The operator observes the "A" and "C" SI Pumps Green status lights are LIT, and Red status lights are EXTINGUISHED.</p> <p>The operator observes the "A" and "B" RHR Pumps Green status lights are LIT, and Red status lights are EXTINGUISHED</p> <p>The operator proceeds to the RNO.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> SI equipment will NOT auto start.</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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## PERFORMANCE INFORMATION

<p><b><u>STEP 8:</u></b> Manually ACTUATE SI by depressing BOTH SI pushbuttons. (EOP-E-0 Step 4.b RNO)</p> <p><b><u>STANDARD:</u></b> The operator presses BOTH SI pushbuttons.</p> <p>The operator observes the “A” and “C” SI Pumps Green status lights are LIT, and Red status lights are EXTINGUISHED.</p> <p>The operator observes the “A” and “B” RHR Pumps Green status lights are LIT, and Red status lights are EXTINGUISHED. <b>(Alternate Path).</b></p> <p><b>EXAMINER’S CUE:</b> NONE</p> <p><b>EXAMINER’S NOTE:</b> Upon completion of the EOP-E-0 Immediate Actions the operator may obtain EOP-E-0 and verify the Immediate Actions, BEFORE proceeding.</p> <p>If so, the operator will likely review the EOP-E-0 Foldout Page, as well.</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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## PERFORMANCE INFORMATION

<p><b><u>STEP 9:</u></b> Manually start both SI Pumps. (Step 5.3.1.c of OMM-022)</p> <p><b><u>STANDARD:</u></b> The operator places the “A” SI Pump Control Switch to Start and observes the Red status lights are LIT, and Green status lights are EXTINGUISHED.</p> <p>The operator places the “C” SI Pump Control Switch to Start and observes the Red status lights are LIT, and Green status lights are EXTINGUISHED.</p> <p><b>EXAMINER’S CUE:</b> NONE</p> <p><b>EXAMINER’S NOTE:</b> This action may be taken at the time that the operator realizes that the manual SI actuation pushbuttons have failed to start the SI equipment using the guidance for Prompt and Prudent actions in OMM-022, Step 5.3.1.c. (Prompt action is necessary to prevent the deterioration of plant conditions or components to a possibly unsafe or unstable level. If time permits, approval from the SM/CRS shall be obtained. Factors to consider include: complexity of action, potential for damage from common cause, etc. Examples include: Failure of automatic systems to perform or respond correctly.)</p> <p>If the operator addresses EOP-E-0 to verify the Immediate Actions upon completion of Step 4, and the SI Pumps have NOT been started, the operator will address Attachment 1 (With the BOP out of the Control Room) and manually start the SI Pumps (Step 1 and Step 1 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>
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Terminating Cue:

Evaluation on this JPM is complete.

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

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2016 Systems - Control Room JPM D

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

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

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



## JPM CUE SHEET

## INITIAL CONDITIONS:

- The plant is stabilized at 2% power.
- The RCS is at normal operating temperature and pressure.
- A plant startup is in progress IAW GP-003, Normal Plant Startup From Hot Shutdown to Critical, and complete through Step 8.4.7.
- You are the OATC.
- The BOP is temporarily outside the Control Room.

## INITIATING CUE:

The CRS has directed you to pull control rods to stabilize reactor power between 3-5% by continuing with Step 8.4.8 of GP-003.

# **SIM JPM E**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Transfer to Long Term Recirculation JPM No.: 2016 Systems –  
Control Room JPM E  
(Alternate Path)

K/A Reference: EPE 011 EA1.11 (4.2/4.2)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions:

- A large break LOCA has occurred.
- The plant is currently on Cold Leg Recirculation IAW EOP-ES-1.3, Transfer to Cold Leg Recirculation.
- RHR Cold Leg Recirculation flow is ≈3000 gpm.

Initiating Cue: The CRS has directed you to transfer to Long Term Recirculation IAW EOP-ES-1.4, Transfer to Long Term Recirculation.

**THIS IS A TIME CRITICAL JPM**

Task Standard: The operator will align for Long Term Recirculation per EOP-ES-1.4, and align only the B RHR Pump for operation when it is determined that SI-863A has failed to OPEN.

Required Materials: None

General References: EOP-ES-1.3 (Transfer to Cold Leg Recirculation), Rev 0

2016 Systems - Control Room JPM E

NUREG 1021, Revision 10

## Job Performance Measure Worksheet

EOP-ES-1.4 (Transfer to Long Term Recirculation), Rev 0  
 OMM-22 (Emergency Operating Procedures User's Guide), Rev 45

Handouts: Handout 1: Blank Copy of EOP-ES-1.4.

Time Critical Task: YES - Siemen's fuel Analysis for LBLOCA, ESR 99- 00273 indicates that the operator must Restore Core cooling flow within 6 minutes when transferring to Piggy-Back Mode (Maximum of 6 minutes of no flow when transferring to the Piggy-Back Mode)

Validation Time: 10 minutes

<b><u>Critical Step Justification</u></b>	
Step 3	This step is critical because placing the A RHR Pump Control Switch to STOP is necessary to align for Long Term Recirculation per EOP-ES-1.4.
Step 4	This step is critical because placing the RHR-759A and 759B Control Switch to CLOSE is necessary to align for Long Term Recirculation per EOP-ES-1.4.
Step 5	This step is critical because placing the SI-863B Control Switch to CLOSE is necessary to align for Long Term Recirculation per EOP-ES-1.4.
Step 6	This step is critical because placing the SI-866A Control Switch to OPEN is OPEN is necessary to align for Long Term Recirculation per EOP-ES-1.4.
Step 7	This step is critical because placing the SI-870A and B Control Switches to CLOSE is necessary to align for Long Term Recirculation per EOP-ES-1.4.
Step 11	This step is critical because placing the A or C SI Pump Control Switch to START is necessary to align for Long Term Recirculation per EOP-ES-1.4.
<b><u>Alternate Path Critical Step Justification</u></b>	
Step 10	This step is critical because placing the B RHR Pump Control Switch to START is necessary to align only the B RHR Pump for operation when it is determined that SI-863A has failed to OPEN.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Construct Scenario File 006\_JPM\_E as follows:
  - IOR diSISAAI201 f:CLOSE (RHR Loop Recirc SI-863A fails to OPEN)
2. Reset simulator to IC-28, (Cold Leg Recirculation).
3. Place in RUN, execute Scenario File 006\_JPM\_E and allow time to stabilize.
4. Perform the following:
  - Stop "A" Primary Water Pump and place in AUTO
  - CLOSE FCV-114A and place in AUTO
  - Place Controller FCV-114A in AUTO
5. Acknowledge alarms on RR-1 and APP-036.
6. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-604 (August, 2015).
2. Place Simulator in Run, acknowledge alarms on RR-1 and APP-036, and Freeze Simulator.
3. Perform Attachment 2 (Simulator Setup For Exams) of TAP-411.
4. Place Simulator in Run when operator assumes the watch.

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

**NOTE:** FOLDOUT for EOP-ES-1.4 is in effect.

**STEP 1:**

CHECK Condition Below - ANY PRESENT  
APP-001-D4, RHR PIT A HI-HI LEVEL - ILLUMINATED  
OR  
APP-001-D5, RHR PIT B HI-HI LEVEL - ILLUMINATED  
OR  
EITHER RHR Pit level indication - GREATER THAN 24 INCHES

\_\_\_ SAT

\_\_\_ UNSAT

PERFORM the following:  
MONITOR RHR Pit indications.  
IF ANY of the RHR Pit level conditions noted occur, THEN GO TO  
EPP-24, Isolation Of Leakage In The RHR Pump Pit.  
GO TO Step 3.  
(Step 1 and 1 RNO).

**STANDARD:** The operator reads the Note, and proceeds.

The operator reviews the Foldout Page Criteria.

The operator observes APP-001-D4 and D5 are extinguished, and that LI-615 A and B are both less than 24 inches; and determines that there is no RHR Pit leakage and proceeds to Step 3.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

## PERFORMANCE INFORMATION

<p><b><u>STEP 2:</u></b> DETERMINE Needed RHR Alignment: CHECK RHR System alignment - IN PIGGY-BACK MODE</p> <p>OBSERVE the CAUTION prior to Step 5 AND GO TO Step 5. (Step 3 and 3 RNO.)</p> <p><b><u>STANDARD:</u></b> The operator observes SI-863A and B Green status lights are LIT, and Red status lights are OFF (Or equivalent) and determines that RHR is NOT in PIGGY-BACK Mode and proceeds to the Caution prior to Step 5.</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>CAUTION:</b> Steps 5 through 8 must be performed without delay to minimize the time without flow through the core.</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 3:</u></b>      ALIGN Equipment To Obtain The Following Conditions: STOP ALL RHR Pumps (Step 5/5.a)</p> <p><b><u>STANDARD:</u></b>    The operator reads the Caution, and proceeds.</p> <p>                          The operator places the "A" RHR Pump Control Switch to STOP and observes the Green status light is LIT and the Red status light is OFF.</p> <p>                          The operator observes the "B" RHR Pump Green status light is LIT and the Red status light is OFF.</p> <p><b>EXAMINER'S CUE:</b>            NONE</p> <p><b>EXAMINER'S NOTE:</b>        The operator will likely read through Steps 5-8 ahead of time before performing actions.</p> <p>  APP-001-A7, RHR HX LO FLOW, is an expected alarm.</p> <p><b>BOOTH OPERATOR CUE:</b>    NONE</p> <p><b><u>COMMENTS:</u></b></p> <p>  <b>TIME CRITICAL START TIME:</b> _____</p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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## PERFORMANCE INFORMATION

<p><b><u>STEP 4:</u></b>      ALIGN Equipment To Obtain The Following Conditions:  CLOSE RHR HX Discharge Valves  RHR-759A  RHR-759B  (Step 5/5.b)</p> <p><b><u>STANDARD:</u></b>    The operator places the RHR-759A Control Switch to CLOSE and observes that the Green status light is LIT and the Red status light is OFF.  The operator places the RHR-759B Control Switch to CLOSE and observes that the Green status light is LIT and the Red status light is OFF.</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>
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## PERFORMANCE INFORMATION

<p><b><u>STEP 5:</u></b> ALIGN Equipment To Obtain The Following Conditions:  OPEN RHR Loop Recirc Valves  SI-863A  SI-863B  (Step 5/5.c)</p> <p><b><u>STANDARD:</u></b> The operator places the SI-863A Control Switch to OPEN and observes that the Green status light remains LIT and the Red status light remains OFF (<b>Alternate Path – mitigated in subsequent steps</b>).  The operator places the SI-863B Control Switch to OPEN and observes that the Red status light is LIT and the Green status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> If operator reports the failure of SI-863A to OPEN, acknowledge as the CRS.</p> <p><b>EXAMINER'S NOTE:</b> The operator should not stop the procedure, the procedure is designed to subsequently mitigate the failure of SI-863A to OPEN.   The operator may place the SI-863A Control Switch back to CLOSE.</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>CAUTION:</b> Opening SI-866A AND SI-866B, Hot Leg Injection Valves, with only one SI pump running will result in SI Pump runout.</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 6:</u></b>      ALIGN For Hot Leg Recirculation: OPEN SI-866A, LOOP 3 HOT LEG INJ Valve (Step 6/6.a)</p> <p><b><u>STANDARD:</u></b>    The operator reads the Caution, and proceeds.</p> <p>                         The operator places the key-operated SI-866A Control Switch to OPEN and observes that SI-866A Red status light is LIT and the Green status light is OFF.</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>      ALIGN For Hot Leg Recirculation: CLOSE BIT Outlet Valves: SI-870A SI-870B (Step 6/6.b)</p> <p><b><u>STANDARD:</u></b>    The operator places the SI-870A Control Switch to CLOSE, and observes that the Green status light is LIT and the Red status light is OFF.</p> <p>                         The operator places the SI-870B Control Switch to CLOSE, and observes that the Green status light is LIT and the Red status light is OFF.</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>

## PERFORMANCE INFORMATION

**CAUTION:** RHR-759A AND RHR-759B, RHR HX Discharge Valves, are closed. The RHR Pumps will run dead-headed AND are subject to damage UNTIL the SI pumps are started.

**STEP 8:** ESTABLISH Hot Leg Recirculation Flow:  
CHECK RHR-759A, RHR HX A DISCH Valve - CLOSED  
(Step 7/7.a)

\_\_\_ SAT

**STANDARD:** The operator reads the Caution, and proceeds.  
  
The operator observes the RHR-759A Green status light is LIT, and Red status light is OFF.

\_\_\_ UNSAT

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

**STEP 9:** ESTABLISH Hot Leg Recirculation Flow:  
CHECK SI-863A, RHR LOOP RECIRC Valve - OPEN  
(Step 7/7.b)

\_\_\_ SAT

**STANDARD:** The operator observes the SI-863A Green status light is LIT and determines that SI-863A is CLOSED (**Alternate Path**), and proceeds to Step 7.b RNO.

\_\_\_ UNSAT

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** The operator has previously attempted to OPEN this valve, and it failed to OPEN. This procedure will address the compensatory actions now.

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

## PERFORMANCE INFORMATION

<p><b><u>STEP 10:</u></b> ESTABLISH Hot Leg Recirculation Flow:  PERFORM the following:  CLOSE RHR-759B, RHR HX B DISCH Valve.  OPEN SI-863B, RHR LOOP RECIRC Valve.  CLOSE SI-863A, RHR LOOP RECIRC Valve.  START RHR Pump B.  GO TO Step 8.  (Step 7/7.b RNO)</p> <p><b><u>STANDARD:</u></b> The operator observes the RHR-759B Green status light is LIT and the Red status light is OFF.  The operator observes the SI-863B Red status light is LIT and the Green status light is OFF.  The operator places the SI-863A Control Switch in the CLOSE position and observes the Green status light is LIT and the Red status light is OFF.  The operator places the "B" RHR Pump Control Switch to START and observes the Red status light is LIT and the Green status light is OFF.  The operator proceeds to Step 8.</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>
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## PERFORMANCE INFORMATION

<p><b><u>STEP 11:</u></b>     START One SI Pump                     (Step 8)</p> <p><b><u>STANDARD:</u></b>    The operator places the “A” or “C” SI Pump Control Switch to START, and observes the Red status light is LIT and the Green status light is OFF.</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>TIME CRITICAL STOP TIME:</b> _____ (Less than 6 Minutes)</p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>						
<p><b><u>STEP 12:</u></b>     CHECK Indicated Flow On The Appropriate Flow Meters:</p> <table border="1" data-bbox="331 1077 1013 1251"> <thead> <tr> <th>PATH</th> <th>FLOW METERS</th> </tr> </thead> <tbody> <tr> <td>SI-866B</td> <td>FI-940, SI Hot Leg Header Flow FI-933, SI Loop 2 Hot Leg Flow</td> </tr> <tr> <td>SI-866A</td> <td>FI-940, SI Hot Leg Header Flow FI-932, SI Loop 3 Hot Leg Flow</td> </tr> </tbody> </table> <p>(Step 9)</p> <p><b><u>STANDARD:</u></b>    The operator observes FI-940 and determines flow to be 640-680 gpm.                     The operator observes FI-932 and determines flow to be 580-600 gpm.</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>	PATH	FLOW METERS	SI-866B	FI-940, SI Hot Leg Header Flow FI-933, SI Loop 2 Hot Leg Flow	SI-866A	FI-940, SI Hot Leg Header Flow FI-932, SI Loop 3 Hot Leg Flow	<p>___ SAT</p> <p>___ UNSAT</p>
PATH	FLOW METERS						
SI-866B	FI-940, SI Hot Leg Header Flow FI-933, SI Loop 2 Hot Leg Flow						
SI-866A	FI-940, SI Hot Leg Header Flow FI-932, SI Loop 3 Hot Leg Flow						

PERFORMANCE INFORMATION

**CAUTION:** The operator should be sure that cavitation is taking place prior to transitioning to steps that attempt to mitigate screen blockage. The actions taken are beyond design basis AND should NOT be taken unless warranted. Stable indication on FI-605 may also be used as an aid in determining if cavitation is present in subsequent steps when RHR-759A OR RHR-759B AND RHR-744A OR RHR-744B are open.

**STEP 13:** CHECK RHR Pump Discharge Pressure - STABLE  
 PI-602A  
 PI-602B  
 (Step 10)

\_\_\_ SAT

**STANDARD:** The operator reads the caution, and proceeds.

\_\_\_ UNSAT

The operator observes PI-602B to be ≈160 psig.

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

COMMENTS:

## PERFORMANCE INFORMATION

<p><b><u>STEP 14:</u></b> DETERMINE If Flow Should Be Established To Cold Legs as follows:  CHECK RCS pressure - LESS THAN 275 PSIG  CHECK RHR Cold Leg Recirculation flow indicated in EOP-ES-1.3,  Transfer To Cold Leg Recirculation  CHECK CV Sump Screen status - HAS REMAINED CLEAR DURING  RECIRCULATION  CHECK ALL of the following - AVAILABLE</p> <ul style="list-style-type: none"> <li>• FI-605, RHR TOTAL FLOW</li> <li>• RHR-759A AND RHR-759B, RHR HX Discharge Valves</li> <li>• SI-863A AND SI-863B, RHR LOOP RECIRC Valves</li> <li>• RHR Pumps A AND B</li> </ul> <p>(Step 11a-d and 11.d RNO)</p> <p><b><u>STANDARD:</u></b> The operator observes PR-444 (or equivalent) to be 5 psig.  The operator recalls that 3000 gpm of flow existed in the Cold Legs  before this procedure started.  The operator observes RHR discharge pressure to be steady at 150  psig (or equivalent), and determines that no RHR Pump cavitation is  occurring.  The operator observes 0 gpm on FI-605.  The operator observes the RHR-759A Green status light is LIT, and  the Red status light is OFF.  The operator observes the RHR-759B Green status light is LIT, and  the Red status light is OFF.  The operator observes the SI-863B Red status light is LIT and the  Green status light is OFF.  The operator observes the SI-863A Green status light is LIT and the  Red status light is OFF.  The operator recognizes that SI-863A is NOT available, and  proceeds to Step 16.</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>
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PERFORMANCE INFORMATION

<p><b>STEP 15:</b> CHECK Time Since Hot Leg Recirculation Established - GREATER THAN 16 HOURS</p> <p>WHEN 16 hours have elapsed, THEN GO TO Step 17. (Step 16 and 16 RNO)</p> <p><b>STANDARD:</b> The operator recognizes that the procedure must be stopped for 16 hours, and reports that the procedure must be placed on hold.</p> <p><b>EXAMINER'S CUE:</b> Another operator will continue with this procedure</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>
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**Terminating Cue:** Evaluation on this JPM is complete.

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

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2016 Systems - Control Room JPM E

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

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

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

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JPM CUE SHEET

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INITIAL CONDITIONS:

- A large break LOCA has occurred.
- The plant is currently on Cold Leg Recirculation IAW EOP-ES-1.3, Transfer to Cold Leg Recirculation.
- RHR Cold Leg Recirculation flow is  $\approx$ 3000 gpm.

INITIATING CUE:

The CRS has directed you to transfer to Long Term Recirculation IAW EOP-ES-1.4, Transfer to Long Term Recirculation.

**THIS IS A TIME CRITICAL JPM**

# **SIM JPM F**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Fill a Safety Injection AccumulatorJPM No.: 2016 Systems - Control Room JPM F

K/A Reference: 006 A4.02 (4.0/3.8)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions:

- The plant is at 100% power.
- SI ACCUM C HI/LO LVL (APP-002-E4) alarm has been received and actions have been reviewed by the RO.
- You are the Licensed Dedicated Operator referred to in OP-202.

Initiating Cue: The CRS has briefed and directed you to fill SI Accumulator "C" to reset the low level alarm IAW OP-202, Section 5.2.1.

Task Standard: The operator will refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits.

Required Materials: None

General References: OP-202 (Safety Injection and Containment Vessel Spray System), Rev 98  
 APP-002 (Engineering Safeguards), Rev 70

Job Performance Measure Worksheet

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Handouts: Handout 1: OP-202, Section 5.2.1 marked up as follows:  
Step 5.2.1.1.a – Initialed  
Step 5.2.1.1.b Bullet 1 – Initialed  
Step 5.2.1.1.b Bullet 2 – NA'd  
Step 5.2.1.1.c – NA'd  
Step 5.2.1.1.d – Initialed  
Step 5.2.1.1.e (1) and (2) – NA'd

Time Critical Task: NO

Validation Time: 8 minutes

## Job Performance Measure Worksheet

<b><u>Critical Step Justification</u></b>	
Step 2	This step is critical because placing the SI-869 Normal/Defeat switch in the NORMAL position is necessary to refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits (Control power must be aligned to the valve to allow for RTGB operation).
Step 4	This step is critical because placing the SI-869 control switch to the OPEN position is necessary to refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits (Open valve to align flowpath to SI Accumulator).
Step 5	This step is critical because placing an SI Pump control switch to the START position is necessary to refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits (Provides adequate flow and pressure to fill the SI Accumulator).
Step 7	This step is critical because placing the SI-851C control switch to the OPEN position, and then closing it within limits is necessary to refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits (align fill path to appropriate accumulator and to secure filling at desired level).
Step 8	This step is critical because placing the operating SI Pump control switch to STOP and returning it to the MID position is necessary to refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits (secure fill source and prevent operating on recirculation for an extended period).
Step 10	This step is critical because placing the SI-869 control switch to the CLOSED position is necessary to refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits (realign SI-869 to its normal Mode 1 alignment).
Step 11	This step is critical because placing the SI-869 Normal/Defeat switch in the DEFEAT position is necessary to refill SI Accumulator "C" to reset the low level alarm without exceeding specified limits (properly align SI-869 Control Power Defeat Switch as required for Mode 1).

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset simulator to IC-5, 100% Power.
2. Lower the C SI Accumulator Level as follows:
  - OPEN SI-852C
  - WHEN APP-002-B4, SI ACCUM C HI/LO LVL, is LIT, CLOSE SI-852C
  - Check C SI Accumulator level at 64%
3. Place in RUN and allow time to stabilize.
4. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-605 (August, 2015).
2. Perform Attachment 2 (Simulator Setup For Exams) of TAP-411.
3. Place Simulator in Run when Operator assumes the watch.



## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

<p><b><u>STEP 1:</u></b></p>	<p>Check open SI-856A, SI PUMP RECIRC and SI-856B, SI PUMP RECIRC (Steps 5.2.1.2.a and b).</p>	<p>___ SAT</p>
<p><b><u>STANDARD:</u></b></p>	<p>The operator observes SI-856A and B RED lights are LIT and the Green status lights are OFF.</p>	<p>___ UNSAT</p>
<p><b>EXAMINER'S CUE:</b></p>	<p>NONE</p>	
<p><b>EXAMINER'S NOTE:</b></p>	<p>The operator may use ERFIS to monitor SI Accumulator "C" level. (ERFIS: QP ACCUM C)</p> <p>The Control Switches for these valves are located on the CV Sump Recirc Panel on the apron section of the RTGB below APP-002.</p>	
<p><b>BOOTH OPERATOR CUE:</b></p>	<p>NONE</p>	
<p><b><u>COMMENTS:</u></b></p>		

## PERFORMANCE INFORMATION

<p><b><u>STEP 2:</u></b> ENSURE the Control Power Defeat switch for SI-869 is in the NORMAL position (Step 5.2.1.c)</p> <p><b><u>STANDARD:</u></b> The operator places the SI-869 NORMAL/DEFEAT key switch in the NORMAL position and observes the Amber status light is LIT.</p> <p><b>EXAMINER'S CUE:</b> If the operator 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>
<p style="text-align: center;"><b>NOTE</b></p> <p>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.</p> <p>The following step is a continuous action step which shall be performed when the stated condition is met.</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 3:</u></b> IF an SI actuation is received during filling, THEN IMMEDIATELY CLOSE the applicable SI Accumulator makeup valve AND PERFORM Step 5.2.1.2.m to restore the SI System lineup. (Step 5.2.1.d)</p> <p><b><u>STANDARD:</u></b> The operator reads the Notes, and proceeds.  The operator reads step and acknowledges continuous actions step in the event of an SI actuation.</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> Open SI-869, SI HOT LEG HDR. (Step 5.2.1.2.e)</p> <p><b><u>STANDARD:</u></b> The operator places the SI-869 Control Switch in the OPEN position and observes the Red status light LIT and the Green status light is OFF.</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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 5:</u></b> Start an SI Pump. (Step 5.2.1.2.f)</p> <p><b><u>STANDARD:</u></b> The operator will make an announcement regarding the pump start.</p> <p>The operator places an SI Pump Control Switch in the START position and observes the Red status light is LIT and the Green status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> Starting the SI Pump will cause APP-002-C3, BIT HDR HI PRESS, to alarm (Expected). The operator may address the APP.</p> <p>The announcement of the Pump start is NOT critical</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> 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.</p>	
<p><b><u>STEP 6:</u></b> ENSURE at least one SI Pump Area Cooling unit (HVH-6A OR HVH-6B OR both) is operating. (Step 5.2.1.2.g)</p> <p><b><u>STANDARD:</u></b> The operator reads the Note, and proceeds.</p> <p>The operator observes the HVH-6A Red status light is LIT and the Green status light is OFF if the "A" SI Pump is started.</p> <p>The operator observes the HVH-6B Red status light is LIT and the Green status light is OFF if the "C" SI Pump is started.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The non-operating HVH Unit Green status light is LIT.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

**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 5.2.1.2.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.

**CRITICAL  
STEP**

\_\_\_ SAT

**STANDARD:** The operator reads the Note and the Caution, and proceeds.

The operator places the SI-851C Control Switch to OPEN and observes the Red status light is LIT and the Green status light is OFF.

The operator observes LI-928 and PI-929 and LI-930 and PI-931 during filling.

When the accumulator level is > 67% and < 75% and accumulator pressure is > 614 psig and < 646 psig, the operator places the SI-851C Control Switch to CLOSE and observes the Green status light is LIT and the Red status light is OFF.

\_\_\_ UNSAT

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** APP-002-E4 will clear during the filling process.

It is acceptable if the "C" Accumulator Hi Level Annunciator (APP-002-E4) alarms during filling, as long as the TS LCO maximum level of 80.4% is NOT exceeded.

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

## PERFORMANCE INFORMATION

<p><b><u>STEP 8:</u></b> Stop the operating SI Pump. (Step 5.2.1.2.k)</p> <p><b><u>STANDARD:</u></b> The operator places the operating SI Pump Control Switch in the STOP position and observes the Green status light is LIT and the Red status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> APP-002-C3 will clear when the SI Pump is stopped.</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 5.2.1.2.l)</p> <p>1) HVH-6A 2) HVH-6B</p> <p><b><u>STANDARD:</u></b> The operator observes the HVH-6A Green status light is LIT and the Red status light is OFF.</p> <p>The operator observes the HVH-6B Green status light is LIT and the Red status light is OFF.</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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 10:</u></b> Close SI-869, SI HOT LEG HDR. (Step 5.2.1.2.m)</p> <p><b><u>STANDARD:</u></b> The operator places the SI-869 Control Switch in the CLOSE position and observes the Green status light LIT and the Red status light is OFF.</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>NOTE:</b> 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.</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 11:</u></b> ENSURE the Control Power Defeat switch for SI-869 in the position determined by plant status. (Step 5.2.1.2.n)</p> <p><b><u>STANDARD:</u></b> The operator reads the Note, and proceeds.</p> <p>The operator places the SI-869 NORMAL/DEFEAT key switch in the DEFEAT position and observes the Amber status light is OFF.</p> <p><b>EXAMINER'S CUE:</b> NA</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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Terminating Cue:

Evaluation on this JPM is complete.

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



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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2016 Systems - Control Room JPM F

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

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

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

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JPM CUE SHEET

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INITIAL CONDITIONS:

- The plant is at 100% power.
- SI ACCUM C HI/LO LVL (APP-002-E4) alarm has been received and actions have been reviewed by the RO.
- You are the Licensed Dedicated Operator referred to in OP-202.

INITIATING CUE:

The CRS has briefed and directed you to fill SI Accumulator "C" to reset the low level alarm IAW OP-202, Section 5.2.1.

# **SIM JPM G**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Remove Source Range Channel N-31 From ServiceJPM No.: 2016 Systems - Control Room JPM G

K/A Reference: 015 A4.03 (3.8/3.9)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions:

- A plant startup is in progress in accordance with GP-003, Normal Plant Startup From Hot Shutdown to Critical.
- SR Channel N-31 has just failed low.

Initiating Cue:

- The CRS has directed you to remove SR Channel N-31 from service IAW OWP-011, Nuclear Instrumentation.
- The latest Revision of OWP-011 has been verified to be Rev 24, and the associated Work Request is 16-02.

Task Standard: The operator will remove SR Channel N-31 from service IAW NI-5 of OWP-011.

Required Materials: None

General References: OWP-011 (Nuclear Instrumentation), Rev 24  
 GP-003, Normal Plant Startup From Hot Shutdown to Critical, Rev 105

## Job Performance Measure Worksheet

Handouts: Handout 1: Blank Copy of OWP-11.

Time Critical Task: NO

Validation Time: 7 minutes

<b><u>Critical Step Justification</u></b>	
Step 2	This step is critical because removing NI-31 from ERFIS Scan is necessary to remove SR Channel N-31 from service IAW NI-5 of OWP-011.
Step 4	This step is critical because placing the Start Up Rate Channel Select Switch to the N32, N35 or N36 is necessary to remove SR Channel N-31 from service IAW NI-5 of OWP-011.
Step 5	This step is critical because placing the NI-31 Level Trip Bypass Switch to the BYPASS position is necessary to remove SR Channel N-31 from service IAW NI-5 of OWP-011.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset simulator to IC-8, (47.25 hours tripped, Critical at 48 hours).
2. Place in RUN and allow time to stabilize.
3. Perform the following:
  - Rod Bank Select Switch to SBB
  - Withdrawal SBB rods to 225 Steps
  - Rod Bank Select Switch to M
  - Withdrawal CBA rods to 22 Steps
  - Place Audio Count Rate Selector in the N31 position
  - Place the Startup Rate Channel Select Switch in the N31 position
4. Insert Malfunction NIS01A, Final: 1 (SR N-31 fails LOW)
5. Acknowledge alarms and stabilize the plant.
6. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-606 (August, 2015).
2. Place Simulator in Run when Operator assumes the watch.

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

<p><b><u>STEP 1:</u></b> Obtain and review the procedure. (OWP-011, NI-5, Steps 1-7).</p> <p><b><u>STANDARD:</u></b> The operator reviews Handout 1 and identifies that NI-5 must be addressed. The operator verifies that Revision 24 is the latest revision (Initial Cue), and prints their name, signs and dates Step 1. Operator reviews Steps 2-7.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The operator may use Green Dots to flag the expected annunciators.</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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## PERFORMANCE INFORMATION

<p><b><u>STEP 2:</u></b> Complete Step 8: REMOVE NI-31 from ERFIS SCAN: NIN0031A. (NI-5 Valve, Breaker, Switch Lineup).</p> <p><b><u>STANDARD:</u></b> The operator selects F3 on ERFIS (Master Menu)  The operator selects ADMIN (Administrative Functions Menu)  The operator selects DR (Del/Res Point From/To Scan or Alarm)  The operator depresses the DELETE SCAN pushbutton  The operator enters Point I.D. NIN0031A</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> This can be checked on ERFIS as follows: Select F3 (Master Menu) Select REAL (Real Time Data Menu) Select DBO (Point Information/Value Display) Enter NNI0031A Observe QUALITY to be DEL</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> Complete Step 8: AUDIO COUNT RATE CHANNEL – CHANNEL SELECTOR Switch (NI-5 Valve, Breaker, Switch Lineup).</p> <p><b><u>STANDARD:</u></b> The operator pulls and rotates the Audio Count Rate Channel Selector Switch counter-clockwise to the N32 position, and initials the Selected to SR 32 block on the NI-5 Valve, Breaker, Switch Lineup.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> This switch is on the Audio Count Rate Drawer</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



## PERFORMANCE INFORMATION

<p><b><u>STEP 4:</u></b> Complete Step 8: START UP RATE CHANNEL SELECT Switch * (NI-5 Valve, Breaker, Switch Lineup).</p> <p><b><u>STANDARD:</u></b> The operator places the Start Up Rate Channel Select Switch to the N32; records the selected instrument in the NI block position, and initials the NI-5 Valve, Breaker, Switch Lineup.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> This switch is on the Comparator and Rate Drawer</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 5:</u></b> Complete Step 8: LEVEL TRIP Switch (NI-5 Valve, Breaker, Switch Lineup).</p> <p><b><u>STANDARD:</u></b> The operator places the NI-31 Level Trip Bypass Switch to the BYPASS position, and initials the NI-5 Valve, Breaker, Switch Lineup.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The operator will acknowledge APP-005-D4, NIS TRIP/DROP ROD BYPASS, as an expected alarm.</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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 6:</u></b> Complete Step 8: NIS TRIP BYPASS NI-31 Status Light (NI-5 Valve, Breaker, Switch Lineup).</p> <p><b><u>STANDARD:</u></b> The operator observes the NI-31 LEVEL TRIP BYPASS status light is LIT and initials the NI-5 Valve, Breaker, Switch Lineup.</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> Complete Step 8: HIGH FLUX AT SHUTDOWN Switch (NI-5 Valve, Breaker, Switch Lineup).</p> <p><b><u>STANDARD:</u></b> The operator places the NI-High Flux At Shutdown Switch to the BLOCK position, and initials the NI-5 Valve, Breaker, Switch Lineup.</p> <p>The operator signs and dates Step 8 of NI-5.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> The operator will acknowledge APP-005-B1, HI FLUX AT SHUTDOWN ALARM BLOCK, as an expected alarm.</p> <p><b>BOOTH OPERATOR CUE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**Terminating Cue:** Evaluation on this JPM is complete.

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



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JPM CUE SHEET

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INITIAL CONDITIONS:

- A plant startup is in progress in accordance with GP-003, Normal Plant Startup From Hot Shutdown to Critical.
- SR Channel N-31 has just failed low.

INITIATING CUE:

- The CRS has directed you to remove SR Channel N-31 from service IAW OWP-011, Nuclear Instrumentation.
- The latest Revision of OWP-011 has been verified to be Rev 24, and the associated Work Request is 16-02.

# **SIM JPM H**

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Start a Reactor Coolant PumpJPM No.: 2016 Systems - Control Room JPM H

K/A Reference: 003 A4.03 (2.8/2.5)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:  X   
 Classroom \_\_\_\_\_ Simulator  X  Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

- Initial Conditions:
- A plant startup is in progress in accordance with GP-002, Cold Shutdown to Hot Sub-Critical at No-Load Tavg.
  - The "A" RCP is running.
  - It is intended to start the "B" RCP next.
  - Section 8.1 of OP-101, Reactor Coolant System and Reactor Coolant Pump Startup and Operation, has been completed through Step 8.1.1.2.y in preparation for starting the Reactor Coolant Pump.
  - It is intended to bypass the Degraded Grid Protection prior to the RCP start and return it to service after the RCP is started per OP-101, and an AO is standing by to assist in this process.

Initiating Cue: The CRS has directed you to start the B Reactor Coolant Pump by continuing with Step 8.1.1.2.z of OP-101.

Task Standard: The operator will start the B RCP IAW OP-101.

Required Materials: None

## Job Performance Measure Worksheet

General References: OP-101 (Reactor Coolant System and Reactor Coolant Pump Startup and Operation), Rev 74  
 AD-OP-ALL-1000 (Conduct of Operations) Rev 4  
 AOP-018 (Reactor Coolant Pump Abnormal Conditions), Rev 31  
 APP-001 (Miscellaneous NSSS), Rev 60  
 Technical Specification LCO 3.3.5 (Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation), Amendment 176

Handouts: Handout 1: Section 8.1 of OP-101 marked up through Step 8.1.1.2.y for this JPM.

Time Critical Task: NO

Validation Time: 10 minutes

NOTE: This JPM should be pre-briefed in the Briefing Room.

<b><u>Critical Step Justification</u></b>	
Step 2	This step is critical because contacting the AO and directing the performance of Step 8.1.1.2.aa.1&3 is necessary to start the B RCP IAW OP-101.
Step 3	This step is critical because placing the Bearing Lift Pump in the START position, and observing that the LIFT PRESSURE status light is LIT is necessary to start the B RCP IAW OP-101.
Step 6	This step is critical because after 2 minutes with the Bearing Oil Lift Pump running, placing the B RCP Control Switch to the START position is necessary to start the B RCP IAW OP-101.
Step 8	This step is critical because contacting the AO and directing the performance of Step 8.1.1.2.gg.1-6 is necessary to start the B RCP IAW OP-101.
Step 10	This step is critical because contacting the AO and directing the performance of Step 8.1.1.2.ii.1-6. is necessary to start the B RCP IAW OP-101.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Construct Scenario File 006\_JPM\_H as follows:
  - IRF EPSL007 f:DEFEAT
  - IRF EPSL008 f:DEFEAT
  - IRF EPSL007 f:NORMAL
  - IRF EPSL008 f:NORMAL
2. Reset simulator to IC-35, 0% Power, Mode 3 at NOP/NOT.
3. Place in RUN execute Scenario File 006\_JPM\_H, and allow time to stabilize.
4. Place PCV-455A in manual and close "B" Loop Spray Valve (PCV-455A).
5. Perform the actions of Section 8.1.1 of OP-101 up to Step 8.1.1.2.y.
6. Stabilize the plant.
7. Freeze the Simulator.

**OR**

1. Reset Simulator to Temporary Snap IC-607 (August, 2015).
2. Open Scenario File 006\_JPM\_H.

**NOTE:** Booth Instructor will need to operate Events 1-4 when contacted by the operator at JPM Steps 2, 8 & 10.

3. Perform Attachment 2 (Simulator Setup For Exams) of TAP-411.
4. Place Simulator in Run when Operator assumes the watch.



## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

**NOTES**

ITS LCO 3.3.5 allows bypassing Degraded Grid Protection when the Unit is NOT in Mode 1. Conservative operating principles have determined that bypassing the Degraded Grid Protection will only be permitted when the Unit is NOT in Mode 1 OR Mode 2. (NCR 151422)

Degraded Grid Voltage Protection is limited to one hour in the DEFEAT position before it shall be returned to NORMAL. (NCR 151422)

**STEP 1:** IF required, THEN ENTER LCO 3.3.5 Action Statement due to bypassing Degraded Grid Protection, AND RECORD time. (Step 8.1.1.2.z).

\_\_\_ SAT

**STANDARD:** The operator reads the Note, and proceeds.

The operator records the time in the block provided.

\_\_\_ UNSAT

The operator informs the CRS that LCO 3.3.5 may need to be entered.

**EXAMINER'S CUE:** As the CRS, acknowledge report.

**EXAMINER'S NOTE:** NONE

**BOOTH OPERATOR CUE:** NONE

**COMMENTS:**

## PERFORMANCE INFORMATION

<p><b><u>STEP 2:</u></b> IF degraded grid protection is in service, THEN DEFEAT the degraded grid voltage protection as follows:</p> <ul style="list-style-type: none"> <li>• On the front of Bus E-1, Cubicle 18A, INSTALL key in the DEGRADED GRID VOLTAGE keylock switch AND PLACE in the DEFEAT position.</li> <li>• CHECK annunciator APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is ILLUMINATED.</li> <li>• On the front of Bus E-2, Cubicle 28A, INSTALL key in the DEGRADED GRID VOLTAGE keylock switch AND PLACE in the DEFEAT position.</li> <li>• CHECK annunciator APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is ILLUMINATED. (Step 8.1.1.2.aa).</li> </ul> <p><b><u>STANDARD:</u></b> The operator contacts AO and directs performance of Step 8.1.1.2.aa.1&amp;3.</p> <p>The operator observes APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is LIT and is an expected alarm.</p> <p>The operator observes APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is LIT and is an expected alarm.</p> <p><b>EXAMINER'S CUE:</b> NONE</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> <b>When directed, defeat Degraded Grid Protection on Bus E-1 RFI EPSL007, and report back as AO that Steps 8.1.1.2.aa.1 has been completed</b></p> <p><b>When directed, defeat Degraded Grid Protection on Bus E-2 RFI EPSL008, and report back as AO that Steps 8.1.1.2.aa.3 has been completed</b></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> Several starts / stops of the Bearing Oil Lift Pump may be required to prime the pump in a Motor where the Upper Reservoir has been drained and refilled.</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 3:</u></b> START the BRG LIFT PUMP AND CHECK the LIFT PRESSURE light ILLUMINATES. (Step 8.1.1.2.bb).</p> <p><b><u>STANDARD:</u></b> The operator reads the Note, and proceeds.</p> <p>The operator places the Bearing Lift Pump “B” Control Switch in the START position, and observes the Red status light is LIT and the Green status light is OFF.</p> <p>The operator observes that that the LIFT PRESSURE status light is LIT.</p> <p><b>EXAMINER’S CUE:</b> If the operator addresses the CRS/SM about AOP-018 because of APP-001-E2, as the SM indicate that the performance of the procedure can be deferred.</p> <p><b>EXAMINER’S NOTE:</b> APP-001-E2, RCP #1 SEAL LEAKOFF LO FLOW, alarms when the Bearing Oil Lift Pump is started. This is because the pump start causes the “B” RCP shaft to be lifted affecting the #1 Seal on the “B” RCP, which will affect the #1 Seal Leakoff flows on the other RCPs.</p> <p>The operator may address the APP, and may address AOP-018, Reactor Coolant Pump Abnormal Conditions. If so, a NOTE on the Entry Conditions to AOP-018 states that “IF RCP#1 Seal Leakoff flow is below 1 gpm due to plant conditions known to affect leakoff flow, the SM may defer procedure entry provided the #1 Seal Leakoff flow remains above 0.8 gpm.”</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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## PERFORMANCE INFORMATION

<p><b><u>STEP 4:</u></b> IF RCP Oil Reservoir level annunciator is NOT EXTINGUISHED, THEN REFER to the appropriate Annunciator Procedure. (Step 8.1.1.2.cc).</p> <p><b><u>STANDARD:</u></b> The operator observes that APP-001-E8, RCP B OIL RESERV HI/LO LVL, is 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>___ SAT</p> <p>___ UNSAT</p>
<p><b><u>STEP 5:</u></b> NOTIFY RC that RCP's are to be started AND to monitor for changing radiological conditions. (Step 8.1.1.2.dd).</p> <p><b><u>STANDARD:</u></b> The operator contacts RC and makes notification.</p> <p><b>EXAMINER'S CUE:</b> As RC Supervisor, Acknowledge</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>CAUTION:</b> Only one Reactor Coolant Pump is to be started at a time.</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 6:</u></b> WHEN the Brg Lift Pump has operated for a minimum of 2 minutes, THEN START the Reactor Coolant Pump. (Step 8.1.1.2.ee).</p> <p><b><u>STANDARD:</u></b> The operator reads the Caution, and proceeds.</p> <p>The operator will make a plant announcement prior to starting the RCP.</p> <p>After 2 minutes with the Bearing Oil Lift Pump running, the operator places the B RCP Control Switch to the START position, and observes the Red status light is LIT and the Green status light is OFF.</p> <p>The operator will observe FI-424 at 118%. (Not Critical)</p> <p>The operator will observe FI-425 at 118%. (Not Critical)</p> <p>The operator will observe FI-426 at 117%. (Not Critical)</p> <p>The operator will observe "B" RCP #1 Seal Leakoff on FR-154B to be 1.24 gpm. (Not Critical)</p> <p>The operator will observe RCS pressure on PR-444 to be ≈360 psig. (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><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>
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## PERFORMANCE INFORMATION

<p><b><u>STEP 7:</u></b> WHEN a minimum of 50 seconds has elapsed since the Reactor Coolant Pump was started, THEN STOP the BRG LIFT PUMP. (Step 8.1.1.2.ff).</p> <p><b><u>STANDARD:</u></b> After a minimum of 50 seconds with the B RCP Running, the operator places the Bearing Oil Lift Pump Control Switch to the STOP position, and observes the Green status light is LIT and the Red status light is OFF. The operator observes that that the LIFT PRESSURE status light is OFF.</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>CAUTION:</b> Do NOT Restore the Degraded Grid Voltage Protection to NORMAL until the Amber indicating light is Extinguished.</p>	
<p><b>NOTE:</b> The Degraded Grid Voltage keylock keys can NOT be removed from switches unless positioned to NORMAL.</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 8:</u></b> IF E-1 Degraded Grid Voltage Protection is to be returned to NORMAL, THEN RESTORE as follows:</p> <ul style="list-style-type: none"> <li>• Momentarily DEPRESS the amber E-1 DEGRADED GRID TRIP SIGNAL light cover AND CHECK the light ILLUMINATES.</li> <li>• CHECK the amber E-1 DEGRADED GRID TRIP SIGNAL light is EXTINGUISHED.</li> <li>• PLACE E-1 DEGRADED GRID VOLTAGE key switch to NORMAL.</li> <li>• REMOVE key.</li> <li>• IF all three RCPs have been placed in service, THEN NOTIFY I&amp;C to perform Attachment 10.3, E-1 Defeat Switch Contact Position Verification.</li> <li>• ENSURE Relay 27 contacts are RESET by performing the following: <ul style="list-style-type: none"> <li>○ DEPRESS the TARGET RESET pushbutton for Relay 27/DVA-1 AND CHECK that the target flag indicates black.</li> <li>○ DEPRESS the TARGET RESET pushbutton for Relay 27/DVB-1 AND CHECK that the target flag indicates black.</li> <li>○ DEPRESS the TARGET RESET pushbutton for Relay 27/DVC-1 AND CHECK that the target flag indicates black.</li> </ul> </li> <li>• CHECK annunciator APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is EXTINGUISHED. (Step 8.1.1.2.gg.1-7).</li> </ul> <p><b><u>STANDARD:</u></b> The operator reads the Caution and Note, and proceeds.</p> <p>The operator contacts AO and directs performance of Step 8.1.1.2.gg.1-6.</p> <p>The operator observes APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is EXTINGUISHED.</p> <p><b>EXAMINER'S CUE:</b> If the operator asks the CRS about leaving the Degraded Grid Voltage Protection in effect until after the "C" RCP is started, direct the operator to continue with the procedure as written.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> <b>When directed, return Degraded Grid Protection on Bus E-1 to normal RFI EPSL007, and report back as AO that Steps 8.1.1.2.gg.1-6 have been completed</b></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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## PERFORMANCE INFORMATION

<p><b><u>STEP 9:</u></b> IF an Action Statement has been entered due to bypassing Degraded Grid Protection, THEN NOTIFY the CRS/SM of exiting the Action Statement AND RECORD time. (Step 8.1.1.2.hh).</p> <p><b><u>STANDARD:</u></b> The operator records the time in the block 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>
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## PERFORMANCE INFORMATION

<p><b><u>STEP 10:</u></b> IF E-2 Degraded Grid Voltage Protection is to be returned to NORMAL, THEN RESTORE as follows:</p> <ul style="list-style-type: none"> <li>• Momentarily DEPRESS the amber E-2 DEGRADED GRID TRIP SIGNAL light cover AND CHECK the light ILLUMINATES.</li> <li>• CHECK the amber E-2 DEGRADED GRID TRIP SIGNAL light is EXTINGUISHED.</li> <li>• PLACE E-2 DEGRADED GRID VOLTAGE key switch to NORMAL.</li> <li>• REMOVE key.</li> <li>• IF all three RCPs have been placed in service, THEN NOTIFY I&amp;C to perform Attachment 10.4, E-2 Defeat Switch Contact Position Verification.</li> <li>• ENSURE relay 27 contacts are RESET by performing the following: <ul style="list-style-type: none"> <li>○ DEPRESS the TARGET RESET pushbutton for relay 27/DVA-2 AND CHECK that the target flag indicates black.</li> <li>○ DEPRESS the TARGET RESET pushbutton for relay 27/DVB-2 AND CHECK that the target flag indicates black.</li> <li>○ DEPRESS the TARGET RESET pushbutton for relay 27/DVC-2 AND CHECK that the target flag indicates black.</li> </ul> </li> <li>• CHECK annunciator APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is EXTINGUISHED. (Step 8.1.1.2.ii).</li> </ul> <p><b><u>STANDARD:</u></b> The operator contacts AO and directs performance of Step 8.1.1.2.ii.1-6.</p> <p>The operator observes APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is EXTINGUISHED.</p> <p><b>EXAMINER'S CUE:</b> If the operator asks the CRS about leaving the Degraded Grid Voltage Protection in effect until after the "C" RCP is started, direct the operator to continue with the procedure as written.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b>BOOTH OPERATOR CUE:</b> <b>When directed, return Degraded Grid Protection on Bus E-2 to normal RFI EPSL008, and report back as AO that Steps 8.1.1.2.ii.1-6 have been completed</b></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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PERFORMANCE INFORMATION

<p><b><u>STEP 11:</u></b> IF an Action Statement has been entered due to bypassing Degraded Grid Protection, THEN NOTIFY the CRS/SM of exiting the Action Statement AND RECORD time. (Step 8.1.1.2.jj).</p> <p><b><u>STANDARD:</u></b> The operator records the time in the block provided.</p> <p>The operator informs the CRS that the LCO 3.3.5 Action Statement may be able to be exited.</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>
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**Terminating Cue:** Evaluation on this JPM is complete.

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



## JPM CUE SHEET

- INITIAL CONDITIONS:
- A plant startup is in progress in accordance with GP-002, Cold Shutdown to Hot Sub-Critical at No-Load Tavg.
  - The “A” RCP is running.
  - It is intended to start the “B” RCP next.
  - Section 8.1 of OP-101, Reactor Coolant System and Reactor Coolant Pump Startup and Operation, has been completed through Step 8.1.1.2.y in preparation for starting the Reactor Coolant Pump.
  - It is intended to bypass the Degraded Grid Protection prior to the RCP start and return it to service after the RCP is started per OP-101, and an AO is standing by to assist in this process.

INITIATING CUE: The CRS has directed you to start the B Reactor Coolant Pump by continuing with Step 8.1.1.2.z of OP-101.

# In-Plant JPM I

**Developed By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Instructor/Developer

**Concurred By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Line Superintendent/Supervisor SRO

**Approved By:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Locally Establish AFW Flow from the SDAFW Pump and Control S/G Levels and PressuresJPM No.: 2016 Systems – In-Plant JPM I

K/A Reference: EPE 055 EA2.01 (3.4/3.7)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:  X  Actual Performance:  \_\_\_\_\_   
 Classroom  \_\_\_\_\_  Simulator  \_\_\_\_\_  Plant  X

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

- Initial Conditions:
- The Plant has experienced a loss of onsite and offsite power.
  - EOP-ECA-0.0, Loss of All AC Power, has been implemented.
  - Wide range levels in all three SGs are 55%.
  - Steam Generator pressures are 1075 psig
  - The SDAFW Pump has just been started.

Initiating Cue: The CRS has directed you to locally perform Attachment 4, Local Control Of S/G Level And Pressure, of EOP-ECA-0.0.

Task Standard: The operator will control AFW flow to the Steam Generators and align the Nitrogen System to the SG PORVs IAW Attachment 4 of EOP-ECA-0.0.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)

General References: EOP-ECA-0.0 (Loss of All AC Power), Rev 4

## Job Performance Measure Worksheet

OMM-022 (Emergency Operating Procedures User's Guide), Rev 45

Handouts: Handout 1: Blank copy of Attachment 4 of EOP-ECA-0.0.

Time Critical Task: NO

Validation Time: 7 minutes

<b><u>Critical Step Justification</u></b>	
Step 1	This step is critical because throttling the SDAFW Pump Discharge Valves is necessary to control AFW flow to the Steam Generators IAW Attachment 4 of EOP-ECA-0.0.
Step 3	This step is critical because closing IA-297 is necessary to align the Nitrogen System to the SG PORVs IAW Attachment 4 of EOP-ECA-0.0.
Step 4	This step is critical because opening SDN-13 is necessary to align the Nitrogen System to the SG PORVs IAW Attachment 4 of EOP-ECA-0.0.
Step 5	This step is critical because closing SDN-29 is necessary to align the Nitrogen System to the SG PORVs IAW Attachment 4 of EOP-ECA-0.0.
Step 6	This step is critical because opening SDN-28 is necessary to align the Nitrogen System to the SG PORVs IAW Attachment 4 of EOP-ECA-0.0.
Step 7	This step is critical because opening IA-423 is necessary to align the Nitrogen System to the SG PORVs IAW Attachment 4 of EOP-ECA-0.0.

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

**NOTE**

Flashlights AND ANY handtools needed are located with AOP/EOP/DSP Tool Kits.

The S/G Wide Range level indicators LI-607A-2, LI-607B-2, AND LI-607C-2 located in the Secondary Control Panel are powered from PP-50 AND should always be available. These channels are credited in the SBO Coping Analysis.

**STEP 1:**      Locally THROTTLE The Steam Driven AFW Pump Discharge Valve(s) At The Secondary Control Panel Area To Maintain S/G WR Levels Between 60% AND 67%.

- AFW-V2-14A - S/G A
- AFW-V2-14B - S/G B
- AFW-V2-14C - S/G C

(Step 1)

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:**      The operator reads the Notes, and proceeds.

The operator depresses the AFW-V2-14A, 14B and 14C de-clutch lever and rotates handwheel counterclockwise to increase feedwater flow or clockwise to decrease feedwater flow.

**AS-FOUND:**              All three valves are CLOSED (Stems fully inserted)

**EXAMINER'S CUE:**              After locating and describing how the three valves are operated, indicate that each valve has been De-Clutched and the handwheel rotated as needed to adjust feedwater flow

When appropriate, indicate that each SG WR level is 64% and stable

If the operator elects to OPEN the motor breakers for these valves, indicate that another operator will perform this action

**EXAMINER'S NOTE:**              The operator may request that a second operator observe SG WR levels while the remainder of the Attachment is completed

**COMMENTS:**



## PERFORMANCE INFORMATION

<p><b><u>STEP 2:</u></b> OBSERVE NOTE Prior To Step 10 AND GO TO Step 10 (Step 2)</p> <p><b><u>STANDARD:</u></b> The operator proceeds to Step 10.</p> <p><b>AS-FOUND:</b> NA</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>NOTE</b> IA-297 is located at the southeast corner of the Pipe Jungle at an elevation between the feed AND steam lines.</p>	
<p><b><u>STEP 3:</u></b> CLOSE IA-297, HDR STOP TO PORV STATION &amp; MSIVS (Step 10)</p> <p><b><u>STANDARD:</u></b> The operator reads the Note, and proceeds.</p> <p>The operator rotates the IA-297 handwheel in the clockwise direction.</p> <p><b>AS-FOUND:</b> OPEN (Stem Fully Withdrawn)</p> <p><b>EXAMINER'S CUE:</b> The IA-297 handwheel will no longer turn in the clockwise direction and the stem is inserted</p> <p><b>EXAMINER'S NOTE:</b> Located at the SE corner of Pipe Jungle between the Feed &amp; Steam lines elevation</p> <p>IA-297 is located in the overhead under a catwalk and the operator must climb an installed ladder, or proceed up the stairs to the top floor of the Turbine Building. However, the valve can be seen from below or above, and discussion of operation can take place from one of these two locations</p> <p><b><u>COMMENTS:</u></b></p>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

**NOTE:** SDN-13 is located at the Steam Dump Nitrogen Accumulator.

**STEP 4:** OPEN SDN-13, NITROGEN BACK UP SUPPLY  
(Step 11)

**CRITICAL  
STEP**

**STANDARD:** The operator reads the Note, and proceeds.

\_\_\_ SAT

The operator rotates the SDN-13 handwheel in the counter-clockwise direction.

\_\_\_ UNSAT

**AS-FOUND:** CLOSED (Stem Fully Inserted)

**EXAMINER'S CUE:** The SDN-13 handwheel will no longer turn in the clockwise direction and the stem is inserted.

**EXAMINER'S NOTE:** Located at the Steam Dump Nitrogen Accumulator

**COMMENTS:**

## PERFORMANCE INFORMATION

**NOTE:** SDN-28 AND SDN-29 are located at the southeast corner of the Pipe Jungle on the Mezzanine Deck.

**STEP 5:** UNLOCK AND CLOSE SDN-29, STEAM LINE PORV NITROGEN B/U TO IA TELL-TALE DRAIN (Step 12)

**CRITICAL STEP**

\_\_\_ SAT

**STANDARD:** The operator reads the Note, and proceeds.

The operator unlocks and rotates the SDN-29 handwheel in the clockwise direction.

\_\_\_ UNSAT

**AS-FOUND:** Locked OPEN (Stem Fully Withdrawn)

**EXAMINER'S CUE:** The SDN-29 handwheel will no longer turn in the clockwise direction and the stem is inserted.

**EXAMINER'S NOTE:** Located at the SE Corner of the Pipe Jungle on the Mezzanine Deck

**COMMENTS:**

**STEP 6:** UNLOCK AND OPEN SDN-28, NITROGEN BACKUP TO STEAM LINE PORVS (Step 13)

**CRITICAL STEP**

\_\_\_ SAT

**STANDARD:** The operator unlocks and rotates the SDN-28 handwheel in the counter-clockwise direction.

**AS-FOUND:** Locked CLOSED (Stem Fully Inserted)

**EXAMINER'S CUE:** The SDN-28 handwheel will no longer turn in the counter-clockwise direction and the stem is withdrawn.

**EXAMINER'S NOTE:** Located at the SE Corner of the Pipe Jungle on the Mezzanine Deck

**COMMENTS:**

\_\_\_ UNSAT

## PERFORMANCE INFORMATION

**NOTE:** IA-423 is located at the southeast corner of the Pipe Jungle on the Mezzanine Deck.

**STEP 7:** UNLOCK AND OPEN IA-423, NITROGEN TO STEAM LINE PORVS (Step 14)

**CRITICAL STEP**

**STANDARD:** The operator reads the Note, and proceeds.

\_\_\_ SAT

The operator unlocks and rotates the IA-423 handwheel in the counter-clockwise direction.

\_\_\_ UNSAT

**AS-FOUND:** Locked CLOSED (Stem Fully Inserted)

**EXAMINER'S CUE:** The IA-423 handwheel will no longer turn in the counter-clockwise direction and the stem is withdrawn.

**EXAMINER'S NOTE:** Located at the SE Corner of the Pipe Jungle on the Mezzanine Deck

**COMMENTS:**

**STEP 8:** NOTIFY The Control Room Of The Following:

- S/G level is under control locally
- The S/G Steam Line PORVs have N2 supplied for motive air (Step 15/15.a and b)

\_\_\_ SAT

**STANDARD:** The operator contacts the Control Room and makes the notifications.

\_\_\_ UNSAT

**AS-FOUND:** NA

**EXAMINER'S CUE:** As the CRS, acknowledge

**EXAMINER'S NOTE:** NONE

**COMMENTS:**

PERFORMANCE INFORMATION

**NOTE:** When MCC-5 is energized, the Control Room will feed S/G A AND S/G C.

**STEP 9:** WHEN Notified From The Control Room, THEN FEED S/G B To 67% S/G Wide Range Level AND SECURE Feeding (Step 16)

**STANDARD:** The operator reads the Note, and proceeds.

The operator recognizes that this is a Continuous Action Step, and reports that the Attachment is complete.

**AS-FOUND:** NA

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**COMMENTS:**

\_\_\_ SAT

\_\_\_ UNSAT

**Terminating Cue:** Evaluation on this JPM is complete.

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



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JPM CUE SHEET

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- INITIAL CONDITIONS:
- The Plant has experienced a loss of onsite and offsite power.
  - EOP-ECA-0.0, Loss of All AC Power, has been implemented.
  - Wide range levels in all three SGs are 55%.
  - Steam Generator pressures are 1075 psig
  - The SDAFW Pump has just been started.

INITIATING CUE: The CRS has directed you to locally perform Attachment 4, Local Control Of S/G Level And Pressure, of EOP-ECA-0.0.

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**

# In-Plant JPM J

Developed By: \_\_\_\_\_ Date: \_\_\_\_\_  
Instructor/Developer

Concurred By: \_\_\_\_\_ Date: \_\_\_\_\_  
Line Superintendent/Supervisor SRO

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_  
Superintendent/Supervisor Training



## Job Performance Measure Worksheet

Facility: HB Robinson

Task No.:

Task Title: Respond to a Loss of Instrument Air JPM No.: 2016 Systems – In-Plant JPM J

K/A Reference: 065 AA1.04 (3.5.3.4)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:  X  Actual Performance: \_\_\_\_\_  
 Classroom \_\_\_\_\_ Simulator \_\_\_\_\_ Plant  X

**READ TO THE EXAMINEE**

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

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions:

- IA Header Pressure is 75 PSIG and lowering.
- AOP-017, Loss Of Instrument Air, has been entered.
- The Station Air Compressor is under clearance and disassembled
- The Station Air Receiver is depressurized and vented.

Initiating Cue:

- The CRS has directed you to perform AOP-017 Step 8.
- The Outside AO is standing by to assist as needed.

Task Standard: The operator will start IA Compressors "A" and "B" and align their discharge to supply air to the Instrument Air Header in accordance with Step 8 of AOP-017.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)

General References: AOP-017 (Loss of Instrument Air), Rev 43  
 OMM-022 (Emergency Operating Procedures User's Guide), Rev 45

## Job Performance Measure Worksheet

Handouts: Handout 1: Blank Copy of AOP-017.

Time Critical Task: NO

Validation Time: 14 minutes

<b><u>Critical Step Justification</u></b>	
Step 6	This step is critical because placing the IA Compressor A & B Control Switches in MANUAL is necessary to start IA Compressors "A" and "B" in accordance with Step 8 of AOP-017.
Step 8	This step is critical because rotating the IA-3665 handwheel in the counter-clockwise direction is necessary to align the IA Compressors "A" and "B" discharge to supply air to the Instrument Air Header in accordance with Step 8 of AOP-017.

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

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

**NOTE**

IA-3821 is located on IA Dryer D.

Operator Aid 97-OP-35 to supply Station Air to Instrument Air is located in the Aux Bldg hallway on the Station Air Receiver.

**STEP 1:** DISPATCH Operator(s) To Perform The Following:  
CHECK Station Air Compressor Available For Service:  
SA-1, STATION AIR TO RECEIVER - OPEN  
AND  
Station Air Compressor Function Switch - ON  
(Step 8/8.a)

\_\_\_ SAT

\_\_\_ UNSAT

**STANDARD:** The operator reads the Notes, and proceeds.

The operator recognizes that SA-1 is OOS and proceeds to the RNO.

**AS FOUND:** SA-1 Red Tagged CLOSED, SAC Function Switch is Red tagged OFF (Cue as needed)

**EXAMINER'S CUE:** NONE

**EXAMINER'S NOTE:** NONE

**COMMENTS:**

## PERFORMANCE INFORMATION

<p><b><u>STEP 2:</u></b> OPEN SA-1 AND PLACE the Station Air Compressor Function switch to ON. IF the Station Air Compressor is still NOT available for service, THEN GO TO Step 8.d. (Step 8.a RNO)</p> <p><b><u>STANDARD:</u></b> The operator recognizes that SA-1 cannot be opened nor can the SAC Function Switch be placed to ON, and proceeds to Step 8.d.</p> <p><b>AS FOUND:</b> SA-1 Red Tagged CLOSED, SAC Function Switch is Red tagged OFF (Cue as needed)</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 3:</u></b> CHECK IA-18, AIR DRYER "A" &amp; "B" BYPASS - OPEN (Step 8.d)</p> <p><b><u>STANDARD:</u></b> The operator observes IA-18, and (After Cue) proceeds to the Step 8.d RNO.</p> <p><b>AS FOUND:</b> IA-18 stem is fully inserted (Cue as needed)</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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 4:</u></b> OPEN IA-18, AIR DRYER "A" &amp; "B" BYPASS. (Step 8.d RNO)</p> <p><b><u>STANDARD:</u></b> The operator rotates the IA-18 handwheel in the counter-clockwise direction.</p> <p><b>AS FOUND:</b> IA-18 stem is fully inserted (Cue as needed)</p> <p><b>EXAMINER'S CUE:</b> After locating and describing how the valve would be opened, indicate that the stem is fully withdrawn.</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 5:</u></b> CHECK the following Compressors - RUNNING</p> <ul style="list-style-type: none"> <li>• INST AIR COMP A</li> <li>• INST AIR COMP B</li> </ul> <p>(Step 8.e)</p> <p><b><u>STANDARD:</u></b> The operator observes the IA Compressor A Control Switch.</p> <p>The operator observes the IA Compressor B Control Switch.</p> <p><b>AS FOUND:</b> Both IA Compressors are stopped, with their local control switches in AUTO (Cue as needed)</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>

## PERFORMANCE INFORMATION

<p><b><u>STEP 6:</u></b> START the following compressors:</p> <ul style="list-style-type: none"> <li>• INST AIR COMP A</li> <li>• INST AIR COMP B</li> </ul> <p>(Step 8.e RNO)</p> <p><b><u>STANDARD:</u></b> The operator places the IA Compressor A Control Switch in MANUAL.</p> <p>The operator places the IA Compressor B Control Switch in MANUAL.</p> <p><b>AS FOUND:</b> Both IA Compressors are stopped, with their local control switches in AUTO (Cue as needed)</p> <p><b>EXAMINER'S CUE:</b> After the IA Compressor Control Switches are placed in MANUAL indicate that the motor starts and the compressor is running</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> CHECK FCV-1740, AIR DRYER HIGH DP FLOW CONTROL valve - OPEN (Step 8.f)</p> <p><b><u>STANDARD:</u></b> The operator observes FCV-1740.</p> <p><b>AS FOUND:</b> CLOSED (Cue as needed)</p> <p><b>EXAMINER'S CUE:</b> After locating and describing how the valve would be verified opened indicate the position indicator is down indicating closed.</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

## PERFORMANCE INFORMATION

<p><b><u>STEP 8:</u></b> OPEN IA-3665, AIR DRYER "A" &amp; "B" BYPASS. (Step 8.f RNO)</p> <p><b><u>STANDARD:</u></b> The operator rotates the IA-3665 handwheel in the counter-clockwise direction.</p> <p><b>AS FOUND:</b> CLOSED (Cue as needed)</p> <p><b>EXAMINER'S CUE:</b> After locating and describing how the valve would be opened indicate the valve has been rotated fully counter-clockwise (stem fully withdrawn)</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 9:</u></b> OPEN IA-3821, INSTRUMENT AIR DRYER "D" BYPASS (Step 8.g)</p> <p><b><u>STANDARD:</u></b> The operator contacts the Outside AO and directs that IA-3821 be OPENED.</p> <p><b>AS FOUND:</b> NA</p> <p><b>EXAMINER'S CUE:</b> As the Outside AO, indicate that IA-3821 is OPEN.  If the operator starts to proceed to IA-3821 (In Turbine Building), rather than call the Outside AO to re-position this valve, indicate that another operator will perform this action and terminate the JPM.</p> <p><b>EXAMINER'S NOTE:</b> IA-3821 is located on the "D" IA dryer.</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**Terminating Cue:** Evaluation on this JPM is complete.

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

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2016 Systems – In-Plant JPM J

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

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

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



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**JPM CUE SHEET**

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**INITIAL CONDITIONS:**

- IA Header Pressure is 75 PSIG and lowering.
- AOP-017, Loss Of Instrument Air, has been entered.
- The Station Air Compressor is under clearance and disassembled
- The Station Air Receiver is depressurized and vented.

**INITIATING CUE:**

- The CRS has directed you to perform AOP-017 Step 8.
- The Outside AO is standing by to assist as needed.

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**

# In-Plant JPM K

Developed By: \_\_\_\_\_ Date: \_\_\_\_\_  
Instructor/Developer

Concurred By: \_\_\_\_\_ Date: \_\_\_\_\_  
Line Superintendent/Supervisor SRO

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_  
Superintendent/Supervisor Training

## Job Performance Measure Worksheet

Facility: HB Robinson Task No.:

Task Title: Loss of North SW Header in the Auxiliary Building JPM No.: 2016 Systems – In-Plant JPM K

K/A Reference: APE 062 AA2.01 (2.9/3.5)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance:  X  Actual Performance: \_\_\_\_\_  
 Classroom \_\_\_\_\_ Simulator \_\_\_\_\_ Plant  X

**READ TO THE EXAMINEE**

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

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handouts 1-2.**

Initial Conditions:

- The plant is at 100% power.
- The North SW header has ruptured inside the Auxiliary Building.
- The Control Room has implemented AOP-022 (Loss of Service Water) for a leak in the North header.

Initiating Cue: The CRS has directed you to isolate the leak IAW Attachment 6 of AOP-022.

Task Standard: The operator will isolate the intact SW header from the ruptured header, isolate the leak, and align cooling water to critical loads IAW Attachment 6 of AOP-022.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)  
 Flashlight  
 Magnifying Glass

General References: AOP-022 (Loss of Service Water), Rev 35

## Job Performance Measure Worksheet

OMM-022 (Emergency Operating Procedures User's Guide), Rev 45  
 Plant Drawing G-190199 (Service & Cooling Water Flow Diagram) Rev 72  
 Figure 9.2.1-1, Flow Diagram Service and Cooling Water, Rev 26

Handouts: Handout 1: Blank Copy of Attachment 6 of AOP-022.  
 Handout 2: Figure 9.2.1-1, Flow Diagram Service and Cooling Water, with the leak location marked.

Time Critical Task: NO

Validation Time: 14 minutes

<b><u>Critical Step Justification</u></b>	
Step 1	This step is critical because closing either SW-18 or SW-19 is necessary to isolate the ruptured header from intact header.
Step 2	This step is critical because closing SW-740 and SW-102 is necessary to isolate the ruptured header from intact header.
Step 4	This step is critical because placing Instrument Air Compressor "B" in OFF is necessary to prevent damage to the compressor.
Step 7	This step is critical because cross-connecting the Booster Pump Suction is necessary to isolate the leak and align cooling water to critical loads (SW-25 must be closed to prevent reinitiating the leak, SW-26 and SW-27 must be opened to supply cooling water to vital equipment, SW-503 must be closed to prevent reinitiating the leak and SW-200A must be opened to provide emergency make up to the IVSW Tank).
Step 9	This step is critical because Closing SW-53 and Opening SW-83 is necessary to align cooling water to critical loads (EDGs).

## PERFORMANCE INFORMATION

*(Critical Steps are identified as such in right-hand column)*

**Provide Operator with Initial Conditions/Cue (Last Page of this JPM), and Handouts 1-2.**

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

**CAUTION**

Electrically rated boots and gloves must be worn in the Auxiliary Building where flooding is in progress.

**NOTE**

Dielectric rubber boots and low voltage electrical gloves are available in the AOP/DSP/EOP Equipment storage Locker inside the Auxiliary Building.

**STEP 1:**

Close One Of The Following Valves In The Auxiliary Building Hallway :

- SW-18, North & South Supply HDR X-Conn (Chain Operated)
- OR
- SW-19, North & South Supply HDR X-Conn (Chain Operated)  
(Step 1)

**STANDARD:**

The operator pulls either the SW-18 or SW-19 chain operator to rotate valve handwheel in the clockwise direction, and observes the area for water.

**AS FOUND:**

Both Valves Are Open

**EXAMINER'S CUE:**

The operator reads the Caution and Note, and proceeds.

After locating and describing how either valve would be closed then indicate the selected valve has been rotated full clockwise and the pointer indicates "Closed".

IF asked if any water is observed on the ground in the AUX BLDG Hallway near the SW Booster Pumps, say YES.

**EXAMINER'S NOTE:**

The valve handwheels face opposite directions. Ensure operator turns the selected handwheel via the chain in the proper direction.

**COMMENTS:**

**CRITICAL  
STEP**

\_\_\_ SAT

\_\_\_ UNSAT

## PERFORMANCE INFORMATION

**NOTE**

SW-102 is located overhead East of CCW Pump B on top of horizontal header supported by adjustable pipe support.

**STEP 2:** Close The Following Valves In The CCW Pump Room:

- SW-740, CCW Heat Exchanger "B" Return
- SW-102, HVH-7B Supply  
(Step 2)

**CRITICAL  
STEP**

**STANDARD:** The operator reads the Note, and proceeds.

\_\_\_ SAT

The operator rotates the SW-740 and SW-102 handwheels in the clockwise direction.

\_\_\_ UNSAT

**AS FOUND:** Both Valves Open (SW-740 Pointer Indicates "POS 1" And SW-102 Stem Is Fully Withdrawn).

**EXAMINER'S CUE:**

After locating and describing how both valves would be closed, indicate the valves have been rotated full clockwise, the SW-740 pointer indicates "Closed" and the SW-102 stem is fully inserted.

**EXAMINER'S NOTE:**

SW-102 is located overhead east of CCW Pump "B" on top of horizontal header supported by adjustable pipe support.

SW-102 is located in the overhead will require a ladder to manipulate. A ladder is located on the south wall of the CCW Pump Room.

**COMMENTS:**

## PERFORMANCE INFORMATION

<p><b><u>STEP 3:</u></b> Notify Control Room Personnel That Steps 1 And 2 of Attachment 6 Are Complete (Step 3)</p> <p><b><u>STANDARD:</u></b> The operator contacts the Control Room and reports Steps 1 and 2 of Attachment 6 are complete.</p> <p><b>AS FOUND:</b> NONE</p> <p><b>EXAMINER'S CUE:</b> When contacted, as CRS then acknowledge the report from the operator</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 4:</u></b> Place Instrument Air Compressor B Control Switch In The OFF Position (Step 4)</p> <p><b><u>STANDARD:</u></b> The operator places the Instrument Air Compressor "B" Control Switch in OFF position</p> <p><b>AS FOUND:</b> IA Compressor B Control Switch is in AUTO</p> <p><b>EXAMINER'S CUE:</b> After locating and describing how the "B" IA compressor would be placed in "OFF" indicate the Control Switch has been rotated to the middle position "OFF".</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>

## PERFORMANCE INFORMATION

**CAUTION**

Subsequent actions to cross-connect cooling water to plant components should not be performed if the leak will be reinitiated.

**NOTE**

SW-53, North Supply HDR To "B" TRN Components In Aux Bldg, is located in Auxiliary Building hallway, midway between Instrument Air Dryers A and B, above third cable tray.

**STEP 5:** Check leak location - Downstream of SW-53.  
(Step 5)

**STANDARD:** The operator reads the caution and Note, and proceeds.

The operator uses the SW flow diagram marked with the leak location (Handout 2), and observes the area for water and determines leak is NOT Downstream of SW-53; and goes to step 5 RNO which directs the operator to Step 9

\_\_\_ SAT

\_\_\_ UNSAT

**AS FOUND:** NONE

**EXAMINER'S CUE:** IF asked if any water is observed on the ground in the AUX BLDG Hallway near the SW Booster Pumps, say YES.

**EXAMINER'S NOTE:** NONE

**COMMENTS:**



## PERFORMANCE INFORMATION

<p><b><u>STEP 6:</u></b> Check Leak Location – Upstream of SW-25, North HDR Supply To SW Booster Pump (Step 9)</p> <p><b><u>STANDARD:</u></b> The operator determines the leak is upstream of SW-25.</p> <p><b>AS FOUND:</b> NONE</p> <p><b>EXAMINER'S CUE:</b> IF asked if any water is observed on the ground in the AUX BLDG Hallway near the SW Booster Pumps, say YES.</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> <ul style="list-style-type: none"> <li>• SW Booster Pump B may be operated as required after the suction path is established from the South Service Water Header.</li> <li>• Closing SW-503, SW Pump Supply To IVSW Tank, also isolates SW to the Penetration Coolers.</li> </ul>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 7:</u></b></p>	<p>Cross-Connect SW Booster Pump Suction Supply As Follows:</p> <ul style="list-style-type: none"> <li>a. Close SW-25, North HDR Supply To SW Booster Pumps</li> <li>b. Open SW-26, SW Booster Pump Suction Cross-Connect</li> <li>c. Open SW-27, SW Booster Pump Suction Cross-Connect</li> <li>d. Close SW-503, SW Pump Supply To IVSW Tank</li> <li>e. Open SW-200A, SWBP "A" TO IVSW Tank Supply (Step 10)</li> </ul>	<p><b><u>CRITICAL STEP</u></b></p> <p>___ SAT</p>
<p><b><u>STANDARD:</u></b></p>	<p>The operator reads the Notes, and proceeds.</p> <p>The operator rotates the T-handle locking device counter-clockwise on SW-25, and rotates the handwheel clockwise.</p> <p>The operator rotates the T-handle locking device counter-clockwise on SW-26, and rotates the handwheel counter-clockwise.</p> <p>The operator rotates the T-handle locking device counter-clockwise on SW-27, and rotates the handwheel counter-clockwise.</p> <p>The operator rotates the SW-503 handwheel clockwise.</p> <p>The operator rotates the SW-200A handwheel counter-clockwise.</p>	<p>___ UNSAT</p>
<p><b>AS FOUND:</b></p>	<p>SW-25 &amp; SW-503, OPEN SW-26, SW-27 &amp; SW-200A, CLOSED</p>	
<p><b>EXAMINER'S CUE:</b></p>	<p>After locating and describing how each valve would be operated then indicate the selected valve has been rotated full counter-clockwise and the stem is fully withdrawn for the "OPEN" valves and rotated full clockwise with the stem fully inserted for the "CLOSED" valves</p> <p>SW-26 and 200A is located above the A SW Booster Pump.</p> <p>SW-503 is located above the vent duct above the B SW Booster Pump, and requires a ladder.</p>	
<p><b>EXAMINER'S NOTE:</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>NONE</p>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 8:</u></b> Notify Control Room Personnel That Step 10 Is Complete And SW Has Been Cross-Connected To Supply SW Booster Pump B (Step 11)</p> <p><b><u>STANDARD:</u></b> The operator contacts the Control Room and reports SW has been cross-connected to supply SW Booster Pump "B".</p> <p><b>AS FOUND:</b> NONE</p> <p><b>EXAMINER'S CUE:</b> When contacted, as CRS acknowledge the report from the operator</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> <ul style="list-style-type: none"> <li>• SW-83, Diesel Supply Cross-Connect, is located at the North end of Emergency Diesel Generator A.</li> <li>• Cross-connecting Service Water to the Emergency Diesel Generators will also cross-connect Service Water to HVH-6B, HVH-8B, and Instrument Air Compressor B.</li> <li>• A ladder is required for access to SW-53, North Supply HDR To "B" TRN Components In Aux BLDG.</li> </ul>	

## PERFORMANCE INFORMATION

<p><b><u>STEP 9:</u></b> Cross-Connect Service Water Supply To EDGs AS Follows:</p> <p>a. Close SW-53</p> <p>b. Open SW-83 (Step 12)</p> <p><b><u>STANDARD:</u></b> The operator reads the Notes, and proceeds.</p> <p>The operator rotates the SW-53 handwheel in the clockwise direction.</p> <p>The operator rotates the SW-83 handwheel in the counter-clockwise direction.</p> <p><b>AS FOUND:</b> SW-53 is OPEN, SW-83 is CLOSED</p> <p><b>EXAMINER'S CUE:</b> After locating and describing how each valve would be operated indicate that the SW-53 handwheel has been rotated full clockwise and the stem is fully inserted, and that the SW-83 handwheel has been rotated full counter-clockwise with the stem fully withdrawn.</p> <p><b>EXAMINER'S NOTE:</b> SW-53 is located in the overhead will require a ladder to manipulate. A ladder is located on the south wall of the CCW Pump Room.</p> <p>There is a label identifying the location of SW-53 on the vent duct above the walkway between the IA Dryers A and B.</p> <p>SW-83 is located in the A EDG Vault Room. This room requires Control Room/WCCS permission to enter the room. The examiner will either need to get permission to enter, or open the door and observe the valve without entering the room (The valve can be seen from the open doorway).</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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## PERFORMANCE INFORMATION

<p><b><u>STEP 10:</u></b> Notify Control Room Personnel That SW Has Been Cross-Connected To Supply The Following Equipment:</p> <ul style="list-style-type: none"> <li>• EDG B</li> <li>• Instrument Air Compressor B</li> <li>• HVH-6B</li> <li>• HVH-8B (Step 13)</li> </ul> <p><b><u>STANDARD:</u></b> The operator contacts the Control Room and reports that SW has been cross-connected to supply the above equipment</p> <p><b>AS FOUND:</b> NONE</p> <p><b>EXAMINER'S CUE:</b> When contacted, as CRS acknowledge the report from the operator</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> Notify Control Room Personnel That Attachment 6 Is Complete (Step 14)</p> <p><b><u>STANDARD:</u></b> The operator contacts the control room and reports that Attachment 6 is complete</p> <p><b>AS FOUND:</b> NONE</p> <p><b>EXAMINER'S CUE:</b> When contacted, as CRS acknowledge that Attachment 6 is complete</p> <p><b>EXAMINER'S NOTE:</b> NONE</p> <p><b><u>COMMENTS:</u></b></p>	<p>___ SAT</p> <p>___ UNSAT</p>

**Terminating Cue:** Evaluation on this JPM is complete.

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



## JPM CUE SHEET

## INITIAL CONDITIONS:

- The plant is at 100% power.
- The North SW header has ruptured inside the Auxiliary Building.
- The Control Room has implemented AOP-022 (Loss of Service Water) for a leak in the North header.

## INITIATING CUE:

The CRS has directed you to isolate the leak IAW Attachment 6 of AOP-022.

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**