

<u>TRAINING MATERIAL TITLE:</u>	<u>Plot and Evaluate 1/M Data</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2AD-016</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2AD-016</u>
<u>REVISION NUMBER:</u>	<u>3</u>

TECHNICAL REFERENCES:

2OM-50.4.D2, Reactor Startup From Mode 3 to Mode 2, Rev 3  
2OM-50.4.F, Performing An Estimated Critical Position Calculation, Rev 9

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 20 Minutes

<b><u>PREPARED BY:</u></b>	M. Klingensmith	Date
<b><u>PEER REVIEW BY:</u></b>		Date
<b><u>APPROVED FOR USE:</u></b>	Training Supervisor or Designee	Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2AD-016

New Revision: 3

Description of Change(s):

1. Updated for procedure revision. Changed duration to 20 minutes
2. Updated for current JPM format.

Reason for Change (s):

1. Minor wording changes to match procedures, revised step 4 to also reference the procedure P&L Attachment.
2. Changed format to the new JPM procedure (BVPS-TR-0026).

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-016 JPM REVISION: 3	JPM TITLE: Plot and Evaluate 1/M Data
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K/A REFERENCE: 2.1.43 4.1 TASK ID: 0011-003-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform	<input type="checkbox"/> Plant Site	<input type="checkbox"/> Annual Requal Exam	<input type="checkbox"/> BVT
<input type="checkbox"/> Simulate	<input type="checkbox"/> Simulator	<input type="checkbox"/> Initial Exam	<input type="checkbox"/> NRC
	<input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Training	<input type="checkbox"/> Other:
		<input type="checkbox"/> Other:	

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes	Allotted Time: 20 Minutes	Actual Time:	minutes
Critical: <input checked="" type="checkbox"/> No			
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation)			
Comments: _____			
_____			
_____			
_____			

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR	
Evaluator (Print): _____	Date: _____
Evaluator Signature: _____	

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	Determines that 1/M data predicts >500 pcm below ECP value for critical rod height. Notify SM/US that appropriate actions of 2OM-50.4.D2 must be taken. (No further rod withdrawal)
<b>RECOMMENDED STARTING LOCATION:</b>	Classroom
<b>INITIAL CONDITIONS:</b>	The unit is in Mode 2. A reactor startup is in progress. Control Bank C is at 94 steps. Control Bank D is at 0 steps. RCS Boron concentration is 561 ppm.
<b>INITIATING CUE:</b>	Your Supervisor directs you to complete the 1/M plot per 2OM-50.4.F, using the SR count rate data provided on Data Sheet 3. Compare the 1/M data with the predicted ECP data and make a recommendation for further rod withdrawal. Document your recommendation in the box below. (Located on candidate direction sheet )
<b>REFERENCES:</b>	2OM-50.4.F, "Performing An Estimated Critical Position Calculation", Rev. 9 2OM-50.4.D2, "Reactor Startup From Mode 3 to Mode 2", Rev. 3
<b>TOOLS:</b>	Calculator; Ruler/straight edge.
<b>HANDOUT:</b>	2OM-50.4.F, "Performing An Estimated Critical Position Calculation", Rev. 9 with Data sheet 1 completed and Data Sheet 3 partially completed. 2OM-50.4.D2, "Reactor Startup From Mode 3 to Mode 2", Rev. 3

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-016 JPM REVISION: 3	JPM TITLE: Plot and Evaluate 1/M Data
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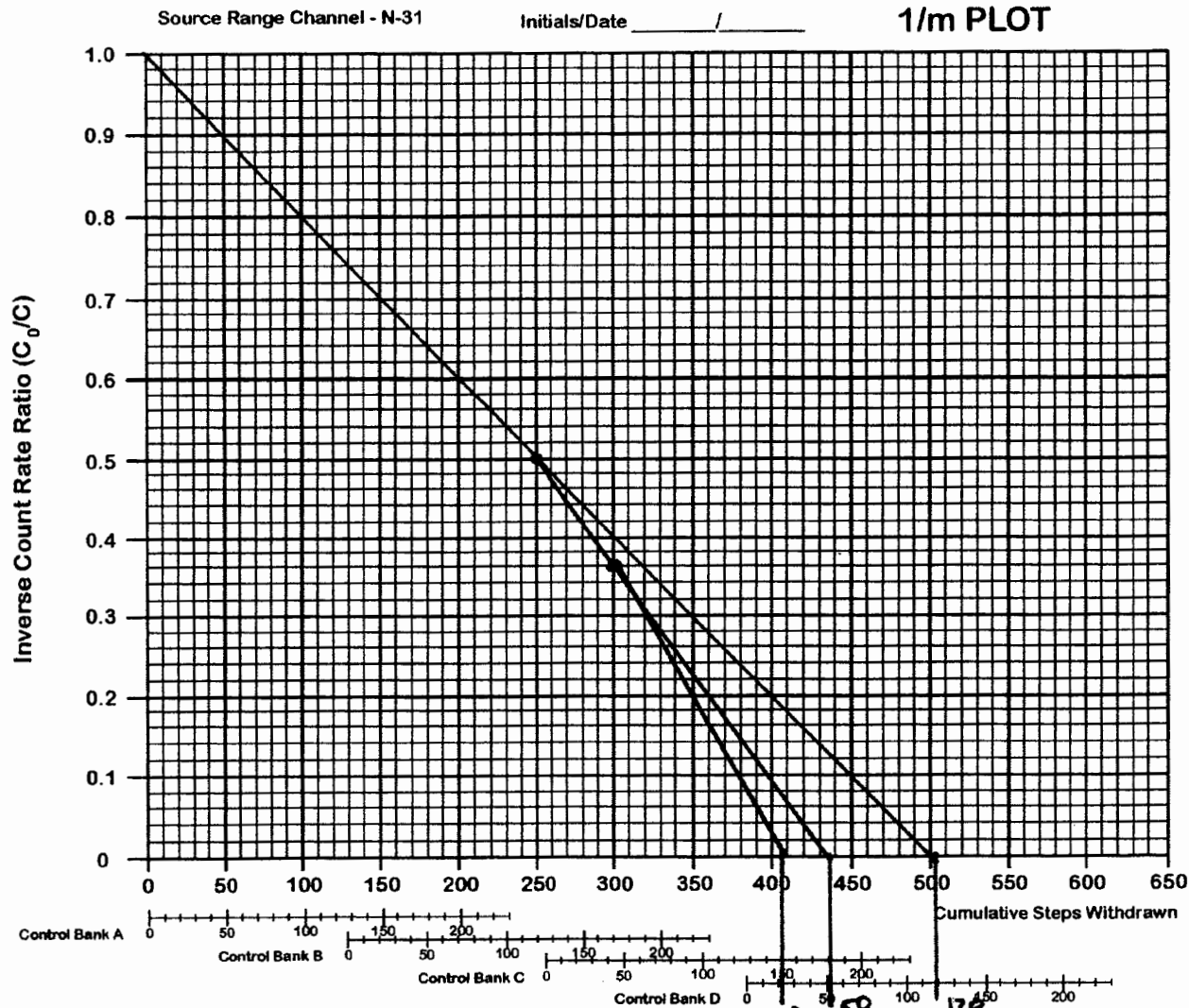
STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
1. Refer to Data sheet 3.	1.1 Refers to data sheet 3 for count rate data.  COMMENTS:	
2.C Plots Data Sheet 3 Data on Figure 1.	2.1. Evaluates count rate data from Data Sheet 3 and plots this data on Figure 1 (1/M Plot) for 250 total steps. (~120 Steps CB "D")  2.2. Evaluates count rate data from Data Sheet 3 and plots this data on Figure 1 (1/M Plot) for 300 total steps. (~50 Steps CB "D")  2.3.C Evaluates count rate data from Data Sheet 3 and plots this data on Figure 1 (1/M Plot) for 350 total steps. (~22 Steps CB "D")  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR NOTE:</b> See Attached Answer Key for 1/M plot values. It is not necessary to plot both SR curves since the data is identical. </div> COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-016 JPM REVISION: 3	JPM TITLE: Plot and Evaluate 1/M Data
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Evaluate 1/M plot data	<p>3.1.C Determines that the 1/M plot predicts criticality &gt;500 pcm below ECP.</p> <p>3.2 Maximum rod height is Bank D at 43 steps versus ECP of Bank D 100 steps.</p> <p>COMMENTS:</p>	
4.C Determines action for continued startup IAW 2OM-50.4.D2 Attachment 1 Precaution and Limitation #9 or Attachment 3 Action 4.	<p>4.1.C Informs SM/US that 1/M data indicates that criticality will occur &gt;500 pcm below the ECP. Recommend <b>NO FURTHER ROD WITHDRAWALS.</b></p> <p>4.2 Action is to immediately insert ALL control banks to ZERO steps per 2OM-50.4.D2, Att. 3, Action 4.</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 10px; margin-top: 20px;"> <p><b>TERMINATING CUE:</b> When the candidate makes a recommendation on continued startup, the evaluation for this JPM is complete.</p> </div>	
	STOP TIME: _____	

# ANSWER KEY 2AD-016



1. The last two data points shall be used to determine Line Slope to the horizontal axis.
2. When determining Control Rod Position, a straight vertical line should be drawn from the horizontal axis to the control bank steps.

BVPS - IFR  
Station Startup  
Operating Procedures  
Performing An Estimated Critical  
Position Calculation

Unit 2

ZOM-50.4.F  
Revision 9  
Page 25 of 30

FIGURE 1: 1/M PLOT

FIGURE 1: 1/M PLOT

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

### **INITIAL CONDITIONS:**

The unit is in Mode 2.  
A reactor startup is in progress.  
Control Bank C is at 94 steps.  
Control Bank D is at 0 steps.  
RCS Boron concentration is 561 ppm.

### **INITIATING CUE:**

Your Supervisor directs you to complete the 1/M plot per 2OM-50.4.F, using the SR count rate data provided on Data Sheet 3. Compare the 1/M data with the predicted ECP data and make a recommendation for further rod withdrawal. Document your recommendation in the box below.

### **RECOMMENDED ACTIONS:**

- ☐ At this time, ask the evaluator any questions you have on this JPM.
- ☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".
- ☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.
- ☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.



REVISION NUMBER: 0

APPROVED FOR USE: T. A. Gaydosik \_\_\_\_\_  
 \_\_\_\_\_  
 Training Supervisor or Designee Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 3AD-023
New Revision: 0
Description of Change(s):  1. New JPM
Reason for Change (s):  1. Exam Bank Development

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 3AD-023 JPM REVISION: 0	JPM TITLE: Determine if License Status is Maintained Active (RO)
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K/A REFERENCE: 2.1.4 3.3 TASK ID: 0481-024-03-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 20 Minutes	Actual Time: minutes	
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation)			
Comments: _____ _____ _____ _____			

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR	
Evaluator (Print): _____	Date: _____
Evaluator Signature: _____	

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

TASK STANDARD:	Determines active license status is not maintained, and evaluates whether each shift meets the requirements.
RECOMMENDED STARTING LOCATION: INITIAL CONDITIONS:	<p>Classroom</p> <p>Today is 12/7/15. You are a Reactor Operator. You are scheduled to stand a Reactor Operator ATC watch tomorrow <i>and need to determine whether or not your license is active or inactive based upon the previous quarter work history</i>. Your work history is as follows:</p> <p><i>7/12/15 Worked 8 hours as BOP in Mode 1 (day shift).</i></p> <p><i>7/13/15 Worked 4 hours as BOP in Mode 1 (day shift).</i></p> <p><i>7/14/15 Worked 6 hours in Mode 1 as ATC and 2 hours ATC doing Crew JIT training on Simulator (day shift).</i></p> <p><i>8/19/15 Worked 12 hours in Mode 5 as BOP (night shift).</i></p> <p><i>8/25/15 Worked 8 hours in Mode 1 as ATC (night shift).</i></p> <p><i>9/21/15 Worked 12 hours in Mode 3 as BOP (night shift).</i></p> <p><i>9/22/15 Worked 8 hours in Mode 4 as BOP (night shift).</i></p> <p><i>9/23/15 Worked 8 hours in Mode 1 as WEC Clearance RO (night shift).</i></p> <p><i>10/27/15 Worked 8 hours in Mode 1 as the 3rd RO in the Control Room (day shift).</i></p>
INITIATING CUE:	<p>Determine if your license status is active or inactive based on the previous quarters work history and document as ACTIVE or INACTIVE on this form. <i>Document the reasons for your determination.</i></p> <p><b>(Provide copies of the references)</b></p>
REFERENCES:	<p>½-ADM-1351 Rev 12, Licensed Operator Continuing Training Program NOP-OP-1002, Conduct Of Operations</p>
TOOLS:	<p>Calculator</p>
HANDOUT:	<p>½-ADM-1351 Rev 12, Licensed Operator Continuing Training Program NOP-OP-1002, Conduct Of Operations</p>

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 3AD-023 JPM REVISION: 0	JPM TITLE: Determine if License Status is Maintained Active (RO)
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<b>EVALUATOR NOTE:</b> Provide copies of the references.	
1. Reviews NOP-OP-1002 and 1/2ADM-1351 Section 7.6.1 for Maintaining an Active License.	1.1 Reviews NOP-OP-1002 and 1/2-ADM-1351 Section 7.6.1 and reviews the Shift requirements for Active license maintenance.  COMMENTS:	
2. Evaluates 7/12/15 work period of 8 hours.	2.1 Determines requirement for working the 8 hour shift is credited towards active license.  COMMENTS:	
3.C Evaluates 7/13/15 work period of 4 hours.	3.1.C Determines requirement for working the 4 hour shift is NOT credited towards active license.  COMMENTS:	
4.C Evaluates 7/14/15 work period of 8 hours.	4.1.C Determines requirement for working the 8 hour shift is NOT credited towards active license, since the 2 hours of JIT Training is not a licensed position function.  COMMENTS:	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 3AD-023 JPM REVISION: 0	JPM TITLE: Determine if License Status is Maintained Active (RO)
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
5. Evaluates 8/19/15 work period of 12 hours.	5.1 <i>Determines requirement for working the 12 hour shift is credited towards active license. This counts as one shift.</i>  COMMENTS:	
6. Evaluates 8/25/15 work period of 8 hours.	6.1 Determines requirement for working the 8 hour shift is credited towards active license.  COMMENTS:	
7. Evaluates 9/21/15 work period of 12 hours.	7.1 <i>Determines requirement for working the 12 hour shift is credited towards active license. This counts as one 8 hour shift.</i>  COMMENTS:	
8. Evaluates 9/22/15 work period of 8 hours.	8.1 Determines requirement for working the 8 hour shift is credited towards active license.  COMMENTS:	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 3AD-023 JPM REVISION: 0	JPM TITLE: Determine if License Status is Maintained Active (RO)
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
9.C Evaluates 9/23/15 work period of 8 hours.	9.1C Determines requirement for working the 8 hour shift is NOT credited towards active license, since this was performed in the Work Execution Center (WEC).  COMMENTS:	
10.C Evaluates 10/27/15 work period of 8 hours.	10.1C Determines requirement for working the 8 hour shift is NOT credited towards active license. This shift was not worked in the previous quarter.  COMMENTS:	
110.C Evaluates work history and determines if the license is NOT Active.	110.1C Determines that the License is NOT active due to not working seven shifts in the previous quarter  COMMENTS:	
	<div> <b>EVALUATOR CUE:</b> When the applicant makes a recommendation regarding Active or Inactive License, state that "The evaluation for this JPM is complete". </div>	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***



Read:

### **INITIAL CONDITIONS:**

Today is 12/7/15. You are a Reactor Operator. You are scheduled to stand a Reactor Operator ATC watch tomorrow *and need to determine whether or not your license is active or inactive based upon the previous quarter work history*. Your work history is as follows:

*7/12/15 Worked 8 hours as BOP in Mode 1 (day shift).*

*7/13/15 Worked 4 hours as BOP in Mode 1 (day shift).*

*7/14/15 Worked 6 hours in Mode 1 as ATC and 2 hours ATC doing Crew JIT training on Simulator (day shift).*

*8/19/15 Worked 12 hours in Mode 5 as BOP (night shift).*

*8/25/15 Worked 8 hours in Mode 1 as ATC (night shift).*

*9/21/15 Worked 12 hours in Mode 3 as BOP (night shift).*

*9/22/15 Worked 8 hours in Mode 4 as BOP (night shift).*

*9/23/15 Worked 8 hours in Mode 1 as WEC Clearance RO (night shift).*

*10/27/15 Worked 8 hours in Mode 1 as the 3rd RO in the Control Room (day shift).*

### **INITIATING CUE:**

Determine if your license status is active or inactive based on the previous quarters work history and document as ACTIVE or INACTIVE on this form. *Document the reasons for your determination.*

**Results:**



- ☐ At this time, ask the evaluator any questions you have on this JPM.
- ☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".
- ☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.
- ☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	<u>Determine Isolation Boundary Points and Mark on Plant VOND</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2AD-048</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2AD-048</u>
<u>REVISION NUMBER:</u>	<u>0</u>

TECHNICAL REFERENCES:

2OM-24. Main Feedwater Operating Manual

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2AD-048
New Revision: 0
Description of Change(s):  1. Developed new JPM for exam bank. 2. Updated for current JPM format.
Reason for Change (s):  1. Exam bank development 2. Formatted to the new JPM procedure (BVPS-TR-0026).

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-048 JPM REVISION: 0	JPM TITLE: Determine Isolation Boundary Points and Mark on Plant VOND
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K/A REFERENCE: 2.2.41 3.5 TASK ID: 0481-007-03-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:

Performer SSN:

Time ☐ Yes  
Critical: ☒ No

Allotted Time: 15 Minutes

Actual Time: minutes

JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

## OBSERVERS

Name/SSN:

Name/SSN:

Name/SSN:

Name/SSN:

## EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	Identifies boundary isolations for leaking Main Feedwater System Check Valve 2FWS-2, marks up the VOND and reports valve lineup to the supervisor.
<b>RECOMMENDED STARTING LOCATION:</b>	Classroom
<b>INITIAL CONDITIONS:</b>	The plant is currently at 75% power. The Turbine Building Tour Operator reports that there is water spraying from a valve body leak on 2FWS-2, the Discharge Check valve on [2FWS-P21B] The "B" Main Feedwater Pump. The pump is in service. The operator recommends that the leakage be isolated.
<b>INITIATING CUE:</b>	You are to identify the isolation points to stop the leak, mark them on the VOND, and inform your supervisor of the results.
<b>REFERENCES:</b>	2OM-24 Steam Generator Feedwater Operating Manual
<b>TOOLS:</b>	None
<b>HANDOUT:</b>	VOND Figure 24-1 Main Feedwater System 2OM-24 Steam Generator Feedwater Operating Manual

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-048	JPM TITLE: Determine Isolation Boundary Points and Mark on Plant
JPM REVISION: 0	VOND

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
1. Reviews 2FWS valve list or VOND 24-1 to locate the leaking valve, 2FWS-2 grid location F-7.	1.1 Locates 2FWS-2 on VOND as the discharge check valve for 2FWS-P21B.  COMMENTS:  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> The sequence of identifying the isolation points is not critical for this JPM, steps may be done in any order.         </div>	
2.C Determines that valve 2CNM-23, on the pump suction piping must be closed.	2.1.C Identifies that valve 2CNM-23 must be closed, 2.2 Marks the valve on the VOND with an "X".  COMMENTS:	
3. Determines that valve 2CNM-436, on the pump suction piping must be closed.	3.1 Identifies that valve 2CNM-436 must remain closed. 3.2 Marks the valve on the VOND with an "X".  COMMENTS:  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> The valve is normally closed.         </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-048	JPM TITLE: Determine Isolation Boundary Points and Mark on Plant
JPM REVISION: 0	VOND

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
4. Determines that valve 2FWR-4, on the pump recirculation piping must be closed.	<p>4.1 Identifies that valve 2FWR-4 must be closed.</p> <p>4.2 Marks the valve on the VOND with an "X".</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR NOTE:</b> Reverse flow to the leaking valve (2FWS-2) is prevented by a check valve (2FWR-6).</p> </div>	
5.C Determines that valve 2FWS-MOV150B, on the pump discharge piping must be closed.	<p>5.1.C Identifies that valve 2FWS-MOV150B must be closed.</p> <p>5.2 Marks the valve on the VOND with an "X".</p> <p>COMMENTS:</p>	
6.C Determines that valve 2FWS-21 on the pump discharge piping must be closed.	<p>6.1.C Identifies that valve 2FWS-21 must be closed.</p> <p>6.2 Marks the valve on the VOND with an "X".</p> <p>COMMENTS:</p>	

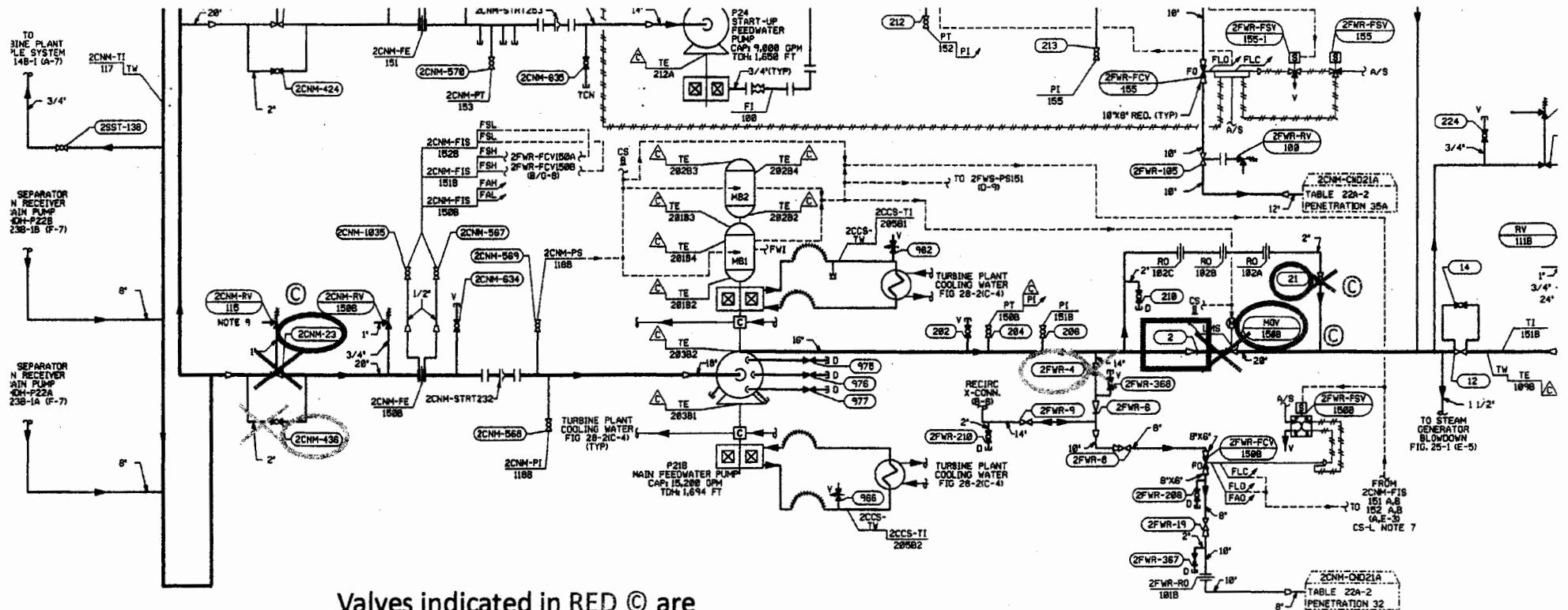
## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-048 JPM REVISION: 0	JPM TITLE: Determine Isolation Boundary Points and Mark on Plant VOND
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
7. Reports to the supervisor the identified isolation points.	7.1 Reports to the supervisor the identified isolation points to stop leakage from the pump discharge check valve 2FWS-2.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> Once the report is made to the Supervisor, state "This JPM is complete" </div>	
	STOP TIME: _____	



**ANSWER KEY RO A.2 and SRO A.2**



**Valves indicated in RED © are Critical**

Valves indicated in BLUE are Not Critical due to Check Valve Isolation or NSA closed.

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

**INITIAL CONDITIONS:** The plant is currently at 75% power. The Turbine Building Tour Operator reports that there is water spraying from a valve body leak on 2FWS-2, the Discharge Check valve on [2FWS-P21B] The "B" Main Feedwater Pump. The pump is in service. The operator recommends that the leakage be isolated.

**INITIATING CUE:** You are to identify the isolation points to stop the leak, mark them on the VOND, and inform your supervisor of the results.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

REVISION NUMBER: 3

APPROVED FOR USE: \_\_\_\_\_  
 Training Supervisor or Designee Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2AD-010
New Revision: 3
<p>Description of Change(s):</p> <ol style="list-style-type: none"><li>1. Minor changes due to procedure revisions.</li><li>2. JPM formatting.</li></ol>
<p>Reason for Change (s):</p> <ol style="list-style-type: none"><li>1. ½-ENV-05.05.F01 was updated to revision 1.</li><li>2. Changed format to the new JPM procedure (BVPS-TR-0026)</li></ol>

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-010 JPM REVISION: 3	JPM TITLE: Determine GW Storage Tank Discharge Bleed Flow rate
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K/A REFERENCE: 2.3.11      3.8/4.3      TASK ID: 0191-006-01-011  
0191-010-01-013

JPM APPLICATION: ☒ REQUALIFICATION      ☒ INITIAL EXAM      ☐ TRAINING

☐ SRO ONLY      ☐ ALTERNATE PATH JPM      ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS
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Performer Name:	Performer SSN:
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Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 10 Minutes	Actual Time: minutes
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JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

OBSERVERS
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Name/SSN:	Name/SSN:
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Name/SSN:	Name/SSN:
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EVALUATOR
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Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

TASK STANDARD:	GW Storage Tank Discharge Bleed Flow rate is calculated to be <b>GREATER than 2 SCFM</b> and the candidate determines that the discharge <b>MUST BE TERMINATED</b> .
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	<p>You are to calculate the GW Storage Tank Discharge Bleed Flow rate.</p> <ul style="list-style-type: none"><li>• The plant is in Mode 5, making preparations to enter Mode 6.</li><li>• Unit 2 Gaseous waste Decay Tanks 2GWS-TK-25A, 25B, 25C, 25D, 25E, 25F, and 25G are being discharged to the Unit 1 Atmospheric Vent, IAW 1/2-OM-19.4A.B, Unit 2 GW Storage Tk Disch To Unit 1 Atmos Vent.</li><li>• The initial pressure in <b>ALL</b> of the tanks was 64 psig.</li><li>• The discharge has been ongoing for 2 hours.</li><li>• The current pressure of <b>ALL</b> tanks is 59.8 psig.</li><li>• The Shift chemist has completed proper tritium sampling.</li></ul>
INITIATING CUE:	<p>Determine the GW Storage Tank Discharge Bleed Flow rate IAW 1/2-OM-19.4A.B, Unit 2 GW Storage Tk Disch To Unit 1 Atmos Vent. Step IV.M.20 <b>AND</b> make a recommendation for continuing the discharge in the box below. (Provided in the candidate direction sheet)</p>
REFERENCES:	<p>1/2-OM-19.4A.B, Unit 2 GW Storage Tk Disch To Unit 1 Atmos Vent. Rev. 15</p> <p>1/2-ENV-05.05.F01, Rev. 1, RWDA-G.</p>
TOOLS:	None
HANDOUT:	<p>1/2-OM-19.4A.B, Unit 2 GW Storage Tk Disch To Unit 1 Atmos Vent. Rev. 15 filled out up to step IV.M.20.</p> <p>Form 1/2-ENV-05.05.F01, Rev. 1, RWDA-G filled out with a <b>MAXIMUM</b> undiluted discharge rate of 2 SCFM.</p>

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-010 JPM REVISION: 3	JPM TITLE: Determine GW Storage Tank Discharge Bleed Flow rate
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
1. Reviews procedure step.	1.1 Reviews 1/2-OM-19.4A.B, Unit 2 GW Storage Tk Disch To Unit 1 Atmos Vent. Step IV.M.20  COMMENTS:	
2.C Two hours after the discharge has been initiated, perform the following steps:  Confirm the bleed flow rate using the following equation:  Bleed flow rate (SCFM) = $\frac{(132\text{FT}^3)(P_i - P_f)(\# \text{ of Tanks being discharged})}{(14.7 \text{ psi})(T_f - T_i) \text{ min.}}$	2.1. C Inserts the numbers from the initial conditions and determines bleed flow:  Bleed flow rate (SCFM) = $\frac{(132)(64-59.8)(7)}{(14.7)(120)}$  Bleed flow rate (SCFM) = <b>2.2 SCFM</b>  COMMENTS:	
	<div style="border: 1px solid black; padding: 10px;"> <b>EVALUATOR NOTE:</b>             Pi = Initial Gaseous Waste Storage Tank pressure in PSIG from [2GWS-PR125] <b>OR</b> PCS computer trend on GP 352.             Pf = Current Gaseous Waste Storage Tank pressure in PSIG from [2GWS-PR125] <b>OR</b> PCS computer trend on GP 352.             Ti = Time the discharge started             Tf = Current time             (Tf-Ti) shall have units of minutes         </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-010		JPM TITLE: Determine GW Storage Tank Discharge Bleed Flow rate	
JPM REVISION: 3			

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C If the bleed flow rate exceeds 2 SCFM, THEN Stop the discharge by performing Steps IV.M.21 and IV.M.22 AND Notify Radiation Protection of the problem. (Otherwise N/A)	3.1. C Determines that the discharge <b>MUST be Terminated.</b>  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR NOTE:</b> When the applicant makes the decision to terminate the discharge, the evaluation for this JPM is complete.         </div>  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR CUE:</b> State "This JPM is complete".         </div>	
	STOP TIME: _____	



## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

### **INITIAL CONDITIONS:**

You are to calculate the GW Storage Tank Discharge Bleed Flow rate.

- The plant is in Mode 5, making preparations to enter Mode 6.
- Unit 2 Gaseous waste Decay Tanks 2GWS-TK-25A, 25B, 25C, 25D, 25E, 25F, and 25G are being discharged to the Unit 1 Atmospheric Vent, IAW 1/2-OM-19.4A.B, Unit 2 GW Storage Tk Disch To Unit 1 Atmos Vent.
- The initial pressure in **ALL** of the tanks was 64 psig.
- The discharge has been ongoing for 2 hours.
- The current pressure of **ALL** tanks is 59.8 psig.
- The Shift chemist has completed proper tritium sampling.

### **INITIATING CUE:**

Determine the GW Storage Tank Discharge Bleed Flow rate IAW 1/2-OM-19.4A.B, Unit 2 GW Storage Tk Disch To Unit 1 Atmos Vent. Step IV.M.20 **AND** make a recommendation for continuing the discharge in the box below. (Provided in the candidate direction sheet)

**GW Storage Tank Discharge Bleed Flow rate is\_\_\_\_\_.**

**Recommendation:**

- ☐ At this time, ask the evaluator any questions you have on this JPM.
- ☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".
- ☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.
- ☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only) \_\_\_\_\_

TRAINING MATERIAL NUMBER: 2AD-019 \_\_\_\_\_

PROGRAM TITLE: Licensed Operator Training \_\_\_\_\_

COMPUTER CODE: 2AD-019 \_\_\_\_\_

REVISION NUMBER: 1 \_\_\_\_\_

TECHNICAL REFERENCES:

2OM-50.4.D2, Reactor Startup From Mode 3 to Mode 2, Rev 3  
2OM-50.4.F, Performing An Estimated Critical Position Calculation, Rev 9

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 20 Minutes

PREPARED BY: M. Klingensmith \_\_\_\_\_ Date \_\_\_\_\_

PEER REVIEW BY: \_\_\_\_\_ Date \_\_\_\_\_

APPROVED FOR USE: \_\_\_\_\_ Date \_\_\_\_\_  
Training Supervisor or Designee

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2AD-019
New Revision: 1
Description of Change(s):  1. Updated for procedure revision. 2. Updated for current JPM format.
Reason for Change (s):  1. Updated to reflect the same initial conditions as RO level JPM 2AD-016. Minor wording changes to match procedures Revised step 4 to also reference the procedure P&L Attachment. 2. Changed format to the new JPM procedure (BVPS-TR-0026).

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-019 JPM REVISION: 1	JPM TITLE: Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only)
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K/A REFERENCE: 2.1.43 4.3 TASK ID: 1340-007-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:

Performer SSN:

Time ☐ Yes  
Critical: ☒ No

Allotted Time: 20 Minutes

Actual Time: minutes

JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

## OBSERVERS

Name/SSN:

Name/SSN:

Name/SSN:

Name/SSN:

## EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	Determine that 1/M data predicts >500 pcm below ECP value for critical rod height. Determines No further rod withdrawal will be allowed, and the following actions must be taken: <ul style="list-style-type: none"><li>• Insert all control rods to 0 Steps.</li><li>• Verify RCS Boron Concentration.</li><li>• Verify SDM</li><li>• DO NOT recommence S/U without Operations Manager approval.</li></ul>
<b>RECOMMENDED STARTING LOCATION:</b>	Classroom
<b>INITIAL CONDITIONS:</b>	The unit is in Mode 2. A reactor startup is in progress. Control Bank C is at 94 steps. Control Bank D is at 0 steps. RCS Boron concentration is 561 ppm.
<b>INITIATING CUE:</b>	Your Supervisor directs you to complete the 1/M plot per 2OM-50.4.F, using the SR count rate data provided on Data Sheet 3. Compare the 1/M data with the predicted ECP data and make a recommendation for further rod withdrawal. Document your recommendation in the box below. (Located on candidate direction sheet )
<b>REFERENCES:</b>	2OM-50.4.F, "Performing An Estimated Critical Position Calculation", Rev. 9 2OM-50.4.D2, "Reactor Startup From Mode 3 to Mode 2", Rev. 3
<b>TOOLS:</b>	Calculator; Ruler/straight edge.
<b>HANDOUT:</b>	2OM-50.4.F, "Performing An Estimated Critical Position Calculation", Rev. 9 with Data sheet 1 completed and Data Sheet 3 partially completed. 2OM-50.4.D2, "Reactor Startup From Mode 3 to Mode 2", Rev. 3

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-019 JPM REVISION: 1	JPM TITLE: Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only)	
STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
1. Refer to Data sheet 3.	1.1 Refers to data sheet 3 for count rate data.  COMMENTS:	
2.C Plots Data Sheet 3 Data on Figure 1.	2.1. Evaluates count rate data from Data Sheet 3 and plots this data on Figure 1 (1/M Plot) for 250 total steps. (~120 Steps CB "D")  2.2. Evaluates count rate data from Data Sheet 3 and plots this data on Figure 1 (1/M Plot) for 300 total steps. (~50 Steps CB "D")  2.3.C Evaluates count rate data from Data Sheet 3 and plots this data on Figure 1 (1/M Plot) for 350 total steps. (~22 Steps CB "D")  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR NOTE:</b> See Attached Answer Key for 1/M plot values. It is not necessary to plot both SR curves since the data is identical. </div> COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-019 JPM REVISION: 1	JPM TITLE: Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only)
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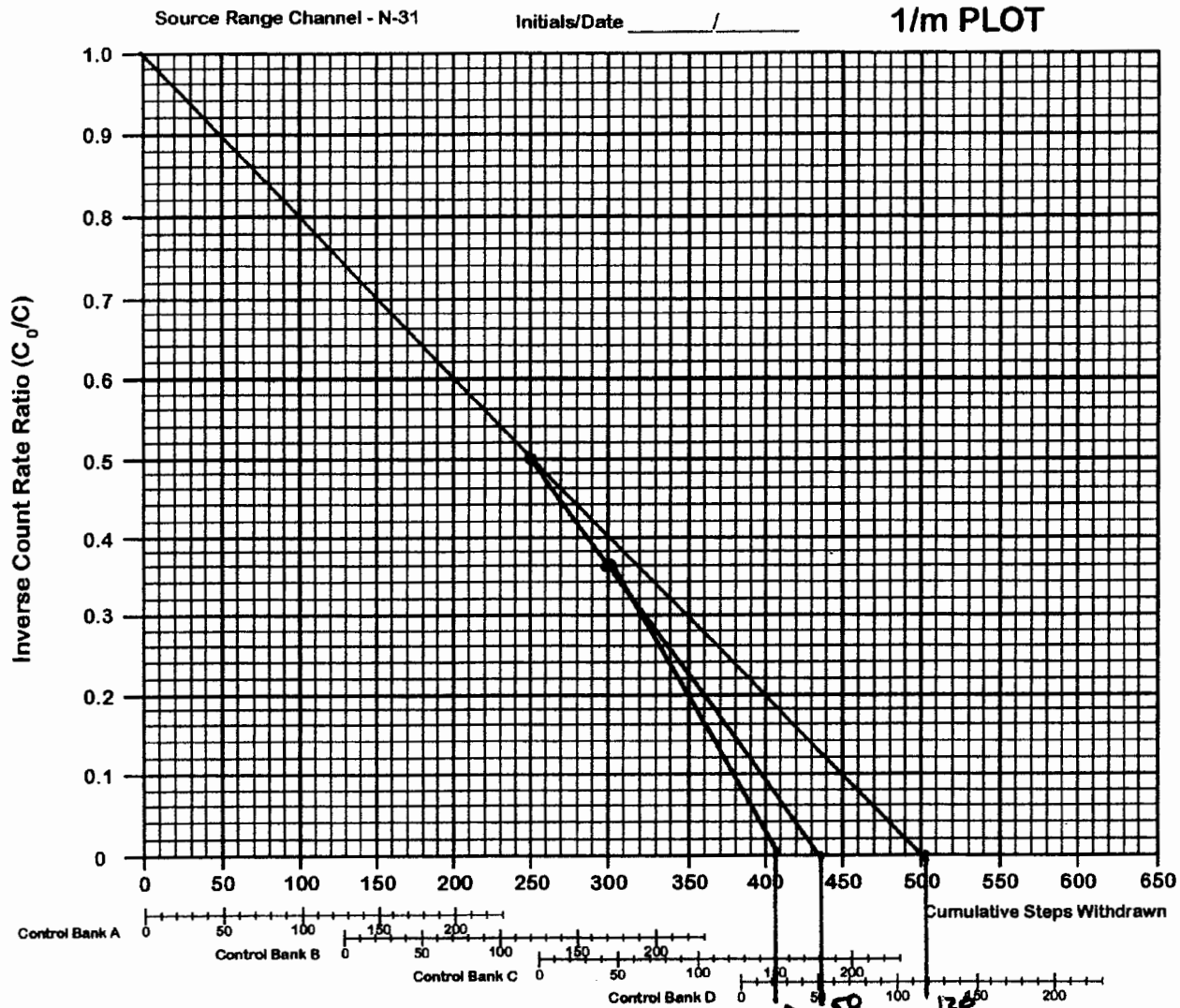
STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Evaluate 1/M plot data	3.1.C Determines that the 1/M plot predicts criticality >500 pcm below ECP.  3.2 Maximum rod height is Bank D at 43 steps versus ECP of Bank D 100 steps.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-019 JPM REVISION: 1	JPM TITLE: Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only)	
STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<b>4.C</b> Determines action for continued startup IAW 2OM-50.4.D2 Attachment 1 Precaution and Limitation #9 or Attachment 3 Action 4.	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> If necessary ask candidate to provide specific actions required.       </div>	
	<p>4.1.C Determines that 1/M data indicates that criticality will occur &gt;500 pcm below the ECP. Recommend <b>NO FURTHER ROD WITHDRAWALS.</b></p> <p>4.2.C Immediately insert ALL control banks to ZERO steps.</p> <p>4.3.C Verify RCS boron concentration.</p> <p>4.4.C Perform 2OST-49.2, "Shutdown Margin Calculation (Plant Shutdown)".</p> <p>4.5. Notify the Operations Manager or designee.</p> <p>4.6. Notify Reactor Engineering to evaluate the initial ECP and all applicable calculation data.</p> <p>4.7 Recalculate the ECP.</p> <p>4.8 Subsequent reactor startup is NOT permitted without Operations permission.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>TERMINATING CUE:</b> When the applicant makes a recommendation on continued startup and actions, the evaluation for this JPM is complete.       </div>	
COMMENTS:		
STOP TIME: _____		



ANSWER KEY LAD-019



1. The last two data points shall be used to determine Line Slope to the horizontal axis.
2. When determining Control Rod Position, a straight vertical line should be drawn from the horizontal axis to the control bank steps.

BVPS - IFR  
Station Startup  
Operating Procedures  
Performing An Estimated Critical  
Position Calculation

Unit 2

ZOM-50.4.F  
Revision 9  
Page 25 of 30

FIGURE 1: 1/M PLOT

FIGURE 1: 1/M PLOT

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

### **INITIAL CONDITIONS:**

The unit is in Mode 2.  
A reactor startup is in progress.  
Control Bank C is at 94 steps.  
Control Bank D is at 0 steps.  
RCS Boron concentration is 561 ppm.

### **INITIATING CUE:**

Your Supervisor directs you to complete the 1/M plot per 2OM-50.4.F, using the SR count rate data provided on Data Sheet 3. Compare the 1/M data with the predicted ECP data and make a recommendation for further rod withdrawal. Document your recommendation in the box below.

### **RECOMMENDED ACTIONS:**

- ☐ At this time, ask the evaluator any questions you have on this JPM.
- ☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".
- ☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.
- ☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Evaluate Operators Work History to Determine if License Status is Active (SRO) \_\_\_\_\_

TRAINING MATERIAL NUMBER: 3AD-024 \_\_\_\_\_

PROGRAM TITLE: Licensed Operator Training \_\_\_\_\_

COMPUTER CODE: 3AD-024 \_\_\_\_\_

REVISION NUMBER: 0 \_\_\_\_\_

TECHNICAL REFERENCES:

½-ADM-1351, Licensed Operator Continuing Training Program, Rev 12  
NOP-OP-1002, Conduct Of Operations

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 30 Minutes

PREPARED BY: M. Klingensmith \_\_\_\_\_ Date \_\_\_\_\_

PEER REVIEW BY: \_\_\_\_\_ Date \_\_\_\_\_

APPROVED FOR USE: T. A. Gaydosik \_\_\_\_\_ Date \_\_\_\_\_  
Training Supervisor or Designee

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 3AD-024
New Revision: 0
Description of Change(s):  1. New JPM
Reason for Change (s):  1. Exam Bank Development

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 3AD-024 JPM REVISION: 0	JPM TITLE: Evaluate Operators Work History to Determine if License Status is Active (SRO)
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K/A REFERENCE: 2.1.4 3.8 TASK ID: 0481-024-03-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 20 Minutes	Actual Time:	minutes
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation)			
Comments: _____ _____ _____ _____			

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR	
Evaluator (Print): _____	Date: _____
Evaluator Signature: _____	

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

TASK STANDARD:

Determines SRO 1 and SRO 3 are Inactive. Determines SRO 2 and SRO 4 are Active.

RECOMMENDED

Classroom

STARTING LOCATION:

INITIAL CONDITIONS:

Today is 12/7/15. You are to evaluate the work history of four SROs and determine whether their license is Active or Inactive. The four Senior Reactor Operators have the following work history for the third quarter of 2015 (Plant was in Mode 1 the entire quarter):

SRO 1	Entered third quarter with active license	
	7/01/2015	Worked 0700-1500 as Command SRO
	7/02/2015	Worked 0700-1500 as Command SRO
	7/03/2015	Worked 0700-1500 as Command SRO
	7/07/2015	Worked 0700-1500 as Command SRO. Was relieved for 3 hours to obtain required biennial License Physical at the Health Center
	7/08/2015	Worked 0700-1500 as Command SRO
	7/15/2015	Worked 0700-1500 as Command SRO
	7/16/2015	Worked 0700-1500 as Command SRO
SRO 2	Entered third quarter with inactive license	
	Completed all requirements for license reactivation 8/15/15 through 8/20/15	
	8/23/15	Worked 0700-1500 as Command SRO
	8/24/15	Worked 0700-1500 as Command SRO
	8/28/15	Worked 0700-1500 as Shift Technical Advisor
SRO 3	Entered third quarter with active license	
	7/10/15	Worked 0700-1500 as Shift Manager
	7/11/15	Worked 0700-1500 as Shift Manager
	7/18/15	Worked 0700-1500 as Shift Manager
	7/19/15	Worked 0700-1500 as Shift Technical Advisor
	7/20/15	Worked 0700-1500 as Shift Manager
	8/1/15	Worked 0700-1500 as Shift Manager
	8/2/15	Worked 0700-1500 as Shift Manager
SRO 4	Entered third quarter with active license	
	8/1/15	Worked 0700-1900 as Command SRO
	8/2/15	Worked 0700-1900 as Command SRO
	8/3/15	Worked 0700-1500 as Command SRO
	8/6/15	Worked 0700-1900 as Command SRO
	8/9/15	Worked 0700-1900 as Command SRO
	8/10/15	Worked 0700-1500 as Shift Technical Advisor
	8/25/15	Worked 0700-1900 as Command SRO

## OPERATIONS JOB PERFORMANCE MEASURE

### INITIATING CUE:

Based on the previous quarters work history determine the license status as of today, **12/7/15**, for each Senior Reactor Operator and document as ACTIVE or INACTIVE on this form.  
Document the reasons for your determination.

**(Provide copy of 1/2ADM-1351, License Operator Continuing Training Program and NOP-OP-1002, Conduct Of Operations**

### REFERENCES:

½-ADM-1351 Rev 12, Licensed Operator Continuing Training Program  
NOP-OP-1002, Conduct Of Operations

### TOOLS:

Calculator

### HANDOUT:

½-ADM-1351 Rev 12, Licensed Operator Continuing Training Program  
NOP-OP-1002, Conduct Of Operations

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 3AD-024	JPM TITLE: Evaluate Operators Work History to Determine if License Status is Active (SRO)
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div>EVALUATOR NOTE: EVALUATOR NOTE: Provide copies of the references.</div>	
1. Reviews NOP-OP-1002 and 1/2ADM-1351 Section 7.6.1 for Maintaining an Active License.	1.1 Reviews NOP-OP-1002 and 1/2-ADM-1351 Section 7.6.1, reviews the Shift requirements for Active license maintenance.  COMMENTS:	
2.C Evaluates SRO 1 work history.	2.1.C Determines requirement for working seven the 8 hour shifts is NOT credited towards active license. The time for the License Physical is not credited toward the watch.  COMMENTS:	
3.C Evaluates SRO 2 work history.	3.1.C Determines requirement for maintaining an active license is met by reactivating the license in the quarter.  COMMENTS:	
4.C Evaluates SRO 3 work history.	4.1.C Determines requirement for working seven the 8 hour shifts is NOT credited towards active license. The STA position is not credited for maintaining an active license.  COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 3AD-024	JPM TITLE: Evaluate Operators Work History to Determine if License Status is Active (SRO)
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
5.C Evaluates SRO 4 work history.	5.1.C Determines requirement for maintaining an active license is met by meeting the five 12 hour shifts.  COMMENTS:	
6. Reports SROs 1 and 3 are NOT active SROs 2 and 4 ARE active.	6.1 Determines that the SRO 1 and 3 Licenses are NOT active due to not working seven 8 hour shifts or five 12 hour shifts in the previous quarter, SRO 2 and 4 are active.  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR CUE:</b> When the applicant makes a decision regarding Active or Inactive License, the evaluation for this JPM is complete. </div> COMMENTS:	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

\*    **THIS SHEET TO BE GIVEN TO CANDIDATE**    \*



Read:

### **INITIAL CONDITIONS:**

Today is 12/7/15. You are to evaluate the work history of four SROs and determine whether their license is Active or Inactive. The four Senior Reactor Operators have the following work history for the third quarter of 2015 (Plant was in Mode 1 the entire quarter):

SRO 1	Entered third quarter with active license	
	7/01/2015	Worked 0700-1500 as Command SRO
	7/02/2015	Worked 0700-1500 as Command SRO
	7/03/2015	Worked 0700-1500 as Command SRO
	7/07/2015	Worked 0700-1500 as Command SRO. Was relieved for 3 hours to obtain required biennial License Physical at the Health Center
	7/08/2015	Worked 0700-1500 as Command SRO
	7/15/2015	Worked 0700-1500 as Command SRO
	7/16/2015	Worked 0700-1500 as Command SRO
SRO 2	Entered third quarter with inactive license	
	Completed all requirements for license reactivation 8/15/15 through 8/20/15	
	8/23/15	Worked 0700-1500 as Command SRO
	8/24/15	Worked 0700-1500 as Command SRO
	8/28/15	Worked 0700-1500 as Shift Technical Advisor
SRO 3	Entered third quarter with active license	
	7/10/15	Worked 0700-1500 as Shift Manager
	7/11/15	Worked 0700-1500 as Shift Manager
	7/18/15	Worked 0700-1500 as Shift Manager
	7/19/15	Worked 0700-1500 as Shift Technical Advisor
	7/20/15	Worked 0700-1500 as Shift Manager
	8/1/15	Worked 0700-1500 as Shift Manager
	8/2/15	Worked 0700-1500 as Shift Manager
SRO 4	Entered third quarter with active license	
	8/1/15	Worked 0700-1900 as Command SRO
	8/2/15	Worked 0700-1900 as Command SRO
	8/3/15	Worked 0700-1500 as Command SRO
	8/6/15	Worked 0700-1900 as Command SRO
	8/9/15	Worked 0700-1900 as Command SRO
	8/10/15	Worked 0700-1500 as Shift Technical Advisor
	8/25/15	Worked 0700-1900 as Command SRO

**INITIATING CUE:**

Based on the previous quarters work history determine the license status as of today, **12/7/15**, for each Senior Reactor Operator and document as ACTIVE or INACTIVE on this form.  
Document the reasons for your determination.

**Results:**

☐

At this time, ask the evaluator any questions you have on this JPM.

☐

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐

Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐

After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	Identify Isolation Boundary Points and Mark on Plant VOND then Identify Method of Plant Configuration Control. (SRO Only)
<u>TRAINING MATERIAL NUMBER:</u>	2AD-049
<u>PROGRAM TITLE:</u>	Licensed Operator Training
<u>COMPUTER CODE:</u>	2AD-049
<u>REVISION NUMBER:</u>	0

TECHNICAL REFERENCES:

2OM-24. Main Feedwater Operating Manual  
NOP-OP-1014 Plant Status Control, Rev 04

**INSTRUCTIONAL SETTING:** Classroom

**APPROXIMATE DURATION:** 15 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2AD-049
New Revision: 0
Description of Change(s):  1. Developed new JPM for exam bank. 2. Updated for current JPM format.
Reason for Change (s):  1. Exam bank development 2. Formatted to the new JPM procedure (BVPS-TR-0026).

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-049 JPM REVISION: 0	JPM TITLE: Identify Isolation Boundary Points and Mark on Plant VOND then Identify Method of Plant Configuration Control. (SRO Only)
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K/A REFERENCE: 2.2.41 3.9 TASK ID: 0481-007-03-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:

Performer SSN:

Time ☐ YesCritical: ☒ No

Allotted

30 Minutes

Time:

Actual

Time:

minutes

JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

## OBSERVERS

Name/SSN:

Name/SSN:

Name/SSN:

Name/SSN:

## EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	Identifies boundary isolations for leaking Main Feedwater System Check Valve 2FWS-2, marks up the VOND and determines that securing the pump and isolating the leak will require two SROs to approve the action, per NOP-OP-1014.
<b>RECOMMENDED STARTING LOCATION:</b>	Classroom
<b>INITIAL CONDITIONS:</b>	The plant is currently at 75% power. The Turbine Building Tour Operator reports that there is water spraying from a valve body leak on 2FWS-2, the Discharge Check valve on [2FWS-P21B] The "B" Main Feedwater Pump. The pump is in service. The operator recommends that the leakage be isolated.
<b>INITIATING CUE:</b>	You are to identify the isolation points to stop the leak, mark them on the VOND, and then determine what approvals are required to maintain plant configuration control during this evolution.
<b>REFERENCES:</b>	2OM-24 Steam Generator Feedwater Operating Manual NOP-OP-1014 Plant Status Control, Rev 04
<b>TOOLS:</b>	None
<b>HANDOUT:</b>	VOND Figure 24-1 Main Feedwater System 2OM-24 Steam Generator Feedwater Operating Manual NOP-OP-1014 Plant Status Control, Rev 04

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-049

JPM TITLE: Identify Isolation Boundary Points and Mark on Plant  
VOND then Identify Method of Plant Configuration Control. (SRO Only)

JPM REVISION: 0

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
1. Reviews 2FWS valve list or VOND 24-1 to locate the leaking valve, 2FWS-2 grid location F-7.	1.1 Locates 2FWS-2 on VOND as the discharge check valve for 2FWS-P21B.  COMMENTS:  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> The sequence of identifying the isolation points is not critical for this JPM, steps           </div>	
2.C Determines that valve 2CNM-23, on the pump suction piping must be closed.	2.1.C Identifies that valve 2CNM-23 must be closed, 2.2 Marks the valve on the VOND with an "X".  COMMENTS:	
3. Determines that valve 2CNM-436, on the pump suction piping must be closed.	3.1 Identifies that valve 2CNM-436 must remain closed. 3.2 Marks the valve on the VOND with an "X".  COMMENTS:  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> The valve is normally closed.           </div>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-049	JPM TITLE: Identify Isolation Boundary Points and Mark on Plant
JPM REVISION: 0	VOND then Identify Method of Plant Configuration Control. (SRO Only)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
4. Determines that valve 2FWR-4, on the pump recirculation piping must be closed.	<p>4.1 Identifies that valve 2FWR-4 must be closed.</p> <p>4.2 Marks the valve on the VOND with an "X".</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR NOTE:</b> Reverse flow to the leaking valve (2FWS-2) is prevented by a check valve (2FWR-6).</p> </div>	
5.C Determines that valve 2FWS-MOV150B, on the pump discharge piping must be closed.	<p>5.1.C Identifies that valve 2FWS-MOV150B must be closed.</p> <p>5.2 Marks the valve on the VOND with an "X".</p> <p>COMMENTS:</p>	
6.C Determines that valve 2FWS-21 on the pump discharge piping must be closed.	<p>6.1.C Identifies that valve 2FWS-21 must be closed.</p> <p>6.2 Marks the valve on the VOND with an "X".</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-049

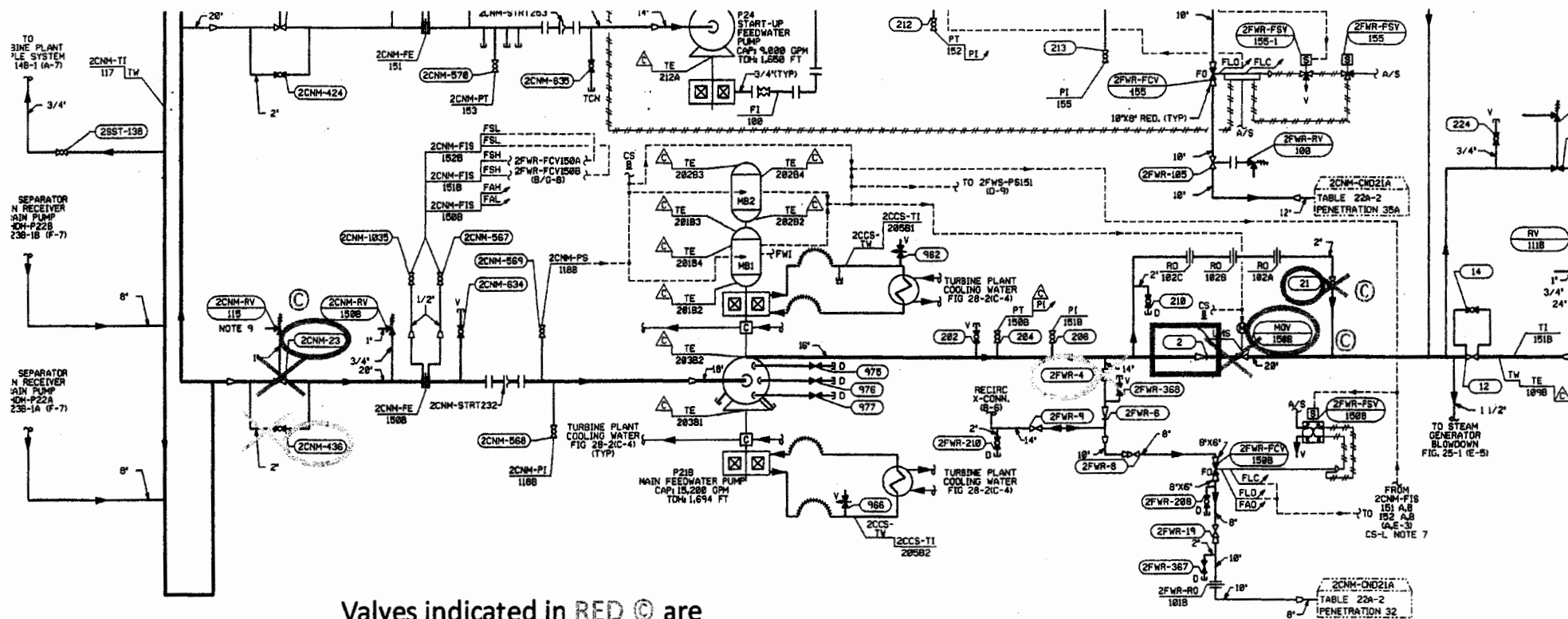
JPM TITLE: Identify Isolation Boundary Points and Mark on Plant

JPM REVISION: 0

VOND then Identify Method of Plant Configuration Control. (SRO Only)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
7. Determines that 2FWS-P21B must be removed from service to be able to isolate the leak.	7.1 Identifies that pump 2FWS-P21B must be secured, plant power must be reduced.  7.2 Determines that power must be reduced to the capacity of one main feedwater pump, approximately 60-65% power.  COMMENTS:	
8.C Refers to NOP-OP-1014, identifies that two SROs must approve the actions to isolate the feedwater leak.	8.1. Refers to sections 4.2 and 4.6 to determine the actions to control plant configuration.  8.2 Notifies the Shift Manager of the action to place the components in a Non-Normal position.  8.3.C Identifies that two SROs must approve the actions to isolate the leak.  8.4 Identifies that the Unit Narrative Log would be updated.  COMMENTS:  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> Candidate may identify other methods of configuration control, such as a Clearance. If so, cue that the isolation is needed in a prompt manner.           </div>	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> Once the report is made, state "This JPM is complete"           </div>	
	STOP TIME: _____	

**ANSWER KEY RO A.2 and SRO A.2**



Valves indicated in RED ① are Critical

Valves indicated in **Red** are Not Critical due to Check Valve Isolation or NSA closed.

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

**INITIAL CONDITIONS:** The plant is currently at 75% power. The Turbine Building Tour Operator reports that there is water spraying from a valve body leak on 2FWS-2, the Discharge Check valve on [2FWS-P21B] The "B" Main Feedwater Pump. The pump is in service. The operator recommends that the leakage be isolated.

**INITIATING CUE:** You are to identify the isolation points to stop the leak, mark them on the VOND, and then determine what approvals are required to maintain plant configuration control during this evolution.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	<u>Determine Emergency Exposure Authorization Limits (SRO Only)</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2AD-038</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2AD-038</u>
<u>REVISION NUMBER:</u>	<u>3</u>

TECHNICAL REFERENCES:

1/2-EPP-IP-5.3 Emergency Exposure Criteria and Control, Rev 11

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 20 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2AD-038
New Revision: 3
Description of Change(s):  1. Modified for exam bank maintenance. 2. Updated for current JPM format.
Reason for Change (s):  1. Modified JPM content for NRC exam, modified dose rates and stay time to modify JPM. 2. Changed format to the new JPM procedure (BVPS-TR-0026).

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-038 JPM REVISION: 3	JPM TITLE: Determine Emergency Exposure Authorization Limits (SRO Only)
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K/A REFERENCE: 2.3.4

3.7

TASK ID: 1350-006-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING☒ SRO ONLY ☐ ALTERNATE PATH JPM ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:	Performer SSN:
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Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 20 Minutes	Actual Time: minutes
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JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

## EVALUATOR

Evaluator (Print): _____	Date: _____
Evaluator Signature: _____	

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

TASK STANDARD:	Determines Emergency Exposure Authorization Limits for stated conditions are 25 rem TEDE, 75 rem lens of eye, and 250 rem organ CDE. Determines acute radiation probable effects to be no detectable clinical effects, delayed effect highly improbable.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	<ul style="list-style-type: none"><li>• A General Emergency has been declared at Unit 2.</li><li>• An individual is trapped and bleeding in a High Radiation Area.</li><li>• An immediate response is necessary to search and rescue this individual.</li><li>• It has been clearly determined that actions establishing adequate or equivalent protection, with less dose are not readily available.</li><li>• Mike Jones, a qualified radiation worker has <b>NOT</b> volunteered to perform the rescue activity but has been briefed on risks of projected radiation exposure.</li><li>• Mike Jones has a year to date exposure of 750 mR (TEDE).</li><li>• The area dose rate is 8350 mR/hr and there is no airborne radioactivity present.</li><li>• The rescue activity could take up to 2 hours.</li><li>• No previous history of accident or emergency exposure.</li></ul>
INITIATING CUE:	As the Emergency Director, you are to evaluate the listed conditions and determine ALL of the Emergency Exposure Authorization Limits. Also determine the Acute Radiation Exposure Probable Effects to this worker based on a 2 hour stay time. The Emergency Exposure Authorization Form will <b>NOT</b> be filled out at this time.
REFERENCES:	1/2-EPP-IP 5.3, "Emergency Exposure Criteria and Control", Rev. 11
TOOLS:	None
HANDOUT:	1/2-EPP-IP 5.3, "Emergency Exposure Criteria and Control", Rev. 11



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-038

JPM REVISION: 3

JPM TITLE: Determine Emergency Exposure Authorization Limits (SRO Only)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U												
	START TIME: _____													
<p><b>1.C</b> Determines the appropriate Emergency Exposure Authorization Limits using Attachment A.</p> <p>(Step 8.1.2)</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR NOTE:</b> Block 4 ONLY is Critical.         </div> <p><b>1.1C</b> Using Attachment A and conditions provided, determines the Emergency Exposure Authorization Limits:</p> <p><b>Block 1:</b></p> <table border="0"> <tr> <td>Declared Emergency</td> <td><b>YES</b></td> <td><b>General</b></td> </tr> <tr> <td></td> <td></td> <td><b>Emergency</b></td> </tr> <tr> <td>Personnel are qualified</td> <td><b>YES</b></td> <td></td> </tr> <tr> <td>No declared pregnant workers</td> <td><b>YES</b></td> <td><b>Male</b></td> </tr> </table> <p><b>Block 2:</b></p> <p>Exposure necessary to (1) save human life <b>YES</b></p> <p><b>Block 3:</b></p> <p>Personnel are volunteers and have been briefed on risks of projected radiation exposure <b>NO –has not volunteered</b></p> <p><b>Block 4.C:</b></p> <p>Limit exposure to: 25 rem TEDE; 75 rem lens of eye, 250 rem organ CDE</p> <p>COMMENTS:</p>	Declared Emergency	<b>YES</b>	<b>General</b>			<b>Emergency</b>	Personnel are qualified	<b>YES</b>		No declared pregnant workers	<b>YES</b>	<b>Male</b>	
Declared Emergency	<b>YES</b>	<b>General</b>												
		<b>Emergency</b>												
Personnel are qualified	<b>YES</b>													
No declared pregnant workers	<b>YES</b>	<b>Male</b>												

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-038	JPM TITLE: Determine Emergency Exposure Authorization Limits (SRO Only)
JPM REVISION: 3	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<b>2.C</b> Determines the Acute Radiation Exposure probable effects (biological risk) using Attachment C.  (Step 8.1.5)	2.1 Determines (2 hours) x (8350 mr/hr) = 16.7 Rem dose will be received which is less than the dose limit of 25 Rem.  2.2.C Based on this determination, references Attachment C and further determines the probable effects to the worker are: <ul style="list-style-type: none"> <li>• No detectable clinical effects</li> <li>• Delayed effects are highly improbable.</li> </ul> COMMENTS: <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <b>EVALUATOR CUE:</b> Once determinations are documented, inform the candidate that this JPM is COMPLETE.           </div>	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

\* **THIS SHEET TO BE GIVEN TO CANDIDATE** \*

☐

Read:

### **INITIAL CONDITIONS:**

- A General Emergency has been declared at Unit 2.
- An individual is trapped and bleeding in a High Radiation Area.
- An immediate response is necessary to search and rescue this individual.
- It has been clearly determined that actions establishing adequate or equivalent protection, with less dose are not readily available.
- Mike Jones, a qualified radiation worker has **NOT** volunteered to perform the rescue activity but has been briefed on risks of projected radiation exposure.
- Mike Jones has a year to date exposure of 750 mR (TEDE).
- The area dose rate is 8350 mR/hr and there is no airborne radioactivity present.
- The rescue activity could take up to 2 hours.
- No previous history of accident or emergency exposure.

### **INITIATING CUE:**

As the Emergency Director, you are to evaluate the listed conditions and determine ALL of the Emergency Exposure Authorization Limits. Also determine the Acute Radiation Exposure Probable Effects to this worker based on a 2 hour stay time. The Emergency Exposure Authorization Form will **NOT** be filled out at this time.

### **DETERMINATIONS:**

☐

At this time, ask the evaluator any questions you have on this JPM.

☐

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐

Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐

After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Determine Protective Action Recommendations (Part 1) (SRO Only)

TRAINING MATERIAL NUMBER: 2AD-037

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-037

REVISION NUMBER: 2

TECHNICAL REFERENCES:

1/2-EPP-IP-4.1, "Offsite Protective Actions", Rev. 31  
1/2-EPP-IP-1.1.F01 FENOC NUCLEAR POWER PLANT INITIAL NOTIFICATION FORM, Rev. 8  
11/2-EPP-I-5 "General Emergency", Rev 41

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: <15 Minutes

PREPARED BY: M. Klingensmith \_\_\_\_\_  
Date

PEER REVIEW BY: \_\_\_\_\_  
Date

APPROVED FOR USE: \_\_\_\_\_  
Training Supervisor or Designee Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2AD-037

New Revision: 2

Description of Change(s):

1. Updated for procedure revision.
2. Updated for current JPM format.
3. Changed wind directions to alter PAR.

Reason for Change (s):

1. ½-EPP-IP-1.1. F01 was revised to rev 8.
2. Changed format to the new JPM procedure (BVPS-TR-0026).
3. Modified Downwind Wedge Sectors to modify answer

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-037 JPM REVISION: 2	JPM TITLE: Determine Protective Action Recommendations (Part 1) (SRO Only)
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K/A REFERENCE: 2.4.44      4.4      TASK ID: 1350-007-03-023

JPM APPLICATION:   ☒ REQUALIFICATION      ☒ INITIAL EXAM      ☐ TRAINING  
☒ SRO ONLY      ☐ ALTERNATE PATH JPM      ☒ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input checked="" type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:

Performer SSN:

Time      ☒ Yes  
Critical:   ☐ NoAllotted      15 Minutes  
Time:Actual  
Time:      minutes

JPM RESULTS:      ☐ SAT  
                         ☐ UNSAT (Comments required for UNSAT evaluation)

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

## OBSERVERS

Name/SSN:

Name/SSN:

Name/SSN:

Name/SSN:

## EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

TASK STANDARD:	Determine Protective Action Recommendations in accordance with 1/2-EPP-IP-4.1.
RECOMMENDED STARTING LOCATION:	Classroom
INITIAL CONDITIONS:	<p>A General Emergency has been declared at Unit 2 at 1000 hours following a small break LOCA and the loss of all 4KV emergency power on EAL SG1. A Core Cooling Red condition exists. The General Emergency was declared due to a Prolonged Loss of all OFFSITE and ONSITE AC power to Emergency Busses (SG1). Unit 1 remains operating at 100% power.</p> <p>The following plant conditions exist:</p> <ul style="list-style-type: none"><li>• 35' wind direction is from 195° at 4 MPH.</li><li>• 150' wind direction is from 195° at 11 MPH.</li><li>• 500' wind direction is from 220° at 15 MPH.</li><li>• <b>NO</b> radioactive release has occurred or is imminent (within 1 hour).</li><li>• The Containment Fission Product Barrier EAL is <b>NOT</b> challenged (no Loss or Potential Loss)</li><li>• There is <b>NO</b> Hostile Action event in progress.</li><li>• Offsite agencies have <b>NOT</b> identified any impediments to evacuation.</li><li>• Health Physics has provided the following dose projections: At the EAB: .025 REM TEDE; .008 REM CDE At 2 miles: .0015 REM TEDE; .004 REM CDE At 5 miles: .009 REM TEDE; .025 REM CDE</li></ul>
INITIATING CUE:	<p>You are the Emergency Director and the TSC/EOF has <b>NOT</b> yet been activated. You are to evaluate the above conditions and determine which, if any, offsite <b>Protective Action Recommendations</b> (PAR) are necessary. Complete 1/2-EPP-IP-1.1.F01 Nuclear Power Plant Initial Notification Form. The evaluator will peer check the form. This JPM is <b>TIME CRITICAL</b>.</p>
REFERENCES:	<p>1/2-EPP-IP-4.1, "Offsite Protective Actions", Rev. 31 1/2-EPP-IP-1.1.F01 Rev. 8 1/2-EPP-I-5 Rev 41</p>
TOOLS:	None
HANDOUT:	<p>1/2-EPP-IP-4.1, "Offsite Protective Actions", Rev. 31 1/2-EPP-IP-1.1.F01 Rev. 8 1/2-EPP-I-5 Rev 41 EAL Flow Chart</p>

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-037	JPM TITLE: Determine Protective Action Recommendations (Part 1)
JPM REVISION: 2	(SRO Only)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
1. Locate Offsite Protective Action Recommendation Flowchart.	<p>1.1 Refers to 1/2-EPP-IP-4.1, Attachment A, Part 1 Offsite Protective Action Recommendation Flowchart.</p> <p>COMMENTS:</p>	
2. Determine offsite protective action.	<p>2.1 Navigates PAR flowchart as follows:</p> <ul style="list-style-type: none"> <li>• General Emergency already declared (↓)</li> <li>• Met data provided in Initial Conditions (↓)</li> <li>• <b>NONE</b> of the following are TRUE (↓): <ul style="list-style-type: none"> <li>➤ 35' wind speed LESS than 2 MPH (or unavailable)?</li> <li>➤ Is either 150' or 500' wind directions unavailable?</li> <li>➤ The difference between the 150' &amp; 500' wind directions is <math>\geq 165</math> and <math>\leq 195</math> degrees? (opposite wind directions) or unavailable?</li> <li>➤ Release transport will span sunrise or sunset hours. No Release is in progress.</li> <li>➤ The TSC / EOP is NOT activated.</li> </ul> </li> <li>• Containment FPB is NOT a Loss or Potential Loss. (→)</li> <li>• No Hostile Action or No impediment to evacuation. (→)</li> <li>• Projected Dose at 5 Miles is less than limits. (→)</li> </ul> <p>COMMENTS:</p>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-037	JPM TITLE: Determine Protective Action Recommendations (Part 1)
JPM REVISION: 2	(SRO Only)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Determine Offsite Protective Action Recommendations.	<p>3.1.C Determines and documents on 1/2-EPP-IP-1.1.F01, Rev. 8, the following PARs:</p> <ul style="list-style-type: none"> <li>• Evacuate 2 Mile Radius, and</li> <li>• Evacuate 5 Miles downwind wedge</li> <li>• All others monitor and prepare</li> <li>• Advise the general public to administer KI per state plan</li> </ul> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR CUE:</b> If necessary, direct the Candidate to perform the downwind wedge determination as part of the PAR.</p> </div>	
4.C Determine downwind wedge.	<p>4.1 Determines that the 150' elevation downwind sectors are "RABCD".</p> <p>4.2 Determines that the 500' evaluation downwind sectors are "ABCDE".</p> <p>4.1.C Determines that the combined sectors are "RABCDE".</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-037	JPM TITLE: Determine Protective Action Recommendations (Part 1)
JPM REVISION: 2	(SRO Only)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
5.C Completes the PAR within 15 minutes.	5.1.C Determines that form is completed within 15 minutes of the start time.  5.2 Confirm the start and stop times are within 15 minutes.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> When the candidate completes the Protective Action Recommendation, the evaluation for this JPM is complete.         </div>	
	STOP TIME: _____	

**FENOC NUCLEAR POWER PLANT  
INITIAL NOTIFICATION FORM  
Beaver Valley Power Station (BVPS)**  
1/2-EPP-IP-1.1.F01 Rev. 8

USE FOR:  
▪ INITIAL CLASSIFICATIONS,  
▪ CHANGES IN CLASSIFICATIONS  
▪ CHANGES IN PROTECTIVE ACTION  
RECOMMENDATIONS  
▪ EVENT TERMINATION

STATE / COUNTY USE ONLY  
DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
MESSAGE NO: \_\_\_\_\_

1. This is applicable to: ☐ BVPS Unit 1 OR ☒ BVPS Unit 2 OR ☐ Both BVPS Units 1 & 2  
Current Reactor Power Levels are: Unit 1: 100 %, Unit 2: 0 %. Code Word is: SIMULATOR
2. This is: ☐ An Actual Emergency ☒ A Drill
3. ☒ a. A ☒ GENERAL EMERGENCY ☐ SITE AREA EMERGENCY ☐ ALERT ☐ UNUSUAL EVENT  
was declared at: 1000 on TODAY based on EAL: SG1  
(TIME) (DATE)  
☐ b. The Emergency situation has been terminated at: \_\_\_\_\_ on \_\_\_\_\_  
(TIME) (DATE)  
☐ c. The Protective Action Recommendation is being modified at: \_\_\_\_\_ on \_\_\_\_\_  
(TIME) (DATE)
4. Brief non-technical description of event: Loss of All Onsite and Offsite Power To Both 4KV Emergency Busses  
And Core Cooling RED Conditions are met
5. The radiological conditions are:  
☐ a. A non-routine release of radioactive material, as a result of this event, is in progress.  
The release is: ☐ Airborne ☐ Liquid  
☐ b. The release of radioactive material associated with this event has been terminated.  
☒ c. NO Radiological Release is in progress as a result of this event.
6. Wind Direction is FROM: 195 degrees at 150' Wind Speed is: 4 mph at 35'
7. Utility Protective Action Recommendations (PARs):  
☐ a. None  
☒ b. EVACUATE ☒ 2 Miles - 360° ☐ 5 Miles - 360° ☐ 10 Miles - 360°  
AND Downwind Wedge ☐ N/A ☒ 5 Miles (check applicable sectors) ☐ 10 Miles (check applicable sectors)  
☒ A ☒ B ☒ C ☒ D ☒ E ☐ F ☐ G ☐ H  
☐ J ☐ K ☐ L ☐ M ☐ N ☐ P ☐ Q ☒ R  
AND that potassium iodide (KI) be administered to the general public in accordance with State procedures.  
The general public in unaffected areas should be advised to monitor EAS and prepare for further protective actions.  
☐ c. SHELTER IN PLACE ☐ 2 Miles - 360° ☐ 5 Miles - 360° ☐ 10 Miles - 360°  
AND Downwind Wedge ☐ N/A ☐ 5 Miles (check applicable sectors) ☐ 10 Miles (check applicable sectors)  
☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H  
☐ J ☐ K ☐ L ☐ M ☐ N ☐ P ☐ Q ☐ R  
AND that potassium iodide (KI) be administered to the general public in accordance with State procedures.  
The general public in unaffected areas should be advised to monitor EAS and prepare for further protective actions.

Callback number is 724-643-8000

For Utility Use Only

PEER Check: EXAMINER

Approved: NAME

## **CANDIDATE DIRECTION SHEET**

\* **THIS SHEET TO BE GIVEN TO CANDIDATE** \*

☐ Read:

### **INITIAL CONDITIONS:**

A General Emergency has been declared at Unit 2 at 1000 hours following a small break LOCA and the loss of all 4KV emergency power on EAL SG1. A Core Cooling Red condition exists. The General Emergency was declared due to a Prolonged Loss of all OFFSITE and ONSITE AC power to Emergency Busses (SG1). Unit 1 remains operating at 100% power.

The following plant conditions exist:

- 35' wind direction is from 195° at 4 MPH.
- 150' wind direction is from 195° at 11 MPH.
- 500' wind direction is from 220° at 15 MPH.
- **NO** radioactive release has occurred or is imminent (within 1 hour).
- The Containment Fission Product Barrier EAL is **NOT** challenged (no Loss or Potential Loss)
- There is **NO** Hostile Action event in progress.
- Offsite agencies have **NOT** identified any impediments to evacuation.
- Health Physics has provided the following dose projections:

At the EAB: .025 REM TEDE; .008 REM CDE

At 2 miles: .0015 REM TEDE; .004 REM CDE

At 5 miles: .009 REM TEDE; .025 REM CDE

### **INITIATING CUE:**

You are the Emergency Director and the TSC/EOF has **NOT** yet been activated. You are to evaluate the above conditions and determine which, if any, offsite **Protective Action Recommendations** (PAR) are necessary. Complete 1/2-EPP-IP-1.1.F01 Nuclear Power Plant Initial Notification Form. The evaluator will peer check the form. This JPM is **TIME CRITICAL**.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE:      Transfer to Hot Leg Recirculation

TRAINING MATERIAL NUMBER:      2CR-570

PROGRAM TITLE:      Licensed Operator Training

COMPUTER CODE:      2CR-570

REVISION NUMBER:      5

TECHNICAL REFERENCES:

2OM-53A.1.ES-1.4, (ISS 2) Revision 0, Transfer To Hot Leg Recirculation

INSTRUCTIONAL SETTING:      Simulator

APPROXIMATE DURATION:      15 Minutes

PREPARED BY:      M. Klingensmith      \_\_\_\_\_  
Date

PEER REVIEW BY:      \_\_\_\_\_  
Date

APPROVED FOR USE:      \_\_\_\_\_  
Training Supervisor or Designee      Date

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2CR-570
New Revision: 5
<p>Description of Change(s):</p> <ol style="list-style-type: none"><li>1. JPM formatting – no procedural revisions occurred.</li><li>2. Added CS (Control Switch) to all switch manipulations.</li></ol>
<p>Reason for Change (s):</p> <ol style="list-style-type: none"><li>1. 1/2-ADM-1301 was deleted and replaced with BVPS-TR-0026.</li><li>2. Accurately indicate control panel manipulations.</li></ol>

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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K/A REFERENCE: 006K4.08 3.4/3.6 TASK ID: 0111-019-01-013  
006A4.01 4.1/3.9  
006A4.02 4.0/3.8  
006A4.05 3.9/3.8

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 Minutes	Actual Time:	minutes
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation)			
Comments: _____ _____ _____ _____			
OBSERVERS			
Name/SSN:		Name/SSN:	
Name/SSN:		Name/SSN:	
EVALUATOR			
Evaluator (Print): _____		Date: _____	
Evaluator Signature: _____			

OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	SI Pumps lined up for Hot Leg Recirculation.
<b>RECOMMENDED STARTING LOCATION:</b>	Simulator
<b>INITIAL CONDITIONS:</b>	It has been approximately 6 hours since the plant had a Loss of Coolant Accident. All required procedures have been performed. The plant is now in Cold leg recirculation. The TSC has recommended transferring to Hot Leg Recirculation.
<b>INITIATING CUE:</b>	Your supervisor directs you perform ES-1.4, Transfer to Hot Leg Recirculation.
<b>REFERENCES:</b>	2OM-53A.1.ES-1.4, (ISS 2) Revision 0, Transfer To Hot Leg Recirculation
<b>TOOLS:</b>	Shorting Bars (Banana Clips)
<b>HANDOUT:</b>	2OM-53A.1.ES-1.4, (ISS 2) Revision 0, Transfer To Hot Leg Recirculation



OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p><b>SIMULATOR SETUP:</b> Start with any 100% power IC, Insert LBLOCA, progress through EOP network, E0, E1, and ES-1.3. After ES-1.3 is complete, clear extraneous alarms, verify alignment supports ES-1.4 and SNAP.</p> <p>Insert following to cause 2SIS*MOV8889 to fail closed:</p> <p>IMF VLV SIS083 2, Turn on GREEN light for 2SIS*MOV8889 Snap IC.</p> <p><b>EVALUATOR NOTE:</b> This is a faulted JPM. Have shorting bars available for candidate to perform the procedure. [2SIS*MOV8889] will not open. Candidate will re-align LHSI flow path to the cold legs.</p>	
	START TIME: _____	
1. Reviews ES-1.4, "Transfer to Hot Leg Recirculation".	<p><b>EVALUATOR CUE:</b> Provide candidate a copy of ES-1.4.</p> <p>1.1 Reviews provided procedure ES-1.4.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
2. 4 KV Emergency Buses – Energized from Offsite Power.	2.1 Checks AE and DF Buses are energized from Offsite Power.  COMMENTS:	
3.C Reset SI Recirc Mode	3.1C Depresses Train A SI Recirc Mode Reset Pushbutton.  3.2 Verifies GREEN Light – LIT and RED Light – NOT LIT.  3.3C Depresses Train B SI Recirc Mode Reset Pushbutton.  3.4 Verifies GREEN Light – LIT and RED Light – NOT LIT.  3.5 Silences/Resets Annunciator A1-2E, “RECIRC. MODE INITIATION”.  COMMENTS:	
4. Recirc Spray Pumps - NO SIGNS OF CAVITATION.  • Motor Amps – STABLE • Flow Rate – STABLE • Discharge Pressure -STABLE	4.1 Checks 2RSS-P21A,B,C & D motor ammeters, discharge pressures, and flow rates are steady for the running pumps.  4.2 Determines amps, pressures, and flow rates are stable, and there are NO indications of Recirc Spray Pump cavitation.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570  
JPM REVISION: 5

JPM TITLE: Transfer to Hot Leg Recirculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>5.C Align RSS pumps for Hot Leg Recirculation - Verify [2RSS*P21C, D] Recirc Spray Pumps – BOTH RUNNING.</p> <p>Close [2SIS*MOV8888A, B] 21A,B LHSI Pump Disch to Cold Legs.</p>	<p>5.1 Verifies 2RSS*P21C and D are both still running from previous step.</p> <p>5.2C Places CS for 2SIS*MOV8888A to CLOSE.</p> <p>5.3 Verifies GREEN Light – LIT and RED Light – NOT LIT.</p> <p>5.4C Places CS for 2SIS*MOV8888B to CLOSE.</p> <p>5.5 Verifies GREEN Light – LIT and RED Light – NOT LIT.</p> <p>COMMENTS:</p>	
<p>6.C Open [2SIS*MOV8887A, B] 21A,B LHSI Pump Disch to Hot Legs.</p>	<p>6.1C Places CS for 2SIS*MOV8887A to OPEN.</p> <p>6.2 Verifies RED Light – LIT and GREEN Light – NOT LIT.</p> <p>6.3C Places CS for 2SIS*MOV8887B to OPEN.</p> <p>6.4 Verifies RED Light – LIT and GREEN Light – NOT LIT.</p> <p>COMMENTS:</p>	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
7. Insert a shorting bar into [2SIS*MOV8889] LHSI Pumps Disch to Hot Legs Isol jack.	7.1 Obtains shorting bar and inserts it into the VB-A jack for 2SIS*MOV8889.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>FAULT STATEMENT</b>            2SIS*MOV8889 will NOT Open in the following step, flow must be re-established to the cold legs.         </div>	
8. OPEN [2SIS*MOV8889].	8.1 Places CS for 2SIS*MOV8889 to OPEN.  8.2 Identifies that GREEN Light – LIT and RED Light – NOT LIT.  8.3 Determines 2SIS*MOV8889 did NOT open and that RNO actions are necessary.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>9.C Re-establish flow to the cold legs by performing the following:</p> <p>CLOSE [2SIS*MOV8887A,B] 21A,B LHSI Pump Disch to Hot Legs and OPEN [2SIS*MOV8888A,B] 21A,B LHSI Pump disch to Cold Legs.</p>	<p>9.1C Places CS for 2SIS*MOV8887A to CLOSE.</p> <p>9.2 Verifies GREEN Light – LIT and RED Light – NOT LIT.</p> <p>9.3C Places CS for 2SIS*MOV8887B to CLOSE.</p> <p>9.4 Verifies GREEN Light – LIT and RED Light – NOT LIT.</p> <p>9.5C Places CS for 2SIS*MOV8888A to OPEN.</p> <p>9.6 Verifies RED Light – LIT and GREEN Light – NOT LIT.</p> <p>9.7C Places CS for 2SIS*MOV8888B to OPEN.</p> <p>9.8 Verifies RED Light – LIT and GREEN Light – NOT LIT.</p> <p>COMMENTS:</p>	
<p>10. Verify [2SIS*FI945 and 946] LHSI Flow – INDICATED.</p>	<p>10.1 Verifies flow on 2SIS*FI945.</p> <p>10.2 Verifies flow on 2SIS*FI946.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
11. Align Charging Pumps for Hot Leg Recirculation.  Verify two Charging/HHSI Pumps running.	11.1 Verifies 2CHS*P21A amps indicated and RED Light – LIT and WHITE Light – NOT LIT.  11.2 Verifies 2CHS*P21C amps indicated and RED Light – LIT and WHITE Light – NOT LIT.  11.3 Determines 2CHS*P21A and C are running.  COMMENTS:	
	<b>EVALUATOR NOTE:</b> When securing and restarting the 'A' and 'C' Charging pumps during this JPM, the following annunciators may alarm. No ARP action is required. A2-3E, Charging Flow Path Trouble A2-4D, Reactor Coolant Pump Seal Trouble	
12.C Stop Train A [2CHS*P21A] Charging pump.	12.1C Places CS for 2CHS*P21A to STOP.  12.2 Verifies amps NOT indicated and WHITE Light – LIT and RED Light – NOT LIT.  COMMENTS:	
13.C Insert Shorting Bar into [2SIS*MOV836] High Head SI Cold Leg Isol Vlv jack.	13.C Obtains shorting bar and inserts it into the VB-A jack for 2SIS*MOV836.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
14.C CLOSE [2SIS*MOV836]	<p>14.1C Places CS for 2SIS*MOV836 to CLOSE.</p> <p>14.2 Verifies GREEN Light – LIT and RED Light – NOT LIT.</p> <p>COMMENTS:</p>	
15.C Insert Shorting Bar into [2SIS*MOV869A] High Head SI Hot Leg Isol Vlv jack.	<p>15.1C Obtains shorting bar and inserts it into the VB-A jack for 2SIS*MOV869A.</p> <p>COMMENTS:</p>	
16.C OPEN [2SIS*MOV869A]	<p>16.1C Places CS for 2SIS*MOV869A to OPEN.</p> <p>16.2 Verifies RED Light – LIT and GREEN Light – NOT LIT.</p> <p>COMMENTS:</p>	
17.C START previously running Charging pump. (2CHS*P21A)	<p>17.1C Places CS for 2CHS*P21A to START.</p> <p>17.2 Verifies amps indicated and RED Light – LIT and WHITE Light – NOT LIT.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5	JPM TITLE: Transfer to Hot Leg Recirculation
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
18. Verify [2SIS*FI940] HHSI Flow – INDICATED.	18.1 Verifies flow on 2SIS*FI940.  COMMENTS:	
19.C STOP train B [2CHS*P21C Charging pump].	19.1C Places CS for 2CHS*P21C to STOP.  19.2 Verifies amps NOT indicated and WHITE Light – LIT and RED Light – NOT LIT.  COMMENTS:	
20.C Close [2SIS*MOV867A,B] High Head SI Cold Leg Isol Vlvs.	20.1C Places CS for 2SIS*MOV867A to CLOSE.  20.2 Verifies GREEN Light – LIT and RED Light – NOT LIT.  20.3C Places CS for 2SIS*MOV867B to CLOSE.  20.4 Verifies GREEN Light – LIT and RED Light – NOT LIT.  COMMENTS:	
21.C Insert Shorting Bar into [2SIS*MOV869B] High Head SI Hot Leg Isol Vlv jack.	21.1C Obtains shorting bar and inserts it into the VB-A jack for 2SIS*MOV869B.  COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-570 JPM REVISION: 5		JPM TITLE: Transfer to Hot Leg Recirculation	
STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U	
22.C Open [2SIS*MOV869B]	22.1C Places CS for 2SIS*MOV869B to OPEN.  22.2 Verifies RED Light – LIT and GREEN Light – NOT LIT.  COMMENTS:		
23.C START previously running Charging pump. (2CHS*P21C)	23.1C Places CS for 2CHS*P21C to START.  23.2 Verifies amps indicated and RED Light – LIT and WHITE Light – NOT LIT.  COMMENTS:		
24. Verify [2SIS*FI943] HHSI Flow – INDICATED.	24.1 Verifies flow on 2SIS*FI943.  COMMENTS:		
	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>EVALUATOR CUE:</b> After flow on 2SIS*FI943 is verified, state “This JPM is complete”.         </div>		
STOP TIME: _____			

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

**INITIAL CONDITIONS:** It has been approximately 6 hours since the plant had a Loss of Coolant Accident. All required procedures have been performed. The plant is now in Cold leg recirculation. The TSC has recommended transferring to Hot Leg Recirculation.

**INITIATING CUE:** Your supervisor directs you perform ES-1.4, Transfer to Hot Leg Recirculation.

- ☐ At this time, ask the evaluator any questions you have on this JPM.
- ☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".
- ☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.
- ☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Discharge Steam Generator Blowdown Evaporator Test Tank  
[2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

TRAINING MATERIAL NUMBER: 2CR-660

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-660

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents  
to Cooling Tower Blowdown Rev. 31  
2OM-43.4.AAA, Radiation Monitoring System Trouble Rev. 9  
2OM-43.4.AAC, Radiation Monitoring Level High Rev. 1  
2OM-43.4.AEE, Local - Liquid Waste Process Effluent [2SGC-RQI100] High Alarm Level Iss. 1, Rev. 5

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: M. Klingensmith \_\_\_\_\_ Date

PEER REVIEW BY: \_\_\_\_\_ Date

APPROVED FOR USE: \_\_\_\_\_  
Training Supervisor or Designee Date

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2CR-660
New Revision: 0
Description of Change(s):  Original Issue
Reason for Change (s):

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660 JPM REVISION: 0	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.
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K/A REFERENCE: 068 A4.03 3.9 / 3.8 TASK ID: 0171-020-01-011  
 068 A4.04 3.8 / 3.7 0171-016-01-013  
 073 A4.01 3.9 / 3.9 0431-033-04-011

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 Minutes	Actual Time: minutes	
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation) Comments: _____ _____ _____ _____			
OBSERVERS			
Name/SSN:		Name/SSN:	
Name/SSN:		Name/SSN:	
EVALUATOR			
Evaluator (Print): _____		Date: _____	
Evaluator Signature: _____			

## OPERATIONS JOB PERFORMANCE MEASURE

### EVALUATOR DIRECTION SHEET

TASK STANDARD:	Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] discharge commenced, then isolated from Unit 2 Cooling Tower Blowdown by closing 2SGC-HCV100 and/or securing 2SGC-P26A.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	<ul style="list-style-type: none"><li>• Annunciator A2-1A, Steam Generator Blowdown System Trouble is in alarm for 2SGC-TK23A tank level high.</li><li>• RWDA-L for Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] has been completed and approved 2 hours ago.</li><li>• Liquid Waste Process Effluent Monitor [2SGC-RQI100] is OPERABLE.</li></ul>
INITIATING CUE:	Your supervisor directs you to discharge Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown beginning at step IV.A.14.d of 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents to Cooling Tower Blowdown.
REFERENCES:	2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank 2SGC-TK23A(B) Contents to Cooling Tower Blowdown Rev 31 2OM-43.4.AEE, Local - Liquid Waste Process Effluent 2SGC-RQI100 High Alarm Level Iss. 1, Rev. 5
TOOLS:	NONE
HANDOUT:	2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank 2SGC-TK23A(B) Contents to Cooling Tower Blowdown Rev 31, place kept up to step IV.A.14.d. RWDA-L for discharging Steam Generator Blowdown Evaporator Test Tank TK23A.  <b>Do NOT handout until the student references the CR procedures.</b> 2OM-43.4.AAA, Radiation Monitoring System Trouble Rev. 9 2OM-43.4.AAC, Radiation Monitoring Level High Rev. 1 2OM-43.4.AEE, Local - Liquid Waste Process Effluent 2SGC-RQI100 High Alarm Level Iss. 1, Rev. 5

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660

JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test

JPM REVISION: 0

Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p><b>SIMULATOR SETUP:</b></p> <p>Initialize a Mode 1-3 IC. Use HTML generated for this JPM.</p>	
	<p><b>JPM SETUP:</b></p> <p>Caution Tag CLOSED 2SGC-AOV125A. Post sign for LW Discharge. Ensure 2SGC-RQI100 ALERT and HIGH alarms are set iaw. the RWDA-L.</p>	
	<p><b>EVALUATOR CUE:</b></p> <p>Provide candidate a copy of 2OM-25.4.L and RWDA-L for Discharge of Steam Generator Blowdown Evaporator Test Tank (2SGC-TK23A).</p> <p>When candidate is ready to begin the JPM, Place the Simulator in RUN.</p>	
	START TIME: _____	
<p>1. Review 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents to Cooling Tower Blowdown.</p>	<p>1.1 Reviews 2OM-25.4.L and verifies step IV.A.14.d is the correct step to begin.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660

JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test

JPM REVISION: 0

Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>2.C Align flow to the [2SGC-RQI100], Liquid Waste Effluent Radiation Monitor, as follows:</p> <p>1) Dispatch an Operator to the [2SGC-RQI100] Radiation Monitor skid. (Aux Bldg 718')</p> <p>2) Open [2SGC-AOV128A OR 128B], Evap Test Tank Pump 26A(B) Disch Vlv, for the pump aligned for recirculation in Part A. (BB-A). (Circle valve being used)</p>	<p>2.1 Dispatches an Operator to the 2SGC-RQI100 Radiation Monitor skid.</p> <p>2.2C Places CS for 2SGC-AOV128A to OPEN.</p> <p>2.3 Verifies RED light – LIT and GREEN light – NOT LIT.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Role-play the local Operator and acknowledge request to go to the 2SGC-RQI100 Radiation Monitor skid.</p> </div> <p>COMMENTS:</p>	
<p>3. Remove the plastic wire tie from [2SGC-3001L], Test Connection Isol Vlv for 2SGC-RQI100. (At 2SGC-RQI100 skid, Aux Bldg 718') (N/A if [2SGC-RQI100] is NOT in service)</p>	<p>3.1 Requests Operator at 2SGC-RQI100 Radiation Monitor skid, remove the plastic wire tie from 2SGC-3001L.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Role-play the local Operator and report the plastic wire tie is removed from 2SGC-3001L.</p> </div> <p>COMMENTS:</p>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test
JPM REVISION: 0	Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>4. Position [2SGC-HCV100], Liquid Waste Eff High Rad Isol Vlv, as follows:</p> <p>1) If [2SGC-RQI100] is in service, Place [2SGC-HCV100] in AUTO.</p> <p>2) If the action required by 1/2-ODC-3.03, (ODCM) for [2SGC-RQI100], Liquid Waste Process Effluent Monitor, inoperable is in effect, Place [2SGC-HCV100] in MAN. (N/A if NOT in effect)</p>	<p>4.1 Verifies CS for 2SGC-HCV100, Liquid Waste Eff High Rad Isol Vlv in AUTO.</p> <p>4.2 2SGC-RQI100 is OPERABLE, therefore N/As step to place 2SGC-HCV100 in MANUAL.</p> <p>COMMENTS:</p>	
<p>5.C Concurrently adjust the discharge flow rate and eliminate air from the sample lines by performing the following:</p> <p>1) Adjust the discharge flow rate using [2SGC-HIC100], Liquid Waste Eff High Rad Isol Vlv controller, to approximately 70% of the maximum discharge flowrate specified in the RWDA-L OR 60 gpm, whichever is less (BB-A).</p>	<p>5.1C Co-ordinates with local operator to adjust Liquid Waste Eff High Rad Isol Vlv controller 2SGC-HIC100 until flowrate is 59-60 gpm.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR CUE:</b>  Role-play the local Operator and report that flowrate is rising when the controller is dialed up. Use the following indicator values as a guide.  5% = ~30 gpm  10% = ~60 gpm (desired flowrate)  15% = ~90 gpm</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test
JPM REVISION: 0	Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>6. Verify the following: (at [2SGC-RQI100] skid):</p> <p>1) The sample pump for [2SGC-RQI100] is operating.</p> <p>2) The green "OPERATE" light on the RM-80 panel is ON.</p>	<p>6.1 Requests Operator at 2SGC-RQI100 Radiation Monitor skid verify the following:</p> <ul style="list-style-type: none"> <li>• sample pump for 2SGC-RQI100 is running</li> <li>• GREEN OPERATE light is LIT.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR CUE:</b> Role-play the local Operator and report the sample pump for 2SGC-RQI100 is running, and the GREEN OPERATE light is LIT.</p> </div> <p>COMMENTS:</p>	
<p>7. At 2SGC-RQI100 skid, Aux Bldg 718':</p> <p>1) Open [2SGC-3001L], Test Connection Isol Vlv for 2SGC-RQI100.</p> <p>2) WHEN 30 seconds has elapsed with [2SGC-3001L] Open, Close [2SGC-3001L].</p> <p>3) Verify the flow rate following closure of [2SGC-3001L] is at least one gpm and stable.</p> <p>4) Replace the plastic wire tie on [2SGC-3001L].</p>	<p>7.1 Requests Operator vent 2SGC-RQI100 by cycling open 2SGC-3001L for 30 seconds, then closing and replacing the plastic wire tie.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR CUE:</b> Role-play the local Operator and report 2SGC-3001L was cycled open, then closed, and the flowrate is 1gpm, and the plastic wire tie has been replaced.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test
JPM REVISION: 0	Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>8.C Close [2SGC-AOV126A(B)], SG Blowdown Test Tk 23A(B) Recirc Isol Vlv, as follows:</p> <p>1) Throttle [2SGC-HCV100] to prevent exceeding the maximum discharge flowrate.</p> <p>2) Close [2SGC-AOV126A OR 126B], SG Blowdown Test Tk 23A(B) Recirc Isol Vlv, for the pump aligned for recirculation in Part A. (BB-A) (Circle valve being used).</p> <p>3) Throttle [2SGC-HCV100] to attain the desired flowrate.</p>	<p>8.1C Places CS for 2SGC-AOV126A to CLOSE.</p> <p>8.2 Verifies GREEN light – LIT and RED light – NOT LIT</p> <p>8.3C Co-ordinates with local operator to adjust 2SGC-HIC100 until flowrate is returned to 59-60 gpm.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR CUE:</b> Role-play the local Operator and report that flowrate has risen and needs to be lowered. At the Evaluators discretion, after an adjustment has been made, report flowrate is ~60 gpm.</p> </div> <p>COMMENTS:</p>	
<p>9. 1) Verify sample pump starts by checking [2SGC-RQ100], Liquid Waste Process Effluent, status field for [1LX065] is backlit GREEN on the RM-11. (N/A if [2SGC-RQI100] has previously been declared inoperable in accordance with Initial Condition III.A)</p> <p>2) If the sample pump fails to start, Close [2SGC-HCV100], Liquid Waste Eff High Rad Isol Vlv. (Otherwise N/A)</p>	<p>9.1 Verify sample pump starts by checking 2SGC-RQ100, Liquid Waste Process Effluent, status field for [1LX065] is backlit GREEN on the RM-11.</p> <p>9.2 Sample pump started, therefore, the step for closing 2SGC-HCV100 is N/A.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660 JPM REVISION: 0	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.
--	--

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
10. Verify discharge flow rate on [2SGC-FIS100], Liquid Waste Disch Flow, is less than the maximum discharge flow rate specified on the RWDA-L. (Aux Bldg 718')	<p>10.1 Requests Operator verify the discharge flowrate is 60 gpm as read on 2SGC-FIS100.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Role-play the local Operator and report 2SGC-FIS100 indicates 60 gpm.</p> </div> <p>10.2 Records discharge flowrate.</p> <p>COMMENTS:</p>	
11. At the beginning of each period of discharge, Record the required discharge data on the RWDA-L as follows:  1) DATE 2) TIME 3) TANK LEVEL	<p>11. Records date, time, and tank level on the RWDA-L.</p> <p>COMMENTS:</p>	
	<div style="border: 1px solid black; padding: 10px;"> <p><b>FAULT STATEMENT:</b> Alternate Path begins here. Annunciator A4-5A Radiation Monitoring System Trouble, and A4-5C Radiation Monitoring Level High will alarm after a time delay that was started when 2SGC-AOV126A was closed. Candidate is expected to refer to 2OM-43.4.AEE, Local - Liquid Waste Process Effluent [2SGC-RQI100] High Alarm Level.</p> </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test
JPM REVISION: 0	Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
12. Refers to ARP for A4-5C, Radiation Monitoring Level High 2OM-43.4.AAC.	12.1 Acknowledges annunciator A4-5C, Radiation Monitoring Level High. 12.2 Locates and refers to 2OM-43.4.AAC. COMMENTS:	
13. Perform the following at the RM-11 operators console:  Press the grid 6 pushbutton AND Determine which radiation monitor in alarm (blinking and has turned red).	13.1 At DRMS panel depresses Grid 6. 13.2 Verifies 1LX065 is blinking and RED. COMMENTS:	
	<b>EVALUATOR NOTE:</b> The four digit number is the radiation monitor number less the letters (i.e. 1PA234 will be 1234).	
14. Type in the 4-digit numerical code number of the alarming monitor AND Press the SEL pushbutton.	14.1 Types 1065 on DRMS keyboard AND depresses the SEL pushbutton COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660 JPM REVISION: 0		JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.	
STEP ( "C" Denotes CRITICAL STEP )		STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
15. Press the STATUS pushbutton.		15.1 Depresses the STATUS pushbutton on the DRMS keyboard.  COMMENTS:	
		<div>EVALUATOR NOTE: Candidate may elect to verify 2SGC-HCV100 CLOSED, or terminate the discharge at this point based on the HIGH Radiation alarm condition on 2SGC-RQI100.</div>	
16. Press SYSTEM ACK to silence the console alarm.		16.1 Depresses the SYSTEM ACK pushbutton on the DRMS keyboard.  COMMENTS:	
17. If any radiation monitor is at OR approaching, 1000 times normal background, Immediately notify the SM/US AND Refer to 1/2OM-57, "Emergency Preparedness Plan" for further actions.		17.1 N/A  <div>EVALUATOR CUE: Role-play SM/US and inform the candidate that 2SGC-RQ100 is NOT 1000 times normal background.</div> COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test
JPM REVISION: 0	Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> Candidate may also refer to 2OM-43.4.ACC in the next step. This would be acceptable. (This procedure also contains the "Critical" steps necessary to isolate the LW discharge).         </div>	
18. Refer to local alarm response procedures 2OM-43.4.ACN through 2OM-43.4.AEJ and 2OM-43.4.AEL for corrective actions.	18.1 Refers to 2OM-43.4.AEE. (Tab 32)  COMMENTS:	
19.C If a high radiation condition is suspected in [2SGC-TK23B]:  Verify Closed [2SGC-HCV100], Liquid Waste Eff Isol Vlv. (BB-A).	19.1 Recognizes 2SGC-HCV100 Liquid Waste Eff High Rad Isol Vlv Green light – NOT LIT and RED light – LIT.  19.2C Rotates 2SGC-HIC100 Liquid Waste Eff High Rad Isol Vlv Controller counterclockwise until demand output is ZERO.  19.3C Verifies 2SGC-HCV100 Liquid Waste Eff High Rad Isol Vlv Green light – LIT and RED light – NOT LIT.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-660	JPM TITLE: Discharge Steam Generator Blowdown Evaporator Test
JPM REVISION: 0	Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown.

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
20.C Stop [2SGC-P26A(B)], SG Blowdown Test Tank Pumps (BB-A).	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR NOTE:</b> Candidate may choose to shut 2SGC-AOV-128B which is NOT critical.         </div> <p>20.1C Places Control Switch for SG Blowdown Test Tank Pump 2SGC-P26A to STOP.</p> <p>20.2 Verifies GREEN light – LIT and RED light – NOT LIT.</p> <p>20.3 Verifies SG Blowdown Test Tank Pump 2SGC-P26A is not running.</p> <p>20.4 Verifies GREEN light – LIT and RED light – NOT LIT.</p> <p>COMMENTS:</p>	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> After candidate terminates the discharge, state “This JPM is complete”.         </div>	
	STOP TIME: _____	



**RWDA-L: Part 1, Summary of Discharge Data**  
**Beaver Valley Power Station - 2**

RWDA-L-01965

This permit authorizes the discharge of a maximum of 17705.3 gallons from tank 2SGC-TK-23A at a maximum discharge rate of 85.0 gpm to the environment via U2 blowdown with a minimum total cooling tower blowdown of 10000.0 gpm at Unit 1 and Unit 2 with a monitor ALERT alarm setpoint of 6.63E-05 uCi/ml and a monitor HIGH alarm setpoint of 7.52E-05 uCi/ml on 2SGC-RQ100. (See Below for Alternate Alarm Setpoints)

This tank was recirculated from YESTERDAY 10:00 to YESTERDAY 23:00, (at which time it was sampled) for a total of 780 minutes.

Prepared By <i>Bgo Ray</i> Today Signature Date		Reviewed By <i>Scott Kay</i> Today Peer Review Signature Date		Remarks:	
Cooling Tower Flow Set Unit 1 <u>    </u> U1&U2 <u>BR</u> Init Init		Monitor Source Check <u>BR</u> Init			
Monitor Alarms <i>Adjusted &amp; Verified Today</i> HI <u>BEE</u> HI-HI <u>BEE</u> Init Init		Approved By <i>John Carley</i> Today U1 Shift Mgr Signature Date		Approved By <i>Joan Cusack</i> Today U2 Shift Mgr Signature Date	

ternate Alarm Setpoints Refer to 1/2-ENV-05.04

( Alarm CT B/D ) ( N/A gpm )  
 ----- = ----- X 4.00E-06 = HIGH = ( N/A uCi/ml )  
 ( Max Exp Disch ) ( N/A gpm ) HIGH X 0.70 = ALERT = ( N/A uCi/ml )

**Discharge Record**

Discharge Start						Discharge Stop						Vol.	CT Flow, gpm		
mo	dy	yr	hr	mn	level	init	mo	dy	yr	hr	mn	level	init	gal.	TOTAL
Discharge Time, min =							Discharge Volume, gal =								
Monitor Alarms Reset HI <u>    </u> HI-HI <u>    </u> Init Init						Reviewed By <i>John Carley</i> Today U1 Shift Mgr Signature Date						Reviewed By <i>Joan Cusack</i> Today U2 Shift Mgr Signature Date			

**Post Release Review**

( C.T. Flow gpm ) X ( Discharge Time min ) = ( Dilution Volume gal )					
( Discharge Vol gal ) / ( C.T. Flow gpm ) = ( Post Time min ) / 1.97E+00 = ( Dose Corr )					
Composite Size ml init date		File Update init		Post Review Signature Date	

TRAINING USE ONLY

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐

Read:

### **INITIAL CONDITIONS:**

- Annunciator A2-1A, Steam Generator Blowdown System Trouble is in alarm for 2SGC-TK23A tank level high.
- RWDA-L for Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] has been completed and approved 2 hours ago.
- Liquid Waste Process Effluent Monitor [2SGC-RQI100] is OPERABLE.

### **INITIATING CUE:**

Your supervisor directs you to discharge Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A] to Unit 2 Cooling Tower Blowdown beginning at step IV.A. 13 of 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents to Cooling Tower Blowdown.

☐

At this time, ask the evaluator any questions you have on this JPM.

☐

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐

Simulate performance or perform as directed the required task.

Point to any indicator or component you verify or check and announce your observations.

☐

After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE

TRAINING MATERIAL TITLE: Rod Control Assembly Partial Movement Test - (Rods continue to move during performance of the test)

TRAINING MATERIAL NUMBER: 2CR-747

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-747

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OST-1.1, Control Rod Assembly Partial Movement Test Rev 13  
2OM-53C.4.2.1.3, Unexpected Control Rod Movement Rev. 10

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 10 Minutes

PREPARED BY: M. Klingensmith \_\_\_\_\_  
Date

PEER REVIEW BY: \_\_\_\_\_  
Date

APPROVED FOR USE: \_\_\_\_\_  
Training Supervisor or Designee Date

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2CR-747
New Revision: 0
Description of Change(s):  Original Issue
Reason for Change (s):

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-747 JPM REVISION: 0	JPM TITLE: Rod Control Assembly Partial Movement Test - (Rods continue to move during performance of the test)
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K/A REFERENCE: 001 A4.03 4.0/3.7 TASK ID: 0535-005-04-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:

Performer SSN:

Time ☐ Yes  
Critical: ☒ No

Allotted  
Time: 10 Minutes

Actual  
Time: minutes

JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

## OBSERVERS

Name/SSN:

Name/SSN:

Name/SSN:

Name/SSN:

## EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Perform 2OST-1.1, and take appropriate action for Continuous Rod motion by placing the Control Rod selector switch to AUTO to stop rod insertion per AOP-2.1.3.

**RECOMMENDED STARTING LOCATION:** Simulator

**INITIAL CONDITIONS:** The plant is in Mode 1 at 100% power.  
All procedural Initial Conditions are satisfied.

**INITIATING CUE:** Your supervisor directs you to verify Control Bank 'D' is operable by performing Section VII.B of 2OST-1.1, Control Rod Assembly Partial Movement Test, and report your results to your supervisor.

The test is to be performed with rods in MANUAL, and it is NOT desired to withdraw the Control Rods prior to beginning the test.

**REFERENCES:** 2OST-1.1, Control Rod Assembly Partial Movement Test Rev. 13  
2OM-53C.4.2.1.3, Unexpected Control Rod Movement Rev. 10

**TOOLS:** NONE

**HANDOUT:** 2OST-1.1, Control Rod Assembly Partial Movement Test filled out up to step VII.B, and pages 13-24 and 29-33 removed.

(Have copies available to replace procedure in binder if used)  
2OM-53C.4.2.1.3, Unexpected Control Rod Movement Rev. 10

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-747		JPM TITLE: Rod Control Assembly Partial Movement Test - (Rods continue to move during performance of the test)	
JPM REVISION: 0			

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p><b>SIMULATOR SETUP:</b>            INIT to any 100% IC            Set trigger 1 to insert control rods at 219 steps:</p> <ul style="list-style-type: none"> <li>• TRGSET 1 'MCRFPA(4) &lt;=219'</li> <li>• IOR XB2I037N (1 0)</li> </ul>	
	<p><b>EVALUATOR NOTE:</b>            Provide candidate a partially filled out copy of 2OST-1.1, after candidate reviews procedure and states they are ready to begin the JPM, ensure Simulator is in RUN and log start time.</p>	
	START TIME: _____	
1. Record initial step counter reading for Control Bank D, Group 1 and 2 in Data Sheet 1.	1.1 Records CB 'D' Group 1 and 2 step counter readings on Data Sheet 1.  COMMENTS:	
2. If rods are at the ARO position AND it is desired to withdraw rods to 230 steps prior to testing, Perform the following: (otherwise, mark this step and Step VII.B.2.c data blocks in Data Sheet 1 "N/A")	2. This step is N/A.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-747 JPM REVISION: 0	JPM TITLE: Rod Control Assembly Partial Movement Test - (Rods continue to move during performance of the test)
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U								
<p>3. Using the DRPI, Record the rod height of the Control Bank D rods in DATA Sheet 1.</p> <p><u>Control Bank D rods</u></p> <table><tr><td>Rod H2</td><td>Rod F6</td></tr><tr><td>Rod B8</td><td>Rod F10</td></tr><tr><td>Rod H14</td><td>Rod K10</td></tr><tr><td>Rod P8</td><td>Rod K6</td></tr></table>	Rod H2	Rod F6	Rod B8	Rod F10	Rod H14	Rod K10	Rod P8	Rod K6	<p>3.1 Records the rod height of the CB ‘D’ rods on Data Sheet 1 using DRPI indication.</p> <p>COMMENTS:</p>	
Rod H2	Rod F6									
Rod B8	Rod F10									
Rod H14	Rod K10									
Rod P8	Rod K6									
<p>4.C Verify the Bank Selector Switch in the MAN position based on the preceding note.</p>	<div><p><b>EVALUATOR NOTE:</b> Initiating Cue states this test is to be performed with control rods in MANUAL.</p></div> <p>4.1C Places the Control Rod Bank Sel SW to MAN position.</p> <p>4.2 Circles MAN on the space provided in the OST.</p> <p>COMMENTS:</p>									
<p>5.C Using Rod Motion In-Out lever, Insert Control Bank D at least 10 steps, in 5 step increments, into the core.</p>	<p>5.1C Inserts Control Bank D control rods 5 steps in using the In-Out-Hold switch on BB-B.</p> <p>5.2 Verifies Rod insertion ↓ arrow light is – LIT.</p> <p>5.3 Verifies Group Step counters decreasing.</p> <div><p><b>EVALUATOR NOTE:</b> Annunciator A4-9G, Computer Monitored Alarm is expected each time rod motion is demanded.</p></div> <p>COMMENTS:</p>									



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-747 JPM REVISION: 0	JPM TITLE: Rod Control Assembly Partial Movement Test - (Rods continue to move during performance of the test)
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<b>FAULT STATEMENT:</b>  Rods will continue to move when the step counter reaches 219 steps, candidate is expected to perform the IOA's of AOP-2.1.3.	
<b>6.C</b> Previous step continued with fault.  Using Rod Motion In-Out lever, Insert Control Bank D at least 10 steps, in 5 step increments, into the core..	<b>6.1C</b> Inserts Control Bank D control rods 5 steps in using the In-Out-Hold switch on BB-B.  <b>6.2</b> Verifies Rod insertion ↓ arrow light is – LIT.  <b>6.3</b> Verifies Group Step counters decreasing.  COMMENTS:	
<b>7.C</b> Recognizes control rods are continuously inserting.	<b>7.1</b> Recognizes Control Rods are inserting.  <b>7.2</b> Performs Immediate Operator Actions of AOP-2.1.3, "Unexpected Control Rod movement" and checks Controls Rods in AUTO.  <b>7.3C</b> Places Control Rod Bank selector switch in AUTO.  <b>7.4</b> Candidate recognizes rod movement has stopped.  COMMENTS:	
	<b>EVALUATOR CUE:</b> State "This JPM is complete".	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐

Read:

**INITIAL CONDITIONS:**

The plant is in Mode 1 at 100% power.  
All procedural Initial Conditions are satisfied.

**INITIATING CUE:**

Your supervisor directs you to verify Control Bank 'D' is operable by performing Section VII.B of 2OST-1.1, Control Rod Assembly Partial Movement Test, and report your results to your supervisor.

The test is to be performed with rods in MANUAL, and it is NOT desired to withdraw the Control Rods prior to beginning the test.

☐

At this time, ask the evaluator any questions you have on this JPM.

☐

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐

Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐

After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	<u>Batch To The Refueling Water Storage Tank</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2CR-537</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2CR-537</u>
<u>REVISION NUMBER:</u>	<u>5</u>

### TECHNICAL REFERENCES:

2OM-7.4.O, Makeup to the Refueling Water Storage Tank, Rev. 15

<u>INSTRUCTIONAL SETTING:</u>	Simulator
<u>APPROXIMATE DURATION:</u>	15 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2CR-537

New Revision: 5

Description of Change(s):

1. Corrected Evaluator Note. Changed 1000 to 3000 in note statement.
2. Added 2OM-7.4.O step 15 to JPM step 14.

Reason for Change (s):

1. Corrected to match JPM step 11.1 and Initiating Cue statement.
2. Ease of Evaluator when following along with the student.

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537 JPM REVISION: 5	JPM TITLE: Batch To The Refueling Water Storage Tank
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K/A REFERENCE: 004A4.01 (3.8/3.9) TASK ID: 0071-025-01-013  
004A4.04 (3.2/3.6)  
004A4.07 (3.9/3.7)

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 Minutes	Actual Time:	minutes
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation)			
Comments: _____ _____ _____ _____			
OBSERVERS			
Name/SSN:		Name/SSN:	
Name/SSN:		Name/SSN:	
EVALUATOR			
Evaluator (Print): _____		Date: _____	
Evaluator Signature: _____			

## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Makeup flow to the RWST is initiated AND terminated after discovery of no boric acid flow.

**RECOMMENDED STARTING LOCATION:** Simulator

**INITIAL CONDITIONS:** The Refueling Water Storage Tank level is currently at 717.5". RWST boron concentration is 2500 ppm and Boric Acid Storage Tank concentration is 7500 ppm. The Spent Fuel Pool was being filled from the RWST. This operation has been secured. Annunciator A6-1D, RWST LEVEL OFF NORMAL has alarmed.

**INITIATING CUE:** Your supervisor directs you to batch 3000 gallons of borated water at current RWST boron concentration to the RWST by manual blender operation, at a rate of 75 gpm, in accordance with 2OM-7.4.O, Makeup To The Refueling Water Storage Tank, beginning at step IV.B.4.

**REFERENCES:** 2OM-7.4.O, "Makeup to the Refueling Water Storage Tank", Rev. 15

**TOOLS:** Calculator

**HANDOUT:** 2OM-7.4.O, "Makeup to the Refueling Water Storage Tank" Rev. 15, place kept up to step IV.B.4

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537

JPM REVISION: 5

JPM TITLE: Batch To The Refueling Water Storage Tank

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div> <b>SIMULATOR SETUP:</b>            Verify RWST level set to 717' 5" (ASISRWST = 7.444E6). Update RWST boron concentration placard to 2500 ppm and BA Storage Tank concentration placard to 7500 ppm. Verify LOA BAT6 to open 2CHS*87. Verify 2CHS*79 is overridden in the closed position LOA BAT 004. Set BA &amp; Total Flow totalizers to ZERO and reset. Adjust 2CHS*FCV113A and 2CHS*FCV114A outside the band for the critical step.         </div> <div> <b>EVALUATOR CUE:</b> When candidate is ready to begin JPM, PLACE the simulator in RUN.         </div>	
	START TIME: _____	
1. Reviews procedure.	1.1 Candidate reviews procedure provided.  COMMENTS:	
2.C Place the Boric Acid Makeup Blender Control Switch in STOP.	2.1C Places Boric Acid Blender Makeup Control Switch to STOP.  2.2 Verifies GREEN light – LIT and RED light – NOT LIT.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537 JPM REVISION: 5	JPM TITLE: Batch To The Refueling Water Storage Tank
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Place the Mode Selector Switch in MAN.	3.1C Places Mode Selector Switch in Manual.  COMMENTS:	
4. Verify the following valves are in the closed position. a. 2CHS*FCV113B, Boric Acid Blender Disch To Chg Pumps b. 2CHS*FCV114B, Blender Outlet To Volume Control Tank c. 2CHS*SOV206, Alt Emergency Boration Vlv d. 2CHS*MOV350, Emergency Boration Isol Vlv	4.1 Verifies the following valves are CLOSED: <ul style="list-style-type: none"> <li>• 2CHS*FCV113B</li> <li>• 2CHS*FCV114B</li> <li>• 2CHS*SOV206</li> <li>• 2CHS*MOV350</li> </ul> 4.2 Verifies GREEN lights – LIT and RED lights – NOT LIT.  COMMENTS:	
5. If this section is being performed for testing of the blender, THEN perform the following: (otherwise N/A)	5.1 Candidate N/A's step.  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR NOTE:</b>            If asked, inform the candidate that no testing is being performed.         </div> COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537 JPM REVISION: 5	JPM TITLE: Batch To The Refueling Water Storage Tank
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>6. Determine Boric Acid Flow from the following calculation:</p> $\text{Boric Acid Flow} = \frac{a \times b}{c}$	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR CUE:</b> If asked, inform the candidate that the desired flowrate is 75 gpm. </div> <p>6.1 Calculates boric acid flow:</p> $\frac{2500 \text{ ppm} \times 75 \text{ gpm}}{7500} = 25.0 \text{ gpm} (\pm 1 \text{ gpm})$ <p>COMMENTS:</p>	
<p>7.C Set 2CHS*FCV113A as follows:</p> $\text{Pot Setting} = \frac{\text{Boric Acid Flow}}{4 \text{ gpm}}$	<p>7.1C Calculates and adjusts 2CHS*FCV113A to desired pot setting (625 units).</p> $6.25 (\pm 0.25) = \frac{25.0}{4 \text{ gpm}}$ <p>COMMENTS:</p>	
<p>8. Adjust 2CHS*HIC168, Blender Total Flow Auto Setpoint, to the blender total flow used in Step IV.A.9.</p> $\text{Pot Setting} = \frac{\text{Total Makeup Flow}}{16 \text{ gpm}}$	<p>8.1 Adjusts 2CHS*HIC168 to desired pot setting. (469 units)</p> $4.69 = \frac{75}{16 \text{ gpm}}$ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>EVALUATOR NOTE:</b> A pot setting of 4.6 to 4.8 is acceptable. </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537

JPM REVISION: 5

JPM TITLE: Batch To The Refueling Water Storage Tank

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>9.C Adjust 2CHS*FCV114A pot setting to the blender total flow used in Step IV.A.9.</p> $\text{Pot Setting} = \frac{\text{Total Makeup Flow}}{16 \text{ gpm}}$	<p>9.1C Adjusts 2CHS*FCV114A to desired pot setting. (469 units)</p> $4.69 = \frac{75}{16 \text{ gpm}}$ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR NOTE:</b> A pot setting of 4.6 to 4.8 is acceptable.</p> </div> <p>COMMENTS:</p>	
<p>10.C Set 2CHS-FQIS113, Boric Acid Flow To Blender Flow Totalizer, to the total volume in gallons of boric acid to be added from the following equation:</p> $B.A.Vol = \frac{B.A. Flow}{Total Makeup Flow} \times Total Makeup Vol$	<p>10.1C Adjusts 2CHS-FQIS113 to 1000 (GREEN LED)</p> $1000 = \frac{25 \pm 1}{75 \text{ gpm}} \times 3000$ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR NOTE:</b> If a volume different than 1000 is set, question the intent of the candidate. Some candidates may perform batch additions.</p> </div> <p>10.2C Depresses 2CHS-FQIS113 RESET PB.</p> <p>10.3 Verifies 2CHS-FQIS113 is reading ZERO (RED LED).</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537 JPM REVISION: 5	JPM TITLE: Batch To The Refueling Water Storage Tank
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
11.C Set 2CHS-FQIS168, Total Makeup From Blender Flow Totalizer, to the desired total volume in gallons of makeup to be added.	<p>11.1C Adjusts 2CHS-FQIS168 to 3000 (GREEN LED)</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> If a volume different than 3000 is set, question the intent of the candidate. Some candidates may perform batch additions.</p> </div> <p>11.2C Depresses 2CHS-FQIS168 RESET PB.</p> <p>11.3 Verifies 2CHS-FQIS168 is reading ZERO (RED LED).</p> <p>COMMENTS:</p>	
<p>12. Record the following information into the Narrative Log:</p> <p>Total Makeup + Total Makeup From Blender Flow Totalizer = Total</p>	<p>12.1 Indicates the values to be recorded in the Narrative Log.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Inform the Candidate that another operator will make the log entry.</p> </div> <p>COMMENTS:</p>	
13. Establish communications with an operator at the blender room (Aux. Bldg. 710')	<p>13.1 Uses page party to contact local operator in the blender room.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Role-play local operator and inform the Candidate that you are standing by in the blender room.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537 JPM REVISION: 5	JPM TITLE: Batch To The Refueling Water Storage Tank
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
14. IF in MODE 4, 5 or 6, align PG water to the blender by unlocking and opening ONE of the following valves: (Aux Bldg. 710') Otherwise N/A	14.1 Plant is not in Mode 4, 5, or 6. This step is N/A.  COMMENTS:	
15.C Open the following valves: (Aux. Bldg. Blender Rm, 710')  a. 2CHS*87, Blender To Refueling Cavity Isolation  b. 2CHS*89, Blender To RWST Isolation	15.1C Directs local operator to OPEN 2CHS*87 and 2CHS*89.  <div><b>EVALUATOR CUE:</b> Role-play local operator and report that 2CHS*87 and 2CHS*89 are OPEN.</div> <div><b>BOOTH OPERATOR CUE:</b> OPEN 2CHS-87 when directed. (LOA-BAT006)</div> COMMENTS:	
16.C To initiate makeup, place the Boric Acid Makeup Blender Control Switch to START.	16.1C Places Boric Acid Makeup Control Switch in Start.  16.2 Verifies RED light – LIT and GREEN light – NOT LIT.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-537 JPM REVISION: 5	JPM TITLE: Batch To The Refueling Water Storage Tank
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <b>FAULT STATEMENT</b>             2CHS*79 is failed closed. In the next step, Boric acid flow will be zero with total flow indicating 75 gpm.         </div>	
17.C Verify expected flows for the following parameters are being recorded at 2CHS-FR113, Boric Acid To Blender Total M/U Flow From Blender:  a. Boric Acid To Blender (red pen)  b. Total M/U Flow From Blender (green pen)	17.1 Locates 2CHS-FR113 and verifies boric acid flow and total makeup flow.  17.2C Takes action to terminate dilution by placing Boric Acid Makeup Control Switch to STOP prior to exceeding a dilution >100 gallons.  17.3 Verifies GREEN light – LIT and RED light – NOT LIT.  17.4 Verifies boric acid flow and total makeup flow on 2CHS-FR113 indicates zero gpm.  COMMENTS:	
	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <b>EVALUATOR CUE:</b> State “This JPM is complete”.         </div>	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

**INITIAL CONDITIONS:** The Refueling Water Storage Tank level is currently at 717.5". RWST boron concentration is 2500 ppm and Boric Acid Storage Tank concentration is 7500 ppm. The Spent Fuel Pool was being filled from the RWST. This operation has been secured. Annunciator A6-1D, RWST LEVEL OFF NORMAL has alarmed.

**INITIATING CUE:** Your supervisor directs you to batch 3000 gallons of borated water at current RWST boron concentration to the RWST by manual blender operation, at a rate of 75 gpm, in accordance with 2OM-7.4.O, Makeup To The Refueling Water Storage Tank, beginning at step IV.B.4.

- ☐ At this time, ask the evaluator any questions you have on this JPM.
- ☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".
- ☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.
- ☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	<u>Perform QPTR Alarm Test</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2CR-144</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2CR-144</u>
<u>REVISION NUMBER:</u>	<u>2</u>

### TECHNICAL REFERENCES:

2OST-2.4, "QPTR Alarm Check", Rev 11

<u>INSTRUCTIONAL SETTING:</u>	Simulator
<u>APPROXIMATE DURATION:</u>	20 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

## OPERATIONS JOB PERFORMANCE MEASURE

## JPM CHANGE SUMMARY

Affected JPM: 2CR-144
New Revision: 2
Description of Change(s):  1. Procedure revision. 2. JPM formatting, changed channel to test.
Reason for Change (s):  1. 2OST-2.4 was revised. 2. ADM-1301 was deleted, and replaced by BVPS-TR-0026.



OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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K/A REFERENCE: 015 A1.04 3.5/3.7 TASK ID: 0021-016-06-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☐ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 20 Minutes	Actual Time:	minutes
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation) Comments: _____ _____ _____ _____			
OBSERVERS			
Name/SSN:		Name/SSN:	
Name/SSN:		Name/SSN:	
EVALUATOR			
Evaluator (Print): _____		Date: _____	
Evaluator Signature: _____			

## OPERATIONS JOB PERFORMANCE MEASURE

### EVALUATOR DIRECTION SHEET

**TASK STANDARD:** Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT" verified operable **AND** QPTR is calculated to be between 0.9438 and 1.0390.

**RECOMMENDED STARTING LOCATION:** Simulator

**INITIAL CONDITIONS:**

- The plant is at 52% equilibrium power
- All systems are in normal system alignment
- The PCS AFD Monitor is INOPERABLE

**INITIATING CUE:** Your supervisor directs you to perform a QPTR Alarm Check for **N43 ONLY** IAW 2OST-2.4, 'QPTR Alarm Check', step VII.D. All initial conditions and Test preparations have **ALREADY** been completed.

**REFERENCES:** 2OST-2.4, "QPTR Alarm Check", Rev. 11

**TOOLS:** Calculator

**HANDOUT:** 2OST-2.4, "QPTR Alarm Check", Rev. 11 filled out up to step VII.D. Include Normalization Factors on All Data Sheets.

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div> <b>SIMULATOR SETUP:</b>            ≥ 50% Steady State Power.            Record Normalization factors on applicable OST data sheets.         </div>	
	START TIME: _____	
1. Reviews 2OST-2.4, "QPTR Alarm Check".	<div> <b>EVALUATOR NOTE:</b> Provide candidate a copy of 2OST-2.4, "QPTR Alarm Check", Rev. 11 filled out up to step VII.D.         </div> <p>1.1 Reviews provided procedure 2OST-2.4.</p> <p>COMMENTS:</p>	
2. Checks the following status lights are OFF: (Status Panel 308)  A-18, "RCS LOOP A OTΔT RUNBACK" B-18, "RCS LOOP B OTΔT RUNBACK" C-18, "RCS LOOP C OTΔT RUNBACK" A-20, "RCS LOOP A OTΔT RX TRIP" B-20, "RCS LOOP B OTΔT RX TRIP" C-20, "RCS LOOP C OTΔT RX TRIP"	<p>2.1 Checks the following status lights on Panel 308 are - NOT LIT:</p> <ul style="list-style-type: none"> <li>A-18, "RCS LOOP A OTΔT RUNBACK"</li> <li>B-18, "RCS LOOP B OTΔT RUNBACK"</li> <li>C-18, "RCS LOOP C OTΔT RUNBACK"</li> <li>A-20, "RCS LOOP A OTΔT RX TRIP"</li> <li>B-20, "RCS LOOP B OTΔT RX TRIP"</li> <li>C-20, "RCS LOOP C OTΔT RX TRIP"</li> </ul> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>3. Notify the SM/US to make an entry in the Narrative Log that the QPTR Alarm Check using Channel PRN43 is commencing AND Record the time of entry into T.S. 3.3.1:</p> <p>Time of entry into T.S. 3.3.1, Table 3.3.1-1, Function 2.a, 2.b, 3, 6, 17.c, 17.d, 17.e: _____.</p>	<p>3.1 Notifies the SM/US to make an entry in the Narrative Log that the QPTR Alarm Check using Channel PRN43 is commencing.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR CUE:</b> Role-play the SM/US and acknowledge the report.</p> </div> <p>3.2 Records time of entry into T.S. 3.3.1.</p> <p>COMMENTS:</p>	
<p>4. Remove the PRN-43 input from the PCS AFD Monitor Program by performing Attachment A, "Removing A Single Power Range Channel Input From The PCS AFD Monitor Program", Part A, for PRN43. (N/A if PCS AFD Monitor is inoperable)</p>	<p>4.1 This step is N/A.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR NOTE:</b> PCS AFD Monitor Program is INOPERABLE per the initial conditions.</p> </div> <p>COMMENTS:</p>	
<p>5.C Place Power Range Channel N43 in the test configuration as follows:</p> <p>Place the PRN43 Operation Selector Switch in DET A&amp;B. (N-43 Power Range B Drawer)</p>	<p>5.1C Rotates PRN43 Operation Selector Switch Clockwise to the DET A&amp;B position.</p> <p>COMMENTS:</p>	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>6. Check "CHANNEL ON TEST" Drawer Status Light is ON.</p> <p>Check Annunciator A4-6H, "NIS CHANNEL ON TEST" is ON.</p>	<p>6.1 Checks "CHANNEL ON TEST" Drawer Status Light - LIT.</p> <p>6.2 Checks Annunciator A4-6H, "NIS CHANNEL ON TEST" - LIT.</p> <p>COMMENTS:</p>	
<p>7. Check the following</p> <p>"UPPER SECTION DEVIATION" AND "LOWER SECTION DEVIATION" Drawer Status Lights are OFF. (Misc. Control And Indication Panel)</p> <p>Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT", is OFF.</p> <p>PCS Points Y0136D, "PR LOWER DET DEV/AUTO DEFEAT" AND Y0137D, "PR UPPER DET DEV/AUTO DEFEAT", indicate NORMAL.</p>	<p>7.1 Checks:</p> <ul style="list-style-type: none"> <li>• "UPPER SECTION DEVIATION" AND "LOWER SECTION DEVIATION" Drawer Status Lights – NOT LIT.</li> <li>• Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT" Lights – NOT LIT.</li> <li>• PCS Point Y0136D, "PR LOWER DET DEV/AUTO DEFEAT" indicates NORMAL. (Selects Group Trends/Group List/OST 2.4)</li> <li>• PCS Point Y0137D, "PR UPPER DET DEV/AUTO DEFEAT", indicates NORMAL.</li> </ul> <p>COMMENTS:</p>	
<p>8.C Record the upper and lower detector current meter indications for Power Range Channels PRN41, PRN42 and PRN44 on Data Sheet 1.</p>	<p>8.1C In the space provided on Data Sheet 1, records the upper and lower detector current meter indications for Power Range Channels PRN41, PRN42 and PRN44.</p> <p>COMMENTS:</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>9.C Perform the test using the Power Range Channel N43 Upper Detector as follows:</p> <p>Turn PRN43 Detector A Test Signal Potentiometer clockwise until the "UPPER SECTION DEVIATION" Drawer Status Light is ON.</p>	<p>9.1C Slowly rotates PRN43 Detector A Test Signal Potentiometer clockwise until the "UPPER SECTION DEVIATION" Drawer Status Light is - LIT.</p> <p>COMMENTS:</p>	
<p>10. Check the following:</p> <ul style="list-style-type: none"> <li>Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT", is ON.</li> <li>PCS Point Y0137D, "PR UPPER DET DEV/AUTO DEFEAT", indicates ALARM.</li> </ul>	<p>10.1 Checks:</p> <ul style="list-style-type: none"> <li>Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT" Lights – LIT.</li> <li>PCS Point Y0137D, "PR UPPER DET DEV/AUTO DEFEAT", indicates ALARM.</li> </ul> <p>COMMENTS:</p>	
<p>11.C Record the PRN43 Detector A current indication when the Status Light turns ON:</p> <p>Detector A Current N43 Power Range B Drawer _____ microamperes</p>	<p>11.1C In the space provided in step 6 of the OST, records the PRN43 Detector A current indication when the Status Light turned ON.</p> <p>COMMENTS:</p>	

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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
12.C Turn the Test Signal Potentiometer fully counterclockwise.	12.1C Slowly rotates PRN43 Detector A Test Signal Potentiometer fully counterclockwise.  COMMENTS:	
13. Check the following: <ul style="list-style-type: none"> <li>• “Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT", is OFF.</li> <li>• “UPPER SECTION DEVIATION" Drawer Status Lights is OFF.</li> <li>• PCS Point Y0137D, " indicates NORMAL</li> </ul>	13. Checks: <ul style="list-style-type: none"> <li>• Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT" Lights – NOT LIT.</li> <li>• “UPPER SECTION DEVIATION" Drawer Status Light – NOT LIT.</li> <li>• PCS Point Y0137D, "PR UPPER DET DEV/AUTO DEFEAT", indicates NORMAL.</li> </ul> COMMENTS:	
14.C Perform the test using the Power Range Channel N43 Lower Detector as follows:  Turn PRN43 Detector B Test Signal Potentiometer clockwise until the "LOWER SECTION DEVIATION" Drawer Status Light is ON.	14.1C Slowly rotates PRN43 Detector B Test Signal Potentiometer clockwise until the "LOWER SECTION DEVIATION" Drawer Status Light - LIT.  COMMENTS:	

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JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>15. Check the following:</p> <ul style="list-style-type: none"> <li>Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT", is ON.</li> <li>PCS Point Y0136D, "PR LOWER DET DEV/AUTO DEFEAT", indicates ALARM.</li> </ul>	<p>15.1 Checks:</p> <ul style="list-style-type: none"> <li>Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT" Lights – LIT.</li> <li>PCS Point Y0136D, "PR LOWER DET DEV/AUTO DEFEAT" indicates ALARM.</li> </ul> <p>COMMENTS:</p>	
<p>16.C Record the PRN43 Detector B current indication when the Status Light turns ON:</p> <p>Detector B Current N43 Power Range B Drawer _____ microamperes</p>	<p>16.1C In the space provided in step 7 of the OST, records the PRN43 Detector B current indication when the Status Light turned ON.</p> <p>COMMENTS:</p>	
<p>17.C Turn the Test Signal Potentiometer fully counterclockwise.</p>	<p>17.1C Slowly rotates PRN43 Detector B Test Signal Potentiometer fully counterclockwise.</p> <p>COMMENTS:</p>	



# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>18. Check the following</p> <ul style="list-style-type: none"> <li>• “Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT", is OFF.</li> <li>• “LOWER SECTION DEVIATION" Drawer Status Lights is OFF.</li> <li>• PCS Points Y0136D, " indicate NORMAL</li> </ul>	<p>18.1 Checks:</p> <ul style="list-style-type: none"> <li>• Annunciator A4-5H, "POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT" Lights – NOT LIT.</li> <li>• “LOWER SECTION DEVIATION" Drawer Status Light – NOT LIT.</li> <li>• PCS Point Y0136D, "PR LOWER DET DEV/AUTO DEFEAT", indicates NORMAL.</li> </ul> <p>COMMENTS:</p>	
<p>19.C Restore Power Range Channel N43 from the test configuration as follows: Place the PRN43 Operation Selector Switch in NORMAL.</p>	<p>19.1C Rotates the PRN43 Operation Selector Switch counterclockwise to the NORMAL.</p> <p>19.2 Requests second verification.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR CUE:</b> Role-play the Unit Supervisor and acknowledge the request. Report second verification completed SAT.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>20. Check "CHANNEL ON TEST" Drawer Status Light is OFF.</p> <p>Check Annunciator A4-6H, "NIS CHANNEL ON TEST" is OFF.</p>	<p>20.1 Checks "CHANNEL ON TEST" Drawer Status Light – NOT LIT.</p> <p>20.2 Checks Annunciator A4-6H, "NIS CHANNEL ON TEST" – NOT LIT.</p> <p>COMMENTS:</p>	
<p>21. Restore the PRN43 input to the PCS AFD Monitor Program by performing Attachment A, "Removing A Single Power Range Channel Input From the PCS AFD Monitor Program", Part B, for PRN43. (N/A if PCS AFD Monitor is inoperable)</p>	<p>21.1 This step is N/A.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR NOTE:</b> PCS AFD Monitor Program is INOPERABLE per initial conditions.</p> </div> <p>COMMENTS:</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-144 JPM REVISION: 2	JPM TITLE: Perform QPTR Alarm Test
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
22.C Transfer the PRN43 recorded values AND Complete Data Sheet 1.	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR CUE:</b>            If subsequent JPM's are to be performed, escort the candidate to a secure location to complete the calculation portion of this JPM.         </div> <p>22.1 Transfers the PRN43 values recorded in steps 6 and 7 of the OST to Data Sheet 1.</p> <p>22.2C Completes Data Sheet 1.</p> <p>22.3 Requests second verification of calculations and Normalization factors.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR CUE:</b>            Role-play the Unit Supervisor and acknowledge the request.         </div> <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b>            Evaluator discretion is required for the grading of the QPTR calculation. Refer to attached answer key for the calculations required in Data Sheet 3. The expected reading for Channels N-41, N-42 and N-44 should be within (+/-) 5 <math>\mu</math> amps of the answer key. Channel N-43 reading should be within (+/-) 5 <math>\mu</math> amps of 135 <math>\mu</math> amps, allowing for potentiometer response variances.         </div> <p>COMMENTS:</p>	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            State "This JPM is complete".         </div>	
	STOP TIME: _____	

UPPER DETECTORS				tilt
	<i>i(uncorr)</i>	<i>factor</i>	<i>i(corr)</i>	<i>ratio</i>
N41	135.00	0.0409	5.521500	
N42	132.00	0.0403	5.319600	
N43	135.00	0.0389	5.251500	0.9712
N44	136.00	0.0407	5.535200	
SUM			21.627800	
AVERAGE			5.406950	

Factor, I Corr and Tilt  
Ratio are all "C" steps

Sum is "C" Step  
AVG is "C" Step

LOWER DET				tilt
	<i>i(uncorr)</i>	<i>factor</i>	<i>i(corr)</i>	<i>ratio</i>
N41	135.00	0.0400	5.400000	
N42	135.00	0.0406	5.481000	
N43	139.00	0.0397	5.518300	1.0120
N44	137.00	0.0395	5.411500	
SUM			21.810800	
AVERAGE			5.452700	

Factor, I Corr and Tilt  
Ratio are all "C" steps

Sum is "C" Step  
AVG is "C" Step

Upper QPTR for the Channel Tested is:

Det Curr	Mult By	Norm Factor	Divided By	AVG	eq	QPTR
135.000	X	0.0389	/	5.406950		0.9712

Lower QPTR for the Channel Tested is:

Det Curr	Mult By	Norm Factor	Divided By	AVG	eq	QPTR
139.000	X	0.0397	/	5.452700		1.0120

Expected range is 135 +/- 5      130 to 140

JPM	Upper	Data	QPTR	SIM IC
Expected	Lower	135.00	0.9712	174
		139.00	1.0120	

LOW	Upper	Data	QPTR	RANGE
	Lower	130.00	0.9438	LOW
		134.00	0.9846	

HIGH	Upper	Data	QPTR	
	Lower	140.00	0.9982	
		144.00	1.0390	HIGH

# ANSWER KEY

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐

Read:

### **INITIAL CONDITIONS:**

- The plant is at 52% equilibrium power
- All systems are in normal system alignment
- The PCS AFD Monitor is INOPERABLE

### **INITIATING CUE:**

Your supervisor directs you to perform a QPTR Alarm Check for **N43 ONLY** IAW 2OST-2.4, 'QPTR Alarm Check', step VII.D. All initial conditions and Test preparations have **ALREADY** been completed.

☐

At this time, ask the evaluator any questions you have on this JPM.

☐

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐

Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐

After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

REVISION NUMBER: 0

APPROVED FOR USE: \_\_\_\_\_  
Training Supervisor or Designee Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2CR-661
New Revision: 0
Description of Change(s):  Original Issue
Reason for Change (s):

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-661 JPM REVISION: 0	JPM TITLE: Respond to Containment Air Recirculation Fan High Vibration Alarm
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K/A REFERENCE: 022 A4.01 3.6/3.6 TASK ID: 0443-001-01-013  
0443-017-04-012

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:
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Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 Minutes	Actual Time: minutes
---	---------------------------	----------------------

JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_



## OPERATIONS JOB PERFORMANCE MEASURE

### EVALUATOR DIRECTION SHEET

TASK STANDARD:	Manually Trip Containment Air Recirc Fan 2HVR*FN201C when the vibration High alarm is received, and start the standby Containment Air Recirc Fan 2HVR*FN201B in accordance with 2OM-44C.4.D.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	The plant has been operating at 100% power for 3 months. No equipment is out of service.
INITIATING CUE:	Your supervisor directs you to respond to annunciator(s) on the Building Service Control Panel (BSP).
REFERENCES:	2OM-44C.4.AAD, Containment Air Recirc Fan Vibration High, Rev. 4 2OM-44C.4.D, Containment Air Recirculation System Startup, Rev. 17
TOOLS:	Pictures of CAR Fan Vibration Panel and monitor (for simulation purposes) located at the back of this JPM.
HANDOUT:	<b>Have copies available to replace simulator copy, if necessary.</b> 2OM-44C.4.AAD, Containment Air Recirc Fan Vibration High, Rev. 4 2OM-44C.4.D, Containment Air Recirculation System Startup, Rev. 17

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-661 JPM REVISION: 0	JPM TITLE: Respond to Containment Air Recirculation Fan High Vibration Alarm
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p><b>SIMULATOR SETUP:</b></p> <p>100% power IC 2HVR*FN201A and 2HVR*FN201C (on 480V Bus 2P) operating.</p> <p>To alarm A11-6H for 2HVR*FN201C 30 sec after run:</p> <ul style="list-style-type: none"> <li>• IMF BST-MSC060 (0 30) 0</li> <li>• IMF BST-MSC061 (0 30) 0</li> </ul> <p>To remove A11-6H:</p> <ul style="list-style-type: none"> <li>• SET TRG 5 = xbso086d OFF</li> <li>• DMF BST-MSC060 (5 45) 0</li> <li>• DMF BST-MSC061 (5 45) 0</li> </ul> <p><b>EVALUATOR NOTE:</b> A11-6H will alarm ~30 seconds after simulator is taken to RUN.</p>	
	START TIME: _____	
1. Acknowledges annunciator A11-6H, Containment Air Recirc Fan Vibration High.	1.1 Acknowledges annunciator A11-6H.  COMMENTS:	
	<p><b>FAULT STATEMENT:</b> 2HVR*FN201C, 'C' Containment Air Recirc Fan does not auto trip as designed, therefore the Operator will have to manually trip the fan.</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-661 JPM REVISION: 0	JPM TITLE: Respond to Containment Air Recirculation Fan High Vibration Alarm
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
2. Reviews alarm response procedure.	2.1 Reviews 2OM-44C.4.AAD, Containment Air Recirc Fan Vibration High.  COMMENTS:	
3.C Monitor vibration on Load Program Control Panel [2LPCP] in the Control Room.  If vibration exceeds trip setpoint of 0.45 in/sec, ensure fan has tripped, OR trip fan, (2BSC).	<div> <b>EVALUATOR NOTE:</b>            Load Program Control Panel [2LPCP] is not in the Unit 2 Simulator. Role Play as required using pictures.         </div> <p>3.1. Monitors vibration on Load Program Control Panel [2LPCP] in the Control Room.</p> <div> <b>EVALUATOR CUE:</b>            Role Play using Pictures 1 &amp; 2. (2HVR*FN201C vibration indicates 0.52 in/sec.)         </div> <p>3.2 Recognizes that the 2HVR*FN201C has not tripped.</p> <p>3.3C Places 2HVR*FN201C CS to STOP or PTL.</p> <p>3.4 Verifies WHITE light – LIT and RED light – NOT LIT.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-661	JPM TITLE: Respond to Containment Air Recirculation Fan High
JPM REVISION: 0	Vibration Alarm

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            If required, Role Play the Unit Supervisor and direct the starting of 2HVR*FN201B.         </div>	
4. To start standby recirc fan refer to 2OM-44C.4.D, "Containment Air Recirculation System Start-Up".	4.1 Reviews 2OM-44C.4.D, "Containment Air Recirculation System Start-Up".  COMMENTS:	
5. If in Modes 5 or 6 AND an alternate supply to Containment Air Cooling Coils is desired, Perform the following:	5.1 Step is N/A. Plant is in Mode 1.  COMMENTS:	
6. If desired for current plant conditions, Open [2SWS*AOV110A(110B)(110C)] Containment Air Recirculation Cooling Coils Cooling Water Isolation Valves (Benchboard-Section A).	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            Role Play the Unit Supervisor and state that it is desired to align cooling water to the cooling coils.         </div> 6.1C Places CS for 2SWS*AOV110B to OPEN. 6.2 Verifies RED light – LIT and GREEN light – NOT LIT. 6.3 Places CS for 2SWS*AOV110C to CLOSE. 6.4 Verifies GREEN light – LIT and RED light – NOT LIT.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-661 JPM REVISION: 0		JPM TITLE: Respond to Containment Air Recirculation Fan High Vibration Alarm	
STEP ( "C" Denotes CRITICAL STEP )		STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
7. Start [2HVR*FN201A] Containment Air Recirculation Fan (2BSC, Red light illuminated.) as follows:		7.1 This step is N/A. 2HVR*FN201A, ‘A’ Containment Air Recirc Fan is RUNNING.  COMMENTS:	
8.C Start [2HVR*FN201B] Containment Air Recirculation Fan (2BSC, Red light illuminated.) as follows:  Defeat Hi Vibration Trip by Depressing AND Releasing the green “PUSH TO INITIATE STARTUP DELAY” pushbutton on [2HVR-NBI101B]. (Inside [PNL-2GENLPC]).  1) Verify Red light is ON (Startup Delay – active when lit).		8.1C Defeat Hi Vibration Trip by Depressing AND Releasing the GREEN “PUSH TO INITIATE STARTUP DELAY” pushbutton on 2HVR-NBI101B. <div><b>EVALUATOR CUE:</b> Role play using Picture 3. Have candidate indicate the “Push to initiate Startup Delay” pushbutton has been depressed.</div> 8.2 Verifies RED light is ON. <div><b>EVALUATOR CUE:</b> Role play using Picture 4 OR state “RED light is LIT”</div> COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-661	JPM TITLE: Respond to Containment Air Recirculation Fan High
JPM REVISION: 0	Vibration Alarm

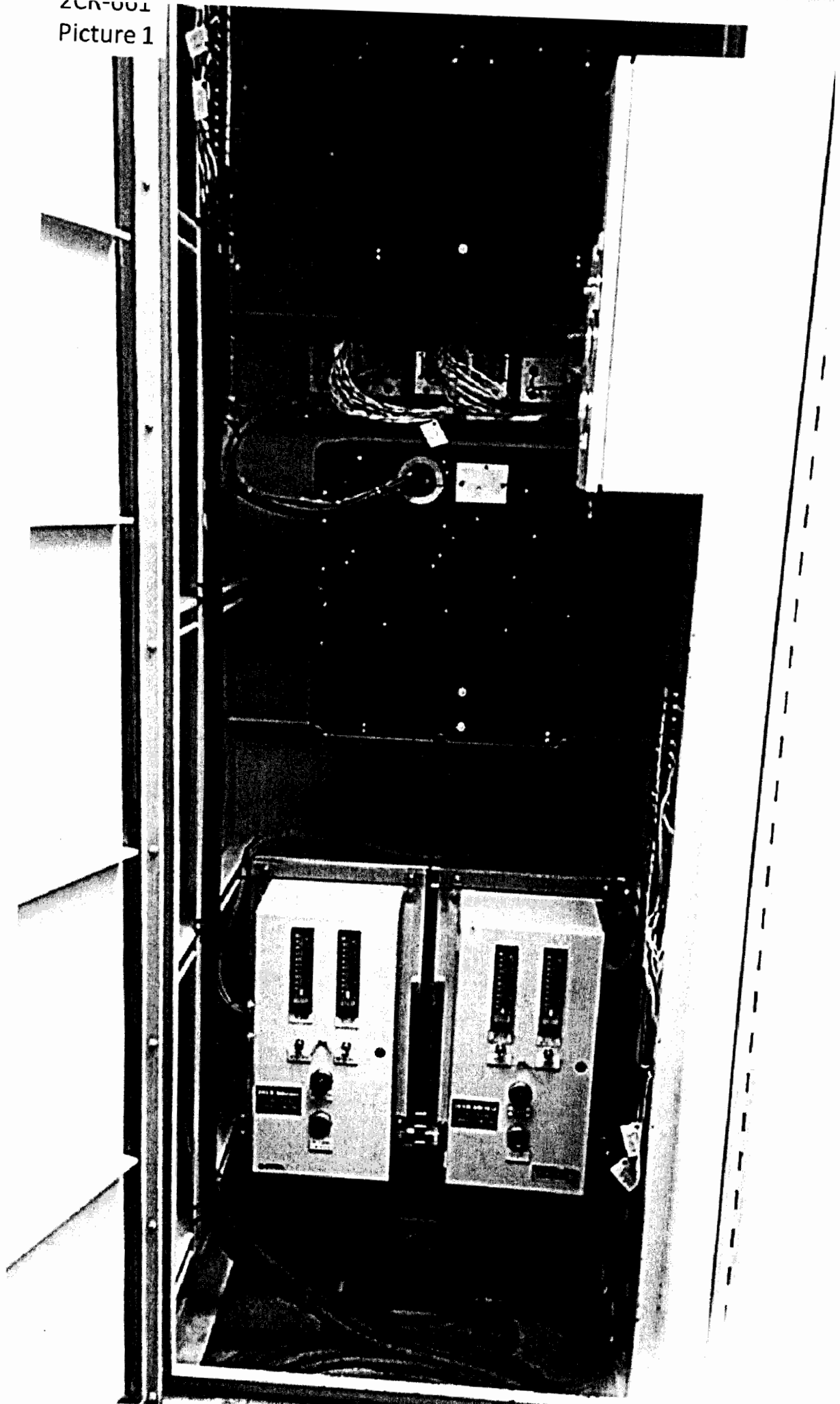
STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p><b>9.C</b> Start [2HVR*FN201B], Containment Air Recirculation Fan.</p> <p>1) Independently Verify that the control switch for [2HVR*FN201B], Containment Air Recirculation Fan, is in AUTO (spring return to AUTO switch) AND Document in the Narrative Log.</p> <p>2) Verify Red light is off after two minutes.</p>	<p>9.1C Places CS for 2HVR*FN201B to START.</p> <p>9.2 Verifies RED light – LIT and WHITE light – NOT LIT.</p> <p>9.3 Request Independent verification of CS in AUTO, and log entry made.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR CUE:</b> Role play as BOP Operator and report 2HVR*FN201B CS is in AUTO, and log entry was completed.</p> </div> <p>9.4 Verifies status of Startup Delay RED light.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR CUE:</b> After 2 minutes, role play using Picture 3 OR state “RED light is NOT LIT”.</p> </div> <p>COMMENTS:</p>	
<p><b>10.</b> Monitor [2SWS-TI132B] Containment Air Recirculation Cooling Coils Outlet Temperature (Vertical Board-Section A) AND Chilled Water Supply Temperature, (computer point [T0101A]) to verify the air recirculation unit is producing a differential temperature, indicating that heat is being removed.</p>	<p>10.1 Monitors CNMT AIR RECIRC COOLER TEMP, 2SWS-TI132B.</p> <p>10.2 Monitors computer point T0101A, Chilled Water Supply Temperature.</p> <p>10.3 Determines differential temperature, indicating that heat is being removed from the ‘B’ CAR Cooling Coils.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-661 JPM REVISION: 0	JPM TITLE: Respond to Containment Air Recirculation Fan High Vibration Alarm
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<b>EVALUATOR CUE:</b> When it is determined that the 'B' CAR fan is cooling, state JPM is complete.	
	STOP TIME: _____	

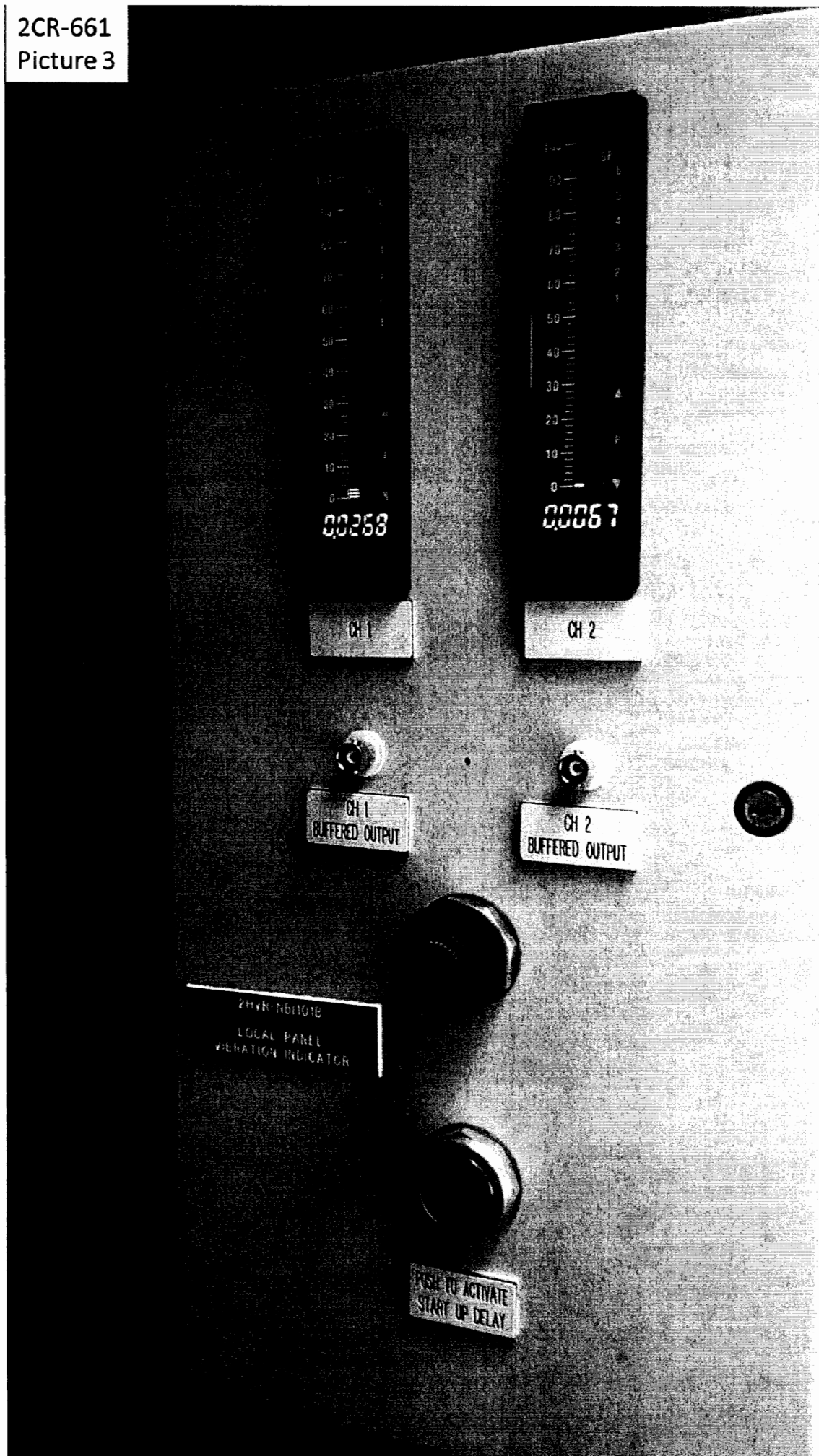
ZCR-001  
Picture 1



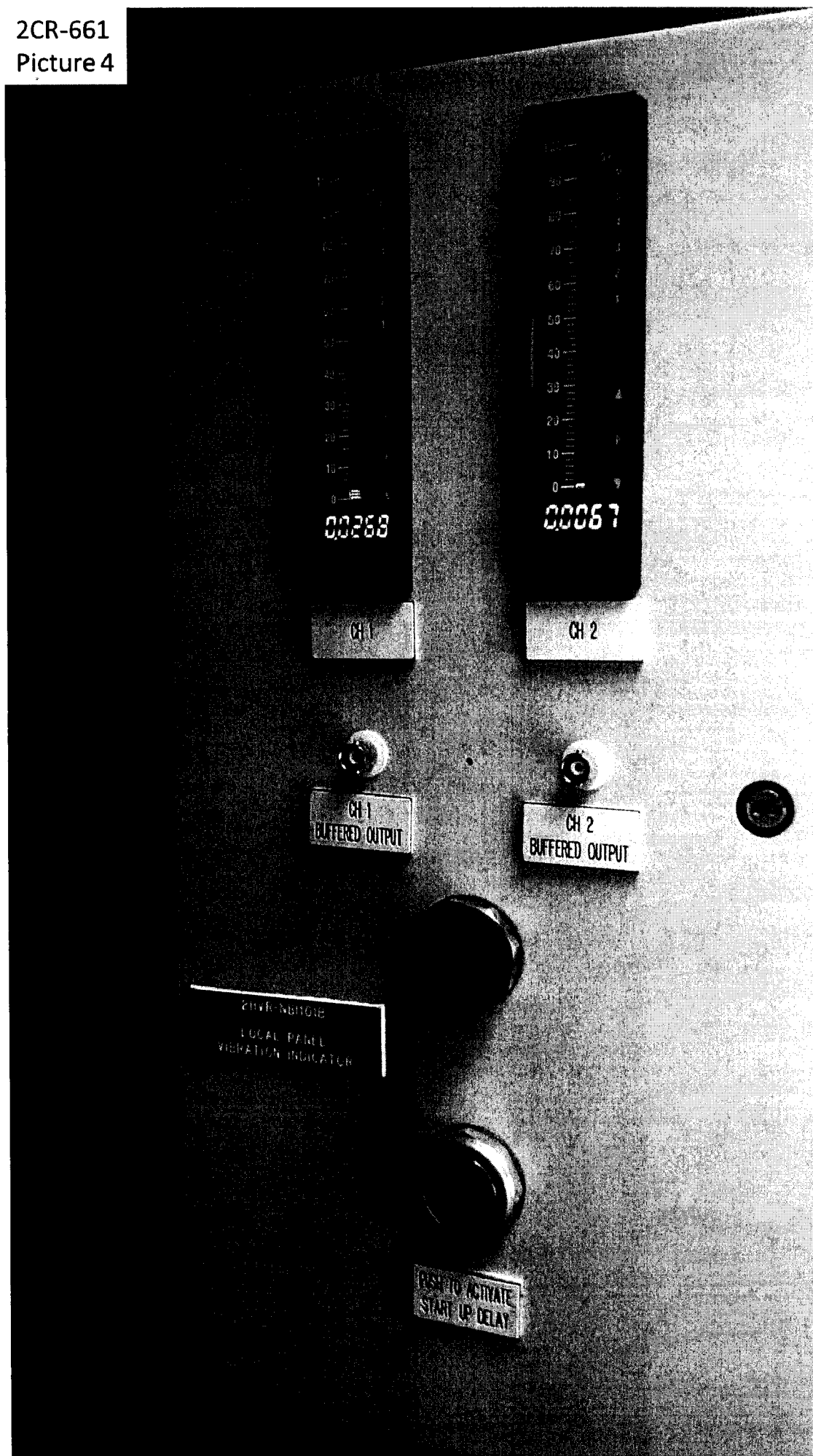


2CR-661  
Picture 2





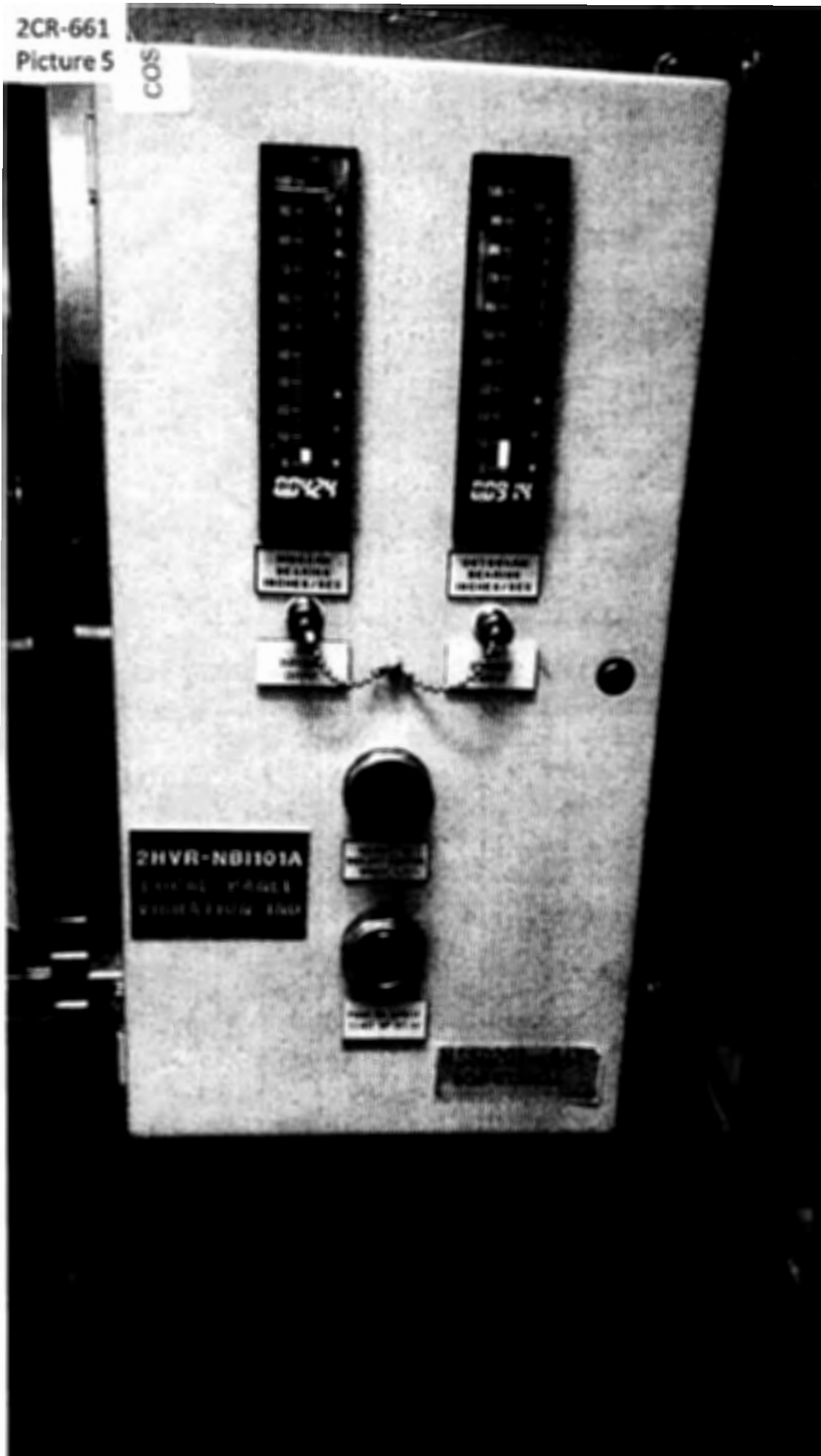
2CR-661  
Picture 4



2CR-661

Picture 5

CO2



## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

**INITIAL CONDITIONS:** The plant has been operating at 100% power for 3 months.  
No equipment is out of service.

**INITIATING CUE:** Your supervisor directs you to respond to annunciator(s) on the  
Building Service Control Panel (BSP).

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	<u>Perform a Hot Bus Transfer</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2CR-523</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2CR-523</u>
<u>REVISION NUMBER:</u>	<u>3</u>

### TECHNICAL REFERENCES:

2OM-36.4.C, "Transferring 4KV System From US Serv Tfmr To SS Serv Tfmr", Rev 14  
2OM-36.4.AAS, "SYS STA Serv Tfmr 2A/2B Thermal Overload", Issue 1, Rev. 3  
2OM-36.4.B, "Transferring 4KV System From SS Serv Tfmr To US Serv Tfmr", Rev 10

<u>INSTRUCTIONAL SETTING:</u>	Simulator
<u>APPROXIMATE DURATION:</u>	15 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2CR-523
New Revision: 3
Description of Change(s):  1. Updated for procedure revision with step addition.
Reason for Change (s):  1. 2OM-36.4.C was revised to rev. 14

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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K/A REFERENCE: 062K1.04 3.7/4.2 TASK ID: 0361-013-01-013  
062A4.01 3.3/3.1 0361-031-04-013  
062A2.01 3.4/3.9

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS

Performer Name:	Performer SSN:
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Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 Minutes	Actual Time: minutes
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JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_



## OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** 4KV Bus 2B is transferred from USST 2C to SSST 2A. After receipt of SYS STA SERV TFMR 2A/2B Thermal Overload Fault, 4KV Bus 2B is transferred from SSST 2A to USST 2C.

**RECOMMENDED  
STARTING LOCATION:** Simulator

**INITIAL CONDITIONS:**

- The plant is in Mode 1 with all systems in NSA.
- It is desired to place 4KV Bus 2B on offsite power to allow for a relay check on ACB-142C.

**INITIATING CUE:** Your supervisor directs you to transfer the 4KV Bus 2B to SSST 2A in accordance with 2OM-36.4.C, "Transferring 4KV System From US Serv Tfmr To SS Serv Tfmr". Do **NOT** set up for auto transfer back to USST 2C.

**REFERENCES:**

2OM-36.4.C, "Transferring 4KV System From US Serv Tfmr To SS Serv Tfmr", Rev 14  
2OM-36.4.AAS, "SYS STA Serv Tfmr 2A/2B Thermal Overload", Issue 1, Rev. 3  
2OM-36.4.B, "Transferring 4KV System From SS Serv Tfmr To US Serv Tfmr", Rev 10

**TOOLS:** None

**HANDOUT:** 2OM-36.4.C, "Transferring 4KV System From US Serv Tfmr To SS Serv Tfmr", Rev 14

**Have spare copies available to replace the following procedures:**

2OM-36.4.AAS, "SYS STA Serv Tfmr 2A/2B Thermal Overload", Issue 1, Rev. 3  
2OM-36.4.B, "Transferring 4KV System From SS Serv Tfmr To US Serv Tfmr", Rev 10

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p><b>SIMULATOR SETUP:</b>  Initialize to an IC Set with all systems in NSA.  Set Trigger 1 to annunciate A7-8D SS SERV TFMR  2A/2B Thermal Overload when Live Bus Transfer  Switch is taken to OFF after ACB 142A is closed.  Use Event Trigger 1:  Enter xc4o020r == 1 &amp;&amp; xc4I014n == 0.  Enter command: IMF A7-8D-T2806D on Trigger 1</p> <p><b>Note:</b> xc4o020r is the red lamp for ACB142A and  xc4I014n is the live bus transfer switch.</p> <p><b>EVALUATOR NOTE:</b> Provide the candidate a non  place kept copy of 2OM-36.4.C. When candidate is  ready to begin, ENSURE the simulator in RUN.  Following JPM performance, replace 2OM-36.4.AAS  and 2OM-36.4.B procedures which will be used during  this JPM.</p>	
	START TIME: _____	
1. Reviews the copy of 2OM-36.4.C, "Transferring 4KV System From US Serv Tfmr To SS Serv Tfmr", provided.	1.1 Reviews 2OM-36.4.C.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>2. Verify voltages on the 4KV Busses and SSSTs are approximately the same on all phases as follows:</p> <p>a. Places the 2A SS Serv Tfmr Voltmeter Phase selector switch to each of the phases of Bus 2A &amp; 2B and compares the values on the 4KV Common Volt meter to the same phase values on the 4KV Bus 2A &amp; 2B Volt meters when 4KV Bus 2A &amp; 2B Voltmeter Phase Selector switches are selected to each phase.</p> <p>b. Perform Data Sheet 1 to check for an open primary circuit on SSST-2A.</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR NOTE:</b> Candidate needs to check only Bus 2B since the other Busses will NOT be transferred for this JPM.         </div> <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> The values specified in step 2.2 are identified in the note preceding the procedure step.         </div>	
	<p>2.1 Locates the 4KV Common Voltmeter, KV Bus 2B Voltmeter, and 2A SS Serv Tfmr Voltmeter Phase Selector Switch.</p> <p>2.2 Checks all phases and verifies SSST 2A voltage is 0 to 2.0 volts higher than Bus 2B voltage, and the unloaded transformer secondary is between 122 volts and 126.5 volts.</p> <p>2.3 Records voltages on Data Sheet 1.</p> <p>COMMENTS:</p>	
<p>3. Adjust the appropriate bus load tap changer to equalize the 4KV Common Voltmeter indication to the appropriate 4KV Bus Volts.</p>	<p>3.1 Determines it is not necessary to adjust tap changer and marks this step N/A.</p> <p>COMMENTS:</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
4.C Place the Live Bus Transfer Switch to ON.	4.1C Places the Live Bus Transfer Switch to the ON position.  COMMENTS:	
5.C Close [ACB-142A], 2A SS Serv Tfmr to 4KV Bus 2B.	5.1C Places control switch for ACB-142A to the CLOSE position.  5.2 Verifies BOTH RED lights – LIT and WHITE light – NOT LIT  5.3 Acknowledges A8-1H, “4160V NORM BUS SUPPLY ACBs PARALLELED”, if received.  COMMENTS:	
6. Check that amps increase on 4KV Bus 2B Tfmr 2A Amps.	6.1 Checks 4KV Bus 2B Tfmr 2A ammeter indicates greater than ZERO amps.  COMMENTS:	
7. IF SSST 2A voltage less than 122 volts prior to transfer, Adjust Load Tap Changer, X-Winding – Bus 2B, by 4 steps to raise bus voltage.	7.1 This step is N/A. SSST 2A voltage is >122 volts.  COMMENTS:	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
8.C Open [ACB-142C], 2C US Serv Tfmr to 4KV Bus 2B.	<p>8.1C Places control switch for ACB-142C to the OPEN/TRIP position.</p> <p>8.2 Verifies WHITE light – LIT and BOTH RED lights – NOT LIT</p> <p>8.3 Silences and resets Annunciator A8-1H, if cleared.</p> <p>COMMENTS:</p>	
9. Check load was picked up by observing 4KV Bus 2B Tfmr 2A Amps.	<p>9.1 Checks load was picked up by observing 4KV Bus 2B Tfmr 2A amps increasing to a higher value.</p> <p>COMMENTS:</p>	
	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><b>FAULT STATEMENT</b></p> <p>Immediately after the Live Bus Transfer Switch is placed to OFF in the next step, a trigger will be inserted to annunciate SYS STA SERV TFMR 2A/2B Thermal Overload which requires the candidate to transfer 4KV Bus 2B from SSST 2A back to USST 2C.</p> </div>	
10. Place the Live Bus Transfer Switch to OFF.	<p>10.1 Places the Live bus Transfer Switch to the OFF position.</p> <p>COMMENTS:</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
11. Responds to receipt of A7-8D, SYS STA SERV TFMR 2A/2B Thermal Overload.	<p>11.1 Acknowledges receipt of A7-8D, SS SERV TFMR 2A/2B Thermal Overload annunciator.</p> <p>11.2 Observe control board indications and determines plant conditions are STABLE.</p> <p>11.3 References 2OM-36.4.AAS (ARP for A7-8D)</p> <p>11.4 Dispatches an NLO to verify 2A SSST winding temperature is high.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR CUE:</b> When dispatched, role play the NLO and report 2A SSST winding temperature is 110 °C and slowly rising and that both banks of cooling are in service.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>EVALUATOR CUE:</b> Role Play the US and if asked, direct the candidate to perform 2OM-36.4.B to transfer 4KV Bus 2B back to 2C USST as directed by the ARP.</p> </div> <p>COMMENTS:</p>	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
12. Monitor the USST 2C Bus 2B voltages on the 4KV Common Voltmeter using the 2C US Serv Tfmr Voltmeter Phase Selector switch. Monitor the SSST 2B voltages on the 4KV Bus 2B voltmeter using the 4KV Bus 2B Voltmeter Phase Selector Switch.	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR CUE:</b>            If asked, DO NOT setup Bus 2B Auto Transfer, perform only up to step 8 of 2OM-36.4.B.         </div> 12.1 Locates the 4KV Common Volts meter, 4KV Bus 2B Voltmeter Phase Selector, and 2C US Serv Tfmr Voltmeter Phase Selector Switch.  12.2 Checks all phases and verifies USST 2C voltage is within 0 to 2.0 volts of Bus 2B voltage and the unloaded bus is between 122 volts and 126.5 volts.  COMMENTS:	
13. If necessary, Place the Bus 2B 4160V Lower Raise & Auto SW, in Manual (Push In) AND adjust Bus 2B voltage to match USST voltage.	13.1 If necessary, places Load Tap Changer X Winding Bus 2B SS Serv Tfrm 2A in MANUAL by pushing control switch IN.  13.2 Adjusts Bus 2B voltage to match 2C USST voltage by intermittently placing control switch handle to RAISE until 4KV Bus 2B volts matches 4KV Common Voltmeter Voltage.  COMMENTS:	
14.C Verify the Live Bus Transfer Switch in the ON position.	14.1C Places the Live Bus Transfer Switch to the ON position.  COMMENTS:	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
15.C Close [ACB-142C], 2C US Serv Tfmr to 4KV Bus 2B.	<p>15.1C Places control switch for ACB-142C to the CLOSE position.</p> <p>15.2 Verifies BOTH RED lights – LIT and WHITE light – NOT LIT.</p> <p>15.3 Acknowledges A8-1H, “4160V NORM BUS SUPPLY ACBs PARALLELED”, if received.</p> <p>COMMENTS:</p>	
16. Verify amps increase on 4KV Bus 2B Tfmr 2C Amps.	<p>16.1 Verifies 4KV BUS 2B TFM R 2C ammeter indicates greater than ZERO amps.</p> <p>COMMENTS:</p>	
17.C Open [ACB-142A], 2A SS Serv Tfmr to 4KV Bus 2B.	<p>17.1C Places control switch for ACB-142A to the OPEN/TRIP position.</p> <p>17.2 Verifies WHITE light – LIT and BOTH RED lights – NOT LIT.</p> <p>17.3 Silences &amp; resets Annunciator A8-1H if cleared.</p> <p>COMMENTS:</p>	



# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-523 JPM REVISION: 3	JPM TITLE: Perform a Hot Bus Transfer
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
18. Verify load was picked up by observing 4KV Bus 2B Tfmr 2C Amps.	18.1 Verifies load was picked up by observing 4KV Bus 2B Tfmr 2C amps increasing to a higher value.  COMMENTS:	
19. Place the Live Bus Transfer Switch to OFF.	19.1 Places the Live Bus Transfer Switch to the OFF position.  COMMENTS:	
	<div>EVALUATOR CUE: State "This JPM is complete"</div>	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

### **INITIAL CONDITIONS:**

- The plant is in Mode 1 with all systems in NSA.
- It is desired to place 4KV Bus 2B on offsite power to allow for a relay check on ACB-142C.

### **INITIATING CUE:**

Your supervisor directs you to transfer the 4KV Bus 2B to SSST 2A in accordance with 2OM-36.4.C, "Transferring 4KV System From US Serv Tfmr To SS Serv Tfmr". Do **NOT** set up for auto transfer back to USST 2C.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	<u>Start the “A” Reactor Coolant Pump</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2CR-513</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2CR-513</u>
<u>REVISION NUMBER:</u>	<u>7</u>

### TECHNICAL REFERENCES:

2OM-6.4.A, "Reactor Coolant Pump Startup", Rev. 19  
2OM-53C.4.2.6.8, "Abnormal RCP Operation", Rev. 12  
2OM-6.4.AAZ, "Reactor Coolant Pump Vibration Alert/Danger", Rev. 7

<u>INSTRUCTIONAL SETTING:</u>	Simulator
<u>APPROXIMATE DURATION:</u>	15 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2CR-513
New Revision: 7
<p>Description of Change(s):</p> <ol style="list-style-type: none"><li>1. 2OM-53C.4.2.6.8, "Abnormal RCP Operation", was revised.</li><li>2. Removed 2RCS*P21B running from the Initial Conditions. RCS flow is still maintained by 2RCS-P21C.</li></ol>
<p>Reason for Change (s):</p> <ol style="list-style-type: none"><li>1. Procedure revision to Rev. 12.</li><li>2. JPM diversity.</li></ol>

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-513 JPM REVISION: 7	JPM TITLE: Start the "A" Reactor Coolant Pump
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K/A REFERENCE: 003A2.02 3.7/3.9  
003A3.04 3.6/3.6  
003A4.06 2.9/2.9

TASK ID: 0062-001-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ SRO ONLY ☒ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input checked="" type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 Minutes	Actual Time:	minutes
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation)			
Comments: _____ _____ _____ _____			

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR	
Evaluator (Print): _____	Date: _____
Evaluator Signature: _____	

## OPERATIONS JOB PERFORMANCE MEASURE

### EVALUATOR DIRECTION SHEET

TASK STANDARD:	2RCS*P21A, Reactor Coolant Pump is started and then tripped after receiving high vibrations.
RECOMMENDED STARTING LOCATION:	Simulator
INITIAL CONDITIONS:	<ul style="list-style-type: none"><li>• The plant is in Mode 3, preparing for entry into Mode 2.</li><li>• 2RCS*P21C, Reactor Coolant Pump is in operation.</li><li>• 2OM-6.4.A, "Reactor Coolant Pump Startup" has been commenced and all steps through step IV.A.10 have been performed for 2RCS*P21A, Reactor Coolant Pump.</li><li>• All systems and components are operable and in NSA.</li></ul>
INITIATING CUE:	Your Supervisor directs you to start 2RCS*P21A, Reactor Coolant Pump in accordance with 2OM-6.4.A, beginning at Step IV.A.11.
REFERENCES:	2OM-6.4.A, "Reactor Coolant Pump Startup", Rev. 19 2OM-53C.4.2.6.8, "Abnormal RCP Operation", Rev. 12 2OM-6.4.AAZ, "Reactor Coolant Pump Vibration Alert/Danger", Rev. 7
TOOLS:	Stopwatch
HANDOUT:	2OM-6.4.A, "Reactor Coolant Pump Startup", Rev. 19, place kept up to and including step IV.A.10.  <b>Have copies of the following available to replace simulator copies.</b> 2OM-53C.4.2.6.8, "Abnormal RCP Operation", Rev. 12 (Only need 1 <sup>st</sup> 4 pages) 2OM-6.4.AAZ, "Reactor Coolant Pump Vibration Alert/Danger", Rev. 7

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-513 JPM REVISION: 7	JPM TITLE: Start the "A" Reactor Coolant Pump
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p><b>SIMULATOR SETUP:</b></p> <ul style="list-style-type: none"> <li>• Start with IC-11, S/D "A" RCP, isolate or reduce SG blowdown flow, wait until Tavg and SG levels stabilize.</li> <li>• Raise Bus 2A voltage to 127 to 129 volts using the Tap Changer, leave tap changer in manual.</li> <li>• Enter Event Action, Select Trigger Number # 1, enter XA4O035D == 1, enter accept new event.</li> <li>• Insert Malf RCP06A, Enter 30 for severity value, Enter 120 for delay time, select event trigger #1. (120 seconds after RCP Red Indicating Light is LIT – RCP High Vibbs will occur)</li> <li>• 2RCS*PCV455A in MAN and 0% demand.</li> <li>• Freeze simulator and Snap into IC.</li> </ul> <p><b>EVALUATOR CUE:</b> After candidate reviews the procedure, and is ready to begin the JPM, Place the simulator to RUN.</p>	
	START TIME: _____	
1. Reviews procedure.	<p>1.1 Reviews 2OM-6.4.A, "Reactor Coolant Pump Startup".</p> <p>COMMENTS:</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-513 JPM REVISION: 7	JPM TITLE: Start the "A" Reactor Coolant Pump
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
2. Ensure [2RCS*PCV455A], Pressurizer Spray Loop A, is in MANUAL and closed.	<p>2.1 Verifies 2RCS*PCV455A MAN light - LIT and AUTO light - NOT LIT.</p> <p>2.2 Verifies 2RCS*PCV455A OUTPUT% is ZERO (0).</p> <p>2.3 Verifies 2RCS*PCV455A GREEN light – LIT and RED light– NOT LIT.</p> <p>COMMENTS:</p>	
3. Check that RCS temperature is within the limits of Precautions and Limitations II.J of this procedure for the number of RCP(s) to be operating.	<p>3.1. Verifies any available RCS temperature <math>\geq 137^{\circ}\text{F}</math>.</p> <p>COMMENTS:</p>	
4. If starting the first RCP AND any unisolated Reactor Coolant System loop cold leg temperature is less than or equal to the enable temperature specified in the PTLR, Verify the following: (otherwise N/A) (T.S. 3.4.6 and T.S. 3.4.7).	<p>4.1 Marks step N/A due to RCP's already running.</p> <p>COMMENTS:</p>	



OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-513 JPM REVISION: 7	JPM TITLE: Start the "A" Reactor Coolant Pump
--	---

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
5.C Place [2RCS*P21A], Reactor Coolant Pump control switch to START <b>AND</b> observe the following:	5.1C Places 2RCS*P21A control switch to Start and notes time.  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR NOTE:</b> Candidate should use some means of timing the RCP start from the start of the lift oil pump.           </div> COMMENTS:	
6. [2RCS-P21A1], 21A Reactor Coolant Pump Bearing Lift Oil Pump starts.	6.1 Verifies 21A Reactor Coolant Pump Bearing Lift Oil Pump starts.  6.2 Verifies 2RCS-P21A1 RED light - LIT and GREEN light – NOT LIT.  COMMENTS:	
7. After approximately 2 minutes, [2RCS*P21A], Reactor Coolant Pump starts.	<b>~2 MINUTES AFTER LIFT OIL PUMP STARTS:</b>  7.1 Verifies 2RCS*P21A RED light - LIT and WHITE light – NOT LIT.  7.2 Verifies 2RCS-FI-414(415)(416) flow rising.  7.3 Verifies 2RCS-II21A amps rising.  COMMENTS:	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-513 JPM REVISION: 7	JPM TITLE: Start the "A" Reactor Coolant Pump
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
8. If the EOPs directed the RCP start attempt AND the RCP failed to start due to the suspected failure of the RCP Oil Lift Pump Pressure Switch, perform Attachment 1, "Jumpering RCP Oil Lift Pump Pressure Switch". (Otherwise N/A)	8.1 Marks step N/A.  COMMENTS:	
9. Approximately 30 seconds after RCP starts, verify starting amps drop off to a normal running amps as indicated on [2RCS-II21A], RCP Amps.	<p>~ 30 SECONDS AFTER RCP STARTS:</p> <p>9.1 Verifies 2RCS-II21A amps drop to ~ 640 - 690 amps.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR NOTE:</b> Candidate should use some means of timing the decay of starting amps. If asked for assistance with various timings, provide assistance as additional Operator <i>specifically</i> for timing.</p> </div> <p>COMMENTS:</p>	
10.C Approximately 50 seconds after RCP starts, verify [2RCS-P21A1], Reactor Coolant Pump Bearing Lift Oil Pump, stops.	<p>~ 50 SECONDS AFTER RCP START.</p> <p>10.1 Verifies 2RCS-P21A1 GREEN light – LIT and RED light – NOT LIT.</p> <p>COMMENTS:</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-513 JPM REVISION: 7	JPM TITLE: Start the "A" Reactor Coolant Pump
--	---

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <b>FAULT STATEMENT</b>            While the next step is being performed, A2-5C ARP "RCP Vibration Alert/Danger" will alarm. This will require the RCP to be tripped due to HIGH vibrations.         </div>	
11. Verify the following Reactor Coolant Pump normal operating parameters:	11.1 Verifies RCP operating parameters are normal.  COMMENTS:	
	<div style="border: 1px solid black; padding: 10px;"> <b>EVALUATOR NOTE:</b>            Due to shaft vibrations at 30 mils or Frame Vibration &gt; 5 mils, the ARP will lead to AOP 2.6.8 which will direct an immediate pump shutdown.             Candidate should recognize that Reactor does not need to be tripped and proceed directly to pump shutdown.         </div>	
12. Reactor Coolant Pump Vibration Alert/Danger alarm is in due to High Frame and Shaft Vibrations.	12.1 Refers to A2-5C ARP "RCP Vibration Alert/Danger" alarm response procedure AND/OR AOP-2.6.8 "Abnormal RCP Operation".  12.2 Verifies on 2RCS-NBI21 21A shaft vibrations at 30 mils or frame vibration > 5 mils.  COMMENTS:	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-513 JPM REVISION: 7	JPM TITLE: Start the "A" Reactor Coolant Pump
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
13.C Stop the affected RCP IAW AOP-2.6.8, Step 1 & Criteria on left hand page.	<div> <b>EVALUATOR NOTE:</b> AOP 2.6.8 Step 1 refers the candidate to the Left Hand Page to determine if any Immediate RCP shutdown criteria is exceeded. It is critical that the candidate recognizes RCP Vibration criteria is exceeded. The candidate should recognize the reactor is already tripped, but may follow the procedural step to trip the reactor and perform E-0 IMAs. This is NOT critical to JPM completion, nor is it scripted below. </div>	
	13.1C Places 2RCS*P21A control switch to STOP.	
	13.2 Verifies 2RCS*P21A WHITE light – LIT and RED light – NOT LIT.	
	13.3 Verifies 2RCS- FI414(415)(416) flow dropping.	
	13.4 Verifies 2RCS-II21A amps dropping.	
14. Close Przr spray valves for affected RCP(s).	13.5 Notes time pump was tripped.	
	COMMENTS:	
	14.1 Previously verified.	
	COMMENTS:	
	<div> <b>EVALUATOR CUE:</b> That completes this JPM </div>	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

### **INITIAL CONDITIONS:**

- The plant is in Mode 3, preparing for entry into Mode 2.
- 2RCS\*P21C, Reactor Coolant Pump is in operation.
- 2OM-6.4.A, "Reactor Coolant Pump Startup" has been commenced and all steps through step IV.A.10 have been performed for 2RCS\*P21A, Reactor Coolant Pump.
- All systems and components are operable and in NSA.

### **INITIATING CUE:**

Your Supervisor directs you to start 2RCS\*P21A, Reactor Coolant Pump in accordance with 2OM-6.4.A, beginning at Step IV.A.11.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

<u>TRAINING MATERIAL TITLE:</u>	<u>Uninterruptible Power Supply [UPS*VITBS2-3(4)] Shutdown</u>
<u>TRAINING MATERIAL NUMBER:</u>	<u>2PL-021</u>
<u>PROGRAM TITLE:</u>	<u>Licensed Operator Training</u>
<u>COMPUTER CODE:</u>	<u>2PL-021</u>
<u>REVISION NUMBER:</u>	<u>10</u>

### TECHNICAL REFERENCES:

2OM-38.4.J, Uninterruptible Power Supply [UPS\*VITBS2-3] Shutdown, Rev. 7  
2OM-38.4.K, Uninterruptible Power Supply [UPS\*VITBS2-4] Shutdown, Rev. 7

<u>INSTRUCTIONAL SETTING:</u>	In-Plant
<u>APPROXIMATE DURATION:</u>	15 Minutes

<u>PREPARED BY:</u>	M. Klingensmith	Date
<u>PEER REVIEW BY:</u>		Date
<u>APPROVED FOR USE:</u>	Training Supervisor or Designee	Date

OPERATIONS JOB PERFORMANCE MEASURE

JPM CHANGE SUMMARY

Affected JPM: 2PL-021

New Revision: 10

Description of Change(s):

1. JPM formatting. Matched Cues to procedure wording, added step to notify Supervisor to evaluate Surveillance Requirement.

Reason for Change (s):

1. Changed format to the new JPM procedure (BVPS-TR-0026)

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-021 JPM REVISION: 10	JPM TITLE: Uninterruptible Power Supply [UPS*VITBS2-3(4)] Shutdown
---	---

K/A REFERENCE: 057AA1.01 3.7 / 3.7      TASK ID: 0381-005-04-013  
0381-002-01-043

JPM APPLICATION: ☒ REQUALIFICATION      ☒ INITIAL EXAM      ☐ TRAINING  
☐ SRO ONLY      ☐ ALTERNATE PATH JPM      ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input type="checkbox"/> Perform <input checked="" type="checkbox"/> Simulate	<input checked="" type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:	Performer SSN:
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Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 Minutes	Actual Time: minutes
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JPM RESULTS: ☐ SAT  
☐ UNSAT (Comments required for UNSAT evaluation)

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

## OBSERVERS

Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

## EVALUATOR

Evaluator (Print): \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_



OPERATIONS JOB PERFORMANCE MEASURE

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Uninterruptible Power Supply [UPS\*VITBS2-3(4)] is removed from service, with the manual bypass switch in the ALTERNATE SOURCE TO LOAD position.

**RECOMMENDED  
STARTING LOCATION:** In Plant

**READ THE INITIAL CONDITIONS FOR THE APPROPRIATE  
PROTECTED TRAIN**

**INITIAL CONDITIONS:** The plant is at 30% power and has received Annunciator A1-1C, "Vital Bus Inverter Operation/Trouble". Your supervisor desires to transfer Vital Bus 2-3(4) to it's alternate power source and shutdown the Inverter/Rectifier in accordance with procedure 2OM-38.4.J(K), Uninterruptible Power Supply [UPS\*VITBS2-3(4)] Shutdown. All Initial Conditions for the procedure performance are completed.

**INITIATING CUE:** Your supervisor directs you to remove the Inverter/Rectifier portion of Uninterruptible Power Supply [UPS\*VITBS2-3(4)] from service, and isolate the static switch.

**REFERENCES:** 2OM-38.4.J, Rev. 7 (Vital Bus 3) with initial conditions section A completed.  
2OM-38.4.K, Rev. 7 (Vital Bus 4) with initial conditions section A completed.

**TOOLS:** None

**HANDOUT:** 2OM-38.4.J, Rev. 7 (Vital Bus 3)  
2OM-38.4.K, Rev. 7 (Vital Bus 4)

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-021 JPM REVISION: 10	JPM TITLE: Uninterruptible Power Supply [UPS*VITBS2-3(4)] Shutdown
---	---

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div>EVALUATOR NOTE: Provide candidate copy of Procedure 2OM-38.4.J(K).</div>	
	START TIME: _____	
1. Check AC Regulating transformer in service.	<p>1.1 Candidate verifies that AC Output Regulating Transformer Voltmeter is reading approximately 120 VAC.</p> <div>EVALUATOR CUE: AC Output Regulating Transformer Voltmeter reads 120 VAC.</div> <p>COMMENTS:</p>	
2. Verify IN SYNC indicating light is ON [UPS*VITBS 2-3(2-4)].	<p>2.1 Candidate verifies IN SYNC lamp ON.</p> <div>EVALUATOR CUE: IN SYNC lamp is ON</div> <div>EVALUATOR CUE: If asked, the Inverter/Rectifier will be returned within 24 hours to satisfy TS 3.8.7. Also T.S. 3.8.9 surveillance 2OST-36.8 will be performed by another operator and the control room will make required log entries.</div> <p>COMMENTS:</p>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-021	JPM TITLE: Uninterruptible Power Supply [UPS*VITBS2-3(4)]
JPM REVISION: 10	Shutdown

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Press the ALTERNATE SOURCE TO LOAD pushbutton to transfer the Static Switch.	<p><b>EVALUATOR NOTE:</b> Annunciator A1-1C is already in alarm.</p> <p>3.1.C Candidate depresses the ALTERNATE SOURCE TO LOAD pushbutton.</p> <p>3.2 Verifies the red indicating light for ALTERNATE SOURCE SUPPLYING LOAD is ON.</p> <p><b>EVALUATOR CUE:</b> The RED light is ON for ALTERNATE SOURCE SUPPLYING LOAD.</p> <p>COMMENTS:</p>	
4.C Place B2 Inverter Output to the OFF position.	<p>4.1.C Candidate places B2 Invert Output circuit breaker to OFF.</p> <p><b>EVALUATOR CUE:</b> Breaker B2 is in the OFF position.</p> <p>COMMENTS:</p>	
5.C Place Manual Bypass to the ALTERNATE SOURCE TO LOAD position.	<p>5.1.C Candidate places the Manual Bypass to the ALTERNATE SOURCE TO LOAD position.</p> <p><b>EVALUATOR CUE:</b> Manual Bypass Switch is in the ALTERNATE SOURE TO LOAD position</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-021 JPM REVISION: 10	JPM TITLE: Uninterruptible Power Supply [UPS*VITBS2-3(4)] Shutdown
---	---

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<b>6.C</b> Shutdown the UPS VITBS2-3(4) Inverter by placing the following circuit breakers to the OFF position:  [B1] Battery Input  [B401] AC Input  [B402] Rectifier DC output.  [B4] Alternate Source AC Input to Static Switch	6.1 Candidate opens the following breakers:  6.2.C [B1] Battery Input.  6.3.C [B401] AC Input.  6.4.C [B402] Rectifier DC Output.  6.5.C [B4] Alternate Source AC Input to Static Switch  <div style="border: 1px solid black; padding: 5px;"><b>EVALUATOR CUE:</b> Breakers are in the OFF position.</div> COMMENTS:	
<b>7.</b> Verify SR 3.8.9.1 or SR 3.8.10.1 is satisfied for the associated Vital Bus by performing the appropriate section of 2OST-36.8, AC Power Source Weekly Breaker Alignment Verification. (Otherwise N/A)	7.1 Informs supervisor of the surveillance requirement or need to N/A the step.  <div style="border: 1px solid black; padding: 5px;"><b>EVALUATOR CUE:</b> Your supervisor will evaluate the Surveillance Requirement.</div> COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"><b>EVALUATOR CUE:</b> State "This JPM is complete".</div>	
	STOP TIME: _____	

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐ Read:

### **USE WHEN TRAIN A IS PROTECTED**

**INITIAL CONDITIONS:** The plant is at 30% power and has received Annunciator A1-1C, "Vital Bus Inverter Operation/Trouble". Your supervisor desires to transfer Vital Bus 2-4 to it's alternate power source and shutdown the Inverter/Rectifier in accordance with procedure 2OM-38.4.K, Uninterruptible Power Supply [UPS\*VITBS2-4] Shutdown. All Initial Conditions for the procedure performance are completed.

**INITIATING CUE:** Your supervisor directs you to remove the Inverter/Rectifier portion of Uninterruptible Power Supply [UPS\*VITBS2-4) from service, and isolate the static switch.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

## **CANDIDATE DIRECTION SHEET**

**\* THIS SHEET TO BE GIVEN TO CANDIDATE \***

☐

Read:

### **USE WHEN TRAIN B IS PROTECTED**

#### **INITIAL CONDITIONS:**

The plant is at 30% power and has received Annunciator A1-1C, "Vital Bus Inverter Operation/Trouble". Your supervisor desires to transfer Vital Bus 2-3 to it's alternate power source and shutdown the Inverter/Rectifier in accordance with procedure 2OM-38.4.J, Uninterruptible Power Supply [UPS\*VITBS2-3] Shutdown. All Initial Conditions for the procedure performance are completed.

#### **INITIATING CUE:**

Your supervisor directs you to remove the Inverter/Rectifier portion of Uninterruptible Power Supply [UPS\*VITBS2-3] from service, and isolate the static switch.

☐

At this time, ask the evaluator any questions you have on this JPM.

☐

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐

Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐

After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

APPROVED FOR USE: \_\_\_\_\_  
Training Supervisor or Designee Date

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004 JPM REVISION: 16	JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve
---	--

### JPM CHANGE SUMMARY

Affected JPM: 2PL-004
New Rev. # 16
Description of Change(s):  Added candidate action to visually check the Overspeed Trip AND/OR depress the Manual Trip Lever in step 3.1 Corrected IV to CV in step 6.2
Reason for Change (s):  TAI 9861 & 9862



OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004 JPM REVISION: 16	JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve
---	--

K/A REFERENCE: 061A2.04 3.4/3.8

TASK ID: 0241-024-01-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☒ TRAINING

☐ SRO ONLY ☐ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 10 minutes	Actual Time:	minutes
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation)			
Comments: _____			
_____			
_____			
_____			

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR	
Evaluator (Print): _____	Date: _____
Evaluator Signature: _____	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004 JPM REVISION: 16	JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve
---	--

### EVALUATOR DIRECTION SHEET

**TASK STANDARD:** 2FWE\*P22 trip throttle valve is reset.

**RECOMMENDED  
STARTING LOCATION:** In plant

**INITIAL CONDITIONS:**

- The plant is in Mode 1.
- 2FWE\*P22 was running, but tripped due to an overspeed condition, which has been corrected.
- The turbine operator has verified that the Trip Throttle valve is closed.
- No auto start signals exist for 2FWE\*P22, and the pump is currently stopped.
- The pump is not required to feed the steam generators at this time.

**INITIATING CUE:** Your supervisor directs you to reset the Trip Throttle Valve for 2FWE\*P22.

**REFERENCES:** 2OM-24.4.R, Revision 21

**TOOLS:** Proper PPE

**HANDOUT:** 2OM-24.4.R, Revision 21

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004  
JPM REVISION: 16

JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve

STEP  
( "C" Denotes CRITICAL STEP )

STANDARD  
(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒

S/U

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

**EVALUATOR CUE:** For exam sequencing this step may be omitted, the evaluator may provide a copy of the procedure.

1. Review 2OM-24.4.R,  
"Resetting And Opening  
TDAFW Pump Trip and  
Throttling Valve".

- 1.1 Reviews 2OM-24.4.R.

COMMENTS:

2. Verify closed  
[2MSS\*SOV105A-F].

- 2.1 Contacts Control Room to determine valve positions.

**EVALUATOR CUE:** All of the steam supply  
SOV's, [2MSS\*SOV105A, B, C, D, E, F], are  
CLOSED.

COMMENTS:

Page 5 is  
the candidate  
Direction Sheet.

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004 JPM REVISION: 16	JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve
---	--

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3. Verify tripped or manually trip the Overspeed Trip Mechanism by performing one of the following:  a. Press the Manual Emergency Trip Lever (local) b. Depress the TDAFW Pump pushbutton (BB-C)	3.1 Visually checks the Overspeed Trip Mechanism is tripped <b>AND/OR</b> Presses the Manual Emergency Trip Lever.  <div><b>EVALUATOR CUE:</b> Overspeed Mechanism is tripped.</div> COMMENTS:	
4. Verify [2FWE*TTV22] Trip and Throttle Valve for 2FWE*P22 is unlatched.	4.1 Verifies that the Trip and Throttle valve is unlatched.  <div><b>EVALUATOR CUE:</b> Trip Throttle Valve is unlatched.</div> COMMENTS:	
5.C Reset and latch the overspeed trip device.  ~ Step 5 continued on next page	<div><b>EVALUATOR CUE:</b> The Turbine Driven Aux Feed pump will <b>NOT</b> be started within the next 15-20 minutes.</div> <div><b>EVALUATOR NOTE:</b> Candidate, after receiving cue, should skip step # 4 and proceed to procedure step # 5.</div> 5.1C Turns 2FWE*TTV22 handwheel <b>CLOCKWISE</b> until the sliding nut and trip lever rise to the upper limit of travel (to the trip hook).  <div><b>EVALUATOR CUE:</b> Sliding nut &amp; lever are all the way up.</div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004  
JPM REVISION: 16

JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p>5.2C Holds the overspeed trip connecting rod to the left, while ensuring the overspeed tappet washer flat side directly faces the overspeed trip lever.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Trip Lever is to the LEFT and ENGAGED in trip hook with flat side tappet washer directly facing the Overspeed Trip Lever.</p> </div> <p>5.3C Pushes the Overspeed Tappet Washer down to ensure tappet is in correct position.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Tappet is in correct position</p> </div> <p>5.4C Releases the connecting rod, allowing spring tension to maintain the reset condition.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> After candidate releases the connecting rod the Overspeed Trip remains RESET.</p> </div> <p>5.5 Verifies the washer flat side is flush against the vertical side overspeed trip lever.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Washer flat side is flush against the overspeed trip lever vertical side.</p> </div> <p>5.6 Verifies valve is latched by observing that the latch on the right side of the valve is fully engaged.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> The trip lever is fully engaged with the trip hook</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004  
JPM REVISION: 16

JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
---------------------------------------	--	-----

6.C Reopen Trip Throttle Valve.

~ Step 6 continued on next page

6.1C Slowly turns [2FWE\*TTV22] handwheel counter-clockwise and verifies that the pump does not accelerate in an uncontrolled manner

**EVALUATOR CUE:** The pump slowly rotates as you open the Trip Throttle Valve and then stops.

**EVALUATOR CUE:** [2FWE\*TTV22] is FULL OPEN.

6.2 Requests concurrent verification or acknowledges that this verification must occur within 4 hours.

**EVALUATOR CUE:** Request for concurrent verification of the valve, inform candidate that other operators will perform this function using step 11 of the procedure. Direct candidate to continue with step 8.

6.3 Adjusts [2FWE\*TTV22] 1/4 turn off of the backseat.

**EVALUATOR CUE:** Valve is 1/4 Turn off its backseat.

6.4 Verifies the overspeed trip mechanism is reset by observing that the flat side of the washer remains engaged with the trip lever.

**EVALUATOR CUE:** Overspeed Trip Mechanism is properly RESET.

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004  
JPM REVISION: 16

JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p>6.5 Contacts the control room to verify that computer point Y5172D indicates OPER.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Role play the Control Room Operator and inform the candidate that Y5172D indicates OPER.</p> </div> <p>COMMENTS:</p>	
<p>7.C Relieve governor oil pressure.</p> <p>~ Step 7 continued on next page</p>	<div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> The Governor Oil Pressure was <u>NOT</u> previously relieved.</p> </div> <p>7.1 Loosens wingnuts and removes cover for access to [2FWE-2CSSOV101], Governor Oil Dump Pushbuttons.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Cover is removed.</p> </div> <p>7.2C Simultaneously depresses both pushbuttons until governor linkage movement has ceased and pushbuttons have been held for 15 seconds and then releases pushbuttons.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> All linkage movement has stopped, 15 seconds has elapsed.</p> </div> <p>7.3 Replaces [2FWE-2CSSOV101] cover and tightens wingnuts.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Cover is reinstalled.</p> </div>	

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-004 JPM REVISION: 16	JPM TITLE: Reset the Terry Turbine Trip and Throttle Valve
---	--

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
---------------------------------------	--	-----

	7.4    Notifies Control Room that [2FWE*P22] is available.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> EVALUATOR CUE: This JPM is COMPLETE. </div>	
	STOP TIME: _____	



## OPERATIONS JOB PERFORMANCE MEASURE

### CANDIDATE DIRECTION SHEET

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

#### INITIAL CONDITIONS:

- The plant is in Mode 1.
- 2FWE\*P22 was running, but tripped due to an overspeed condition, which has been corrected.
- The turbine operator has verified that the Trip Throttle valve is closed.
- No auto start signals exist for 2FWE\*P22, and the pump is currently stopped.
- The pump is not required to feed the steam generators at this time.

#### INITIATING CUE:

Your supervisor directs you to reset the Trip Throttle Valve for 2FWE\*P22.

- ☐ At this time, ask the evaluator any questions you have on this JPM.
- ☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".
- ☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.
- ☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Place the Diesel-Driven Air Compressor [2IAS-C21] in Service

TRAINING MATERIAL NUMBER: 2PL-031

PROGRAM TITLE: Operator Training

COMPUTER CODE: 2PL-031

REVISION NUMBER: 6

TECHNICAL REFERENCES:

2OM-34.4.P, Diesel-Driven Air Compressor [2IAS-C21] Operation, Rev. 4

INSTRUCTIONAL SETTING: In-plant

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: \_\_\_\_\_ Date

PEER REVIEW BY: \_\_\_\_\_ Date

APPROVED FOR USE: \_\_\_\_\_ Date  
Training Supervisor or Designee

## JPM CHANGE SUMMARY

Affected JPM: 2PL-031
New Rev. # 6
Description of Change(s): Updated JPM to reflect current JPM procedure
Reason for Change (s): New JPM procedure

# OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-031 JPM REVISION: 6	JPM TITLE: Place the Diesel-Driven Air Compressor [2IAS-C21] in Service
--	---

K/A REFERENCE: 065 AA1.04 3.5/3.4 TASK ID: 0341-009-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☒ TRAINING  
☐ SRO ONLY ☐ ALTERNATE PATH JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input type="checkbox"/> Perform <input type="checkbox"/> Simulate	<input type="checkbox"/> Plant Site <input type="checkbox"/> Simulator <input type="checkbox"/> Classroom	<input type="checkbox"/> Annual Requal Exam <input type="checkbox"/> Initial Exam <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes Critical: <input checked="" type="checkbox"/> No	Allotted Time: 15 minutes	Actual Time: minutes	
JPM RESULTS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT (Comments required for UNSAT evaluation) Comments: _____ _____ _____ _____			

OBSERVERS	
Name/SSN:	Name/SSN:
Name/SSN:	Name/SSN:

EVALUATOR	
Evaluator (Print): _____	Date: _____
Evaluator Signature: _____	

OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-031 JPM REVISION: 6	JPM TITLE: Place the Diesel-Driven Air Compressor [2IAS-C21] in Service
--	---

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Diesel-Driven Air Compressor [2IAS-C21] in service supplying the header.

**RECOMMENDED STARTING LOCATION:** In plant

**INITIAL CONDITIONS:** A loss of the station air compressors has occurred.

**INITIATING CUE:** The US has authorized an emergency start of the diesel-driven air compressor and directed you to place [2IAS-C21], Diesel Driven Air Compressor, in service and align its discharge to the instrument air header by performing 2OM-34.4.P, Diesel-Driven Air Compressor [2IAS-C21] Operation, Step IV.A and report back when the compressor is running and aligned.

**REFERENCES:** 2OM-34.4.P, Diesel-Driven Air Compressor [2IAS-C21] Operation, Rev. 4

**TOOLS:** None

**HANDOUT:** 2OM-34.4. P, Diesel-Driven Air Compressor [2IAS-C21] Operation.

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-031  
JPM REVISION: 6

JPM TITLE: Place the Diesel-Driven Air Compressor [2IAS-C21] in Service

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<b>EVALUATOR CUE:</b> Provide candidate a copy of 2OM-34.4.P	
1. Review procedure.	1.1 Candidate reviews procedure.  COMMENTS:	
2.C Place the Load/Unload switch in the UNLOAD (down) position.	2.1C Places the Load/Unload switch in the UNLOAD (down) position.  <b>EVALUATOR CUE:</b> Load/Unload switch in the UNLOAD (down) position.  COMMENTS:	
3.C Place the Manual/Off Reset/Auto switch in MANUAL, and Check (after a 16 second delay) that the starter operates to crank the engine until 15 seconds has elapsed OR until the engine starts (whichever occurs first).	3.1C Places the Manual/Off Reset/Auto switch in MANUAL.  <b>EVALUATOR CUE:</b> Manual/Off/Reset/Automatic switch in Manual.  3.2 After 16 second pre-lube delay, verifies that the engine starts.  <b>EVALUATOR CUE:</b> After a 16 second delay, the engine is running.  COMMENTS:  <i>Page 5 is the Candidate Direction Sheet</i>	

<p><b>4.C</b> After the engine has started, Place the [2IAS-C21] Diesel-driven Air Compressor Load/Unload switch in the LOAD (up) position.</p>	<p><b>4.1C</b> Places the [2IAS-C21] Diesel-driven Air Compressor Load/Unload switch in the LOAD (up) position.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Load/Unload switch in the LOAD (up) position.</p> </div> <p>COMMENTS:</p>	
<p><b>5.</b> Verify [2HVT-FN229F], Power Roof Ventilator, is operating by verifying the fan louvers are open and the fan is rotating (located above the compressor).</p>	<p><b>5.1</b> Verifies [2HVT-FN229F], Power Roof Ventilator, is operating by verifying the fan louvers are open and the fan is rotating.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Roof fan is located above the compressor.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Louvers are open and fan is rotating.</p> </div> <p>COMMENTS:</p>	
<p><b>6.</b> When engine has started and warmed up (for approximately 45 seconds), Check that the compressor loads until pressure at the compressor discharge pressure is approximately 110 psig on [2IAS-PI131], Discharge Pressure. (Compressor Instrument Panel)</p>	<p><b>6.1</b> Checks compressor discharge pressure [2IAS-PI131] slowly rises and then stabilizes at ~110 psig.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> [2IAS-PI131] slowly rises and is now stable at 108 psig</p> </div> <p>COMMENTS:</p>	
<p><b>7.</b> Verify [2IAS-DRY23], Standby Instrument Air Train Dryer, is running (green Power On light is On).</p>	<p><b>7.1</b> Verifies [2IAS-DRY23], Standby Instrument Air Train Dryer, is running (green Power On light is On).</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Green Power On light LIT.</p> </div> <p>COMMENTS:</p>	

<p>8. If the fire protection automatic shutdown function is not available, establish a Fire Watch at [2IAS-C21] while the compressor is operating.</p>	<p>8.1 Determines fire protection panel automatic shutdown is not functional.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> When candidate locates fire protection panel, Inform Candidate that fire protection panel is not functional.</p> </div> <p>8.2 Contacts the US and reports that a Fire Watch at [2IAS-C21] is required while the compressor is running.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Role-play the US, and acknowledge the report and report back that another operator will perform the required fire watch.</p> </div> <p>COMMENTS:</p>	
<p>9. If desired, Verify alignment of [2IAS-C21] to the Instrument Air Header as follows:</p> <p>a. Verify pressure is being maintained <math>\geq 100</math>psig on [2IAS-PI129], located on the side of [2IAS-TK22].</p> <p>b. Verify Open [2IAS-1125], 2IAS-DRY23 Inlet Isolation, located on dryer skid.</p> <p>c. Verify Open [2IAS-1126], 2IAS-DRY23 Outlet Isolation, located on dryer skid.</p>	<p>9.1 Verifies pressure is being maintained <math>\geq 100</math>psig on [2IAS-PI129]</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> [2IAS-PI129] is indicating 108 psig and stable.</p> </div> <p>9.2 Verifies handwheel for [2IAS-1125] 2IAS-DRY23 Inlet Isolation is parallel to the flowpath.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> 2IAS-1125 handwheel is parallel to the flowpath.</p> </div> <p>9.3 Verifies handwheel for [2IAS-1126] 2IAS-DRY23 Outlet Isolation is parallel to the flowpath.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> 2IAS-1126 handwheel is parallel to the flowpath.</p> </div>	



d. Verify Open [2IAS-1073], Standby Instrument Air Train Receiver 2IAS-TK22 Inlet Isolation.	9.4 Verifies handwheel for [2IAS-1073], Standby Instrument Air Train Receiver is parallel to the flowpath.  <b>EVALUATOR CUE:</b> 2IAS-1073 handwheel is parallel to the flowpath.
e. Verify Open [2IAS-1074], Standby Instrument Air Train Receiver 2IAS-TK22Outlet Isolation.	9.5 Verifies handwheel for [2IAS-1074], Standby Instrument Air Train Receiver is parallel to the flowpath.  <b>EVALUATOR CUE:</b> 2IAS-1074 handwheel is parallel to the flowpath.
f. Verify Open [2IAS-1106], Standby Instrument Air Train Inlet Isolation, located in the Turbine Basement above [2IAS-DRY22].	9.6 Verifies handwheel for [2IAS-1106], Standby Instrument Air Train Inlet Isolation is parallel to the flowpath.  <b>EVALUATOR NOTE:</b> Valve located in turbine basement above 2IAS-DRY22.  COMMENTS:
	<b>EVALUATOR CUE:</b> That completes this JPM.
	STOP TIME: _____

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**INITIAL CONDITIONS:** A loss of the station air compressors has occurred.

**INITIATING CUE:** The US has authorized an emergency start of the diesel-driven air compressor and directed you to place [2IAS-C21], Diesel Driven Air Compressor, in service and align its discharge to the instrument air header by performing 2OM-34.4.P, Diesel-Driven Air Compressor [2IAS-C21] Operation, Step IV.A and report back when the compressor is running and aligned.

☐ At this time, ask the evaluator any questions you have on this JPM.

☐ When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

☐ Simulate performance or perform as directed the required task.  
Point to any indicator or component you verify or check and announce your observations.

☐ After determining the Task has been met announce "I have completed the JPM".  
Then hand this sheet to the evaluator.

**Appendix D****Scenario Outline****2L15N1**

Facility: **BVPS Unit 2** Scenario No. 1 Op Test No.: **BV2LOT15 NRC**  
 Examiners: \_\_\_\_\_ Candidates: \_\_\_\_\_ SRO  
 \_\_\_\_\_ ATC  
 \_\_\_\_\_ BOP

Initial Conditions: **IC-142(15):** 48% power, MOL, Equ. XE Conditions, CB "D" @ 158 steps, RCS boron - 558 ppm.

Turnover: Maintain 48% power.

Critical Tasks:

- 1. CT-10 (E-0.M)** Crew closes PORV block MOV
- 2. CT-13 (E-0.Q)** Crew manually trips turbine
- 3. CT-43 (FR-H.1.A)** Crew establishes feedwater flow

Event No.	Malf. No.	Event Type	Event Description
1	XMT-RCS019A	(I,A) ATC, SRO (TS) SRO	Pressurizer level transmitter, 2RCS*LT459 drifts low.
2	XMT-MSS053A	(I,A) BOP, SRO (TS) SRO	2MSS*PT496 fails low over 30 sec, requires manual control of 2FWS*FCV498.
3	RCS02A	(C,A) ATC, SRO (TS) SRO	30 gpm RCS leak (unisolable)
4		(R) ATC (N) BOP, SRO	Ops management directed Emergency Shutdown, AOP 2.51.1.
5	RCS02A	(M) ALL	400 gpm loop A LOCA , requires manual Rx trip
6	EHC08A	(C) BOP, SRO	Auto main Turbine trip failure
7	VLV-RCS034A	(C) ATC, SRO	2RCS*PCV456 lifts/fails to reseal on Rx trip, requires manual closure of MOV block valve, 2RCS*MOV536.
8	PMP-AFW001, 2, LOA-AFW022	(M) ALL	Loss of all feed, Entry into FR-H.1, success path - main feed
9	VLV- MSC104,105,106	(C) ATC, SRO	2SSR-AOV117A, B, C, SG BD sample line auto isolation failure

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal

E-0 → FR-H.1 → E-0 → E-1

After taking the shift at 48% power, Pressurizer level transmitter, 2RCS-LT459 will drift low. The crew will diagnose the indications and IAW AOP 2.4.1, Process Control Failure, remove the failed channel from service and ensure the plant is stable, the SRO will transition to the instrument failure procedure for further channel actions and will address Tech Specs for the failed channel.

The channel 3, "C" SG steam pressure transmitter, 2MSS\*PT496, will then drift low, the crew will recognize the SG level perturbation and IAW AOP 2.4.1, the BOP will place the controller for 2FWS\*FCV498 in manual and will restore SG level, the SRO will transition to the instrument failure procedure for additional channel removal actions and will address Tech Specs for the failed instrument.

A non-isolable 30 gpm leak will then occur on the "A" loop, the crew will enter AOP 2.6.7, Excessive Primary Plant Leakage, to evaluate leak rate and leak location. The crew will determine the leak rate is greater than 10 gpm and is not isolable. The SM will report to the SRO that due to the leakage, management directs an immediate plant shutdown IAW AOP 2.51.1 at 2% per minute.

When reactor power lowers to < 42%, the RCS leak will increase to 400 gpm. The crew will identify degrading plant parameters and the SRO will direct a pre-emptive reactor trip and enter E-0. The turbine will fail to automatically trip due to the reactor trip, the BOP will manually trip the turbine.

Additionally, PORV, 2RCS\*PCV456 will fail 20% open on the reactor trip. The ATC will identify the open PORV, attempt to close it, recognize that the PORV did not close and close the block valve, 2RCS\*MOV536 to isolate the stuck open PORV.

When "Verifying AFW Status" in E-0, the crew will identify that all auxiliary feedwater pumps have failed, the SRO will transition to FR-H.1. While performing the actions of FR-H.1, the ATC will identify that the SG blowdown sample valves failed to automatically close and will manually close 2SSR\*AOV117A, B & C.

IAW FR-H.1 direction the crew will restore feedwater flow by starting a main feedwater pump. After feed flow is verified, the SRO will return to E-0.

The crew will progress thru E-0 and transition to E-1 after diagnosing that containment pressure and sump level are not consistent with pre-event values.

The scenario will be terminated when the crew "Checks if SI Flow Should be Reduced" and determines plant conditions support SI termination and transition to ES-1.1.

Expected procedure flow path is E-0 → FR-H.1 → E-0 → E-1

## BEAVER VALLEY JOWER STATION

**INITIAL CONDITIONS:** IC-142(15): 48% power, MOL, Equ. XE Conditions, CB "D" @ 158 steps, RCS boron - 558 ppm.

<b><u>ADDITIONAL LINEUP CHANGES</u></b>	<b><u>STICKERS</u></b>	<b><u>MONITOR SETUP</u></b>
		Normal Splash w/ Mid Power Screen, on VB-A
<b><u>EQUIPMENT STATUS</u></b>	<b><u>DATE/TIME OOS</u></b>	<b><u>TECHNICAL SPECIFICATION(S)</u></b>

### **SHIFT TURNOVER INFORMATION**

1. 48% power for the past week, MOL equilibrium conditions, shift goal is to maintain current power.

### **SCENARIO SUPPORT MATERIAL REQUIRED**

1. MOL Reactivity Placard

### **PROCEDURES NEEDED**

E-0  
E-1  
FR-H.1  
Attachment A-0.11  
AOP 2.4.1  
AOP 2.6.7  
AOP 2.51.1  
6 IF, Attach 1  
24 IF, Attach 1  
24 IF, Attach 4

# BEAVER VALLEY, DOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Insert the following per the simulator preload section of the HTML file for this scenario:	Insert all pre-loads required to support the scenario.	
<b>IMF EHC08A (0 0)</b>	Inhibit Automatic Turbine Trip	
<b>IMF PPL10A (0 0)</b>	Inhibit Train A MSLI	
<b>IMF PPL10B (0 0)</b>	Inhibit Train B MSLI	
<b>IMF PMP-AFW002 (0 0) 3</b>	2FWE*P23B sheared shaft	
<b>TRGSET 5 'OAFWT22.GT.50'</b>	Trigger 5 = 2FWE*P22 start	
<b>IRF LOA-AFW022 (5 0) TRIP</b>	2FWE*P22 trips during startup	
<b>IMF PMP-AFW001 (5 60) 2</b>	2FWE*P23A shaft seizure (60 secs after start)	
<b>TRGSET 1 'JPPLP4(1)'</b>	Trigger 1 = reactor trip	
<b>IMF VLV-RCS034A (1 0) 20 0 ASIS</b>	2RCS*PCV456 fails to 20% open upon Rx trip	
<b>IMF VLV-MSC104 (0 0) 1</b>	2SSR*AOV117A failed open	
<b>IMF VLV-MSC105 (0 0) 1</b>	2SSR*AOV117B failed open	
<b>IMF VLV-MSC106 (0 0) 1</b>	2SSR*AOV117C failed open	
<b>TRGSET 10 'XA11104C'</b>	Trigger 10 = CS – 2SSR-AOV117's to CLOSE	
<b>TRG 10 'DMF VLV-MSC104'</b>	2SSR-AOV117A allowed to close	
<b>TRGSET 11 'XA11104C'</b>	Trigger 11 = CS – 2SSR-AOV117's to CLOSE	
<b>TRG 11 'DMF VLV-MSC105'</b>	2SSR-AOV117B allowed to close	
<b>TRGSET 12 'XA11104C'</b>	Trigger 12 = CS – 2SSR-AOV117's to CLOSE	
<b>TRG 12 'DMF VLV-MSC106'</b>	2SSR-AOV117C allowed to close	
<b>TRGSET 4 'FNISPR(3)&lt;=42'</b>	Trigger 4 = reactor power < 42%	
<b>TRG 4 'IMF RCS02A (4 0) 400 60'</b>	400 gpm loop A LOCA	

# BEAVER VALLEY JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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Assign shift positions

SRO:\_\_\_\_\_

ATC:\_\_\_\_\_

BOP:\_\_\_\_\_

Conduct a shift turnover with oncoming operators.

Simulator frozen until after shift turnover unless it needs to be run momentarily for an alignment change.

When the shift turnover is completed, place the simulator to RUN and commence the scenario.

Simulator running.

Crew assumes control of the unit.

# BEAVER VALLEY LOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENT 1:

Pressurizer level transmitter  
2RCS\*LT459 drifts low.

### IMF XMT-RCS019A (0 0) 0 60

IMMEDIATE PLANT RESPONSE:  
ALARMS:  
A4-1C, PRZR Control Lvl Dev High/Low,  
2RCS-LI459 indicates downscale.

SRO enters 2OM-6.4.IF, attachment 1.

ATC reports unexpected PRZR level deviation alarm.  
ATC identifies 2RCS\*LT459 is failing low.  
IAW AOP 2.41, ATC removes 2RCS\*LT459 from  
service by placing PRZR level control channel selector  
to position II & III.  
If necessary ATC places 2CHS\*FCV122 in manual  
and restores PRZR level.

SRO enters AOP 2.4.1.  
SRO provides a control band and Rx trip criteria of  
5% low/90% high for manual PRZR level control.

BOP refers to ARP.

SRO transitions to 2OM-6.4.IF, attachment 1.

ATC places PRZR level control channel selector to  
position II & III. (previously performed IAW AOP  
2.4.1.

ATC verifies PRZR level recorder selector is  
positioned to record the controlling level channel.

ATC verifies there is adequate makeup to the VCT.

ATC verifies PRZR heaters (Control & Backup)  
groups have returned to normal or manually energizes  
heaters as necessary.



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 1:** (continued)

SRO references Technical Specifications:  
 3.3.1 (RTS Instrumentation) Condition A,  
 immediately enter the Condition referenced in Table  
 3.3.1-1 function 9 (PRZR level high) Condition K; trip  
 channel in 72 hrs. or reduce power to < P-7 in 78 hrs.

SRO determines following TS are for tracking only  
 3.3.3 (PAM instrumentation) Table 3.3.3-1 function  
 11 is met if LT460 and LT461 are operable.

3.3.4 (Remote Shutdown System) Table B.3.3.4-1  
 function 4.a requirement is met if LT460 is operable.

SRO contacts operations management and notifies  
 I&C of level transmitter failure.

Proceed with next event at LE  
 discretion

# BEAVER VALLEY JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENT 2:</u></b>		
<p>SG Steam Pressure 2MSS*PT496 drifts low</p> <p><b>IMF XMT-MSS053A (0 0) 0 30</b></p>	<p>2MSS*PT496 slowly lowering. “C” SG Steam flow and feed flow slowly lowering. 21C SG main feedwater control vlv slowly closing.</p> <p>SRO enters AOP 2.4.1.</p> <p>A6-11C, Loop C Stmline Hi rate of Press change A6-11F, Loop C Feedwater Flow &gt; Steam Flow A6-11G, Loop C Stmline Pressure Low</p> <p>SRO transitions to 2OM-24.4.IF, Attachment 4, section F.</p>	<p>BOP diagnoses 2MSS*PT496 failing low.</p> <p>IAW AOP 2.4.1, BOP places 2FWS*FCV498, in MAN and adjust feed flow to restore proper SG level.</p> <p>SRO establishes a control band of <math>44 \pm 5\%</math> and transient Rx trip criteria of 25% low and 85% high for manual SG level control.</p> <p>ATC reviews ARPs. BOP identifies 2MSS*PT496 failed low.</p> <p>BOP places 2FWS-FR498, 21C SG Feedwater Flow Signal Selector, in Position FT 497, CH III.</p>
<p><b>NOTE:</b> The steam flow signal is compensated by the steam pressure signal. The loss of a steam pressure transmitter has the same effect on feedwater control as if a steam flow transmitter has failed, therefore the steam flow signal selector switch has to be used to regain control.</p>		
<p><b>NOTE:</b> For purposes of scenario progression, time compression is used for I&amp;C responses during event 2</p>		
<p><b>ROLE PLAY I&amp;C:</b> After 1 minute, contact control room and report that I&amp;C is ready to place 2FWS-FR498, 21C SG Steam Flow Signal Selector, in position F494.</p> <p><b>IOR XC11088F (0 0) 0</b></p>	<p>A1-4E, Main Steam Flow Channel Selected Trouble.</p> <p>SRO references Tech. Specs. for 2FWS*LT496.</p>	<p>Crew contacts I&amp;C to place 2FWS-FR498, 21C SG Steam Flow Signal Selector, in position F494. (primary process rack RK-2PRI-PROC-8, Control Bldg, 707')</p> <p>SRO declares 2FWS*LT496, 21C SG Narrow Range Level Transmitter Channel III, inoperable. Tech Spec 3.3.1 Table 3.3.1-1 function 14 Cond. E, Place channel in trip condition within 72 hrs.</p> <p>Tech Spec 3.3.2 Table 3.3.2-1 functions: 5.b and 6.b, Cond. D, Place channel in trip condition within 72 hrs</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENT 2:</u></b> (continued)		
<b>ROLE PLAY I&amp;C:</b> As directed, after 2 minutes, insert following commands then contact control room and report the following bistables tripped: 2LS/496A (BS 1) 2LS/496C (BS 2)		IAW 2OM-24.4.IF, Attachment 1, SRO directs I&C to trip bistables associated with 2FWS*LT496 IAW 2MSP 24.09-I.
<b>IRF LOA-PCS003 (0 0) 1</b> <b>IMF BST-PCS038 (0 0) 0</b> <b>IMF BST-PCS029 (0 0) 0</b> <b>IRF LOA-PCS003 (0 0) 0</b>	Protection rack 3 door open status light on. Ch 3 Low-low reactor trip – LIT (pnl-19, C-12) Ch 3 High-high level – LIT (pnl-47, C-3) Protection rack 3 door open status light off.	As directed, I & C trips the following bistables for 2FWS*LT496: 2LS/496A (BS 1) 2LS/496C (BS 2)
		BOP returns 2FWS*FCV498, 21C SG Main Feedwater Reg Vlv, to AUTO.
<b>ROLE PLAY I&amp;C:</b> As directed, after 2 minutes, insert following commands then contact control room and report the following bistables tripped: 2PS/496A (BS 1) 2PS/496B (BS 2)	SRO returns to 2OM-24.4.IF, Attachment 4.	IAW 2OM-24.4.IF, Attachment 1, SRO directs I&C to trip bistables associated with 2MSS*PT496 IAW 2MSP 21.09-I.
<b>IRF LOA-PCS004 (0 0) 1</b> <b>IMF BST-PCS083 (0 0) 0</b> <b>IMF BST-PCS074 (0 0) 0</b> <b>IRF LOA-PCS004 (0 0) 0</b>	Protection rack 4 door open status light on. Ch 4 Low Press SI/SLI – LIT (pnl-19, D-3) Ch 4 Hi Press rate SLI – LIT (pnl-19, D-6) Protection rack 4 door open status light off.	As directed, I & C trips the following bistables for 2MSS*PT496: 2PS/496A (BS 1) 2PS/496B (BS 2) IAW 2MSP 21.09-I

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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**EVENT 2:** (continued)

SRO references Tech. Specs. for 2MSS\*PT496.

SRO declares 2MSS\*PT496 inoperable.

Tech Spec 3.3.2 Table 3.3.2-1 functions: 1.e, 4.d.1 and 4.d.2, Condition D, Place channel in trip condition within 72 hrs.

Tech Spec 3.3.4 Table B 3.3.4-1 function 3c, Condition A, Restore in 30 days.

Proceed with next event at LE discretion

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENT 3:

30 gpm unisolable "A" loop RCS leak inside CNMT.

**IMF RCS02A (0 0) 30 0 0**

## IMMEDIATE PLANT RESPONSE:

PRZR pressure begins decreasing.  
PRZR spray valves close  
A4-5A/5C, DRMS Trouble(Alert)/ High Alarms  
CNMT Radiation monitors;  
2RMR-RQ303A, B ALERT/HIGH alarms  
CNMT humidity increasing  
VCT level slowly decreasing.

SRO enters 2.6.7, Excessive Primary Plant Leakage

SRO transitions from AOP 2.6.7, step 2 to step 6

ATC reports indications of a RCS leak inside CNMT.

BOP reviews ARPs.  
BOP verifies valid Rad monitor indication using ARP.

ATC checks if PRZR level can be maintained >5%.

ATC checks if leakage is RCS/CVCS leakage by:

- Checking CNMT, PAB and safeguards conditions are consistent with pre-event.

Crew determines CNMT conditions are NOT consistent with pre-event based upon rising sump levels and CNMT radiation levels.

Crew verifies RCS temperature is stable.

ATC determines 2CHS\*FCV122 is not maintaining constant PRZR level in AUTO and places 2CHS\*FCV122 in MANUAL to stabilize PRZR level.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENT 3:</u></b> (continued)</p> <p><b>NOTE:</b> Due to dynamic nature of event, a followup question regarding applicable TS may be necessary.</p>		<p>Crew checks VCT level trend and determines that VCT level is DROPPING at &gt;0.7%/min. and reports to SRO that leakrate is &gt;10 gpm but may be isolable.</p> <p>SRO recognizes TS 3.4.13 Condition A, is applicable for unidentified leakage.</p> <p>ATC quantifies leakage &amp; checks for CVCS leakage by:</p> <ul style="list-style-type: none"> <li>• Isolating charging/letdown by closing valves:</li> <li>• 2CHS*AOV200A &amp; B Letdown orifice isol.</li> <li>• 2CHS*LCV460A &amp; B Regen Ht Ex inlet.</li> <li>• 2CHS*FCV122, charging flow control vlv.</li> <li>• ATC adjusts RCP seal injection flow to obtain NET RCS input of 10 gpm.</li> <li>• Crew determines PRZR level is not rising.</li> </ul> <p>SRO informs Shift Manager to evaluate EPP due to RCS leakrate being &gt;10 gpm and is not isolated by charging and letdown.</p> <p>ATC determines VCT level can be maintained with normal makeup.</p> <p>ATC controls 2CHS*FCV122 and 2CHS*HCV186 as necessary to maintain at approximately programmed PRZR level.</p>

# BEAVER VALLEY JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 3:** (continued)

### **ROLE PLAY:**

After the crew has restored charging and letdown, report as SM that due to the RCS leak, Operations Management has directed the crew to perform a plant S/D at 2%/minute IAW AOP 2.51.1, Unplanned Power Reduction.

Crew restores charging and letdown to service by:

- Adjusting 2CHS\*FCV122 to obtain 30-50 gpm,
- Verifying PRZR level is >14%.
- Placing 2CHS\*PCV145 in MAN and at 50%.
- Opening 2CHS\*LCV460A, B.
- Opening 2CHS\*AOV200A, B as desired.
- Adjusting 2CHS\*PCV145 until backpressure is ~260 psig.
- Placing 2CHS\*PCV145 in AUTO.
- Placing 2CHS\*FCV122 in AUTO.

## **EVENT 4:**

Unplanned Power Reduction IAW AOP 2.51.1.

SRO enters AOP 2.51.1, Unplanned Power Reduction.

SRO directs ATC and BOP to reduce power to take the plant offline IAW AOP 2.51.1.

Crew sounds the standby alarms and announces a Unit 2 rapid power reduction.

ATC places all PRZR heaters to ON.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 4:** (continued)

ATC initiates boration IAW Attachment 1;  
(2% per minute power reduction).

- Places boric acid makeup blender control switch to STOP.
- Places mode selector switch to BORATE.
- Sets 2CHS\*FCV113A to flow rate desired.
- Sets 2CHS-FQIS113, BA totalizer, to total volume of BA to be added per reactivity plan.
- Resets 2CHS\*FQIS113
- Ensures 2CHS\*FQIS168 is set to “zero”, then depresses reset.
- Places boric acid makeup blender control switch to START, then verifies inservice BA pump starts, 2CHS\*FCV113B opens and boric acid flow is indicated on 2CHS-FR113.
- Adjusts 2CHS\*FCV113A setpoint as desired to control boration flowrate.

BOP initiates turbine load reduction:

- Depress 1<sup>st</sup> STG IN pushbutton.
- Set EHC SETTER to desired load.
- Set LOAD RATE thumbwheel to 2%.
- Depress GO.
- Maintain power factor within limits.

ATC verifies rod control in AUTO and maintaining Tavg within  $\pm 5F$  of Tref.

BOP references and performs Attachment 4 to transfer busses to the offsite sources.

**NOTE:** Event 5 will automatically initiate when reactor power is reduced to <42% (approx. 6% power reduction).



# BEAVER VALLE , JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 5:**

400 gpm SBLOCA on “A” RCS Loop  
**TRGSET 4 ‘FNISPR(3)<=42’**  
**TRG 4 ‘IMF RCS02A (4 0) 400 60’**  
 (preloaded)

PRZR level and pressure decreases.  
 A2-2B, Unidentified Leakage system trouble.  
 A1-2G, Incore Instrument/CNMT sump lvl Hi.

ATC reports degrading primary plant conditions.  
 SRO directs ATC to manually trip the reactor and  
 initiate Safety Injection.  
 SRO directs the crew to perform IOA’s for E-0.

## **EVENTS 6, 7, 8, & 9:**

(all preloaded to occur on the reactor  
 trip)

Auto main turbine trip failure.  
 2RCS\*PCV456 fails to 20% open – block valve  
 can be closed to stop leak.  
 Loss of all AFW  
 2SSR-AOV117A,B, C SG BD sample line auto  
 isolation failure.

SRO enters E-0.

ATC and BOP commence IOA’s of E-0.

ATC verifies reactor trip:

- A5-6D - LIT.
- Power range indication is < 5%.
- Neutron flux is dropping.

## BEAVER VALLEY JEWEL STATION

[illegible]

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 6, 7, 8, & 9: (continued)

Check if HHSI flow should be secured by checking the following:

- CNMT & Secondary radiation
- CNMT pressure & sump level
- SG – pressures and levels
- RCS subcooling
- Secondary heat sink exists
- RCS pressure – stable or rising
- PRZR level – >17%
- SI occurred automatically

Due to CNMT parameters not being consistent with pre-event, crew determines SI is required; SI flow should not be secured at this time.

ATC verifies SI System status:

- 2CHS\*P21A & 2CHS\*P21B running.
- 2SIS\*P21A & 2SIS\*P21B running.
- HHSI Flow indicated on 2SIS-FI943.

BOP verifies AFW System status

- Motor-driven AFW Pumps – NONE RUNNING and won't start from CR.
- Turb driven AFW Pump Stm Supply Isol Valves – OPEN but turbine is tripped.
- AFW Throttle Vlv – FULL OPEN
- Total AFW Flow – < 340 GPM

BOP reports no Aux Feedwater pumps running and no aux feed water flow exists.

SRO recognizes that AFW flow cannot be established and enters FR-H.1

# BEAVER VALLEY JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 6, 7, 8, & 9:** (continued)

### **NOTE:**

PORV's may lift several times during this transient due to natural circulation being established while Safety Injection flow is occurring.

With WR levels >14%, PORV's opening are not due to loss of heat sink; bleed and feed is not required.

ATC checks if secondary heat sink is required by:

- Verifying RCS press is > any non-faulted SG.
- RCS hot leg temperatures >350°F.

Crew determines a secondary heat sink is required.

Crew checks SG WR levels and determines if RCS bleed and feed should be initiated.

- BOP verifies WR lvl in at least 2 SG's is >14%.

Crew determines bleed and feed is not required at this time and continues to monitor WR level.

BOP checks primary plant demineralized water storage tank, 2WTD-TK210, level is >85 inches.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (continued)</p> <p><b>ROLE PLAY:</b>            When directed to investigate AFW pump status locally, wait 3 minutes then report as appropriate:            2FWE*P23A, is not running, nothing obvious at the pump.            2FWE*P23B, motor is running, pump is not turning.            2FWE*P22 is not running due to the trip throttle valve linkage rod being broken.            If dispatched to AE switchgear, wait 2 minutes then report that overcurrent relay 51-VE218 is tripped on ACB 2E18 for 2FWE*P23A.</p>		<p>Crew tries to establish AFW flow to at least 1 SG.</p> <p>ATC verifies SG blowdown and blowdown sample lines are isolated.            ATC reports SG blowdown sample line isolation valves failed to automatically close and manually closes 2SSR-AOV117A,B,C.</p> <p>Crew confirms</p> <ul style="list-style-type: none"> <li>• “A” motor-driven pump has tripped</li> <li>• “B” motor-driven pump has tripped</li> <li>• Turbine-driven pump tripped on startup.</li> <li>• All AFW throttle valves are open.</li> </ul> <p>SRO continues to try to restore AFW flow while continuing in procedure.            BOP confirms AFW flow is not &gt;340 gpm.</p> <p>Crew dispatches an operator to locally establish AFW flow via Attachment A-1.8.</p> <p>ATC stops all RCP's.</p> <p>Try to establish main feedwater flow:            BOP verifies 2 condensate pumps are running.            ATC reports CNMT FWI valves are closed.            SRO directs ATC/BOP to reset SI and FWI signals.</p> <ul style="list-style-type: none"> <li>• SI signal – both trains.</li> <li>• FWI signal – both trains.</li> </ul> <p>ATC opens all feedwater CMNT isol valves, 2FWS*HYV157A, B, C.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (continued)  <b>NOTE:</b> Either main feed pump will start if attempted.</p>		<p>BOP starts either main feed pump, 2FWS-P21A or 2FWS-P21B.</p>
<p><b><u>Critical Task: CT-43 (FR-H.1.A)</u></b>  Crew establishes feedwater flow into at least one SG before RCS feed and bleed is required.</p>		<p>BOP feeds intact SGs using the feedwater bypass control valves.</p>
<p>SAFETY SIGNIFICANCE -- Failure to establish feedwater flow to any SG results in the crew's having to rely upon the lower priority action of establishing RCS bleed and feed to minimize core uncover. This constitutes incorrect performance that "leads to degradation of any barrier to fission product release."</p>		<p>BOP feeds intact SGs using the feedwater bypass control valves and verifies that either:</p> <ul style="list-style-type: none"> <li>• Core Exit TC's are dropping</li> <li>OR</li> <li>• SG Wide Range levels are rising.</li> </ul>
	<p>SRO returns to E-0, step 10 IAW FR-H-1, step 8.b.</p>	<p>BOP verifies CETC are dropping and WR SG levels are rising.</p>
<p><b>NOTE:</b>  Evaluation of BOP performing Attachment A-0.11 begins on page 26.</p>	<p><u>List of Attachment A-0.11 discrepancies:</u>  No discrepancies, however, may note that AFW did not function on SIS actuation and that FWI was reset and CNMT FWI valves have been opened.</p>	<p>Feedwater flow now verified.</p> <p>SRO directs BOP to verify automatic actions by performing Attachment A-0.11 in a timely manner.</p> <p>BOP performs Attachment A-0.11.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 6, 7, 8, & 9:** (continued)

### **NOTE:**

RCP's should have been tripped in FR-H.1 due to loss of heat sink, therefore, ATC needs to check Tcold's VS. Tavg.

### **Critical Task: CT-10 (E-0.M)**

Crew closes the upstream block MOV of the stuck open PRZR PORV prior to completion of the "PRZR PORV check" step of E-0.

SAFETY SIGNIFICANCE -- Failure to close the block MOV under the postulated plant conditions constitutes "misoperation or incorrect crew performance which leads to degradation of any barrier to fission product release." In this case, the RCS fission-product barrier can be restored to full integrity simply by closing the block MOV. Therefore, failure to close the MOV also represents a "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plant safety."

ATC checks RCS Tcold stable at or trending to 547F.

ATC reports RCS cold leg temperature and cooldown caused by LOCA/ SI flow.

Crew stops any steam release, reheat steam is isolated and reduces feedwater flow to minimize cooldown.

ATC verifies PRZR isolated:

- PORVs – CLOSED

ATC reports PORV, 2RCS\*PCV456, indicates dual indication and won't close.

ATC closes block valve, 2RCS\*MOV536, to isolate stuck open PORV.

ATC continues verifying PRZR isolated:

- Spray Valves – CLOSED.
- Safety relief valves – CLOSED (use PSMS).
- PRT conditions – CONSISTENT WITH EXPECTED VALUES.
- Power to at least one block valve – AVAILABLE (all).
- Block valves – AT LEAST ONE OPEN, (2 are open.)

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (continued)</p> <p><b>NOTE:</b> RCP's were previously S/D in FR-H.1 due to loss of heat sink.</p>		<p>ATC checks if RCPs should be stopped:</p> <ul style="list-style-type: none"> <li>• D/P between RCS pressure and highest SG pressure – LESS THAN 205 PSID [220 PSID]</li> </ul> <p>ATC reports all RCPs previously stopped.</p> <p>ATC/BOP checks if any SGs are faulted:</p> <ul style="list-style-type: none"> <li>• Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER OR</li> <li>• ANY SG COMPLETELY DEPRESSURIZED</li> </ul> <p>Crew determines no SG's are faulted.</p> <p>Crew checks if SG tubes are intact:</p> <ul style="list-style-type: none"> <li>• Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER</li> <li>• Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES</li> </ul> <p>Crew determines no SG levels are rising in an uncontrolled manner and secondary radiation is consistent with pre-event values, therefore all SG tubes are intact.</p>



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (continued)	Hi radiation alarm is in due to containment radiation levels.	Crew checks if RCS is intact by checking CNMT conditions consistent with pre-event values: <ul style="list-style-type: none"> <li>• CNMT radiation</li> <li>• CNMT pressure</li> <li>• CNMT sump level</li> </ul>
	Incore room and containment radiation monitors in Hi alarm. Containment pressure is rising Containment sump level is rising	Crew determines the RCS is not intact, based on CNMT conditions.  Crew verifies 2SIS*MOV867A,B,C & D all are open and determines transition to E-1 is appropriate.
	SRO transitions to E-1.	ATC checks if CREVS should be actuated:  Checks EITHER of the following: <ul style="list-style-type: none"> <li>• Control Room radiation monitor, 2RMC*RQ201,202, - NOT IN HIGH ALARM</li> <li>• CIB - HAS NOT OCCURRED</li> </ul> Crew determines CREVs should not be actuated for given conditions.  ATC checks if RCPs should be stopped.  ATC reports RCPs were previously stopped.  ATC checks recirc spray pump status and reports CIB has not actuated.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (continued)	SGs are NOT faulted	<p>ATC/BOP checks if any SGs are faulted:</p> <ul style="list-style-type: none"> <li>• Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER</li> <li>OR</li> <li>• ANY SG COMPLETELY DEPRESSURIZED</li> </ul> <p>Crew determines NO SGs are faulted.</p> <p>BOP checks intact SG levels:</p> <ul style="list-style-type: none"> <li>• NR levels – &gt;12% [31% ADVERSE CNMT]</li> </ul> <p>BOP controls feed flow to maintain NR level between 12% [31% ADVERSE CNMT] and 50%.</p> <p>Crew checks if SG tubes are intact:</p> <ul style="list-style-type: none"> <li>• Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER.</li> <li>• Check secondary radiation – CONSISTENT WITH PRE-EVENT VALUES.</li> </ul> <p>Crew determines no SG levels are rising in an uncontrolled manner and secondary radiation is consistent with pre-event values, therefore all SG tubes are intact.</p> <p>ATC checks PORV's and block valves:</p> <ul style="list-style-type: none"> <li>• Power to block valves – AVAILABLE.</li> <li>• PORVs – CLOSED. (2RCS*PCV456 previously identified as being dual position).</li> <li>• Block valves – Two open. (2RCS*MOV536 previously closed due to stuck open PORV.).</li> </ul>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 6, 7, 8, & 9: (continued)

Crew checks if SI flow should be reduced.

ATC verifies RCS subcooling is >41F [59F ADVERSE CNMT] based on CETC's.

BOP confirms secondary heat sink available by >340 gpm of feed flow available OR NR level in at least 1 SG >12% [31% ADVERSE CNMT].

ATC confirms RCS pressure is stable or rising.

ATC confirms PRZR level is >17% [38% ADVERSE CNMT]

Crew determines that current plant conditions support SI reduction.

**NOTE:** Based upon procedure progression, timing and cooldown rate, plant conditions may not support SI termination at this time.

SRO transitions to ES-1.1, SI Termination

Terminate scenario when the crew determines transition to ES-1.1 is appropriate or not.

Classify Event:

**SITE AREA EMERGENCY** based on EAL **FS1** due to entry into FR-H.1 which indicates a "Potential loss of the RCS barrier" and a "Potential loss of the Fuel Clad barrier" due to a loss of heat sink when a Heat Sink is required.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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**Attachment A-0.11** 'Verification of Automatic Actions' performed in a timely manner.

BOP performs Attachment A-0.11, 'Verification of Automatic Actions' as follows:

Checks both EDGs running with SWS valve alignment and ventilation in service.

Verifies power to both AC emergency busses.

Checks 2HVS\*FN204A or 2HVS\*FN204B running.

Ensure reheat steam isolation:

- Verify 2MSS-MOV100A and B – closed.
- Reset reheater controller.
- Verify 2GSS-MOV204, spillover vlv, closed

Check if main steamline isolation required:

- CNMT pressure – > 7 PSIG  
-OR-
- Steamline pressure – < 500 PSIG  
-OR-
- Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS.

If steamline isolation is required, verifies SLI by checking all YELLOW SLI marks – LIT.

If steamline isolation is not required continues on.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## Attachment A-0.11 – (continued)

### NOTE:

BOP may have already pre-emptively opened 2CCS-AOV118 to provide cooling to the station air compressors.

Establish domestic water system cooling to station air compressors:

- Opens 2CCS-AOV118.
- Verifies at least 1 air compressor is running.

Verifies at least 1 CCP pump is running unless a CIB has occurred.

Align neutron flux monitoring for shutdown:

- Verifies SR CHs energized when IR <1E-10.
- Transfer 2NME-NR45, nuclear recorder, to operable SR and IR displays.

Check CIB and CNMT spray status:

- CNMT pressure – has remained <11 PSIG.

If not – Actuate CIB if required by:

- Manually initiating CIB – BOTH SWITCHES FOR BOTH TRAINS.
- Manually align equipment as required.
- Verify all RCPs – STOPPED.
- BV-1 operator verifies CREVS actuation.
- Service water flow established to RSS HX(s).

Verify service water system in service:

- SWS pumps - TWO RUNNING.
- Check SWS header pressure – >55 psig.
- SWS pump seal water pressure – NOT LOW.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> – (continued)</p>	<p>AFW pumps started IAW SIS actuation, then failed.</p> <p>FWI actuated satisfactorily, but has been reset and CNMT FWI isolation valves reopened IAW FR-H.1.</p>	<p>Verify both CNMT hydrogen analyzers running: 2HCS*SOV100A1, B1 – CNMT sample amber lights – LIT.</p> <p>Verify ESF equipment status:</p> <ul style="list-style-type: none"> <li>• Verify SI status by checking all RED SIS marks – LIT.</li> <li>• Verify CIA by checking all ORANGE CIA marks – LIT.</li> <li>• Verify FWI by checking all GREEN FWI marks – LIT.</li> </ul> <p>Verify source range channels energized with audible indication functioning properly, adjusts multiplier switch and volume as necessary.</p>
<p><b>Attachment A-0.11</b> – COMPLETE</p>	<p><u>Discrepancies:</u> No discrepancies this scenario. However, may note that AFW did not function on SIS actuation and that FWI was reset and CNMT FWI valves have been opened.</p>	<p>Upon completion, report any discrepancies to SRO.</p>

**Appendix D****Scenario Outline****2L15N2**

Facility: **BVPS Unit 2** Scenario No. 2 Op Test No.: **BV2LOT15 NRC**  
 Examiners: \_\_\_\_\_ Candidates: \_\_\_\_\_ SRO  
 \_\_\_\_\_ ATC  
 \_\_\_\_\_ BOP

Initial Conditions: **IC-143 (10):** 100% power, BOL, Equ. XE Conditions, CB "D" @ 227 steps, RCS boron - 1100 ppm.

Turnover: Maintain current plant conditions

Critical Tasks:

1. **CT-6 (E-0.I)** Crew establishes SIS Flow
2. **CT-52 (FR-S.1.C)** Crew inserts negative reactivity
3. **CT-17 (E-2.A)** Crew isolates the faulted SG

Event No.		Event Type	Event Description
1	XMT-MSS043A	(R) ATC (N) BOP/SRO	Load rejection – VPL failure, 2OM-26.4.X
2	GEN02	(C,A) BOP/SRO	MUG Voltage regulator overexcitation failure.
3	XMT-RCS030A	(I,A) ATC/SRO SRO T.S.	2RCS*PT444 drifts HIGH, PRZR pressure decreases, manual control of PRZR pressure required.
4	<i>XMT-RCS002A</i>	<i>SRO T.S.</i>	<i>"A" RCS loop flow transmitter, 2RCS*FT415, fails low.</i>
5	FLX-CFW33 PPL01A PPL01B	(M) ALL	2800 gpm Feedwater leak inside CNMT on "C" SG with an ATWS – <i>Failure of auto/manual Rx trip on manual Rx trip attempt.</i>
6	VLV-SIS069 VLV-SIS070	(C) ATC, SRO	2SIS*MOV867A and 2SIS*MOV867B auto open failure.
7	VLV-MSC021, 023, 024, 025	(C) BOP/SRO	"B" Train Hydrogen Analyzer fails to automatically start on SIS signal.
8	VLV-AFW014	(C) BOP/SRO	AFW valve, 2FWE*HCV100B, fails to close from the CR.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal

E-0 → FR-S.1 → E-0 → E-2

After taking the shift at 100% power, the valve position limiter will fail to 70% causing a load rejection. The control rods will initially insert in response to the load rejection but will stop moving at 212 steps. The crew will initially respond with AOP 2.1.3, Unexpected Control Rod Movement, and then transition to AOP 2.35.2, Load Rejection, after the load rejection is diagnosed. The crew will stabilize the plant after which the BOP will be directed to use procedure 2OM-26.4.X, Recovering Turbine Governor Valves from the Valve Position Limiter, to remove the turbine from the valve position limiter.

The MUG, main unit generator, voltage regulator will then fail causing an over excitation of the MUG, IAW AOP 2.4.1, Process Control Failure, the BOP will place the voltage regulator to "OFF" and correct the over excitation by manually adjusting the "base adjust".

The controlling PRZR pressure channel, 2RCS\*PT444 will drift high causing RCS pressure to lower due to the pressurizer spray valves/PORV's opening. The crew will initially respond IAW AOP 2.4.1, identify the failure and close the spray valves/PORV's, the SRO will then transition to 2OM-6.4.IF, attachment 2 to address the failed channel. The ATC controls PRZR pressure by manually operating the PRZR heaters and spray valves, or manual control of the PRZR pressure master controller. The SRO will address applicable TS entered due to the instrument failure.

***1 of 3 "A" RCS loop flow transmitters will fail low requiring the SRO to identify and address applicable TS.***

A ramped 2800 gpm feedwater leak on the "C" SG inside of containment causing containment pressure to rise, the crew will investigate and diagnose a feedwater leak inside containment. The SRO will direct a pre-emptive reactor trip due to the leak. The reactor will fail to trip from the control room. The SRO will direct the ATC and BOP to perform the IOA's of FR-S.1, "Response to Nuclear Power Generation – ATWS. The control rods will require manual insertion by the ATC. The reactor will be tripped via a local operator after being dispatched and the crew will return to E-0.

SIS will automatically actuate due to high containment pressure. Upon SIS actuation, 2SIS\*MOV867A and 2SIS\*MOV867B will fail to automatically open, the ATC will manually open valves to initiate SIS injection flow.

Additionally, the "B" train Hydrogen Analyzer will fail to automatically start due to the SI signal, the BOP will manually start the "B" Hydrogen Analyzer.

The crew will progress thru E-0, diagnose a faulted SG and transition to E-2, Faulted Steam Generator Isolation.

When the BOP attempts to isolate Aux feedwater flow to the "C" SG, it will be identified that 2FWE\*HCV100B will fail to close from the Control Room. The BOP will take contingency actions using EOP Attachment A-1.24, AFW Throttle Valve Failure, to isolate AFW flow to the faulted "C" SG.

After the crew has completed isolation of the faulted SG, plant conditions will support SI termination, the crew will transition to ES-1.1, SI Termination, at which time the scenario will be terminated.

Expected procedure flow path is E-0 → FR-S.1 → E-0 → E-2



## BEAVER VALLE . JWER STATION

**INITIAL CONDITIONS:** IC-143(10): 100% power, BOL, Equ. XE Conditions, CB “D” @ 227 steps, RCS boron - 1100 ppm.

<b><u>ADDITIONAL LINEUP CHANGES</u></b>	<b><u>STICKERS</u></b>	<b><u>MONITOR SETUP</u></b>
		Normal Splash w/ Hi Power Screen, on VB-A
<b><u>EQUIPMENT STATUS</u></b>	<b><u>DATE/TIME OOS</u></b>	<b><u>TECHNICAL SPECIFICATION(S)</u></b>

### **SHIFT TURNOVER INFORMATION**

1. 100% power, BOL equilibrium conditions, shift goal is to maintain 100% power.

### **SCENARIO SUPPORT MATERIAL REQUIRED**

1. BOL Reactivity Placard

### **PROCEDURES NEEDED**

E-0  
E-2  
FR-S.1  
Attachment A-0.11  
Attachment A-1.24  
AOP 2.1.3  
AOP 2.4.1  
AOP 2.6.7  
AOP 2.35.2  
2OM-26.4.X  
6 IF, Attach 2  
6 IF, Attach 3

# BEAVER VALLEY LOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Insert the following per the simulator preload section of the HTML file for this scenario:	Insert all pre-loads required to support the scenario.	
<b>TRGSET 1 'JPPLP4(1)'</b> <b>IMF PPL01A (0 0) 1</b> <b>IMF PPL01B (0 0) 1</b> <b>TRGSET 3 'JPPLASO(1)'</b> <b>TRGSET 4 'MCRFPA(4) &lt;= 212'</b> <b>IMF CRF01A (4 0) 1</b> <b>IMF PPL02A (30 120)</b> <b>IMF PPL02B (30 130)</b> <b>IRF LOA-CRF007 (30 140) 1</b> <b>IRF LOA-CRF008 (30 150) 1</b> <b>TRG 3 'IMF FLX-CFW33 (0 0) 2800'</b> <b>TRGSET 6 'jcfwflex(33)'</b> <b>IMF VLV-AFW014 (0 0) 0</b> <b>IMF VLV-SIS069 (0 0) 2</b> <b>TRGSET 12 'XA4I081P'</b> <b>TRG 12 'DMF VLV-SIS069'</b> <b>IMF VLV-SIS070 (0 0) 2</b> <b>TRGSET 13 'XA4I076P'</b> <b>TRG 13 'DMF VLV-SIS070'</b> <b>IMF VLV-MSC021 (0 0) 2</b> <b>IMF VLV-MSC023 (0 0) 2</b> <b>IMF VLV-MSC024 (0 0) 2</b> <b>IMF VLV-MSC025 (0 0) 2</b> <b>IOR XA5O024A (0 0) 0</b> <b>TRGSET 24 'XA5I023P'</b> <b>TRG 24 'DMF VLV-MSC021'</b> <b>TRGSET 25 'XA5I023P'</b> <b>TRG 25 'DMF VLV-MSC023'</b> <b>TRGSET 26 'XA5I023P'</b>	Trigger 1 = reactor trip Train A RTB failed closed Train B RTB failed closed Trigger 3 = turbine trip Trigger 4 = control bank D < 212 steps Fail auto rod insertion at <212 steps. Train A trip BKR open Train B trip BKR open Trip A rod drive MG set Trip B rod drive MG set Increase Feed leak on Turbine trip Trigger 6 = feed leak active. 2FWE*HCV100B failed open. 2SIS*MOV867A failed closed. Trigger 12 = 2SIS*MOV867A switch to open 2SIS*MOV867A manually opens 2SIS*MOV867B failed closed. Trigger 13 = 2SIS*MOV867B switch to open 2SIS*MOV867B manually opens 2HCS*SOV133B failed closed 2HCS*SOV134B failed closed 2HCS*SOV135A failed closed 2HCS*SOV135B failed closed 2HCS*SOV100B1 failed off Trigger 24 = H2 Analyzer Trn B PB depressed DMF preventing 2HCS*SOV133B closure. Trigger 25 = H2 Analyzer Trn B PB depressed DMF preventing 2HCS*SOV134B closure. Trigger 26 = H2 Analyzer Trn B PB depressed	

# BEAVER VALLEY JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b>TRG 26 'DMF VLV-MSC024'</b>	DMF preventing 2HCS*SOV135A closure.	
<b>TRGSET 27 'XA5I023P'</b>	Trigger 27 = H2 Anaylzer Trn B PB depressed	
<b>TRG 27 'DMF VLV-MSC025'</b>	DMF preventing 2HCS*SOV135B closure.	
<b>TRGSET 29 'XA5I023P'</b>	Trigger 29 = H2 Anaylzer Trn B PB depressed	
<b>TRG 29 'DOR XA5O024A'</b>	DMF preventing 2HCS*SOV100B1 closure.	

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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Assign shift positions

SRO: \_\_\_\_\_

ATC: \_\_\_\_\_

BOP: \_\_\_\_\_

Conduct a shift turnover with oncoming operators.

Simulator frozen until after shift turnover unless it needs to be run momentarily for an alignment change.

When the shift turnover is completed, place the simulator to RUN and commence the scenario.

Simulator running.

Crew assumes control of the unit.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 1:**

Turbine Runback due to Valve Position limiter failure, Control rods step in until 212 steps then quit moving in auto.

**IMF EHC06 (0 0) 70 0 ASIS**

### **NOTE:**

If the crew immediately recognizes that a load rejection has occurred, AOP 2.35.2 may be entered directly.

## **IMMEDIATE PLANT RESPONSE:**

Rods begin stepping in,  
Megawatts decrease,  
RCS temperature and pressure rise accordingly.  
Rods stop moving at 212 steps.

SRO enters AOP 2.1.3.

SRO transitions to AOP-2.35.2.

IAW IOAs of AOP 2.1.3, ATC announces unexpected rod motion, verifies control rods are in auto then checks for a load rejection. ATC verifies megawatts decreasing and announces load rejection has occurred.

ATC checks rods are inserting in AUTO and Tav<sub>g</sub> is dropping to Tref.

When rods quit moving ATC recognizes Tav<sub>g</sub>-Tref mismatch exists and places rods to manual and continues insertion.

ATC checks if reactor overpower has occurred, ATC verifies reactor power is ~95% and an overpower has not occurred.

BOP checks if 1<sup>st</sup> stage pressure channel has failed, BOP reports 2MSS\*PT446 and 2MSS\*PT447 are consistent with current power level and Tref.

ATC checks control rod system.  
ATC reports control rods inserted automatically until 212 steps then quit moving, after verifying Tav<sub>g</sub> was not matched with Tref, ATC previously placed rods in manual and continued inserting to match Tav<sub>g</sub> and Tref.  
ATC reviews reactivity plan to determine required boration.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 1:** (continued)

### **ROLE PLAY SM:**

If necessary, as SM, direct the crew to remove the turbine from the limiter.

### **NOTE:**

Due to the failed limiter position, at 1%/minute rate IAW 2OM-26.4.X, it will take ~20 minutes to reduce the reference setting below the current GV position. It is not the intent to recover completely from the limiter, next event can be entered at the LE discretion.

Proceed to next event at LE discretion.  
(see note above)

Crew sounds the standby alarm, announces a Unit 2 load rejection and informs the SM to evaluate EPP.

BOP verifies normal EHC system operation by:

- Verifying valve position limit is not consistent with pre-event.

SRO directs BOP to perform 2OM-26.4.X to remove the turbine from the limiter.

IAW 2OM-26.4.X, step 2, BOP recovers the turbine governor valves from the limiter as follows:

- Adjusts the setter below the present reference setting.
- Sets the load rate thumbwheel to 1%/minute.
- Presses the “GO” pushbutton.
- Adjusts the load rate thumbwheel as directed by SRO.
- Presses the “HOLD” pushbutton when the “VALVE POS LIMIT” light extinguishes.

When Tavg/Tref deviation is within  $\pm 2F$ , BOP resets the steam dump controller.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 2:**

Voltage Regulator Failure  
**IMF GEN02 (0 0) 27 30 ASIS**

## **IMMEDIATE PLANT RESPONSE:**

MUG Excitation increases  
Main Generator VARS increase  
Main Generator Power Factor decreases (more lagging)  
A7-4C, Generator Field Forcing

BOP reports unexpected electrical alarm.

BOP identifies voltage regulator failure.

ATC refers to ARP.

IAW AOP 2.4.1, BOP turns voltage regulator off and manually reduces MUG excitation using exciter base adjust to lower VARS to restore power factor.

SRO provides BOP a control band for power factor of 0.9 to 1.0 lagging.

SRO contacts Operations management and notifies maintenance of voltage regulator failure.

Continue with next event at LE discretion

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENT 3:</u></b>		
Pressurizer pressure control channel drifts high. <b>IMF XMT-RCS030A (0 0) 2500 90</b>	<b><u>IMMEDIATE PLANT RESPONSE:</u></b> 2RCS*PT444 drifts high PRZR htr grps A & D, backup grps B & E turn off. PRZR htr Control grp C modulates low. spray valves, 2RCS*PCV455A & 455B modulate open.  A4-1D, PRZR Control Press High/Low A4-1E, PRZR Control Press Dev High/Low A4-2G, PRZR B/U Htr Group Auto On/Off A4-2F, Pressure Relief Block  After plant is stable, SRO transitions to 2OM-6.4.IF, Attachment 2	ATC reports unexpected alarm, A4-1E.  ATC identifies 2RCS*PT444 failing high.  IAW IOAs of AOP 2.4.1, part B, ATC controls PRZR pressure by operating master pressure controller in manual.  BOP refers to ARP. With PRZR htrs and spray valve control in manual, SRO establishes a control band and transient Rx trip criteria of 2100 psig low / 2340 psig high for manual PRZR pressure control.  IAW 2OM-6.4.IF, attachment 2: ATC places the CS for 2RCS*PCV455C to close. ATC verifies 2RCS-PK444A controller is in manual and manually controls RCS pressure using the controller in manual and/or manually controlling PRZR heaters as necessary.  SRO evaluates applicable TS: TS 3.4.1 for RCS DNB parameters, Condition A: restore RCS pressure within 2 hours. TS 3.3.4 for Remote Shutdown Instrumentation – for Info Only.  SRO contacts Operations management and notifies I&C of pressure transmitter failure.
<b>NOTE:</b> If crew response is delayed, PORV, 2RCS*PCV455C, will open in response to control channel failure.		
<b>NOTE:</b> Due to dynamic nature of event, a followup question regarding applicable TS may be necessary.		
Proceed with next event at LE discretion		



# BEAVER VALLEY LOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENT 4:

“A” Loop RCS flow transmitter fails low. **IMF XMT-RCS02A (0 0) 0 40**

2RCS\*FT415, “A” RCS loop, channel II flow fails low.  
Status panel 495 (BB-A) B-3 illuminates.  
A2-5E, Reactor coolant loop flow low.  
2RCS-FI415 (VB-A) fails to zero.

ATC reports unexpected RCS low flow alarm.  
Crew verifies plant stability.  
BOP references ARP.  
Crew recognizes single instrument failure.  
IAW ARP, SRO enters 2OM-6.4.IF, attachment 3.

SRO evaluates applicable TS;  
TS 3.3.1, RTS Instrumentation, Function 10,  
Condition K, Place channel in trip within 72 hours.

Proceed with next event at LE discretion

SRO contacts Operations management and notifies I&C of loop flow transmitter failure.

## EVENT 5:

Feed line break inside containment  
**IMF FLX-CFW33 (0 0) 2800 600 250**

Multiple malfunctions occur on reactor trip.

Feedwater header leak inside containment.  
CNMT pressure gradually rises, “C” SG level begins dropping with increased feedwater flow.  
A2-2B, UIL trouble  
A6-11E, SG 21C level deviation from setpoint  
A1-2G, Incore Instrum/CNMT sump lvl high  
A2-3B, UIL flow > 60 gallons

The crew will identify degrading containment conditions along with dropping “C” SG level.

IAW AOP 2.4.1, the BOP will manually control the “C” SG main feedwater regulating valve and attempt to restore and stabilize level.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 6, 7, &amp; 8:</u></b></p> <p><b>NOTE:</b> ATC may momentarily place the control rods to AUTO then return to manual after verifying no auto rod motion occurs.</p>	<p>The reactor will fail to trip either automatically or manually from either control room switch. The control rods will fail to automatically insert if returned to auto mode. (previously in manual due to load rejection) 2SIS*MOV867A and 2SIS*MOV867B fail to automatically open upon SIS actuation signal. “B” train Hydrogen analyzer fails to automatically start. “C” AFW feedwater control valve, 2FWE*HCV100B fails to close from the control room.</p> <p>SRO enters E-0.</p> <p>SRO transitions to FR-S.1.</p>	<p>With CNMT pressure continuing to rise and “C” SG level continuing to drop. SRO directs the crew to manually trip the reactor and perform IOAs of E-0.</p> <p>ATC attempts a manual reactor trip, reports reactor trip failure/ ATWS condition.</p> <p>SRO directs operators to perform IOA’s of FR-S.1, enters FR-S.1 at step 1 of E-0.</p>

BEAVER VALLEY, JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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**EVENTS 6, 7 & 8:** (continued)

**Critical Task: CT-52 (FR-S.1.C)**

Crew inserts negative reactivity into the core by inserting RCCAs before completing the immediate action steps of FR-S.1.

SAFETY SIGNIFICANCE -- Failure to insert negative reactivity, under the postulated plant conditions, results in an unnecessary situation in which the reactor remains critical or returns to a critical condition. Performance of the critical task would make the reactor subcritical and provide sufficient shutdown margin to prevent or at least minimize the power excursion associated with any subsequent return to criticality.

Failure to insert negative reactivity constitutes "mis-operation or incorrect crew performance which leads to incorrect reactivity control (e.g., failure to initiate emergency boration or manually insert RCCAs)."

Crew performs IOA's of FR-S.1.  
BOP manually trips turbine.

ATC manually begins inserting rods.

# BEAVER VALLE, JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 6, 7 & 8: (continued)

### NOTE:

Dependent upon crew response, SI may have occurred at this time, if so the crew will recognize emergency boration is not required due to SI flow.

- Checking SI is actuated.
- Verifying HHSI flow indicated.

BOP verifies AFW status.  
BOP manually starts 2FWE\*P23A and 2FWE\*P23B motor-driven AFW pumps.

BOP manually opens 2MSS\*SOV105A-F to start turbine-driven AFW pump, 2FWE\*P22.

BOP verifies all AFW throttle valves are open.

BOP verifies AFW flow.

Crew initiates emergency boration flow by:

- Verifying SI has not actuated.
- Verifying at least 1 HHSI pump running.
- Opening 2CHS\*MOV350.
- Starting "A" Boric Acid pump.
- Verifying >30 GPM flow.
- Adjusting 2CHS\*FCV122 to establish >40 gpm flow.
- Verifying PRZR press <2330 psig.

# BEAVER VALLEY .OWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 6, 7 & 8:** (continued)

### **ROLE PLAY:**

When requested to open the reactor trip breakers & trip the rod drive MG set output ACBs, insert:

### **TRG! 30**

Following commands are preloaded, activate Trigger 30 as soon as requested, 1<sup>st</sup> Rx trip breaker will open 2 minutes after actuating Trigger 30.

**(TRG! 30)**

**IMF PPL02A (30 120)**

**IMF PPL02B (30 130)**

**IRF LOA-CRF007 (30 140) 1**

**IRF LOA-CRF008 (30 150) 1**

(all commands preloaded)

### **ROLE PLAY:**

When all breakers are open, report actions to the control room.

Crew alerts plant personnel by:

- Sounding the standby alarm.
- Announcing a Unit 2 Rx trip w/o SCRAM.
- Dispatching an operator to locally trip the Rx.

Crew continues in FR-S.1 after dispatching an operator to locally trip the Unit 2 reactor.

BOP verifies turbine is tripped.  
BOP verifies 2MSS-MOV100A, and B automatically CLOSED.  
BOP depresses the RESET pushbutton on the reheater controller.

ATC checks if SI is actuated and reports SI is not actuated.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 6, 7 & 8:** (continued)

### **NOTE:**

This is a continuous action step, when the Rx is locally tripped the crew will return to this step and then transition back to E-0, Step 1.

SRO returns to E-0.

ATC checks if reactor is subcritical:

- Power range channels < 5%.
- IR channels – negative startup rate.
- Continues boration as necessary.

Crew confirms that reactor is subcritical, SRO returns to procedure and step in effect. (E-0, step 1)

ATC and BOP commence IOA's of E-0.

ATC verifies reactor trip:

- A5-6D - LIT.
- Power range indication is < 5%.
- Neutron flux is dropping.

BOP verifies turbine trip:

- Throttle OR Governor valves ALL closed.
- Main Generator output brks – open.
- Exciter Circuit breaker – open.

BOP verifies power to AC emergency busses:

- Using VB-C voltmeters, verifies both 2AE and 2DF busses have voltage indicated.

## BEAVER VALLEY JEWEL STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 6, 7 &amp; 8:</u></b> (continued)</p> <p><b>NOTE:</b></p> <p>SI requirement at this time is dependent upon crew response, CNMT pressure will continue to rise due to the feedwater leak and will require SI. If SI setpoint is not reached yet, the crew may transition to ES-0.1 until SI actuates.</p> <p>The crew may have previously manually actuated SI due to CNMT pressure rise.</p> <p>Script assumes SI has occurred.</p>	<p>SI automatically actuated</p>	<p>Check SI status:</p> <p>ATC reports SI automatically actuated and manually actuates SI by turning both trains' control switches.</p>
		<p>ATC/BOP, sounds standby alarm, announces Unit 2 reactor trip and safety injection.</p> <p>Check if HHSI flow should be secured by checking the following:</p> <ul style="list-style-type: none"> <li>• CNMT &amp; Secondary radiation</li> <li>• CNMT pressure &amp; sump level</li> <li>• SG – pressures and levels</li> <li>• RCS subcooling</li> <li>• Secondary heat sink exists</li> <li>• RCS pressure – stable or rising</li> <li>• PRZR level – &gt;17%</li> <li>• SI occurred automatically</li> </ul> <p>Due to CNMT parameters not being consistent with pre-event, crew determines SI is required; SI flow should not be secured at this time.</p>

# BEAVER VALLE, JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>EVENTS 6, 7 &amp; 8:</b> (continued)  <b>Critical Task: CT-6 (E-0.1)</b>  Crew establishes flow from at least one high head ECCS pump before transition out of E-0.</p> <p>SAFETY SIGNIFICANCE -- Failure to manually start at least one Charging/SI pump or align valves as necessary under these conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent "degraded emergency core cooling system capacity."</p> <p><b>NOTE:</b>  The crew may have preemptively isolated AFW flow to the "C" SG when faulted SG is identified.</p>	<p>2SIS*MOV867A and B failed to open on the SI signal.</p> <p><u>List of Attachment A-0.11 Discrepancies:</u></p> <p>2SIS*MOV867A and B failed to auto open.  "B" train Hydrogen analyzer failed to start.</p>	<p>ATC verifies SI system status:</p> <ul style="list-style-type: none"> <li>• 2CHS*P21A &amp; 2CHS*P21B running.</li> <li>• 2SIS*P21A &amp; 2SIS*P21B running.</li> <li>• No HHSI Flow indicated on 2SIS-FI943.  ATC recognizes 2SIS*MOV867A and B are not open, opens the valves and verifies SI flow.</li> </ul> <p>BOP verifies AFW status:</p> <ul style="list-style-type: none"> <li>• Both motor-driven pumps running.</li> <li>• Turb driven pump, all stm supply SOV's open.</li> <li>• AFW throttle valves all FULL OPEN.</li> <li>• Total AFW flow is &gt;340 gpm.</li> </ul> <p>SRO directs BOP verify automatic actions by performing Attachment A-0.11 in a timely manner.</p> <p>BOP performs Attachment A-0.11.</p>
<p><b>NOTE:</b>  Evaluation of BOP performing Attachment A-0.11 begins on page 23.</p>		



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>EVENTS 6, 7 &amp; 8:</b> (continued)</p> <p><b>NOTE:</b> If the feed break was not diagnosed prior to the trip, steam pressures will begin to diverge following steamline isolation, allowing for diagnosis of the faulted SG.</p> <p><b>NOTE:</b> MSLI may have previously occurred either due to manual preemptive action or automatically due to CNMT pressure.</p> <p><b>NOTE:</b> Pressurizer pressure control previously placed in manual due to 2RCS*PT444 failure.</p>	<p>RCS temperature &lt;547°F and dropping due to SI flow and feed break flow.</p>	<p>ATC/BOP checks RCS Tavg stable at or trending to 547F.</p> <p>ATC reports RCS Tavg is &lt;547F and dropping. SRO directs ATC to:</p> <ul style="list-style-type: none"> <li>• Stop dumping steam &amp; verify steam dumps closed.</li> <li>• Verify 2MSS-MOV100A, B are closed.</li> <li>• Depress the reheater controller RESET PB.</li> <li>• Minimize total feedflow while maintaining &gt; 340 gpm until 1 NR level is &gt;31% (adverse).</li> <li>• Initiates steamline isolation by depressing 4 of 4 PB.</li> </ul> <p>ATC verifies PRZR isolated:</p> <ul style="list-style-type: none"> <li>• PORVs – CLOSED.</li> <li>• Spray Valves – CLOSED.</li> <li>• Safety relief valves – CLOSED (use PSMS).</li> <li>• PRT conditions – CONSISTENT WITH EXPECTED VALUES.</li> <li>• Power to at least one block valve – ALL AVAILABLE.</li> <li>• Block valves – AT LEAST ONE OPEN (All).</li> </ul> <p>ATC checks if RCPs should be stopped:</p> <ul style="list-style-type: none"> <li>• D/P between RCS pressure and highest SG pressure – &lt;205 PSID [220 PSID]</li> </ul> <p>Crew determines criteria for stopping RCPs is not met.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 6, 7 & 8:** (continued)

SRO transitions to E-2.

ATC/BOP checks if any SGs are faulted:

- Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER  
OR
- ANY SG COMPLETELY DEPRESSURIZED

Crew determines there is a faulted SG, verifies HHSI flow is indicated and transition to E-2 is required.

Verify CREVS actuated.

ATC/BOP reports CREVS not actuated.

SRO directs ATC/BOP to actuate both trains of CREVS using the CONTROL ROOM EMERG AIR SUP ACTUATION pushbuttons,

- Verifies the control room air intake and exhaust dampers are CLOSED.
- Verifies 2HVC\*FN241A running after time delay.

SRO requests a BV-1 operator to verify proper CREVS actuation and place CR air intake and exhaust dampers control switches in CLOSE.

SRO directs STA to commence Control Room ventilation actions. Refer to Attachment A-2.4.

ATC/BOP verifies steamline isolation has occurred by checking all YELLOW SLI identified components are in the designated position. (previously verified)

## **NOTE:**

Main steamline isolation should have already occurred due to CNMT pressure and verified via attachment A-0.11 by this time, crew not likely to verify again at this time.

BVPS – 2L15 NRC 2, r1

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>EVENTS 6, 7 &amp; 8:</b> (continued)</p> <p><b>Critical Task: CT-17 (E-2.A)</b> Crew isolates the faulted SG and directs operator to close isolation valves operated from outside of the CR before transition out of E-2.</p> <p>SAFETY SIGNIFICANCE -- Failure to isolate a faulted SG that can be isolated causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Also, depending upon the plant conditions, it could constitute a demonstrated inability by the crew to recognize a failure of the automatic actuation of an ESF system or component.</p> <p><b>ROLE PLAYS:</b> When requested to isolate 2SVS-29, wait 9 minutes then insert: <b>IRF LOA-MSS011 0 60</b> then report that 2SVS-29 is isolated. When requested to deenergize and close 2FWE*HCV100B, wait 8 min. insert: <b>IMF VLV-AFW014A 0 60</b> then report that 2FWE*HCV100B is deenergized and closed.</p>	<p>“C” SG pressure is lower than “A” &amp; “B”. “A” &amp; “B” may be slowly lowering as expected due to the cooldown. Crew should respond with “stable” for “A” &amp; “B” SG’s. “C” SG pressure &amp; level lowering.</p> <p><b>NOTE:</b> Crew may have pre-emptively isolated AFW flow to the “C” SG after fault was recognized.</p>	<p>Crew checks for any non-faulted SGs: BOP identifies “A” &amp; “B” steam generator pressures are “stable or rising”.</p> <p>Crew identifies “C” SG as faulted.</p> <p>BOP isolates the faulted, “C” SG as follows:</p> <ul style="list-style-type: none"> <li>• Verifies FWI. (previously verified)</li> <li>• Closes AFW throttle valves on “C” SG 2FWE*HCV100A, B.</li> </ul> <p>BOP reports 2FWE*HCV100B will not close. SRO directs BOP to respond IAW Attachment A-1.24.</p> <ul style="list-style-type: none"> <li>• Verifies 2FWE*P22 or 23A running with flow.</li> <li>• Resets SI signal, both trains.</li> <li>• Secures 2FWE*P23B, places CS in PTL.</li> <li>• Dispatches an operator to locally de-energize and close 2FWE*HCV100B.</li> <li>• Verifies AFW flow to “C” SG at zero.</li> </ul> <ul style="list-style-type: none"> <li>• Verifies residual heat release valve is closed.</li> <li>• Directs field operator to close 2SVS-29.</li> <li>• Verifies 2MSS-SOV105C and F closed.</li> <li>• Verifies, “C” SG Atmospheric steam dump valve is closed.</li> <li>• Verifies SG blowdown isolated, 2BDG*AOV100C1.</li> <li>• Verifies SG blowdown sample valves closed, 2SSR*AOV117A, B, C.</li> </ul>

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**EVENTS 6, 7 & 8:** (continued)

BOP verifies 2FWE-TK210, PPDWST level is >85 in.

Crew checks if SG tubes are intact:

- Checks all SG levels – NONE RISING IN AN UNCONTROLLED MANNER.
- Check secondary radiation is CONSISTENT WITH PRE-EVENT VALUES.

Determines no SG levels are rising in an uncontrolled manner and secondary radiation is CONSISTENT WITH PRE-EVENT VALUES.

Crew determines SG tubes ARE INTACT.

Crew checks if SI flow should be reduced by:

- ATC verifies RCS subcooling is >41F [59F ADVERSE CNMT] based on CETC's.
- BOP confirms secondary heat sink available by >340 gpm of feed flow available OR NR level in at least 1 SG >12% [31% ADVERSE CNMT].
- ATC confirms RCS pressure is stable or rising.
- ATC confirms PRZR level is >17% [38% ADVERSE CNMT]

Crew determines that current plant conditions support SI reduction.

Terminate scenario when the crew transitions to ES-1.1.

SRO transitions to ES-1.1, SI Termination

Classify Event:

**SITE AREA EMERGENCY** per SS3, due to a failure of the reactor protection system.

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**Attachment A-0.11** 'Verification of Automatic Actions' performed in a timely manner.

BOP performs Attachment A-0.11, 'Verification of Automatic Actions' as follows:

Checks both EDGs running with SWS valve alignment and ventilation in service.

Verifies power to both AC emergency busses.

Checks 2HVS\*FN204A or 2HVS\*FN204B running.

Ensure reheat steam isolation:

- Verify 2MSS-MOV100A and B – closed.
- Reset reheater controller.
- Verify 2GSS-MOV204, spillover vlv, closed

Check if main steamline isolation required:

- CNMT pressure – > 7 PSIG  
-OR-
- Steamline pressure – < 500 PSIG  
-OR-
- Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS.

If steamline isolation is required, verifies SLI by checking all YELLOW SLI marks – LIT.

If steamline isolation is not required continues on.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> – (continued)</p> <p><b>NOTE:</b> BOP may have already pre-emptively opened 2CCS-AOV118 to provide cooling to the station air compressors.</p> <p><b>NOTE:</b> Depending upon crew timing and procedure progression, CIB is not expected to have occurred at this time.</p> <p>When CIB setpoint is reached, all CIB actuations will occur as designed.</p>		<p>Establish domestic water system cooling to station air compressors:</p> <ul style="list-style-type: none"> <li>• Opens 2CCS-AOV118.</li> <li>• Verifies at least 1 air compressor is running.</li> </ul> <p>Verifies at least 1 CCP pump is running unless a CIB has occurred.</p> <p>Align neutron flux monitoring for shutdown:</p> <ul style="list-style-type: none"> <li>• Verifies SR CHs energized when IR &lt;1E-10.</li> <li>• Transfer 2NME-NR45, nuclear recorder, to operable SR and IR displays.</li> </ul> <p>Check CIB and CNMT spray status:</p> <ul style="list-style-type: none"> <li>• CNMT pressure – has remained &lt;11 PSIG.</li> </ul> <p>If not – Actuate CIB if required by:</p> <ul style="list-style-type: none"> <li>• Manually initiate CIB – BOTH SWITCHES FOR BOTH TRAINS.</li> <li>• Manually align equipment as required.</li> <li>• Verify all RCPs – STOPPED.</li> <li>• BV-1 operator verifies CREVS actuation.</li> <li>• Service water flow established to RSS HX(s).</li> </ul> <p>Verify service water system in service:</p> <ul style="list-style-type: none"> <li>• SWS pumps - TWO RUNNING.</li> <li>• Check SWS header pressure – &gt;55 psig.</li> <li>• SWS pump seal water pressure – NOT LOW.</li> </ul>

# BEAVER VALLEY . JWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b>Attachment A-0.11</b> – (continued)	“B” CNMT hydrogen analyzer failed to automatically start.	Verify both CNMT hydrogen analyzers running: 2HCS*SOV100A1, B1 – CNMT sample amber lights – LIT. NOTES “B” H2 analyzer did not start and depresses START pushbutton, then verifies amber light lit.
<b><u>Critical Task: CT-6 (E-0.1)</u></b> Crew establishes flow from at least one high head ECCS pump before transition out of E-0.	2SIS*MOV867A and B failed to automatically open on the SI signal.	Verify ESF equipment status: <ul style="list-style-type: none"> <li>• Verify SI status by checking all RED SIS marks – LIT. OPENS 2SIS*MOV867A and B.</li> <li>• Verify CIA by checking all ORANGE CIA marks – LIT.</li> <li>• Verify FWI by checking all GREEN FWI marks – LIT.</li> </ul> Verify source range channels energized with audible indication functioning properly, adjusts multiplier switch and volume as necessary.
<b>Attachment A-0.11</b> – COMPLETE	<u>Discrepancies:</u> 2SIS*MOV867A and B failed to auto open. “B” train Hydrogen analyzer failed to start.	Upon completion, report any discrepancies to SRO.

## Appendix D

## Scenario Outline

2L15N4

Facility: **BVPS Unit 2** Scenario No. 4 Op Test No.: **BV2LOT15 NRC**  
 Examiners: \_\_\_\_\_ Candidates: \_\_\_\_\_ SRO  
 \_\_\_\_\_ ATC  
 \_\_\_\_\_ BOP

Initial Conditions: **IC 145:** 4.8% power, MOL, Rx S/U in progress, CB "D" @ 105 steps, RCS boron - 1349 ppm.

Turnover: Raise power to 15% to S/U main turbine IAW 20M-52.4.A.

Critical Tasks:

1. **CT-11 (E-0.O)** CNMT isolation
2. **CT-18 (E-3.A)** Crew isolates ruptured SG
3. **CT-19 (E-3.B)** Crew establishes/maintains RCS temperature
4. **CT-20 (E-3.C)** Crew depressurizes RCS to meet SI termination criteria

Event No.	Malf. No.	Event Type	Event Description
1		(R) ATC (N) SRO	Normal power increase to 15% IAW 20M-52.4.A
2		<b>(N) BOP/SRO</b>	<b><i>After Mode 1 declared, S/U 2CCS-P21B &amp; S/D 2CCS-P21A.</i></b>
3	CNH-CFW11	(C,A) BOP/SRO	2FWS*FCV479, Bypass Feedwater valve controller fails as is in AUTO, requires manual operation.
4	PMP-CHS002	(C,A) ATC/SRO SRO (TS)	2CHS*P21B, Charging/ HHSI pump shaft seizure.
5		<b>(N) ATC/SRO</b>	<b><i>Restore normal charging and letdown.</i></b>
6	XMT-MS038A	SRO (TS)	2LMS*PT952, CNMT pressure transmitter fails high.
7	PPL02A	(M) ALL	Spurious Rx trip.
8	RCS04B	(M) ALL	21B SG 520 gpm tube rupture.
9	PPL07B	(C) ATC/SRO	2CHS*P21C, Charging / HHSI auto start failure
10	VLV-SEA015	(C) BOP/SRO	Train B CIA failure with 2CHS*MOV378 auto close failure.
11	VLV- RCS032,33,34	(C) ATC/SRO	PRZR PORV fails to close when opened for RCS depressurization in E-3, requires isolation.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal

E-0 → ES-0.1 → E-0 → E-3



The crew will take the shift at 4.8% power with instructions to raise power to 15% IAW the reactivity plan to S/U the main turbine. The following malfunctions will occur as power is raised.

***After Mode 1 is entered, IAW 2OM-28.4.H, the BOP will start 2CCS-P21B, S/D 2CCS-P21A and place in auto.***

After power is >5% and a dilution has been performed, the “B” Charging/ HHSI pump will experience a shaft seizure. The crew will respond with AOP 2.7.1, Loss of Charging or Letdown, and start the standby charging pump after isolating charging and letdown. The crew will dispatch operators to place the spare charging pump 2CHS\*P21C in service on the 2DF bus. The SRO will address the applicable TS.

***After the standby charging pump is started, the ATC will restore normal charging and letdown IAW 2OM-7.4.AB.***

Also occurring at 5% power, the “A” bypass feedwater regulating valve controller will fail as is. As power rises, the controller problem will become evident requiring the BOP to manually control “A” SG level IAW AOP 2.4.1, Process Control Failure.

At 8% reactor power, Containment Pressure Transmitter, 2LMS\*PT952, will fail high. The SRO will enter the instrument failure procedure and address the applicable TS.

When the reactor reaches 10% power, a spurious reactor trip will occur, the crew will enter E-0, Reactor Trip and Safety Injection. The crew will determine SI is not actuated nor required and transition to ES-0.1, Reactor Trip Response.

5 minutes after the reactor trip occurs a 520 gpm SGTR, steam generator tube rupture, will occur on the “B” SG. The crew will note that plant parameters are degrading and IAW ES-0.1, left hand page direction, actuate SI and return to E-0. The crew will diagnose a SGTR has occurred and will transition to E-3, Steam Generator Tube Rupture.

2CHS\*P21C will fail to automatically start from the SIS but will start when the ATC attempts a manual start.

The safety injection actuation will fail to actuate the train “B” CIA signal, and train “A” CIA valve, 2CHS\*MOV378 will fail to automatically close. While performing attachment A-0.11, Verification of Automatic Actions, the BOP will recognize the failure and isolate the containment penetration via either manually actuating Train “B” CIA or manually closing 2CHS\*MOV378.

The crew will progress thru E-3, when a PORV is opened to depressurize the RCS it will fail to close, the ATC will then close the applicable MOV block valve to isolate the stuck open PORV.

The scenario will be terminated after the crew establishes a normal charging flowpath in E-3.

Expected procedure flow path is E-0 → ES-0.1 → E-0 → E-3

## BEAVER VALLEY . JWER STATION

**INITIAL CONDITIONS:** 4.8% power, MOL, Rx S/U in progress, CB “D” @ 105 steps, RCS boron - 1349 ppm.

<b><u>ADDITIONAL LINEUP CHANGES</u></b>	<b><u>STICKERS</u></b>	<b><u>MONITOR SETUP</u></b>
		Normal Splash w/ Mid Power Screen, on VB-A
<b><u>EQUIPMENT STATUS</u></b>	<b><u>DATE/TIME OOS</u></b>	<b><u>TECHNICAL SPECIFICATION(S)</u></b>

### **SHIFT TURNOVER INFORMATION**

1. ~5% power, MOL, Rx S/U in progress, shift goal is to raise power and put turbine online.
2. After Mode 1 is entered, crew is required to swap inservice CCS pumps.  
IAW 2OM-28.4.H, crew is to place 2CCS-P21B in service and 2CCS-P21A placed in auto.

### **SCENARIO SUPPORT MATERIAL REQUIRED**

1. MOL Reactivity Placard
2. Reactivity plan to support plant start up.
3. 2OM-52.4.A
4. 2OM-28.4.H

### **PROCEDURES NEEDED**

E-0  
ES-0.1  
E-3  
Attachment A-0.11  
AOP 2.4.1  
AOP 2.7.1  
2OM-1.4.IF  
2OM-7.4.AB  
2OST-6.4

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Insert the following per the simulator preload section of the HTML file for this scenario:

**TRGSET 11 'FNISPR(1) >=5.2'**  
**IMF CNH-CFW11 (11 0) 1**  
**TRGSET 12 'FNISPR(1) >=8.0'**  
**IMF XMT-MSC038A (12 0) 55 60**  
**TRGSET 13 'XA4o0422.and.XA8D053G>=20'**  
**TRGSET 14 'et\_array(11).and.et\_array(13).and.xa8d053g<=2'**  
**IMF PMP-CHS002 (14 120) 2**  
**IMF PPL07B (0 0) 1**  
**IMF PPL08B (0 0) 0**  
**TRGSET 10 'XA4I106C'**  
**IMF VLV-SEA015 (0 0) 1**  
**TRG 10 'DMF VLV-SEA015'**  
**TRGSET 1 'JPPLP4(1)'**  
**TRGSET 9 'FNISPR(2) >=10.0&&FNISPR(3) >=10.0'**  
**IMF PPL02A (9 45)**  
**IMF RCS04B (1 300) 520 0 0**  
**TRGSET 4 'XB1I033P'**  
**IMF VLV-RCS033 (4 0) 1**  
**TRGSET 5 'XB1I034P'**  
**IMF VLV-RCS034 (5 0) 1**  
**TRGSET 6 'XB1I035P'**  
**IMF VLV-RCS032 (6 0) 1**  
**IRF LOA-HIV065 (21 240) RACKOUT**  
**IRF LOA-HIV005 (21 300) BUS\_2DF**  
**IRF LOA-HIV068 (21 360) RACKIN**  
**IRF LOA-SWS020 (21 420) 1 0**  
**IRF LOA-SWS031 (21 480) 1 0**  
**IRF LOA-SWS019 (21 540) 0 0**  
**IRF LOA-SWS025 (21 600) 0 0**

Insert all pre-loads required to support the scenario.

ENSURE STEAM DUMP POT AT 822 units.  
 Trigger 11 = Reactor power >5%  
 2FWS\*FCV479 controller fails as is in AUTO  
 Trigger 12 = Reactor power 8.0%  
 2LMS\*PT952 fails high  
 Trigger 13 = M/U initiated  
 Trigger 14 = M/U stopped after initiation & >5%  
 2CHS\*P21B shaft seizure  
 2CHS\*P21C auto start failure on 2DF bus  
 Train B auto CIA actuation failure  
 Set trigger 10 on 2CHS\*MOV378 CS to close  
 2CHS\*MOV378 failed open  
 2CHS\*MOV378 closes manually  
 Trigger 1 = reactor trip  
 Trigger 9 = N42 and N43 >= 10%  
 Spurious Rx trip  
 21B 520 gpm SGTR 5 min. after reactor trip  
 Trigger 4 = 2RCS\*PCV455D CS to open  
 PORV 2RCS\*PCV455D failed open  
 Trigger 5 = 2RCS\*PCV456 CS to open  
 PORV 2RCS\*PCV456 failed open  
 Trigger 6 = 2RCS\*PCV455C CS to open  
 PORV 2RCS\*PCV455C failed open  
 2CHS\*P21B ACB-2F12 racked out  
 2CHS\*P21C manual transfer sw selected to 2DF  
 2CHS\*P21C ACB-2F15 racked in  
 2SWS\*165 (2CHS\*E25C B header supply) open  
 2SWS\*339 (2CHS\*E25C B header return) open  
 2SWS\*164 (2CHS\*E25B B header supply) closed  
 2SWS\*182 (2CHS\*E25B B header return) closed

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INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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Assign shift positions

SRO:\_\_\_\_\_

ATC:\_\_\_\_\_

BOP:\_\_\_\_\_

Conduct a shift turnover with oncoming operators.

Simulator frozen until after shift turnover unless it needs to be run momentarily for an alignment change.

When the shift turnover is completed, place the simulator to RUN and commence the scenario.

Simulator running.

Crew assumes control of the unit.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 1, 2, 3, 4, 5 &amp; 6:</u></b>  Normal Plant Startup, reactor power increase to 15% to support turbine startup.  With; S/U of 2CCS-P21B (event 2), Bypass feed regulating valve controller failure (event 3), Charging pump trip (event 4), normal charging/letdown restoration (event 5) and CNMT pressure transmitter failure (event 6).</p> <p><b>NOTE:</b>  Reactivity plan requires 400 gallons dilution and 10 rod steps to raise power to 10%. Crew may elect to add total dilution volume in multiple steps.</p> <p><b>NOTE:</b>  Events 3, 4 &amp; 6 are triggered to actuate on rising power, however each event may be inserted at LE discretion.</p>	<p>2OM-52.4.A, step 7.a in progress.</p>	<p>IAW reactivity plan, ATC dilutes and withdraws rods to raise reactor power to &gt; 15%.</p> <p>When Rx power is &gt;5%, crew identifies and announces entry into Mode 1.</p> <p>ATC initiates control rod withdrawal and dilution IAW the reactivity plan.</p> <ul style="list-style-type: none"> <li>• Places Boric Acid Makeup CS to STOP.</li> <li>• Verifies 2CHS*FCV114A set to desired flow rate.</li> <li>• Set 2CHS-FQIS168A, Total M/U from Blender Flow Totalizer, to desired dilution quantity.</li> <li>• Reset 2CHS-FQIS168A.</li> <li>• Verify 2CHS-FQIS113, Boric Acid Flow to Blender Flow Totalizer, is set to zero.</li> <li>• Places Mode Selector switch in DIL or ALT DIL.</li> <li>• Places Boric Acid Makeup CS to START.</li> <li>• Verify 2CHS*FCV114A opens.</li> <li>• Verify correct flow rate on 2CHS-FR113.</li> <li>• When 2CHS-FQIS168A reaches preset value, verify dilution automatically stops.</li> </ul> <p>IAW 2OM-28.4.H, BOP verifies field operator is standing by and starts 2CCS-P21B.  After confirmation of SAT operation from field operator, BOP shuts down 2CCS-P21A and places CS in Auto.</p>
<p><b><u>EVENT 2:</u></b>  S/U 2CCS-P21B &amp; S/D 2CCS-P21A</p>		

# BEAVER VALLEY JOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>EVENT 3:</b> Malfunction for event 3 is triggered to insert at 5% power and will become evident when power rises.</p>	<p>“A” SG level decreases due to increased steaming rate at higher power and constant valve position.</p> <p>A6-9E will alarm for SG level dev. if the crew doesn’t notice 2FWS*FCV479 malfunction.</p>	<p>BOP recognizes “A” SG level decreasing. IAW AOP 2.4.1, BOP places controller for 2FWS*FCV479 in manual and restores SG level to program.</p>
<p><b>EVENT 4:</b> Malfunction for event 4, <b>IMF PMP-CHS002 (14 120) 2</b>, is triggered to actuate 2 minutes after a dilution is completed and power is &gt;5%.</p>	<p>2CHS*P21B, charging pump shaft seizure.</p> <p>IMMEDIATE PLANT RESPONSE: ALARMS: A6-2E, 4Kv pump motor overcurrent trip A2-3D, Charging pump auto start/auto stop A2-4D, RCP seal trouble A2-3E, Charging flowpath trouble Charging and seal injection flow decreases</p> <p>SRO enters AOP 2.7.1, Loss of Charging or Letdown.</p>	<p>ATC announces multiple unexpected charging related alarms.</p> <p>BOP reviews ARPs.</p> <p>Crew recognizes 2CHS*P21B has tripped and no charging pumps are running.</p> <p>ATC performs IOA’s of AOP 2.7.1:</p> <ul style="list-style-type: none"> <li>• closes 2CHS*AOV200A and B</li> <li>• closes 2CHS*FCV122</li> <li>• closes 2CHS*HCV186</li> </ul> <p>ATC verifies thermal barrier flow to each RCP.</p> <p>Crew verifies no instrument failures have occurred.</p> <p>ATC confirms acceptable VCT level. ATC verifies 2CHS*LCV115C and 115E are OPEN &amp; 2CHS*LCV115B and 115D are CLOSED.</p>

# BEAVER VALLEY . JWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 4:** (continued)

Crew checks if trip was due to cavitation or loss of suction to 2CHS\*P21B by reviewing following parameter trends prior to trip.

- VCT level and pressure
- Charging pump discharge pressure and flow
- 2DF bus amps.

Crew determines all parameters were stable before trip and cavitation or loss of suction is not likely.

ATC verifies 2CHS\*HCV186 was previously closed and starts 2CHS\*P21A.

ATC restores charging and seal injection flow by slowly throttling open 2CHS\*FCV122 to restore PRZR level and 2CHS\*HCV186 to obtain 6-9 gpm seal injection flow to each RCP.

## **ROLE PLAY:**

When dispatched to place 2CHS\*P21C on the 2DF bus, INSERT **TRG! 21**, after 10 minutes report to the control room that 2CHS\*P21C is racked onto the 2DF bus with cooling water aligned.

Crew dispatches operators to verify operation of 2CHS\*P21A and IAW 2OM-7.4.A to place 2CHS\*P21C on the 2DF bus.

After receiving field report, ATC places 2DF control switch for 2CHS\*P21C in auto.

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## EVENT 5:

IAW 2OM-7.4.AB, ATC restores normal charging and letdown flow by:

- Verifying 2CHS\*FCV122 in MAN & closed.
- Verifying 2CHS\*MOV310 and 289 open.
- Verifying 2CHS\*AOV200A,B & C closed.
- Verifying 2CHS\*AOV204 open.
- Placing 2CHS\*PCV145 in MAN and at 50%.
- Verifying 2CHS\*MOV100A open.
- Verifying 2CHS\*LCV460A, B open.
- Throttling 2CHS\*FCV122 to 30-50 gpm flow.
- Opening 2CHS\*AOV200A
- Throttling 2CHS\*FCV122 to >60 gpm flow.
- Throttling 2CHS\*PCV145 to lower l/d press.
- Opening 2CHS\*AOV200B while monitoring l/d pressure.
- Adjusting 2CHS\*PCV145 until backpressure is ~260 psig.
- Placing 2CHS\*PCV145 in AUTO.
- Adjusting 2CHS\*HCV186 6-9 gpm each RCP
- Adjusting 2CHS\*FCV122 to restore prog. lvl.
- Verifying 2RCS-LK459F is in AUTO.
- Placing 2CHS\*FCV122 in AUTO.

SRO assigns crew member to perform 2OST-6.4 to verify TS 3.5.5, Seal Injection Flow < 28 gpm.

SRO reviews applicable TS:

3.5.2, ECCS, Condition A, restore w/in 72 hrs.

3.5.5, Seal Injection Flow, adjust w/in 4 hrs.

LR 3.1.4, Charging Pumps, Condition A, restore w/in 72 hrs.

ATC continues with power increase.



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INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b>EVENT 6:</b> Malfunction for event 6 will insert when power rises to >8%. 2LMS*PT952 CNMT pressure transmitter fails high.	2LMS*PT952 CNMT pressure indicator rises. ALARM: A1-2F, CNMT Pressure High/High High  SRO enters 2OM-1.4.IF	ATC announces unexpected CNMT pressure alarm.  BOP references ARP.  Crew determines 2LMS*PT952 is failing high.  SRO reviews 2OM-1.4.IF attachment 1.  SRO reviews applicable TS: 3.3.2, ESFAS Instrumentation, Function 1.c, 4.c, Cond D, place CH in trip, 72 hrs. Function 2.a.3, 2.b.2, 3.b.3, Cond E, place CH in bypass, 72 hrs.  ATC continues with power increase.
<b>EVENT 7:</b> Malfunction for event 7 will insert when power rises to > 10%. Spurious reactor trip. <b>IMF PPL02A (9 45)</b>	Reactor at >10% power.  "A" reactor trip breaker spuriously opens. A4-8A, Rod Control Sys Urgent Alarm followed by A5-6D, Turbine Trip due to Reactor Trip.	Spurious reactor trip. ATC reports reactor trip has occurred. SRO directs crew to perform IOA's for E-0.
<b>EVENTS 8, 9 &amp; 10:</b>  Multiple malfunctions are triggered to occur following the reactor trip.  All commands preloaded	520 gpm "B" steam generator tube rupture occurs 5 minutes after the reactor trip requiring the crew to initiate SI. 2CHS*P21C and Train "B" CIA actuation (with 2CHS*MOV378 malfunction) will occur on the SI actuation.	

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 8, 9 &amp; 10:</u></b>(continued)</p> <p><b>NOTE:</b> Only the “A” Rx trip breaker opens to cause the Rx trip, the ATC may open the “B” Rx trip breaker manually using BB Rx trip switch.</p>	<p>SRO enters E-0.</p>	<p>ATC and BOP commence IOA’s of E-0.</p> <p>ATC verifies reactor trip:</p> <ul style="list-style-type: none"> <li>• A5-6D - LIT.</li> <li>• Power range indication is &lt; 5%.</li> <li>• Neutron flux is dropping.</li> </ul> <p>BOP verifies turbine trip:</p> <ul style="list-style-type: none"> <li>• Throttle OR Governor valves ALL closed.</li> <li>• Main Generator output brks – open.</li> <li>• Exciter Circuit breaker – open.</li> </ul> <p>BOP verifies power to AC emergency busses:</p> <ul style="list-style-type: none"> <li>• Using VB-C voltmeters, verifies both 2AE and 2DF busses have voltage indicated.</li> </ul>
<p><b>NOTE:</b> Only the 1<sup>st</sup> 5 steps of ES-0.1 are scripted, Event 8 is triggered to occur 5 minutes after the reactor trip. “B” SG level will begin rising and PRZR level will drop. When the crew recognizes degrading plant parameters, the SRO will direct the crew to initiate SI and return to E-0. E-0 scripting will start on page 13.</p>	<p>SI not actuated and not required.</p> <p>SRO transitions to ES-0.1.</p>	<p>Check SI status: Crew checks if SI is required:</p> <ul style="list-style-type: none"> <li>• ATC checks CNMT press not &gt;5psig.</li> <li>• ATC checks PRZR press not &lt;1860 psig.</li> <li>• ATC/BOP checks Stmline press not &lt;500 psig.</li> </ul> <p>Crew determines SI is not required and transition to ES-0.1 is applicable.</p> <p>ATC/BOP, sounds standby alarm, announces Unit 2 reactor trip.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 8, 9 &amp; 10:</u></b> (continued)	RCS temperature <547F but trending to 547F.	<p>Crew monitors RCS temperature for proper response:</p> <ul style="list-style-type: none"> <li>• ATC verifies all 3 RCPs are running.</li> <li>• RCS temp – STABLE AT OR TRENDING TO 547F:</li> <li>• Using Tav<sub>g</sub> since RCPs are running.</li> </ul>
<p><b>NOTE:</b> Depending up crew response to reactor trip and timing, letdown may have isolated due to low PRZR level caused by the RCS cooldown.</p>	<p><b>NOTE:</b> Condenser steam dumps were in steam pressure mode on turnover.</p> <p>RCS temperature maintained by condenser steam dumps:</p>	<p>ATC verifies letdown flow is indicated.</p> <p>Crew maintains RCS temperature by verifying:</p> <ul style="list-style-type: none"> <li>• Station instrument air press &gt;90 psig.</li> <li>• MSIV's at least 1 open.</li> <li>• Condenser available</li> </ul> <p>Crew verifies the condenser steam dumps are automatically maintaining RCS temperature in steam pressure mode.</p> <p>Crew checks Feedwater Status:</p> <ul style="list-style-type: none"> <li>• All but one feedwater pump – STOPPED</li> <li>• A5-2C(3C)(4C) 'SG 21A(21B)(21C) Level Low-Low Reactor Trip' – NONE LIT AS FIRST OUT</li> <li>• RCS Tav<sub>g</sub> – &lt; 554F</li> <li>• ALL main feed reg valves – CLOSED</li> <li>• Total feed flow to SGs – &gt;340 GPM(available, BOP may have preemptively reduced flow)</li> </ul> <p>BOP controls feedwater flow to maintain NR level between 12% and 50%.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 8, 9 &amp; 10:</u></b>(continued)</p> <p>SGTR, HHSI pump start failure and CIA failure. All commands preloaded</p>	<p>520 gpm “B” Steam Generator tube rupture occurs 5 minutes after the reactor trip. “B” SG level rises. PRZR level decreases.</p> <p>SRO re-enters E-0 at step 1.</p> <p>SI manually actuated as directed by SRO.</p>	<p>Crew recognizes plant parameters are degrading.</p> <p>SRO directs the crew to initiate SI and perform IOA’s of E-0.</p> <p>Crew performs IOAs of E-0.</p> <p>ATC verifies reactor trip:</p> <ul style="list-style-type: none"> <li>• A5-6D - LIT.</li> <li>• Power range indication is &lt; 5%.</li> <li>• Neutron flux is dropping.</li> </ul> <p>BOP verifies turbine trip:</p> <ul style="list-style-type: none"> <li>• Throttle OR Governor valves ALL closed.</li> <li>• Main Generator output brks – open.</li> <li>• Exciter Circuit breaker – open.</li> </ul> <p>BOP verifies power to AC emergency busses:</p> <ul style="list-style-type: none"> <li>• Using VB-C voltmeters, verifies both 2AE and 2DF busses have voltage indicated.</li> </ul> <p>Check SI status: ATC reports SI manually actuated by turning both trains’ control switches as directed by SRO.</p> <p>ATC/BOP, sounds standby alarm, announces Unit 2 reactor trip and safety injection.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 8, 9 & 10:(continued)

Check if HHSI flow should be secured by checking the following:

- CNMT & Secondary radiation
- CNMT pressure & sump level
- SG – pressures and levels
- RCS subcooling
- Secondary heat sink exists
- RCS pressure – stable or rising
- PRZR level – >17%
- SI occurred automatically

Due to secondary parameters not being consistent with pre-event, crew determines SI is required; SI flow should not be secured at this time.

## **IMF PPL07B (0 0) 1** (preloaded)

2CHS\*P21C failed to start on the SI signal.

ATC verifies SI system status:

- Only 2CHS\*P21A running, starts 2CHS\*P21C
- 2SIS\*P21A & 2SIS\*P21B running.
- HHSI Flow indicated on 2SIS-FI943.

BOP verifies AFW status:

- Both motor-driven pumps running.
- Turb driven pump, all stm supply SOV's open.
- AFW throttle valves all FULL OPEN.
- Total AFW flow is >340 gpm. (may have been preemptively reduced if NR level adequate.)

SRO directs BOP verify automatic actions by performing Attachment A-0.11 in a timely manner.

# BEAVER VALLEY LOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b>EVENTS 8, 9 &amp; 10:(continued)</b> <b>NOTE:</b> Evaluation of BOP performing Attachment A-0.11 begins on page 22.	<u>List of Attachment A-0.11 Discrepancies:</u>  2CHS*P21C failed to start on SI signal. Train B CIA failed to actuate along with 2CHS*MOV378 (Train A) failing to automatically close on SI signal.  RCS temperature < 547°F and dropping due to SI flow.	BOP performs Attachment A-0.11.  Crew checks RCS Tavg stable at or trending to 547F.  ATC reports RCS Tavg is <547F and dropping. SRO directs ATC to: <ul style="list-style-type: none"> <li>• Stop dumping steam &amp; verify steam dumps closed.</li> <li>• Verify 2MSS-MOV100A, B are closed.</li> <li>• Depress the reheater controller RESET PB.</li> <li>• Minimize total feedflow while maintaining &gt;340 gpm until 1 NR level is &gt; 12%</li> </ul> ATC verifies PRZR isolated: <ul style="list-style-type: none"> <li>• PORVs – CLOSED.</li> <li>• Spray Valves – CLOSED.</li> <li>• Safety relief valves – CLOSED (use PSMS).</li> <li>• PRT conditions – CONSISTENT WITH EXPECTED VALUES.</li> <li>• Power to at least one block valve – ALL AVAILABLE.</li> <li>• Block valves – AT LEAST ONE OPEN (All).</li> </ul> ATC checks if RCPs should be stopped: <ul style="list-style-type: none"> <li>• D/P between RCS pressure and highest SG pressure – &lt;205 PSID.</li> </ul> Crew determines criteria for stopping RCPs is not met.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 8, 9 & 10:(continued)

ATC/BOP checks if any SGs are faulted:

- Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER  
OR
- ANY SG COMPLETELY DEPRESSURIZED

Crew determines no SG's are faulted.

Crew checks if SG tubes are intact:

- Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES

Crew determines "B" SG level is rising in an uncontrolled manner and verifies HHSI valves, 2SIS\*MOV867A,B,C,D all open & transitions to E-3.

SRO transitions to E-3.

SRO directs STA to commence control room ventilation actions. Refer to Attachment A-2.5.

ATC checks if RCPs should be stopped:

- D/P between RCS pressure and highest SG pressure – <205 PSID.

Crew determines criteria for stopping RCPs is not met.

"B" SG ruptured

Crew notes that "B" SG was previously identified as the ruptured SG based upon unexpected NR level rise.

- BOP verifies "B" SG NR level >12%.
- SRO directs BOP to isolate feed flow to ruptured SG.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 8, 9 &amp; 10:(continued)</u></b></p> <p><b><u>Critical Task: CT-18 (E-3.A)</u></b> Crew isolates feed flow into and steam flow from the ruptured SG and directs operator to close isolation valve(s) operated from outside of the control room before a transition to ECA-3.1 occurs.</p> <p>SAFETY SIGNIFICANCE -- Failure to isolate the ruptured SG causes a loss of differential pressure between the ruptured SG and the intact SGs. Upon a loss of differential pressure, the crew must transition to a contingency procedure that constitutes an incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy.</p> <p><b>ROLE PLAY:</b> 5 minutes after being dispatched to locally isolate 2SVS*28, insert <b>IRF LOA-MSS010 (0 0) 0 0</b> then report back that 2SVS*28 has been closed.</p>		<p>ATC/BOP isolates flow from the ruptured SG.</p> <p>BOP verifies "B" SG atmospheric steam dump, 2SVS*PCV101B, closed and raises setpoint to 100%.</p> <p>SRO dispatches operator to locally close 2SVS*28. BOP verifies residual heat removal valve – CLOSED.</p> <p>Isolate ruptured SG to turbine driven AFW pump.</p> <ul style="list-style-type: none"> <li>• BOP reports 2 motor driven AFW pps running.</li> <li>• BOP closes 2MSS*SOV105B and 105E.</li> </ul> <p>Verify closed ruptured SG blowdown isolation valve.</p> <ul style="list-style-type: none"> <li>• BOP verifies 2BDG*AOV100B1 is closed.</li> </ul> <p>Close main steamline drain from ruptured SG.</p> <ul style="list-style-type: none"> <li>• BOP closes 2SDS*AOV111B1.</li> </ul> <p>Close 2SDS*AOV129A, RHR piping drain isolation.</p> <ul style="list-style-type: none"> <li>• BOP closes 2SDS*AOV129A.</li> </ul> <p>Close ruptured SG main steam isol &amp; bypass vlvs.</p> <ul style="list-style-type: none"> <li>• BOP closes 2MSS*AOV101B.</li> <li>• BOP verifies 2MSS*AOV102B closed.</li> </ul> <p>BOP checks ruptured SG pressure – &gt;240 PSIG.</p>



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 8, 9 &amp; 10:</u></b> (continued)	Condenser available	<p>Crew initiates RCS cooldown: SRO determines required core exit temperature as a function of ruptured SG pressure:</p> <p>SRO directs ATC to block low steamline pressure SI when PRZR pressure &lt;2000 psig.</p> <p>BOP dumps steam to condenser from A &amp; C SGs at maximum rate by:</p> <ul style="list-style-type: none"> <li>• Checking MSIVs - AT LEAST ONE OPEN.</li> <li>• Checking condenser available.</li> <li>• Confirming condenser steam dump controller in MANUAL.</li> <li>• Confirms steam dumps are in STM PRESS Mode</li> <li>• Checks TAVG &gt;541°F by Status light D-11, "2/3 Lo-Lo Tavg" (Panel 622) - LIT</li> <li>• Defeats TAVG interlock until status light A-12, "Stm Dump Defeat Interlock" (Panel 622) – LIT</li> <li>• Gradually raises steam dump rate to maximum rate (~25% demand)</li> </ul> <p>Crew verifies that the condenser steam dump valves are effectively reducing CETC's.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 8, 9 &amp; 10:</u></b>(continued)</p> <p><b><u>Critical Task: CT-19 (E-3.B)</u></b>  Crew establishes/maintains an RCS temperature so that transition from E-3 does not occur because the RCS temperature is in either of the following conditions:</p> <p>Too high to maintain minimum required subcooling for subsequent RCS depressurization</p> <p>OR</p> <p>Below the RCS temperature that causes a red or orange path challenge to Sub-criticality or Integrity CSF</p> <p>SAFETY SIGNIFICANCE -- Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency procedure, which constitutes an incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy.</p>		<p>BOP checks if RCS cooldown should be stopped:</p> <ul style="list-style-type: none"> <li>• When core exit TCs (average of hottest trisector) – &lt; REQUIRED TEMPERATURE.</li> </ul> <p>BOP stops RCS cooldown and maintains core exit TCs – LESS THAN REQUIRED TEMPERATURE.</p> <p>BOP checks intact SG levels:</p> <ul style="list-style-type: none"> <li>• “A” &amp; “C” NR levels – &gt;12%.</li> </ul> <p>BOP controls feed flow to maintain narrow range level between 26% and 50%.</p> <p>ATC checks PRZR PORVs and block valves:</p> <ul style="list-style-type: none"> <li>• Power to block valves – ALL AVAILABLE.</li> <li>• PORVs – ALL CLOSED.</li> <li>• Block valves – AT LEAST ONE OPEN. (all)</li> </ul> <p>ATC resets SI, CIA and CIB.</p> <p>BOP verifies ruptured “B” SG Pressure- STABLE OR RISING.</p> <p>ATC verifies RCS subcooling based on core exit TCs - &gt;61F.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 11:**

PRZR PORV fails open following depressurization.

**IMF VLV-RCS032 (6 0) 1**

**IMF VLV-RCS033 (4 0) 1**

**IMF VLV-RCS034 (5 0) 1**

(commands pre-loaded)

### **Critical Task: CT-20 (E-3.C)**

Crew depressurizes the RCS to meet SI termination criteria before water release from the ruptured SG safety or atmospheric relief valve.

SAFETY SIGNIFICANCE -- Failure to stop reactor coolant leakage into a ruptured S/G by depressurizing the RCS needlessly complicates mitigation of the event. It also constitutes a "significant reduction of safety margin beyond that irreparably introduced by the scenario."

ATC depressurizes RCS to minimize break flow and refill PRZR.

- Checks RCPs 21A & 21C, BOTH RUNNING.
- Fully opens both PRZR spray valves.
- Opens one PRZR PORV.

Checks depressurization method – IS EFFECTIVELY REDUCING RCS PRESSURE.

ATC continues depressurization until any of the following conditions satisfied:

- PRZR level >76%.  
OR
- RCS subcooling < Attachment A-5.1.  
OR
- RCS pressure <"B" SG pressure AND PRZR level >17%.  
OR
- RCS pressure w/in 300 psi of "B" SG AND PRZR level >47%.

ATC closes PORV.

ATC reports PORV will not close.

SRO directs ATC to close associated block valve.

ATC closes spray valves.

Checks RCS pressure is rising:

- ATC verifies RCS pressure is rising.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENT 11:** (continued)

Terminate scenario when the crew has isolated HHSI flow and established a normal charging flowpath.

Classify Event:

**ALERT** per **FA1**, due to a Loss of an RCS barrier. (ruptured SG results in an SI actuation.

Crew checks if SI flow should be terminated.

ATC verifies RCS subcooling is > 41°F based on CETC's, if not, verifies subcooling is > required on Attachment A-5.1.

BOP confirms secondary heat sink available by >340 gpm of feed flow available OR NR level in at least 1 SG >12%.

ATC confirms RCS pressure is stable or rising.

ATC reports PRZR level is >17%.

Crew determines that current plant conditions support SI termination.

ATC stops all but 1 charging pump.

Isolate high head injection flow:

- ATC closes 2SIS\*MOV867A, B, C, & D.
- ATC verifies HHSI flow indicates zero gpm.

ATC establishes normal charging flowpath by:

- Closing 2CHS\*FCV122.
- Opening 2CHS\*MOV310.
- Opening 2CHS\*MOV289.
- Adjusting 2CHS\*FCV122 as necessary to control PRZR level between 31% and 50%.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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**Attachment A-0.11** 'Verification of Automatic Actions' performed in a timely manner.

BOP performs Attachment A-0.11, 'Verification of Automatic Actions' as follows:

Checks both EDGs running with SWS valve alignment and ventilation in service.

Verifies power to both AC emergency busses.

Checks 2HVS\*FN204A or 2HVS\*FN204B running.

Ensure reheat steam isolation:

- Verify 2MSS-MOV100A and B – closed.
- Reset reheater controller.
- Verify 2GSS-MOV204, spillover vlv, closed

Check if main steamline isolation required:

- CNMT pressure – > 7 PSIG.  
-OR-
- Steamline pressure – < 500 PSIG.  
-OR-
- Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS.

If steamline isolation is required, verifies SLI by checking all YELLOW SLI marks – LIT.

If steamline isolation is not required continues on.

## BEAVER VALLEY JEWEL STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> – (continued)</p> <p><b>NOTE:</b> BOP may have already pre-emptively opened 2CCS-AOV118 to provide cooling to the station air compressors.</p>		<p>Establish domestic water system cooling to station air compressors:</p> <ul style="list-style-type: none"> <li>• Opens 2CCS-AOV118.</li> <li>• Verifies at least 1 air compressor is running.</li> </ul> <p>Verifies at least 1 CCP pump is running unless a CIB has occurred.</p> <p>Align neutron flux monitoring for shutdown:</p> <ul style="list-style-type: none"> <li>• Verifies SR CHs energized when IR &lt;1E-10.</li> <li>• Transfer 2NME-NR45, nuclear recorder, to operable SR and IR displays.</li> </ul> <p>Check CIB and CNMT spray status:</p> <ul style="list-style-type: none"> <li>• CNMT pressure – has remained &lt;11 PSIG.</li> </ul> <p>Verify service water system in service:</p> <ul style="list-style-type: none"> <li>• SWS pumps - TWO RUNNING.</li> <li>• Check SWS header pressure – &gt;55 psig.</li> <li>• SWS pump seal water pressure – NOT LOW.</li> </ul>
<p><b>Attachment A-0.11</b> – (continued)</p>		<p>Verify both CNMT hydrogen analyzers running: 2HCS*SOV100A1, B1 – CNMT sample amber lights – LIT.</p>

# BEAVER VALLEY LOWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> – (continued)</p> <p><b><u>Critical Task CT-11 (E-0.O):</u></b> Crew closes CNMT isolation valves such that at least one valve is closed on each critical phase A penetration before the end of the scenario.</p> <p>SAFETY SIGNIFICANCE -- Closing at least one containment isolation valve on each critical Phase A penetration, under these conditions and when it is possible to do so, constitutes a task that “is essential to safety,” because “its improper performance or omission by an operator will result in direct adverse consequences or significant degradation in the mitigative capability of the plant.”</p>	<p>“B” train HHSI pump failed to auto start on SI signal.</p> <p>Train “B” CIA failed to actuate with Train “A” CIA valve, 2CHS*MOV378, failing to automatically close.</p> <p><u>List of Attachment A-0.11 Discrepancies:</u></p> <p>2CHS*P21C failed to start on SI signal. Train B CIA failed to actuate along with 2CHS*MOV378 (Train A) failing to automatically close on SI signal.</p>	<p>Verify ESF equipment status:</p> <ul style="list-style-type: none"> <li>• Verify SI status by checking all RED SIS marks – LIT.</li> <li>• Verify CIA by checking all ORANGE CIA marks – LIT.</li> <li>• Verify FWI by checking all GREEN FWI marks – LIT.</li> </ul> <p>Verify source range channels energized with audible indication functioning properly, adjusts multiplier switch and volume as necessary.</p> <p>Upon completion, reports any discrepancies to SRO.</p>