

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE:      Perform An Estimated Critical Position Calculation

TRAINING MATERIAL NUMBER:      2AD-007

PROGRAM TITLE:      Licensed Operator Training

COMPUTER CODE:      2AD-007

REVISION NUMBER:      2

TECHNICAL REFERENCES:

2OM-50.4.F, "Performing An Estimated Critical Position Calculation", Rev. 7  
BV-2 Curve Book, Cycle 16

INSTRUCTIONAL SETTING:      Classroom

APPROXIMATE DURATION:      35 Minutes

PREPARED BY:      R. J. Brooks      \_\_\_\_\_  
Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2AD-007		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 2
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 1 New Change #
List/Description of Change(s):  Updated content for Cycle 16 data.		
Reason for Change (s):  Maintain JPM current		
APPROVALS:		
R. J. Brooks		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Prepared by	Date	
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Changes" only</i> )	Date	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-007 JPM REVISION: 2	JPM TITLE: Perform An Estimated Critical Position Calculation
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K/A REFERENCE: 2.1.23 (4.3/4.4)

TASK ID: 0011-003-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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: 35 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>	Boron concentration for startup calculated within the specified tolerance.
<b>RECOMMENDED STARTING LOCATION:</b>	Classroom
<b>DIRECTIONS:</b>	You are to perform an Estimated Critical Position Calculation.
<b>INITIAL CONDITIONS:</b>	<ul style="list-style-type: none"><li>• A plant startup is being performed exactly 5 days after a reactor trip from 100% power.</li><li>• Prior to the trip, the plant was at 100% with All Rods Out for 3 months.</li><li>• An RCS Boron sample was taken at 100% power just prior to the Reactor trip. It indicated that the RCS Boron concentration was 826 ppm.</li><li>• Current Core burnup is 10,000 MWD/MTU.</li><li>• The plant computer is NOT available.</li></ul>
<b>INITIATING CUE:</b>	<p>The Shift Manager directs you to determine the boron concentration for startup by performing 2OM-50.4.F, "Performing An Estimated Critical Position Calculation", steps IV. A through IV.C.1.k. Control rod position Expected at Criticality is Bank D at 100 steps. Reactor Engineering was consulted regarding <math>B^{-10}</math> Correction for Criticality. They report that the <math>B^{-10}</math> correction Factor for criticality (Data Sheet 1 block VII) is 0.926.</p>
<b>REFERENCES:</b>	<p>2OM-50.4.F, "Performing An Estimated Critical Position Calculation", Rev. 7 BV-2 Curve Book, curves CB-12, 21, 22, 23, 24B, and 29</p>
<b>TOOLS:</b>	None
<b>HANDOUT:</b>	<p>2OM-50.4.F BV-2 Cycle 16 Curve Book</p>



## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

DIRECTIONS: You are to perform an Estimated Critical Position Calculation.

INITIAL CONDITIONS:

- A plant startup is being performed exactly 5 days after a reactor trip from 100% power.
- Prior to the trip, the plant was at 100% with All Rods Out for 3 months.
- An RCS Boron sample was taken at 100% power just prior to the Reactor trip. It indicated that the RCS Boron concentration was 826 ppm.
- Current Core burnup is 10,000 MWD/MTU.
- The plant computer is NOT available.

INITIATING CUE: The Shift Manager directs you to determine the boron concentration for startup by performing 2OM-50.4.F, "Performing An Estimated Critical Position Calculation", steps IV. A through IV.C.1.k. Control rod position Expected at Criticality is Bank D at 100 steps. Reactor Engineering was consulted regarding B<sup>-10</sup> Correction for Criticality. They report that the B<sup>-10</sup> correction Factor for criticality (Data Sheet 1 block VII) is 0.926.

- ☐ 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 NUMBER: 2AD-007  
JPM REVISION: 2

JPM TITLE: Perform An Estimated Critical Position Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div style="border: 1px solid black; padding: 10px;"> <p><b>DEVELOPER/VALIDATION NOTES:</b> When updating this JPM for the current plant cycle, use care to choose parameters that will not require interpolation.</p> </div>	
	START TIME: _____	
<p>1. Input Critical Data Data Sheet 1, (Part A I Prior to Shutdown)</p> <p>Date/Time Boron Conc. Power Burnup Xenon Samarium Control Rod Position</p>	<p>1.1 Inputs Critical Data Part A I Prior to Shutdown.</p> <p>Date/Time = 5 days ago Boron Conc. = 826 ppm Power = 100% Burnup = 10,000 (MWD/MTU) Xenon = 100% (CB-12) Samarium = 100% (CB-22) Control Rod Position = ARO at 225 steps</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-007  
JPM REVISION: 2

JPM TITLE: Perform An Estimated Critical Position Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>2. Input Critical Data Data Sheet 1, (Part A II Expected at Criticality)</p> <p>Date/Time Burnup Xenon Samarium Control Rod Position</p>	<p>2.1 Inputs Critical Data Part A II Expected at Criticality.</p> <p>Date/Time = NOW Burnup = 10,000 (MWD/MTU) Xenon = 0% (CB-23) Samarium = 137.5% (CB-22) Control Rod Position = Banks A &amp; B @ 225 steps Bank C @ 225 steps Bank D @ 100 steps</p> <p>COMMENTS:</p>	
<p>3. Determine Effective boron Concentration Data Sheet 1, (Part A III, IV, &amp; V)</p> <p>Part III, Boron Conc. Part IV, B-10 Corr factor Part V, Effective Boron Conc.</p>	<p>3.1 Determines the Effective Boron Concentration Part A III, IV, &amp; V)</p> <p>Part III, Boron Conc. = 826 ppm Part IV, B-10 Correction Factor = 0.918 (CB-29) Part V Effective Boron Conc. = 826 ppm X 0.918 = 758.26 ppm</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-007  
JPM REVISION: 2

JPM TITLE: Perform An Estimated Critical Position Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>4. Calculate Reactivity Balance (Data Sheet 1, Part B)</p> <p>Part B.1 Part B.2 Part B.3 Part B.4 Part B.5</p>	<p>4.1 Calculates Part B, Item 5.</p> <ul style="list-style-type: none"> <li>• Power Defect = <math>- 0 - 2300 = - 2300</math> pcm (CB-21)</li> <li>• Control Rods = <math>963 - 0 = + 963</math> pcm (CB-24B)</li> <li>• Xenon = <math>0 - 2699 = - 2699</math> pcm (CB-23)</li> <li>• Samarium = <math>862 - 627 = + 235</math> pcm (CB-22)</li> <li>• Reactivity Change = <math>- 3801</math> pcm</li> </ul> <p>COMMENTS:</p>	
<p>5. Calculate Boron Concentration for Startup (Data Sheet 1, Part C)</p> <p>Part C.I Part C.II Part C.III Part C.IV Part C.V</p>	<p>5.1 Calculates Part C, Line 1, Item V.</p> <ul style="list-style-type: none"> <li>• Reactivity Change = <math>- 3801</math> pcm (from B.5)</li> <li>• Differential Boron Worth = <math>- 7.47</math> pcm/ppm (CB-20)</li> <li>• Boron Change = <math>+ 509</math> ppm</li> <li>• Eff Boron Conc. at Shutdown = <math>758.26</math> ppm</li> <li>• Eff Boron Conc. For Startup = <math>1267.26</math> ppm</li> </ul> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-007

JPM REVISION: 2

JPM TITLE: Perform An Estimated Critical Position Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<b>6C. Calculate Boron Concentration for Startup</b> (Data Sheet 1, Part C) Part C.I Part C.II Part C.III Part C.IV Part C.V Part C.VI Part C.VII Part C.VIII	<b>6.1C. Calculates Part C, Line 2, Item V.</b> <ul style="list-style-type: none"> <li>• Reactivity Change = - 3801 pcm (from B.5)</li> <li>• Differential Boron Worth = - 7.08 pcm/ppm (CB-20)</li> <li>• Boron Change = + 537 ppm</li> <li>• Eff. Boron Conc. at Shutdown = 758.26 ppm (from A.V)</li> <li>• Eff. Boron Conc. For Startup = 1295.26 ppm (+/- <b>50 ppm</b>)</li> <li>• Eff. Boron Conc. For Startup = 1295.26 (from C.V)</li> <li>• B-10 Correction Factor for Criticality = 0.926</li> <li>• Boron Concentration for Startup = 1398.76</li> </ul> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <b>EVALUATOR NOTE:</b>            Grader Discretion Required.         </div> <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <b>TERMINATING CUE:</b>            When the Candidate completes the calculation, the evaluation for this JPM is complete.         </div>	
	STOP TIME: _____	

### OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Perform a Quadrant Power Tilt Ratio Calculation

TRAINING MATERIAL NUMBER: 2CR-003

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-003

REVISION NUMBER: 5

### TECHNICAL REFERENCES:

2OST-2.4A, Quadrant Power Tilt Ratio Manual Calculation”, Rev. 8

**INSTRUCTIONAL SETTING:** Simulator/Classroom

**APPROXIMATE DURATION:** 15 minutes

PREPARED BY:      R. J. Brooks                                  \_\_\_\_\_  
Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-003		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 5
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 4 New Change #
List/Description of Change(s):  Updated JPM to reflect most current JPM format. Revised JPM to reflect most current plant procedure. Added pictures of NI drawers to allow for classroom performance of this JPM.		
Reason for Change (s):  JPM Enhancement.		
APPROVALS:		
R. J. Brooks Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> ) _____ Date _____		

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-003  
JPM REVISION: 5

JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

K/A REFERENCE: 015A1.04 3.5/3.7 TASK ID: 0021-005-06-013  
015A4.02 3.9/3.9  
2.1.37 4.3/4.6JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED JPM ☐ ADMINISTRATIVE JPM

EVALUATION METHOD:	LOCATION:	TYPE:	ADMINISTERED BY:
<input 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 type="checkbox"/> Classroom	<input type="checkbox"/> OJT/TPE	<input type="checkbox"/> Other:
		<input type="checkbox"/> Training	
		<input type="checkbox"/> Other:	

## EVALUATION RESULTS

Performer Name:

Performer SSN:

Time ☐ Yes  
Critical: ☒ NoAllotted 15 minutes  
Time:Actual  
Time: minutesJPM 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>	The QPTR calculation is completed within the allowable tolerances and compared to Technical Specification limits, as specified in the OST Acceptance Criteria.
<b>RECOMMENDED STARTING LOCATION:</b>	Simulator/Classroom
<b>DIRECTIONS:</b>	You are to perform a Quadrant Power Tilt Ratio (QPTR) Manual Calculation.
<b>INITIAL CONDITIONS:</b>	Mode 1, The plant computers are unavailable.
<b>INITIATING CUE:</b>	The Unit Supervisor directs you to perform a QPTR manual calculation and report the results in accordance with 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation".
<b>REFERENCES:</b>	2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 8.
<b>TOOLS:</b>	Calculator, NI Cabinet Pictures (if performed in the Classroom).
<b>HANDOUT:</b>	1OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 8, place kept up to Step VII.B.1, including normalization values provided on Data Sheet 1.

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐

Read:

TASK:

You are to perform a Quadrant Power Tilt Ratio (QPTR) Manual Calculation.

INITIAL CONDITIONS:

Mode 1, The plant computers are unavailable.

INITIATING CUE:

The Unit Supervisor directs you to perform a QPTR manual calculation and report the results in accordance with 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation".

☐

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 NUMBER: 2CR-003  
JPM REVISION: 5

JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<b>EVALUATOR NOTE:</b> This JPM is designed to use an accompanying Data Sheet Set and can be performed either in the Simulator or Classroom setting. For any of the following data cues, refer to the accompanying Data Sheet Set. This JPM can also be performed in a classroom using NI pictures.	
1. Review 2OST-2.4A, "QPTR Manual Calculation" procedure.	<b>EVALUATOR CUE:</b> Provide a copy of 2OST-2.4A completed up to step VII.B.1. This includes normalization factors filled out on Data Sheet 1.  1.1 Reviews 2OST-2.4A, "QPTR Manual Calculation" procedure.  COMMENTS:	
2.C Record detector current values for each of the power range detectors in the "Current (Uncor.) column of Data Sheet 1, using either of the following methods:  a. Detector current meters located on power range drawers.  b. Test jacks located below the meter faces using a DVM, in accordance with Attachment A.	<b>EVALUATOR CUE:</b> If asked, inform the candidate that no uncertainty exists and the use of a DVM is <b>NOT</b> required.  <b>EVALUATOR NOTE:</b> Acceptable detector current tolerance is $\pm 3$ minor scale subdivisions of actual indication.  2.1C Records detector currents for each of the power range detectors (either from the NI cabinets or picture provided) in the Data Sheet 1 Current (Uncor.) column.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-003  
JPM REVISION: 5

JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p><b>3.C</b> Multiply each of the detector current readings by its associated normalization factor AND record the result in the "Current (Cor)" columns of Data Sheet 1.</p>	<p><b>3.1C</b> Determines corrected current by multiplying each detectors Current (Uncor.) value by the associated normalization factor and records the result in the appropriate Data Sheet 1 Current (Cor.) column.</p> <p>COMMENTS:</p>	
<p><b>4.C</b> Determines the following for the Upper Detectors on Data Sheet 1:</p> <ul style="list-style-type: none"> <li>a. Add the values in the Current (Cor.) column AND Record the results in the space marked "SUM".</li> <li>b. Divide the value in the "SUM" space by 4(3) AND Record the result in the space marked "AVG".</li> <li>c. Determine the Tilt Ratio for each of the upper detectors by dividing each value in the "Current(Cor.)" columns by the value of the "AVG" AND Record the results in the "Tilt Ratio" column.</li> </ul>	<p><b>4.1C</b> Adds the values in the Current (Cor.) column AND records the results in the space marked "SUM".</p> <p><b>4.2C</b> Divides the value in the "SUM" space by 4(3) AND records the result in the space marked "AVG".</p> <p><b>4.3C</b> Determines the Tilt Ratio for each of the upper detectors by dividing each value in the "Current(Cor.)" columns by the value of the "AVG" AND Record the results in the "Tilt Ratio" column.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-003  
JPM REVISION: 5

JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>5.C Determines the following for the Lower Detectors on Data Sheet 1:</p> <ul style="list-style-type: none"> <li>a. Add the values in the Current (Cor.) column <b>AND</b> Record the results in the space marked "SUM".</li> <li>b. Divide the value in the "SUM" space by 4(3) <b>AND</b> Record the result in the space marked "AVG".</li> <li>c. Determine the Tilt Ratio for each of the upper detectors by dividing each value in the "Current(Cor.)" columns by the value of the "AVG" <b>AND</b> Record the results in the "Tilt Ratio" column..</li> </ul>	<p>5.1C Adds the values in the Current (Cor.) column <b>AND</b> records the results in the space marked "SUM".</p> <p>5.2C Divides the value in the "SUM" space by 4(3) <b>AND</b> records the result in the space marked "AVG".</p> <p>5.3C Determines the Tilt Ratio for each of the upper detectors by dividing each value in the "Current(Cor.)" columns by the value of the "AVG" <b>AND</b> Record the results in the "Tilt Ratio" column.</p> <p>COMMENTS:</p>	
<p>6. If uncertainty exists with calculated values, request the Tilt Review Map from the IPC <b>AND</b> Compare the map with the results of the OST.</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>EVALUATOR CUE:</b> Inform the candidate that no uncertainty exists and a computer tilt map is <b><u>NOT</u></b> required.</p> </div> <p>6.1 This step is N/A based on cue provided.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-003  
JPM REVISION: 5

JPM TITLE: Perform a Quadrant Power Tilt Ratio Calculation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>7.C Candidate determines if QPTR is within specifications.</p>	<p>7.1C Compares test data with Acceptance Criteria to determine if QPTR exceeds 1.02.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> After candidate determines tilt is either within OR out of specification, compare candidates data sheet with the Answer Key to ensure calculations are within the specified tolerances: <math>\pm 3</math> minor scale subdivisions <b>AND</b> calculation method is correct.</p> </div> <p>COMMENTS:</p>	
	<p>STOP TIME: _____</p>	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Prepare a Clearance Tagout [2QSS-P21B] Quench Spray Pump 21B

TRAINING MATERIAL NUMBER: 2AD-031

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-031

REVISION NUMBER: 0

TECHNICAL REFERENCES:

NOBP-OP-1001, Manual Clearance Generation, Rev. 3

NOP-OP-1001, Clearance/Tagging Program, Rev. 18

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 25 Minutes

PREPARED BY: R. J. Brooks

Date

PEER REVIEW BY:

Date

APPROVED FOR USE:

Training Supervisor or Designee

Date

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: JPM 2AD-031		
Type of Change:		
<input type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input type="checkbox"/> No	New Rev. # 0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # N/A  New Change #
List/Description of Change(s):  Updated for  Updated for OM Fig 13-2 Rev 20		
Reason for Change (s):          		
APPROVALS:		
R. J. Brooks Prepared by _____ Date _____		<div style="border: 1px solid black; padding: 5px;"> <b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.         </div>
Training Superintendent/Supervisor/Peer ("Changes Not Requiring Revision" only) _____ Date _____		



JPM NUMBER: 2AD-031 JPM REVISION: 0	JPM TITLE: Prepare a Clearance Tagout [2QSS-P21B] Quench Spray Pump 21B
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K/A REFERENCE: 2.2.13 4.1

TASK ID: 0481-007-03-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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: 25 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: \_\_\_\_\_

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	Identify the tags and sequence of placement for a tagout of 2QSS-P21B Quench Spray Pump 21B.
<b>RECOMMENDED STARTING LOCATION:</b>	Classroom
<b>DIRECTIONS:</b>	You are to perform the task Prepare a <b>SAFE</b> Clearance Tagout.
<b>INITIAL CONDITIONS:</b>	The plant is in Refueling Mode, no fuel is in the reactor. [2QSS-P21B] Quench Spray Pump 21B is to be placed on clearance.
<b>INITIATING CUE:</b>	You are to identify the required clearance points (equipment), position (placement configuration), and sequence for clearing [2QSS-P21B] Quench Spray Pump 21B for pump seal replacement IAW the attached clearance coversheet. Document your results on the worksheet provided. <b>For this JPM, it is NOT necessary to complete the Clearance Preparation Checklist, but it may be used as a tool.</b>
<b>REFERENCES:</b>	NOP-OP-1001, Clearance/Tagging Program, Rev. 18
<b>TOOLS:</b>	None
<b>HANDOUT:</b>	<p>NOP-OP-1001-10 Clearance Preparation Checklist, Rev. 05 NOP-OP-1001, Clearance/Tagging Program, Rev. 18 OP Manual Fig. No. 13-2, 10080-RM-413-2, Rev. 20 OM Chapter 2OM-13.3.C, Power Supply and Control Switch Checklist Rev. 9. OM Chapter 2OM-13.3.B.1, Valve List Rev. 11 Clearance coversheet 2R16-13-QSS-TRNG Today/NOW 2QSS-P21B] Quench Spray Pump 21B Seal Replacement</p> <p>Yes    Mode 4</p> <p>Use caution when breaching seal package; casing may not be completely drained.</p> <p>*2R16 – SEAL REPLACEMENT 2001005844</p>

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐

Read:

TASK:

You are to perform the task Prepare a **SAFE** Clearance Tagout.

INITIAL CONDITIONS:

The plant is in Refueling Mode, no fuel is in the reactor. [2QSS-P21B] Quench Spray Pump 21B is to be placed on clearance.

INITIATING CUE:

You are to identify the required clearance points (equipment), position (placement configuration), and sequence for clearing [2QSS-P21B] Quench Spray Pump 21B for pump seal replacement IAW the attached clearance coversheet. Document your results on the worksheet provided. **For this JPM, it is NOT necessary to complete the Clearance Preparation Checklist, but it may be used as a tool.**

☐

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 NUMBER: 2AD-031	JPM TITLE: Prepare a Clearance Tagout [2QSS-P21B] Quench Spray Pump 21B
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div> <b>EVALUATOR NOTE:</b>            This task is normally performed using the SOMS clearance computer and signed electronically. For this JPM, the SOMS computer is NOT available. IF necessary inform candidates that it is not required to follow the instructions for Manual Clearance Generation (IAW NOP-OP-1001 section 4.14).         </div> <div> <b>EVALUATOR NOTE:</b>            Provide JPM handout and student copy of worksheet.         </div>	
1.C Candidate completes the table.	1.1C Candidates table matches the ANSWER KEY.  COMMENTS:  <div> <b>EVALUATOR CUE:</b>            When the candidate identifies and reports that all tags are identified, the evaluation for this JPM is complete.         </div>	
	STOP TIME: _____	

# ANSWER KEY (DO NOT GIVE TO STUDENTS)

**Evaluator NOTE:** Student may identify additional points. The points listed below are the minimum required for this JPM. All additional points and different sequences must be evaluated to ensure the clearance is correct.

<b>Component ID</b>	<b>Component Description</b>	<b>Position</b>	<b>Sequence</b>
2QSS*P21B-CS (DF)	Control Switch for Quench Spray Pump 21B 2QSS*P21B (DF)	Pull-To-Lock (PTL)	1
2QSS*MOV101B-CS	Quench Pump 21B Discharge Isolation Valve	Shut	2
2QSS*MOV100B-CS	Quench Pump 21B Suction Isolation Valve	Shut	2
4KVS-2DF-2F2	Supply to Quench Spray Pump 21B 2QSS*P21B	Racked Out OR Bus Barrier	3
2QSS-9	Quench Pump 21B Recirc Isol	Shut	4
480 VAC MCC*2-E12 Cub 1A	Supply to Quench Pump 21B Suction Isolation Valve	Open	4
480 VAC MCC*2-E12 Cub 2A	Supply to Quench Pump 21B Discharge Isolation Valve	Open	4
2QSS*MOV101B-HW	Quench Pump 21B Discharge Isolation Valve	Shut	5
2QSS*MOV100B-HW	Quench Pump 21B Suction Isolation Valve	Shut	5
2QSS-206 And/Or 2QSS-204	Quench Spray Pmp 21B Discharge/Suction Drain Isol Valve	Open	6
2QSS-310	Vent valve for Quench Spray Pmp 21B	Open	7

# STUDENT COPY

[illegible]

[illegible][illegible]

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Select RWP and Determine Maximum Allowable Stay Time

TRAINING MATERIAL NUMBER: 2AD-044

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-044

REVISION NUMBER: 0

TECHNICAL REFERENCES:

NOP-OP-4107, "Radiation Work Permit (RWP)", Rev 10

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 20 minutes

PREPARED BY: R. J. Brooks \_\_\_\_\_  
Date

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

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



## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2AD-044		
Type of Change:		
<input type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input type="checkbox"/> No	New Rev. #0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # New Change #
List/Description of Change(s):  Original Issue		
Reason for Change (s):		
APPROVALS:		
<u>R. J. Brooks</u> Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
<u>Training Superintendent/Supervisor/Peer</u> ("Changes Not Requiring Revision" only) _____ Date _____		

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-044 JPM REVISION: 0	JPM TITLE: Select RWP and Determine Maximum Allowable Stay Time
--	--

K/A REFERENCE: 2.3.7 3.5/3.6

TASK ID: 0481-005-03-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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

JPM NUMBER: 2AD-044	JPM TITLE: Select RWP and Determine Maximum Allowable Stay
JPM REVISION: 0	Time

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Select the correct RWP and associated Task Number AND determine the maximum stay time according to survey map dose rates (cannot complete task due to RWP limit of 25 mrem dose)

**RECOMMENDED  
STARTING LOCATION:** Classroom

**DIRECTIONS:** You are to determine correct RWP and associated Task Number for the given task, maximum stay time, and whether job will be completed based on this stay time.

**INITIAL CONDITIONS:**

- A clearance is being prepared to work on the containment sump flow integrator 2DAS-FQT100 located in the "A" Penetration.
- You are assigned the task of connecting a drain hose to 2DAS-408, located near 2DAS-FQT100, in support of clearance posting.
- The task will take 1.5 hours to perform.

**INITIATING CUE:** You are to SELECT the correct RWP and associated task number to perform the task from the RWPs provided, AND calculate your MAXIMUM stay time using the appropriate survey map and RWP. Report your results in the "Candidate Answer" Box, including whether job can be completed based on calculated stay time.

**REFERENCES:** NOP-OP-4107, "Radiation Work Permit (RWP)", Rev 10

**TOOLS:** Calculator

**HANDOUT:** Set of 4 RWPs (112-1014, 212-2014, 112-1001, 212-2001)  
Radiation Survey Maps (Multiple maps including "A" penetration, ensure dose near 2DAS-FQT100 is reflective of calculated numbers used for JPM)

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**TASK:** You are to determine correct RWP and associated Task Number for the given task, maximum stay time, and whether job will be completed based on this stay time.

**INITIAL CONDITIONS:**

- A clearance is being prepared to work on the containment sump flow integrator 2DAS-FQT100 located in the "A" Penetration.
- You are assigned the task of connecting a drain hose to 2DAS-408, located near 2DAS-FQT100, in support of clearance posting.
- The task will take 1.5 hours to perform.

**INITIATING CUE:** You are to SELECT the correct RWP and associated task number to perform the task from the RWPs provided, AND calculate your MAXIMUM stay time using the appropriate survey map and RWP. Report your results in the "Candidate Answer" Box, including whether job can be completed based on calculated stay time.

**CANDIDATE ANSWER(s):**

- ☐ 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 NUMBER: 2AD-044	JPM TITLE: Select RWP and Determine Maximum Allowable Stay
JPM REVISION: 0	Time

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> This JPM is designed to be performed in a classroom setting. Provide candidate with the set of RWPs, calculator, and Survey Maps.         </div>	
1.C Review set of three (3) RWPs provided and select correct RWP and task number.	1.1C Selects RWP 212-2001 based on Operations clearance activities and records RWP # in candidate answer box.  1.2C Selects Task # 3 (clearance activities).  <div style="border: 1px solid black; padding: 5px;"> <b>EVALAUTOR NOTE:</b> If asked, inform the candidate that connecting the drain hose is considered a clearance activity. Continue the task.         </div> COMMENTS:	
2.C Calculate the maximum stay time.	2.1C Determines maximum stay time is 1.25 hours (1 hour and 15 minutes) and records this time in the candidate answer box.  $\begin{array}{ccccc} 25 \text{ mr} & / & 20 \text{ mr/hr} & = & 1.25 \text{ hrs} \\ \text{(EAD dose limit)} & & \text{(highest dose rate)} & & \text{(Stay Time)} \end{array}$ COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-044 JPM REVISION: 0	JPM TITLE: Select RWP and Determine Maximum Allowable Stay Time
--	--

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Determines allowable stay time does NOT allow completion of the work.	<p>3.1C Determines that stay time is 1.25 hours, and estimated completion for the job is 1.5 hours and records that job CANNOT be completed in candidate answer box.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"><b>EVALUATOR CUE:</b> When candidate reports results in candidate answer box, This COMPLETES this JPM. Evaluator discretion is required.</div> <p>COMMENTS:</p>	
	STOP TIME: _____	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Review Shutdown Margin Calculation (At Power and ONE Inoperable Rod) (SRO ONLY)

TRAINING MATERIAL NUMBER: 2AD-039

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-039

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OST-49.1, Shutdown Margin Calculation (Plant Critical), Rev. 18  
Unit 2 Curve Book Cycle 16

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 25 Minutes

PREPARED BY: R. J. Brooks

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Date

APPROVED FOR USE: \_\_\_\_\_

\_\_\_\_\_  
Training Supervisor or Designee

\_\_\_\_\_  
Date

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-039	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE
JPM REVISION: 0	Inoperable Rod) (SRO ONLY)

K/A REFERENCE: 2.1.25 4.2

TASK ID: 0011-006-06-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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: 25 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>	Incorrect values for Inoperable rod worth, power defect, and SDM are identified and corrected. (See Answer Key for specific values)
<b>RECOMMENDED STARTING LOCATION:</b>	Classroom
<b>DIRECTIONS:</b>	Review completed Shutdown Margin calculation that was performed in accordance with 2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16).
<b>INITIAL CONDITIONS:</b>	The Unit is in Mode 1, 100% power. All rods at 225 steps. Annunciator [A4-3C], TAVG DEVIATION FROM TREF is "NOT LIT". ONE control rod has been determined to be inoperable, untrippable, and immovable during performance of 2OST-1.1, Control Rod Assembly Partial Movement Test. Chemistry has just reported current RCS boron concentration at 833 ppm. Current burnup is 12,000 MWD/MTU. The RO has completed 2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16), and has requested the Shift Manager to review the completed OST.
<b>INITIATING CUE:</b>	As Shift Manager, review the completed 2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16). Document the results of your review in the appropriate section of the OST.
<b>REFERENCES:</b>	2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16), Rev. 18, Unit 2 Curve Book Cycle 16.
<b>TOOLS:</b>	Calculator
<b>HANDOUT:</b>	Unit 2 Curve Book Cycle 16. 2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16), Rev. 18 Filled out with the following errors on Data Sheet 1: 0.857 % $\Delta$ k/k for inoperable rod worth instead of 2.31 % $\Delta$ k/k 2800 PCM for power defect instead of 2300 PCM 3.0096 % $\Delta$ k/k for SDM instead of 2.054 % $\Delta$ k/k

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐

Read:

TASK:

Review completed Shutdown Margin calculation that was performed in accordance with 2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16).

INITIAL CONDITIONS:

The Unit is in Mode 1, 100% power. All rods at 225 steps. Annunciator [A4-3C], TAVG DEVIATION FROM TREF is "NOT LIT". ONE control rod has been determined to be inoperable, untrippable, and immovable during performance of 2OST-1.1, Control Rod Assembly Partial Movement Test. Chemistry has just reported current RCS boron concentration at 833 ppm. Current burnup is 12,000 MWD/MTU. The RO has completed 2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16), and has requested the Shift Manager to review the completed OST.

INITIATING CUE:

As Shift Manager, review the completed 2OST-49.1, Shutdown Margin Calculation (Plant Critical) (Updated for Cycle 16). Document the results of your review in the appropriate section of the OST.

☐

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 NUMBER: 2AD-039 JPM REVISION: 0	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE Inoperable Rod) (SRO ONLY)
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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: 5px;"> <b>EVALUATOR NOTE:</b>            Some judgment may be required to determine satisfactory performance on this JPM. Refer to attached Data Sheet 1 ANSWER KEY.         </div>	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            If the candidate hands in the OST after ONLY finding the first error, provide the following cue:            Make any necessary corrections and complete the SDM calculation.         </div>	
	START TIME: _____	
1. If the plant is in Mode 1, Verify that Tavg is less than 3°F above Tref (Annunciator A4-3C, TAVG DEVIATION FROM TREF is OFF) (Otherwise N/A).  (Step VII.A.1)	1.1 Verifies Step VII.A.1, (Plant in Mode 1, Tavg <3°F above Tref (Annunciator A4-3C OFF) from Initial Conditions.  COMMENTS:	
2. If the plant is in Mode 2, Verify that Tavg is less than 8°F above Program Tavg as follows: (Otherwise N/A)  (Step VII.A.2)	2.1 Verifies Step VII.A.2, is N/A (Plant not in Mode 2).  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-039	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE Inoperable Rod) (SRO ONLY)
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3. Request Chemistry to determine current RCS Boron concentration in ppm. (Step VII.A.3)	3.1 Verifies current boron concentration is 833 ppm from initial conditions.  COMMENTS:	
4. Record the number of steps withdrawn for Control Bank D from the group demand counters, (BB-B) on Data Sheet 1. (Step VII.A.4)	4.1 Verifies Control Bank D as 225 steps withdrawn on Data Sheet 1 (Block A.4) from initial conditions.  COMMENTS:	
5. Record the current reactor power level in percent of full power from [2NME-NR45], Power Range Recorder, (VB-B) OR PCS computer point U1150, 1MIN AVG PWR RNG NUCLEAR FLUX, on Data Sheet 1. (Step VII.A.5)	5.1 Verifies reactor power as 100% on Data Sheet 1 (Block A.5).  COMMENTS:	
6. Record the number of immovable or untrippable control rods on Data Sheet 1. (Step VII.A.6)	6.1 Verifies number of immovable or untrippable rods as "ONE" on Data sheet 1 (Block A.6) (given in Initial Conditions).  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-039	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE Inoperable Rod)
JPM REVISION: 0	(SRO ONLY)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>7. If the number of immovable or untrippable control Rods is greater than 1, Use Attachment 1 to determine the required boron concentration with greater than one struck rod and Record below. (Otherwise N/A)</p> <p>(Step VII.A.7)</p>	<p>7.1 Verifies Step VII.A.7 is N/A.</p> <p>COMMENTS:</p>	
<p>8. Determine control bank reactivity worth per the following:</p> <p>Using the ARO Total Bank Worth table on Data Sheet 1, Enter the total bank worth for the current core burnup range, in the space provided on Data Sheet 1.</p> <p>(Step VII.B.1.a)</p>	<p>8.1 Verifies ARO Total Bank Worth (from the Data Sheet 1 table) to be 7.571 %Δk/k and recorded on Data Sheet 1 (Block B.1.a).</p> <p>COMMENTS:</p>	
<p>9. Using Curve Book Figures CB-24A, 24B or CB-24C, Determine integral rod worth for the current bank position AND Enter this value on Data Sheet 1.</p> <p>Divide value from curve (in pcm) by 1000 to convert to %Δk/k AND Record on Data Sheet 1.</p> <p>(Step VII.B.1.b)</p>	<p>9.1 Verifies integral rod worth to be ZERO and recorded on Data Sheet 1 (Blocks B.1.b.1) and B.1.b).</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-039	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE Inoperable Rod)
JPM REVISION: 0	(SRO ONLY)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
10. Subtract the integral rod worth from the Total Bank Worth <b>AND</b> Enter the result on Data Sheet 1.  (Step VII.B.1.c)	10.1 Verifies TBW-IRW is 7.571 % $\Delta$ k/k and recorded on Data Sheet 1 (Block B.1.c).  COMMENTS:	
11 Multiply this result by 0.9 to apply a 10% uncertainty <b>AND</b> Enter the result on Data Sheet 1.  (Step VII.B.1.d)	11.1 Verifies 90% of TBW to be 6.8139 % $\Delta$ k/k and recorded on Data Sheet 1 (Block B.1.d).  COMMENTS:	
12.C If <b>ONE</b> rod is inoperable (untrippable), Record "Worst Case Stuck Rod with Inoperable Rod" worth on Data Sheet 1. Value is determined from Column "B" on Attachment 2 for the appropriate Cycle Burnup.  (Step VII.B.2.b)	12.1C Determines stuck rod worth should be 2.310 % $\Delta$ k/k <b>NOT</b> 0.857 and records on Data Sheet 1 (Block B.2).  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b>  Candidate may need cued to make any necessary corrections and complete the SDM calculation. </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-039	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE
JPM REVISION: 0	Inoperable Rod) (SRO ONLY)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>13.C Subtract Stuck Rod(s) Worth from the 90% Total Bank Worth value <b>AND</b> Enter the result on Data Sheet 1.</p> <p>(Step VII.B.3)</p>	<p>13.1C Determines 90% Total Bank Worth minus Stuck Rod(s) Worth to be 4.5039 %Δk/k and records on Data Sheet 1 (Block B.3).</p> <p>COMMENTS:</p>	
<p>14. Determine Power Defect as follows:</p> <p>Record RCS Boron Concentration results from Chemistry on Data Sheet 1.</p> <p>(Step VII.B.4.a)</p>	<p>14.1 Record RCS Boron Concentration of 833 ppm on Data Sheet 1 (Block B.4.a).</p> <p>COMMENTS:</p>	
<p>15. Using Curve Book Figure 29, Determine the B-10 Correction Factor for the present Burnup (If between two Burnup values, Use the B-10 Correction Factor for the greater MWD/MTU Burnup entry) <b>AND</b> Record on Data Sheet 1.</p> <p>(Step VII.B.4.b)</p>	<p>15.1 Determines B-10 Correction Factor to be 0.900 and records on Data Sheet 1 (Block B.4.b).</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-039	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE Inoperable Rod)
JPM REVISION: 0	(SRO ONLY)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
16. Determine Corrected Boron Concentration by multiplying the RCS Boron Concentration and the B-10 Correction Factor <b>AND</b> Record on Data Sheet 1.  (Step VII.B.4.c)	16.1 Determines Corrected Boron Concentration to be 750 ppm and records on Data Sheet 1 (Block B.4.c).  COMMENTS:	
17.C Using Curve Book Figure 21, Determine the <b>ABSOLUTE VALUE</b> of the Power Defect for the current power level and the Corrected Boron Concentration <b>AND</b> Enter this value on Data Sheet 1.  (Step VII.B.4.d)	17.1C Determines <b>ABSOLUTE VALUE</b> of the Power Defect to be 2300 pcm <b>NOT</b> 2800 pcm and records on Data Sheet 1 (Block B.4.d).  COMMENTS:	
18.C Divide value from curve (in pcm) by 1000 to convert to %Δk/k <b>AND</b> Record on Data Sheet 1.  (Step VII.B.4.e)	18.1C Converts <b>ABSOLUTE VALUE</b> of the Power Defect of 2300 pcm to 2.30 %Δk/k and records on Data Sheet 1 (Block B.4.e).  COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-039 JPM REVISION: 0	JPM TITLE: Review Shutdown Margin Calculation (At Power and ONE Inoperable Rod) (SRO ONLY)
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<b>19.C</b> Add 0.150 % $\Delta k/k$ for operating temperature band margin to the Power Defect recorded in Step VII.B.4.e <b>AND</b> Record on Data Sheet 1.  (Step VII.B.4.f)	<b>19.1C</b> Determines Power Defect plus operating temperature band margin to be 2.45 % $\Delta k/k$ <b>NOT</b> 2.95 % $\Delta k/k$ and records on Data Sheet 1 (Block B.4.f).  COMMENTS:	
<b>20.C</b> Determine SHUTDOWN MARGIN by subtracting Power Defect (Step VII.B.4.f) from the value determined in Step VII.B.3 <b>AND</b> Record on Data Sheet 1.  (Step VII.B.5)	<b>20.1C</b> Determines SDM to be 2.054 % $\Delta k/k$ NOT 3.009 % $\Delta k/k$ and records on Data Sheet 1 (Block B.4.f) AND space provided on candidate direction sheet.  COMMENTS:	
	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <b>EVALUATOR CUE:</b> That Completes this JPM         </div>	
	STOP TIME: _____	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Review a Completed Quadrant Power Tilt Ratio Calculation (SRO ONLY)

TRAINING MATERIAL NUMBER: 2AD-045

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-045

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OST-2.4A, Quadrant Power Tilt Ratio Manual Calculation", Rev. 8

INSTRUCTIONAL SETTING: Simulator/Classroom

APPROXIMATE DURATION: 20 minutes

PREPARED BY: R. J. Brooks \_\_\_\_\_ Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2AD-045		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # N/A New Change #
List/Description of Change(s):  Original Issue		
Reason for Change (s):		
APPROVALS:		
<u>R. J. Brooks</u> Prepared by		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Date		
<u>Training Superintendent/Supervisor/Peer</u> ( <i>"Changes Not Requiring Revision" only</i> )		Date

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-045	JPM TITLE: Review a Completed Quadrant Power Tilt Ratio
JPM REVISION: 0	Calculation (SRO ONLY)

K/A REFERENCE: 015A1.04 3.5/3.7 TASK ID: 0021-005-06-013  
015A4.02 3.9/3.9  
2.1.37 4.3/4.6

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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:	The QPTR calculation is corrected and compared to Technical Specification limits, <b>AND</b> a determination is made that the OST Acceptance Criteria are NOT met and TS 3.2.4 Condition A is applicable.
RECOMMENDED STARTING LOCATION:	Classroom
DIRECTIONS:	Review/approve a completed 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation".
INITIAL CONDITIONS:	Mode 1 100% power. The plant computers are unavailable.
INITIATING CUE:	<p>The STA has just completed his review of the recently completed 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation". As Shift Manager you are to review/approve the completed 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation". Document the results of your review/approval in the appropriate section of the OST.</p> <p><b>Use the provided Pictures of the NI cabinets and "Quadrant Power Tilt Ratio Normalization Factors" to perform this review/approval.</b></p>
REFERENCES:	2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 8.
TOOLS:	Calculator
HANDOUT:	<ol style="list-style-type: none"><li>2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation", Rev. 8, completed with the following errors:<ul style="list-style-type: none"><li>N42 upper current is recorded as <b>249</b> instead of 259;</li><li>N41 and N42 lower detector Normalization Factors are <b>REVERSED</b>.</li></ul></li><li>NI Cabinet Pictures.</li><li>Attached "Quadrant Power Tilt Ratio Normalization Factors"</li><li>Have additional blank copies of Data sheet 1 and Tech Specs available in case candidates request them.</li></ol>

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

TASK: Review/approve a completed 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation".

INITIAL CONDITIONS: Mode 1 100% power. The plant computers are unavailable.

INITIATING CUE: The STA has just completed his review of the recently completed 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation". As Shift Manager you are to review/approve the completed 2OST-2.4A, "Quadrant Power Tilt Ratio Manual Calculation". Document the results of your review/approval in the appropriate section of the OST.

**Use the provided Pictures of the NI cabinets and "Quadrant Power Tilt Ratio Normalization Factors" to perform this review/approval.**

☐ 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

## “Quadrant Power Tilt Ratio Normalization Factors”

## UPPER DETECTORS

	<b>Norm Factor</b>
N41A	0.0543
N42A	0.0447
N43A	0.0556
N44A	0.0400

## LOWER DETECTORS

	<b>Norm Factor</b>
N41B	0.0483
N42B	0.0470
N43B	0.0600
N44B	0.0460

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-045	JPM TITLE: Review a Completed Quadrant Power Tilt Ratio Calculation (SRO ONLY)
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<b>EVALUATOR NOTE:</b> This JPM is designed to use an accompanying Quadrant Power Tilt Ratio Normalization Factors sheet and NI cabinet pictures.	
1. Review 2OST-2.4A, "QPTR Manual Calculation" procedure.	<b>EVALUATOR CUE:</b> Provide an erroneously completed copy of 2OST-2.4A, Quadrant Power Tilt Ratio Normalization Factors sheet and NI pictures.  1.1 Reviews 2OST-2.4A, "QPTR Manual Calculation" procedure.  COMMENTS:	
2.C Identifies reading error for N42 upper detector.	<b>EVALUATOR NOTE:</b> Acceptable detector current tolerance is $\pm 3$ minor scale subdivisions of actual indication.  2.1 Identifies N42 upper detector current is <b>259</b> and not the recorded current of <b>249</b> .  2.2C Records in appropriate block of Data Sheet 1.  COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-045	JPM TITLE: Review a Completed Quadrant Power Tilt Ratio
JPM REVISION: 0	Calculation (SRO ONLY)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Identifies the transposition error with N41 and N42 lower detector correction factors.	3.1 Identifies N41 and N42 lower detector correction factors are <b>REVERSED</b> .  3.2C Records in appropriate block of Data Sheet 1.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR CUE:</b> It may be necessary to ask the candidate to make the necessary corrections to the QPTR calculations.         </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR NOTE:</b> Refer to answer key for critical steps of the corrected QPTR calculation.         </div> <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> If requested, provide the candidate with blank copies of Data sheet 1.         </div>	
4.C Corrects the errors in the QPTR calculations.	4.1 Completes the QPTR calculations.  4.2C Records in appropriate blocks of Data Sheet 1.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-045  
JPM REVISION: 0

JPM TITLE: Review a Completed Quadrant Power Tilt Ratio  
Calculation (SRO ONLY)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>5.C Determines OST acceptance criteria are NOT met.</p>	<p>5.1 Compares QPTR calculation against OST acceptance criteria and determines OST acceptance criteria are NOT met.</p> <p>5.2C Records problems encountered on the cover sheet and/or the OST problem sheet.</p> <p>5.3C Records on the cover sheet and/or the OST problem sheet that TS 3.2.4 LCO actions are applicable.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR NOTE:</b> It may be necessary to ask a follow-up question to determine that the candidate is aware that TS 3.2.4 LCO actions are applicable.</p> </div> <p>COMMENTS:</p>	
	<p>STOP TIME: _____</p>	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Perform a Risk Assessment [2FWE\*P23A Maintenance] (SRO Only)

TRAINING MATERIAL NUMBER: 2AD-041

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-041

REVISION NUMBER: 0

TECHNICAL REFERENCES:

NOP-OP-1007, "Risk Management", Rev. 15  
Technical Specifications Beaver Valley Power Station Units 1 & 2

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 minutes

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

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2AD-041		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. #0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. N/A New Change #
List/Description of Change(s):  Updated to reflect Revision 15 of NOP-OP-1007.		
Reason for Change (s):		
APPROVALS:		
R. J. Brooks Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> ) _____ Date _____		

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-041	JPM TITLE: Perform a Risk Assessment [2FWE*P23A Maintenance]
JPM REVISION: 0	(SRO Only)

K/A REFERENCE: 2.2.17 2.6/3.8

TASK ID: 1300-027-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☒ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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: 2AD-041  
JPM REVISION: 0

JPM TITLE: Perform a Risk Assessment [2FWE\*P23A Maintenance]  
(SRO Only)

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Determines Risk Level is ORANGE and the Director of Site Operations (or designee) is the required approver for this condition.

**RECOMMENDED  
STARTING LOCATION:** Classroom

**DIRECTIONS:** You are to determine the risk level for given plant conditions and required approver for this level of risk.

**INITIAL CONDITIONS:**

- The Unit is in Mode 1 at 100% power.
- PRA Risk & Traffic Light are GREEN.
- Protected Train is "B".
- Currently the Unit is in YELLOW Risk due to ongoing scaffold erection over the operable "A" Main Feed pump.
- AFW Pump 2FWE\*P23A will be taken out of service for repairs to address increasing pump vibrations.
- The planned repairs will render the pump inoperable for 48 hours.

**INITIATING CUE:** As Shift Manager you are to evaluate the risk level based on initial plant conditions for upcoming activities (2FWE\*P23A repairs) **AND** determine who must approve this risk level in accordance with NOP-OP-1007, "Risk Management". Report the results of your risk assessment and required approver of this risk level in the "Candidate Answer" Box below. (provided on candidate direction sheet)

**REFERENCES:** NOP-OP-1007, "Risk Management", Rev. 15  
Technical Specifications Beaver Valley Power Station Units 1 & 2

**TOOLS:** None

**HANDOUT:** NOP-OP-1007, "Risk Management", Rev. 15  
Technical Specifications Beaver Valley Power Station Units 1 & 2  
(Need to be available in the event the candidate wants to reference)

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**TASK:** You are to determine the risk level for given plant conditions and required approver for this level of risk.

**INITIAL CONDITIONS:**

- The Unit is in Mode 1 at 100% power.
- PRA Risk & Traffic Light are GREEN.
- Protected Train is "B".
- Currently the Unit is in YELLOW Risk due to ongoing scaffold erection over the operable "A" Main Feed pump.
- AFW Pump 2FWE\*P23A will be taken out of service for repairs to address increasing pump vibrations.
- The planned repairs will render the pump inoperable for 48 hours.

**INITIATING CUE:** As Shift Manager you are to evaluate the risk level based on initial plant conditions for upcoming activities (2FWE\*P23A repairs) **AND** determine who must approve this risk level in accordance with NOP-OP-1007, "Risk Management". Report the results of your risk assessment and required approver of this risk level in the "Candidate Answer" Box below.

**CANDIDATE ANSWER(S):**

- ☐ 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 NUMBER: 2AD-041	JPM TITLE: Perform a Risk Assessment [2FWE*P23A Maintenance]
JPM REVISION: 0	(SRO Only)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<b>EVALUATOR CUE:</b> Provide a copy of NOP-OP-1007, "Risk Management".	
1. Refers to NOP-OP-1007, "Risk Management" provided.	1.1 Refers to NOP-OP-1007.  COMMENTS:	
2.C Refers to Attachment 3, Risk Assessment Worksheet, to determine risk.	<b>EVALUATOR NOTE:</b> The candidate may want to refer to TS 3.7.5 as part of this JPM step. Ensure Technical Specifications Beaver Valley Power Station Units 1 & 2 is available for reference. TS 3.7.5 Condition B applies since 2FWE*P23A is inoperable. Condition C requires a plant shutdown if 2FWE*P23A cannot be returned to service within 72 hours.  2.1C Determines that this activity is ORANGE risk level. This is based on Attachment 3, Section E.5 answer is YES because 48 hours is greater than half of the 72 hour allowed Technical Specification (TS) Action Statement for any TS which requires a Unit Shutdown if not exited.  2.2 Records approver in the candidate answer box of the candidate direction sheet.  COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-041 JPM REVISION: 0	JPM TITLE: Perform a Risk Assessment [2FWE*P23A Maintenance] (SRO Only)
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Refers to Attachment 2, Plant Risk Matrix or to section 4.3.C on page 19, to determine required approval.	<p>3.1C Determines that based on an Orange Risk, the Director of Site Operations (or designee) is the required approver for this risk level.</p> <p>3.2 Records approver in the candidate answer box of the candidate direction sheet.</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"><b>EVALUATOR CUE:</b> When the candidate determines risk level and approver, This JPM is COMPLETE.</div>	
STOP TIME: _____		

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Determine compensatory actions for 2GWS-P21 and 2GWS-OA-100A being OOS. (SRO ONLY)

TRAINING MATERIAL NUMBER: 2AD-042

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-042

REVISION NUMBER: 0

TECHNICAL REFERENCES:

LRM 3.3.12, Rev. 52  
½ ODCM Section 3.0.3, Rev. 11  
OM Fig. 19-3 Rev. 4

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 20 Minutes

PREPARED BY: R. J. Brooks

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Date

APPROVED FOR USE: \_\_\_\_\_

Training Supervisor or Designee

\_\_\_\_\_  
Date

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2AD-042		
Type of Change:		
<input type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input type="checkbox"/> No	New Rev. # 0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # N/A  New Change #
List/Description of Change(s):  Original Issue.		
Reason for Change (s):		
APPROVALS:		
R. J. Brooks		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Prepared by	Date	
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> )	Date	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-042	JPM TITLE: Determine compensatory actions for 2GWS-P21 and 2GWS-OA-100A being OOS. (SRO ONLY)
JPM REVISION: 0	

K/A REFERENCE: 2.3.11 (4.3)

TASK ID: 1300-029-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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

JPM NUMBER: 2AD-042  
JPM REVISION: 0

JPM TITLE: Determine compensatory actions for 2GWS-P21 and  
2GWS-OA-100A being OOS. (SRO ONLY)

**EVALUATOR DIRECTION SHEET****TASK STANDARD:**

The compensatory actions required are determined to be:  
At least once per 24 hours take grab samples and analyze for Oxygen concentration **AND**, least once per 24 hours, verify that the GW storage tanks contain less or equal to 19,000 curies.

**RECOMMENDED  
STARTING LOCATION:  
DIRECTIONS:**

Classroom

Refer to Initiating Cue Below.

**INITIAL CONDITIONS:**

It is desired to fill the Gaseous Waste Storage Tanks in accordance with 2OM-19.4.G, "Filling Unit 2 Gaseous Waste Storage Tanks from Unit 2 Surge Tank".

- The plant is operating at 100% power with all system in NSA.
- Gaseous Waste Storage Tanks (2GWS-TK25A-G) pressures are 8 psig and STABLE.
- Gaseous Waste Surge Tank (2GWS-TK21) pressure is 62 psig and slowly RISING.
- The Gaseous Waste Storage Tanks Recirculation Pump [2GWS-P21] is out of service (OOS).
- Oxygen Analyzer (2GWS-OA100A) is also OOS.
- Oxygen Analyzer (2GWS-OA100B) is OPERABLE.

**INITIATING CUE:**

For these plant conditions, determine the **REQUIRED** LRM/ODCM compensatory actions for filling the Gaseous Waste Storage Tanks. Document any compensatory actions in the block below. (provided on the candidate direction sheet).

**REFERENCES:**

LRM 3.3.12, Rev. 52  
TS 5.5.8, Amend 278/170  
½ ODCM Section 3.0.3, Rev. 11  
OM Fig. 19-3 Rev. 4

**TOOLS:**

None

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐

Read:

TASK:

Refer to Initiating Cue Below.

INITIAL CONDITIONS:

It is desired to fill the Gaseous Waste Storage Tanks in accordance with 2OM-19.4.G, "Filling Unit 2 Gaseous Waste Storage Tanks from Unit 2 Surge Tank".

- The plant is operating at 100% power with all system in NSA.
- Gaseous Waste Storage Tanks (2GWS-TK25A-G) pressures are 8 psig and STABLE.
- Gaseous Waste Surge Tank (2GWS-TK21) pressure is 62 psig and slowly RISING.
- The Gaseous Waste Storage Tanks Recirculation Pump [2GWS-P21] is out of service (OOS).
- Oxygen Analyzer (2GWS-OA100A) is also OOS.
- Oxygen Analyzer (2GWS-OA100B) is OPERABLE.

INITIATING CUE:

For these plant conditions, determine the **REQUIRED** LRM/ODCM compensatory actions for filling the Gaseous Waste Storage Tanks. Document any compensatory actions in the block below.

**Required compensatory actions, if any:**☐

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 NUMBER: 2AD-042	JPM TITLE: Determine compensatory actions for 2GWS-P21 and 2GWS-OA-100A being OOS. (SRO ONLY)
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div><b>EVALUATOR CUE:</b> Provide the Candidate with the Candidate Direction Sheet and a current copy of OM Fig. 19-3, LRM, AND ½ ODCM Section 3.0.3,</div> <div><b>EVALUATOR NOTE:</b> These steps may be performed in any order.</div>	
	<div><b>EVALUATOR NOTE:</b> The next step may not be necessary. The candidate may already be familiar enough with the system to know the impact of 2GWS-P21 being OOS.</div>	
1.1 Determines the impact of 2GWS-P21 being OOS.	1.1 Refers to OM Fig. 19-3 and determines that Waste Gas Storage Tank Radiation Monitor (2GWS-RQ104) is out of service as a result of 2GWS-P21 being OOS.	
2.C Determines ½ ODCM compensatory actions for Waste Gas Storage Tank Radiation Monitor (2GWS-RQ104) being out of service.	2.1 Refers to ½ ODCM Section 3.0.3, Att. O item 4.11.25.1 on page 66.  2.2C Determines that it will be required to verify, least once per 24 hours, that the GW storage tanks contain less or equal to 19,000 curies. (when adding radioactive materials to the tank)  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-042	JPM TITLE: Determine compensatory actions for 2GWS-P21 and 2GWS-OA-100A being OOS. (SRO ONLY)	
JPM REVISION: 0		

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Determines LRM compensatory actions for Oxygen Analyzer (2GWS-OA100A) being OOS.	3.1 Refers to LRM 3.3.12 Condition B.1. 3.2C Determines at least once per 24 hours take grab samples and analyze for oxygen content. COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            That completes this JPM.         </div>	
	STOP TIME: _____	



OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Classify an Emergency Event (Scenario Specific)

TRAINING MATERIAL NUMBER: 2AD-046

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-046

REVISION NUMBER: 0

TECHNICAL REFERENCES:

EPP/I-1a, Recognition and Classification of Emergency Conditions, Rev. 15

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks \_\_\_\_\_  
Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2AD-046		
Type of Change:		
<input type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input type="checkbox"/> No	New Rev. # 0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # New Change #
List/Description of Change(s):  Original Issue		
Reason for Change (s):		
APPROVALS:		
R. J. Brooks Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> ) _____ Date _____		

JPM NUMBER: 2AD-046  
JPM REVISION: 0

JPM TITLE: Classify an Emergency Event (Scenario Specific)

K/A REFERENCE: 2.4.41 (4.1)

TASK ID: 1350-004-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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 Critical: <input checked="" type="checkbox"/> Yes <input 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: _____			

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	The correct EPP classification is made for the associated scenario <b>AND</b> all “critical” steps of the initial notification form are correctly completed.
<b>RECOMMENDED STARTING LOCATION:</b>	Simulator
<b>DIRECTIONS:</b>	You are to perform the task Classify An Emergency Event and complete the initial notification form.
<b>INITIAL CONDITIONS:</b>	The simulator scenario just completed.(2LOT8 NRC Exam)
<b>INITIATING CUE:</b>	<p>As the Unit Supervisor, you are to classify the events in the scenario just completed in accordance with EPP/I-1a, Recognition and Classification of Emergency Conditions <b>AND</b> complete the initial notification form.</p> <p>For the purpose of filling out the initial notification form the following conditions exist:</p> <ul style="list-style-type: none"><li>• The code word is “Simulator”</li><li>• Unit 1 is at 100% steady state power</li><li>• Wind direction at 150’ is 135°</li><li>• Wind speed at 35’ is 15 mph</li></ul>
<b>REFERENCES:</b>	<p><b>THIS IS A TIME CRITICAL JPM</b></p> <p>EPP/I-1a, Recognition and Classification of Emergency Conditions, Rev. 15</p>
<b>TOOLS:</b>	None
<b>HANDOUT:</b>	EPP/I-1a, Recognition and Classification of Emergency Conditions, Rev. 15; ½-EPP-IP-1.1.F01, FENOC Nuclear Power Plant Initial Notification Form Rev. 5

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**TASK:** You are to perform the task Classify An Emergency Event and complete the initial notification form.

**INITIAL CONDITIONS:** The simulator scenario just completed.(2LOT8 NRC Exam)

**INITIATING CUE:** As the Unit Supervisor, you are to classify the events in the scenario just completed in accordance with EPP/I-1a, Recognition and Classification of Emergency Conditions **AND** complete the initial notification form.  
For the purpose of filling out the initial notification form the following conditions exist:

- The code word is "Simulator"
- Unit 1 is at 100% steady state power
- Wind direction at 150' is 135°
- Wind speed at 35' is 15 mph

**THIS IS A TIME CRITICAL JPM**

- ☐ 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 NUMBER: 2AD-046  
JPM REVISION: 0

JPM TITLE: Classify an Emergency Event (Scenario Specific)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE: The Candidate is being evaluated on classifying the events in the scenario just completed. (2LOT8 NRC Exam) It may be necessary to review the events before beginning the JPM.</b> </div>	
<b>1.C</b> Classify the event in accordance with the Emergency Plan.	<b>1.1C</b> Candidate correctly classifies the event. <ul style="list-style-type: none"> <li>• Scenario #1: Unusual Event, Tab 2.10 Steam/Feed Line Break</li> <li>• Scenario #2: Site Area Emergency, Tab 1.1.1 &amp; 1.2.1, Fission Product Matrix Tabs 1.1.1 &amp; 1.2.1 Potential loss – Heat Sink Red Path</li> <li>• Scenario #3: Alert, Tab 1.2.4, Steam Generator Tube Rupture that results in a Safety Injection Actuation</li> <li>• Scenario #4: Alert, Tab 2.3, Failure of Reactor Protection</li> <li>• Scenario #5: Alert, Tab 1.2.3, Potential loss of RCS barrier due to RCS leak rate.</li> </ul> COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-046  
JPM REVISION: 0

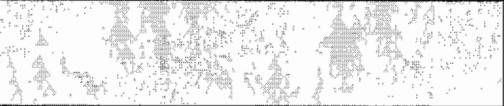
JPM TITLE: Classify an Emergency Event (Scenario Specific)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>2.C Completes the initial notification form.</p>	<p>2.1 Places the following information on the space provided on the initial notification form.</p> <ul style="list-style-type: none"> <li>• C Item 1 places a checkmark in BV 2 block and records 100% power for Unit 1 and 0% power for Unit 2</li> <li>• Item 2 places a checkmark in the this is a drill box</li> <li>• Places/verifies the word "Simulator" in the code space.</li> <li>• C Item 3 places a checkmark in the appropriate classification box (as identified in step 1 of the JPM above) and places a checkmark in the initial declaration box</li> <li>• Item 3 places current time in the declaration time space, places the date in the date space.</li> <li>• C Item 3 places the appropriate EAL tab number in the EAL number space (as identified in step 1 of the JPM above).</li> <li>• Item 4 places the appropriate EAL description in the space provided (as identified in step 1 of the JPM above)</li> <li>• C Item 5 places checkmarks in the non-routine AND airborne radiological release in progress due to this event box.</li> <li>• C Item 6 places a checkmark in NONE box for the PAR</li> <li>• C Item 7 places 135° and 15 mph in the wind speed and direction spaces</li> </ul>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2AD-046  
JPM REVISION: 0

JPM TITLE: Classify an Emergency Event (Scenario Specific)

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<p>2.2 Places candidate name in the approved space.</p> <div><p><b>EVALUATOR NOTE:</b> Refer to Answer Key for initial notification form critical steps.</p></div> <div><p><b>TERMINATING CUE:</b> That completes this JPM</p></div> <p>COMMENTS:</p>	
	STOP TIME: _____	



OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Shift From Main Feedwater Reg Valves to Bypasses

TRAINING MATERIAL NUMBER: 2CR-072

PROGRAM TITLE: Licensed Operator Retraining

COMPUTER CODE: 2CR-072

REVISION NUMBER: 4

TECHNICAL REFERENCES:

2OM-52.4.R.1.F, Revision 23, Attachment 10

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: Paul T. Eisenmann \_\_\_\_\_  
Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-072		
Type of Change:		
<input checked="" type="checkbox"/> Major	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 4
<input type="checkbox"/> Minor	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 3 New Change #
List/Description of Change(s):  Updated to current procedure revision. Changed K/A System ID from 035 to 059 per TAI 29384		
Reason for Change (s):  Procedure revised.		
APPROVALS:		
<u>P. T. Eisenmann</u> Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR- 1104-.
Training Superintendent/Supervisor/Peer _____ Date _____ <i>(Minor Changes Only)</i>		

JPM NUMBER: 2CR-072  
JPM REVISION: 4

JPM TITLE: Shift From Main Feedwater Reg Valves to Bypasses

K/A REFERENCE: 059A4.08 3.0\*/2.9\*

TASK ID: 0241-004-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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: \_\_\_\_\_

JPM NUMBER: 2CR-072  
JPM REVISION: 4

JPM TITLE: Shift From Main Feedwater Reg Valves to Bypasses

### **EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** The "A" Bypass Feed Regulating Valve is in automatic and controlling steam generator level.

**RECOMMENDED  
STARTING LOCATION:** SIMULATOR

**DIRECTIONS:** You are to Transfer from Main Feed Regulating Valve to Bypass Feed Regulating Valve for the "A" S/G.

**INITIAL CONDITIONS:**

- The plant is at approximately 25% power.
- 2OM-52.4.R.1.F, "Station Shutdown from 100% Power to Mode 5" has been completed up to Step D.8.

**INITIATING CUE:**

- Your supervisor directs you to place 21A S/G Bypass Feed Reg Valve [2FWS-FCV479] in service in accordance with Attachment 10 of 2OM-52.4.R.1.F
- [2FWS-FCV479] is to be placed in automatic to control steam generator level.
- You are to maintain 21A S/G NR level between 39% and 49%.

**REFERENCES:** 2OM-52.4.R.1.F, Revision 23

**TOOLS:** None

**HANDOUT:** 2OM-52.4.R.1.F, "Station Shutdown from 100% Power to Mode 5", Revision 23, place kept to step D.8 and a separate copy of Attachment 10.

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**DIRECTIONS:** You are to Transfer from Main Feed Regulating Valve to Bypass Feed Regulating Valve for the "A" S/G.

**INITIAL CONDITIONS:**

- The plant is at approximately 25% power.
- 2OM-52.4.R.1.F, "Station Shutdown from 100% Power to Mode 5" has been completed up to Step D.8.

**INITIATING CUE:**

- Your supervisor directs you to place 21A S/G Bypass Feed Reg Valve [2FWS-FCV479] in service in accordance with Attachment 10 of 2OM-52.4.R.1.F
- [2FWS-FCV479] is to be placed in automatic to control steam generator level.
- You are to maintain 21A S/G NR level between 39% and 49%.

☐ 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 NUMBER: 2CR-072  
JPM REVISION: 4

JPM TITLE: Transfer from Main Feedwater Reg Valves to Bypasses

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE: Initialize IC-224,</b>  Put Steam Generator Wide Range Levels on trend up on BOP's PCS screen. Select "Trends" then select "SG Wide Range Level".  Open MFRV isolation valve 2FWS-MOV154A. </div>	
1. Review 2OM-52.4.R.1.F and attachment 10.	1.1 Reviews 2OM-52.4.R.1.F and Attach. 10.  COMMENTS:	
2.C Place controller in MANUAL AND Slowly Open the 21A Bypass FCV.  As the 21A Bypass FCV is being opened, close [2FWS-FCV478] 21A Main Feedwater Reg Valve, in MANUAL OR AUTO to maintain 21A S/G level within 39% to 49%	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> Inform candidate that it is desired to close 2FWS-FCV478 in the MANUAL mode of control. </div> 2.1 Locates Steam Flow, Feed Flow and Steam Generator level indicators  2.2.C Intermittently opens the Bypass Control Valve [2FWS-FCV479] by depressing the up button.  2.3.C Depresses the MANUAL PB then closes the Main Feed Reg Valve [2FWS-FCV478] by intermittently depressing lower PB.  2.4 Maintains Feed Flow approximately equal to Steam Flow.  2.5 Verifies the Main Feed Reg Valve [2FWS-FCV478] Green light –LIT, Red light- NOT LIT.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-072  
JPM REVISION: 4

JPM TITLE: Transfer from Main Feedwater Reg Valves to Bypasses

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>3. When S/G 21A Main Feedwater Reg Valve is fully closed, perform the following:</p> <p>Verify S/G 21A Main Feedwater Reg Valve controller in MAN.</p> <p>Observe Feedwater flow, steam flow and S/G level for evidence of leakage past the 21A Main Feed Reg Valve.</p> <p>Closes [2FWS-MOV154A], 21A S/G Main Feedwater Isol Vlv.</p>	<p>3.1 Verifies controller for 2FWS-FCV478 remains in MANUAL.</p> <p>3.2 Locates indicators and observes for evidence of leakage past 2FWS-FCV478.</p> <p>3.3 Closes 2FWS-MOV154A by placing CS to close, and verifies Green light – LIT and Red light – NOT LIT.</p> <p>COMMENTS:</p>	
<p>4.C Place controller for the 21A Bypass FCV in AUTO AND Monitor S/G level and flow.</p> <p>If level control is NOT stable, restore the valve controller to MANUAL AND maintain S/G NR level between 39% and 49%.</p>	<p>4.1 Verify feedwater flow is approximately equal to steam flow and level is approximately 44%.</p> <p>4.2C Place the controller for 2FWS-FCV479 in AUTO.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Inform candidate that it is desired to operate in AUTO mode. If candidate feels that control is not stable in AUTO they may continue to operate in MANUAL.</p> </div> <p>4.3 Monitors AUTO operation of the valve to ensure it controls level between 39% and 49%.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-072 JPM REVISION: 4		JPM TITLE: Transfer from Main Feedwater Reg Valves to Bypasses	
STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒		S/U
5. If level control is NOT stable, restore the valve controller to MANUAL AND maintain S/G NR level between 39% and 49%.	5.1. If in MANUAL, using the auto/manual station for [2FWS-FCV479] slowly adjusts valve controller to control steam generator level between 39% and 49%.  COMMENTS:  <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"><b>EVALUATOR CUE:</b> That completes this JPM.</div>		
		STOP TIME: _____	



### OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Respond to Radiation Monitor Alarm

TRAINING MATERIAL NUMBER: 2CR-622

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-622

REVISION NUMBER: 3

### TECHNICAL REFERENCES:

2OM-43.4.AEB, Local-Leak Collection Ventilation [2RMR RQI301] High Level Alarm, Issue 1 Revision 5

## 2OM-43.4.AAC Radiation Monitoring Level High, Revision 1

**INSTRUCTIONAL SETTING:** Simulator

**APPROXIMATE DURATION:** 20 Minutes

PREPARED BY:      Paul T. Eisenmann

Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-622		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 3
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 2 New Change #
List/Description of Change(s):  Updated to current procedure revisions. Updated to current JPM format.		
Reason for Change (s):  Procedure Enhancement		
APPROVALS:		
<u>Pual T. Eisenmann</u> Prepared by _____ Date _____  Training Superintendent/Supervisor/Peer ("Changes Not Requiring Revision" only) _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.

JPM NUMBER: 2CR-622  
JPM REVISION: 3

JPM TITLE: Respond to Radiation Monitor Alarm

K/A REFERENCE: 073A4.02 3.7/3.7

TASK ID: 0431-031-04-012

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☒ FAULTED 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"/> OJT/TPE <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: _____			

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Contiguous area ventilation aligned through the filtered flowpath.

**RECOMMENDED  
STARTING LOCATION:** Simulator

**DIRECTIONS:** You are to perform the task, Respond to a Radiation Monitor Alarm

**INITIAL CONDITIONS:** Annunciator A4-5C "Radiation Monitor Level High" has just alarmed.

**INITIATING CUE:** Your supervisor directs you to respond to the alarm using the appropriate Alarm Response Procedure.

**REFERENCES:** 2OM-43.4.AEB, Local-Leak Collection Ventilation [2RMR RQI301]  
High Level Alarm, Issue 1 Revision 5.

2OM-43.4.AAC Radiation Monitoring Level High, Revision 1

**TOOLS:** None

**HANDOUT:** 2OM-43.4.AEB, Local-Leak Collection Ventilation [2RMR RQI301]  
High Level Alarm, Issue 1 Revision 5.

2OM-43.4.AAC Radiation Monitoring Level High, Revision 1

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐

Read:

TASK:

You are to perform the task, Respond to a Radiation Monitor Alarm

INITIAL CONDITIONS:

Annunciator A4-5C "Radiation Monitor Level High" has just alarmed.

INITIATING CUE:

Your supervisor directs you to respond to the alarm using the appropriate Alarm Response Procedure.

☐

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 NUMBER: 2CR-622  
JPM REVISION: 3

JPM TITLE: Respond to Radiation Monitor Alarm

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div> <p><b>SIMULATOR SETUP:</b> Use HTML "JPM 2CR-622" to insert commands to prevent damper swapping on HIGH radiation level and to allow MANUAL re-positioning of the dampers. <i>(Train A switch removes malfunction from 2HVS-MOD202A, Train B switch removes malfunction from 2HVS-MOD201B)</i></p> </div> <div> <p><b>EVALUATOR CUE:</b> When candidate is ready to begin JPM, PLACE the simulator in RUN.</p> </div>	
	START TIME: _____	
<p>1. Obtain procedure. (2OM-43.4.AAC)</p>	<div> <p><b>EVALUATOR NOTE:</b> Steps 1 – 6 are required only if the candidate refers to 2OM-43.4.AAC. Steps 7 and beyond are to be referenced for 2OM-43.4.AEB actions.</p> </div> <p>1.1 Locates copy of procedure 2OM-43.4.AAC</p> <div> <p><b>EVALUATOR CUE:</b> After candidate locates the procedure, the evaluator can provide a copy of 2OM-43.4.AAC to candidate.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-622  
JPM REVISION: 3

JPM TITLE: Respond to Radiation Monitor Alarm

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
2. Determine which radiation monitor is in alarm at the RM-11 console.	2.1 Depresses the grid 6 pushbutton on the RM-11 console.  2.2 Verifies 2GB042 is blinking and has turned red.  COMMENTS:	
3. At the RM-11 console, type in the 4-digit numerical code number of the alarming monitor and select.	3.1 Types in 2042 and depresses the SEL pushbutton.  COMMENTS:	
4. Press the STATUS pushbutton.	4.1 Depresses the STATUS pushbutton on the DRMS keyboard.  COMMENTS:	
5. Press SYSTEM ACK to silence the console alarm.	5.1 Depresses the SYSTEM ACK pushbutton on the DRMS keyboard.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-622 JPM REVISION: 3	JPM TITLE: Respond to Radiation Monitor Alarm
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
6. Verify if radiation level is greater than 1000 times background.	6.1 N/A  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUTOR CUE:</b>              If asked, role-play SM/US and inform the candidate that 2RMR-RQI301 is <b>NOT</b> 1000 times normal background.           </div>  COMMENTS:	
7. Determine 2RMR-RQI301 is in alarm and refers to local alarm response procedure for corrective actions.	7.1 Determines 2RMR-RQI301 (Leak Collection Ventilation Radiation Monitor) is in alarm.  7.2 Refers to local alarm response procedure (2OM-43.4AEB) for corrective actions.  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>              After candidate locates the procedure, the evaluator can provide a copy of 2OM-43.4.AEB to candidate.           </div>  COMMENTS:	
8. At the RM-11 console, verify the indicating box turns red and moves to the right of the CHANNEL IN HIGH ALARM.	8.1 Verifies that the red box moves to the right.  COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-622 JPM REVISION: 3	JPM TITLE: Respond to Radiation Monitor Alarm
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
9. Depress the CHANNEL ITEMS button and verify that the actual level is higher than the high alarm setpoint.	<p>9.1 Depresses the CHANNEL ITEMS pushbutton and compares the actual level to the HIGH alarm setpoint.</p> <p>9.2 Determines that the actual value is higher than the HIGH alarm setpoint.</p> <p>COMMENTS:</p>	
10. Notify the SM and obtain directions.	<p>10.1 Candidate notifies SM of HIGH radiation monitor alarm and asks for direction.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Role-play the SM and acknowledge the report. <b>DIRECT</b> the candidate to perform steps 1.e. and 1.f. The SM will perform the other remaining steps of this procedure (1.d., 1.g., 1.h., &amp; 1.i.)</p> </div> <p>COMMENTS:</p>	
	<div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> <b>FAULT STATEMENT</b> In the next 2 steps (11 &amp; 12), Dampers 2HVS*MOD201A and 2HVS*MOD201B Should have automatically CLOSED. Dampers 2HVS*MOD202A and 2HVS*MOD202B Should have automatically OPENED. The candidate will be required to manually align these dampers by going to "FILT" position. CS's can be manipulated in any order. 2HVS*MOD201A and 2HVS*MOD202B will NOT change position. Both Trains Switches will need to be placed to the "FILT" pos. to isolate the Ventilation Vent &amp; align SLCRS.</p> </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-622  
JPM REVISION: 3

JPM TITLE: Respond to Radiation Monitor Alarm

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>11.C Verify [2HVS*MOD201A] and [2HVS*MOD201B] are CLOSED.</p>	<p>11.1 Verifies [2HVS*MOD201A] and [2HVS*MOD201B] green lights – NOT LIT and red lights – LIT</p> <p>11.2C Places the Train A control switch to the FILT position (2HVS*MOD202A will open, however, 2HVS*MOD201A will NOT go closed. 2HVS*MOD201B will also remain open unless the "B" train CS was placed in "FILT" position).</p> <p>COMMENTS:</p>	
<p>12.C Verify [2HVS*MOD202A] and [2HVS*MOD202B] are OPEN.</p>	<p>12.1 Verifies [2HVS*MOD202A] and [2HVS*MOD202B] green lights – LIT and red lights – NOT LIT (Only 2HVS*MOD202A will open, 2HVS*MOD202B will not open)</p> <p>12.2C Places the Train B control switch to the FILT position (2HVS*MOD201B will close when the "B" train CS is placed in "FILT").</p> <p>COMMENTS:</p>	
	<div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Candidate should report to supervisor that 2HVS*MOD201A/202B did not change positions.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> That Completes this JPM</p> </div>	
	<p>STOP TIME: _____</p>	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE:      Raise Reactor Power to 10<sup>-8</sup> Amps

TRAINING MATERIAL NUMBER: 2CR-644

PROGRAM TITLE:                      License Operator Training

COMPUTER CODE:                      2CR-644

REVISION NUMBER:                      2

TECHNICAL REFERENCES:

2OM-50.4.D2, Reactor Startup from Mode 3 to Mode 2, Rev. 2

2OM-53C.4.2.1.3, RCCA Control Bank Inappropriate Continuous Movement, Rev. 7

Data Sheet 3, 2OM-50.4.F, Rev 7

INSTRUCTIONAL SETTING:              Simulator

APPROXIMATE DURATION:              16 Minutes

PREPARED BY:              P.T. Eisenmann                      \_\_\_\_\_  
Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-644		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 2
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 1 New Change #
List/Description of Change(s):  Updated to reflect changes in procedure revisions Reordered steps to match current procedure.		
Reason for Change (s):  Procedure Changes		
APPROVALS:		
P.T. Eisenmann		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Prepared by	Date	
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> )	Date	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-644  
JPM REVISION: 2JPM TITLE: Raise Reactor Power to 10<sup>-8</sup> AmpsK/A REFERENCE: 001 A2.11 4.4/4.7  
001 AA1.05 4.3/4.2TASK ID: 0011-014-01-013  
0535-006-04-013JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☒ FAULTED 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"/> OJT/TPE <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: 16 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>	The reactor is tripped in response to inappropriate continuous control rod motion.
<b>RECOMMENDED STARTING LOCATION:</b>	Simulator
<b>DIRECTIONS:</b>	You are to "Raise Reactor Power To $10^{-8}$ Amps"
<b>INITIAL CONDITIONS:</b>	<p>A reactor startup is in progress in accordance with 2OM-50.4.D2, Reactor Startup From Mode 3 to Mode 2. The following conditions exist:</p> <ul style="list-style-type: none"><li>• All shutdown bank rods are fully withdrawn.</li><li>• Control Bank "D" is at 91 steps.</li><li>• The estimated critical position is 100 steps on Control Bank "D".</li></ul>
<b>INITIATING CUE:</b>	The Unit Supervisor directs you to withdraw control rods to 116 steps on Bank D <b>OR</b> to criticality in accordance with 2OM-50.4.D2, beginning at Step IV.C.9, and stabilize power at $10^{-8}$ amps on IR indication.
<b>REFERENCES:</b>	2OM-50.4.D2, Reactor Startup From Mode 3 to Mode 2, Rev. 2 Data Sheet 3 2OM-50.4.F Rev 7 Filled out for 1/M plot 2OM-53C.4.2.1.3, RCCA Control Bank Inappropriate Continuous Movement, Rev. 7
<b>TOOLS:</b>	None
<b>HANDOUTS:</b>	2OM-50.4.D2, Reactor Startup From Mode 3 to Mode 2, Rev 2, Placekept up to step IV.C.9 Filled out Data Sheet 3 (1/M Plot) of 2OM-50.4.F, Rev 7 (may cue as met) 2OM-53C.4.2.1.3, RCCA Control Bank Inappropriate Continuous Movement, Rev. 7 (not provided initially)

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**DIRECTIONS:** You are to "Raise Reactor Power To 10<sup>-8</sup> Amps"

**INITIAL CONDITIONS:** A reactor startup is in progress in accordance with 2OM-50.4.D2, Reactor Startup From Mode 3 to Mode 2. The following conditions exist:

- All shutdown bank rods are fully withdrawn.
- Control Bank "D" is at 91 steps.
- The estimated critical position is 100 steps on Control Bank "D".

**INITIATING CUE:** The Unit Supervisor directs you to withdraw control rods to 116 steps on Bank D **OR** to criticality in accordance with 2OM-50.4.D2, beginning at Step IV.C.9, and stabilize power at 10<sup>-8</sup> amps on IR indication.

☐ 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 NUMBER: 2CR-644  
JPM REVISION: 2

JPM TITLE: Raise Reactor Power To 10<sup>-8</sup> Amps

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div><b>SIMULATOR SETUP:</b></div> <ul style="list-style-type: none"> <li>• Initialize IC-with CB "D" Rods at 91 Steps,</li> <li>• Select <b>FAST</b> speed on NR-45</li> <li>• TRG1 XB2I016B= =1</li> <li>• IMF CRF04B Uncontrolled Rod Motion Manual</li> <li>• Verify CBD = 91 steps</li> <li>• Verify CBC at 219 steps.</li> <li>• Power should be ~ 6E-11 amps</li> </ul> <div> <p><b>EVALUATOR NOTE:</b> Provide Candidate with 1/M Plot or cue that another operator is monitoring the data.</p> </div>	
	START TIME: _____	
<p>1. Reviews 2OM-50.4.D2 and Data Sheet 3 of 2OM-50.4.F (1/M plot).</p>	<p>1.1 Reviews 2OM-50.4.D2 and 1/M plot.</p> <p>1.2 Determines Inverse Count Rate Ratio is &lt; 0.25.</p> <p>COMMENTS:</p>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-644

JPM REVISION: 2

JPM TITLE: Raise Reactor Power To  $10^{-8}$  Amps

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>2. WHEN the Inverse Count Rate Ratio is less than 0.25, Reduce rod withdrawal intervals to 25 step increments.</p> <p>(Step IV.C.9.b)</p>	<p>2.1 Candidate initiates rod withdrawal at less than 25 step increments.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> As the Unit Supervisor, inform the candidate that the ICCR is less than 0.25. Withdraw control rods at 5 step increments to take the reactor critical.</p> </div> <p>COMMENTS:</p>	
<p>3. When Status Light Annunciator A12-3B "P6 Permissive" is on (1E-10 amps), Block the SR high flux trip by performing the following:</p> <p>Record Source Range Neutron Level indicators:  [NI-NI-31A] _____ CPS  [NI-NI-32A] _____ CPS</p> <p>Step IV.C.10.a)</p>	<p>3.1. Records SR counts for N31 and N32.</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> The Reactor Engineer has recorded the Source Range Counts.</p> </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-644  
JPM REVISION: 2

JPM TITLE: Raise Reactor Power To  $10^{-8}$  Amps

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p><b>4.C</b> De-energize the N31 SR High Voltage and block the Train A SR High Flux trip by performing the following.</p> <p>Momentarily turn the switch, Source Range 'A' Block to the BLOCK position (BB-B).</p> <p>(Step IV.C.10.b)</p>	<p><b>4.1C</b> Places Source Range 'A' Block to the BLOCK position.</p> <p>COMMENTS:</p>	
<p><b>5.C</b> De-energize the N32 SR High Voltage and block the Train B SR High Flux trip by performing the following.</p> <p>Momentarily turn the switch, Source Range 'B' Block to the BLOCK position (BB-B).</p> <p>(Step IV.C.10.c)</p>	<p><b>5.1C</b> Places Source Range 'B' Block to the BLOCK position.</p> <p>COMMENTS:</p>	
<p><b>6.</b> Check that both source ranges HV Manual ON/OFF switches are in the NORMAL position.</p> <p>(Step IV.C.10.d)</p>	<p><b>6.1</b> Verifies both source range HV MANUAL CONTROL switches in NORMAL. (NI Rack)</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 10px; margin-top: 20px;"> <p><b>EVALUATOR CUE:</b> Another operator has verified that the HV MANUAL Control Switches are in NORMAL.</p> </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-644 JPM REVISION: 2	JPM TITLE: Raise Reactor Power To 10 <sup>-8</sup> Amps
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
7. Verify that the detector voltmeters on both source range drawers indicate approximately zero volts.  (Step IV.C.10.e)	7.1 Verifies both Source Range DETECTOR VOLTS indicate approximately zero.  COMMENTS:  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> Another operator has verified that the Source Range DETECTOR VOLTS indicate zero volts.           </div>	
8. Select both IR channels to indicate on recorder NR-45.  (Step IV.C.11)	8.1 Places NI SYS RECORDER SEL SW 1N45 and 2N45 to record IR channels N35 and N36.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>FAULT STATEMENT:</b> The following step begins the alternate path portion of the JPM. Following blocking of the SR High Flux Trip, on the next rod withdrawal, the Rods will begin stepping out in an uncontrolled manner.           </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-644  
JPM REVISION: 2

JPM TITLE: Raise Reactor Power To  $10^{-8}$  Amps

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>9.C Continue incremental rod withdrawal until the reactor is critical as indicated by a stable positive startup rate with no rod motion, on the intermediate range instrumentation once the prompt jump has receded.</p> <p>(Step IV.C.12)</p>	<p>9.1C Candidate continues withdrawing control rods to obtain a stable startup rate.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> If asked, inform Candidate to withdraw rods at not more than 5 step increments to obtain a stable startup rate.</p> </div> <p>COMMENTS:</p>	
<p>10. Determine that rods are withdrawing with NO demand signal.</p>	<p>10.1 Candidate determines from CONTROL BANK D GROUP 1 and GROUP 2 ROD POSITION indication that rods are withdrawing with <b>NO</b> demand signal.</p> <p>COMMENTS:</p>	
<p>11.C Trip the reactor in response to inappropriate continuous rod motion.</p> <p>(AOP-2.1.3, Step 1 RNO)</p>	<p>11.1C Manually trips the reactor in response to inappropriate continuous rod motion.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EXAMINER NOTE:</b> Candidate may refer to AOP-2.1.3 and determine that a reactor trip is required based on Step 1 RNO.</p> </div> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> When the Candidate trips the reactor, state - That completes this JPM .</p> </div>	
	<p>STOP TIME: _____</p>	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Isolate SI Accumulators During a LOCA

TRAINING MATERIAL NUMBER: 2CR-654

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-654

REVISION NUMBER: 2

TECHNICAL REFERENCES:

2OM-53.A.1.ES-1.2, Post LOCA Cooldown And Depressurization, Issue 1C, Rev. 10

2OM-11.4.G, Venting A Safety Injection Accumulator, Rev. 21

2OM-53A.1.A-5.1, 0F Plus Subcooling Based On Core Exit TCs, Rev. 1

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: P.T. Eisenmann

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Date

APPROVED FOR USE: \_\_\_\_\_

Training Supervisor or Designee

\_\_\_\_\_  
Date

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-654		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 2
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 1  New Change #
List/Description of Change(s):  Updated JPM to current procedure and JPM format.		
Reason for Change (s):  Enhance JPM		
APPROVALS:		
P.T. Eisenmann Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Training Superintendent/Supervisor/Peer ("Changes Not Requiring Revision" only) _____ Date _____		

JPM NUMBER: 2CR-654  
JPM REVISION: 2

JPM TITLE: Isolate SI Accumulators During a LOCA

K/A REFERENCE: 009 EA1.13 4.4/4.4

TASK ID: 0111-011-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ FAULTED 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"/> OJT/TPE <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 Critical: <input type="checkbox"/> Yes <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: _____			

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	SI Accumulators 'A' and 'B' are isolated. SI Accumulator 'C' is venting.
<b>RECOMMENDED STARTING LOCATION:</b>	Simulator
<b>DIRECTIONS:</b>	You are to Isolate the SI Accumulators During a LOCA.
<b>INITIAL CONDITIONS:</b>	A LOCA has occurred. The crew is performing ES-1.2, Post LOCA Cooldown and Depressurization.
<b>INITIATING CUE:</b>	The Unit Supervisor directs you to isolate the SI accumulators in accordance with ES-1.2, Post LOCA Cooldown And Depressurization, beginning at Step 27.
<b>REFERENCES:</b>	2OM-53.A.1.ES-1.2, Post LOCA Cooldown and Depressurization, Issue 1C, Rev. 10 2OM-11.4.G, Venting A Safety Injection Accumulator, Rev. 21 2OM-53A.1.A-5.1, 0F Plus Subcooling Based On Core Exit TCs, rev 1
<b>TOOLS:</b>	Three Shorting Bars
<b>HANDOUT:</b>	2OM-53.A.1.ES-1.2, Post LOCA Cooldown and Depressurization, Issue 1C, Rev. 10, place kept up to step 27. 2OM-11.4.G, Venting A Safety Injection Accumulator, Rev. 21 2OM-53A.1.A-5.1, 0F Plus Subcooling Based On Core Exit TCs rev. 1



**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**DIRECTIONS:** You are to Isolate the SI Accumulators During a LOCA.

**INITIAL CONDITIONS:** A LOCA has occurred. The crew is performing ES-1.2, Post LOCA Cooldown and Depressurization.

**INITIATING CUE:** The Unit Supervisor directs you to isolate the SI accumulators in accordance with ES-1.2, Post LOCA Cooldown And Depressurization, beginning at Step 27.

☐ 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 NUMBER: 2CR-654 JPM REVISION: 2	JPM TITLE: Isolate SI Accumulators During a LOCA	
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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 simulator to any Mode 1 IC.  Insert SBLOCA @ 500 gpm.  Progress through EOP set up until Step 27 of ES-1.2.  PZR Level needs to be &gt; 17% and RCS Subcooling needs to be &gt; 41F (non adverse containment).  Insert VLV-SIS068 (override SIS*MOV865C in the open position).  NOTE: This JPM takes significant setup work and requires careful attention to C/D rate, AFW flowrate and other dynamic items.</p> <p><b>EVALUATOR NOTE:</b>  RCS pressure may drop low enough to begin injecting accumulators. Ensure Shorting Bars are available.</p>	
	START TIME: _____	
1. Review procedure.	1.1 Reviews 2OM-53A.1.ES-1.2, Post LOCA Cooldown and Depressurization.  COMMENTS:	
2. RCS subcooling based on core exit TCs - GREATER THAN SUBCOOLING LISTED ON ATTACHMENT A-5.1.	2.1 Verifies RCS subcooling on VB-B (2RCS*YI001 or 2RCS*YR001) or the PCS. 2.2 Compares existing value to Attachment A-5.1. 2.3 Determines existing RCS subcooling is GREATER than Attachment A-5.1 minimum required value.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-654  
JPM REVISION: 2

JPM TITLE: Isolate SI Accumulators During a LOCA

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3. PRZR level - GREATER THAN 38%.	3.1 Verifies [2RCS-LI459A, 460, and 461] are greater than 38%.  COMMENTS:	
4. Power to [2SIS*MOV865A, B, C] - AVAILABLE.	4.1 Verifies [2SIS*MOV865A, B, C] red lights – LIT and green lights – NOT LIT.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            Shorting Bars will be needed in the next step. When requested, Role-play the Shift Manager and supply the shorting bars.         </div>	
5.C Insert Shorting Bars and closes [2SIS*MOV865A, B, C].	5.1 Contacts Shift manager and requests shorting bars. 5.2C Inserts into [2SIS*MOV865A] jack. 5.3C Inserts into [2SIS*MOV865B] jack. 5.4 Inserts into [2SIS*MOV865C] jack.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-654  
JPM REVISION: 2

JPM TITLE: Isolate SI Accumulators During a LOCA

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>FAULT STATEMENT:</b>            Alternate path begins here: [2SIS*MOV865C] will NOT CLOSE in the following step.         </div>	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b>            Accumulator isolations may be done in any order.         </div>	
<p>6.C Close [2SIS*MOV865A, B, C].</p>	<p>6.1C Places [2SIS*MOV865A, B, C] CS to CLOSE.</p> <p>6.2 Verifies Green lights – LIT and Red lights – NOT LIT for [2SIS*MOV865A, B].</p> <p>6.3 Verifies Red light – LIT and Green light – NOT LIT for [2SIS*MOV865C].</p> <p>COMMENTS:</p>	
<p>7. Vent any unisolated accumulator. Refer to 2OM-11.4.G, "Venting A Safety Injection Accumulator".</p>	<p>7.1 Refers to 2OM-11.4.G to vent 2SIS*TK21C.</p> <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            If necessary, Role-play the Unit Supervisor and direct the Candidate to perform Section F for direct venting to containment.         </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-654  
JPM REVISION: 2

JPM TITLE: Isolate SI Accumulators During a LOCA

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
8. If containment is not under vacuum, close [2SIS*367 (369) (399)] Accumulator [2SIS*TK21A (B), (C)] Level Isolation to prevent educting liquid into the vent line during venting.	8.1 No action required.  COMMENTS:	
9. Check closed, [2GNS*AOV101-1 (101-2), SI ACC Nitrogen Makeup Outside (Inside) Cnmt Isol Vlv.	9.1 Verifies [2GNS*AOV101-1 and 101-2] Green lights – LIT and Red lights – NOT LIT  COMMENTS:	
10.C Open [2GNS*SOV853A(D) (853B (E)) (853C (F))] 21A (B) (C) SI Accumulator Nitrogen Makeup Vlv.	10.1C Places [2GNS*SOV853C <b>OR</b> F] CS to OPEN. 10.2 Verifies Red light – LIT and Green light – NOT LIT.  COMMENTS:	
11.C Open [2GNS*SOV854A (854B)] SI Accumulator Vent Vlv until the Accumulator is lowered to the desired value, then close [2GNS*SOV854A (854B)].	11.1C Places [2GNS*SOV854A <b>OR</b> B] CS to OPEN. 11.2 Verifies Red light – LIT and Green light – NOT LIT. 11.3 Verifies [2SIS-PI929 & 931] indicate accumulator pressure is lowering.  <div style="border: 1px solid black; padding: 5px;"><b>EVALUATOR NOTE:</b> Candidate may refer to PCS to monitor accumulator pressure.</div> COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-654  
JPM REVISION: 2

JPM TITLE: Isolate SI Accumulators During a LOCA

STEP  
( "C" Denotes CRITICAL STEP )

STANDARD

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

S/U

**EVALUATOR CUE:**

When accumulator pressure begins to lower, terminate JPM.

That completes this JPM.

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

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Perform Manual Makeup to the Charging Suction

TRAINING MATERIAL NUMBER: 2CR-581

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-581

REVISION NUMBER: 6

TECHNICAL REFERENCES:

2OM-7.4.N, Blender Manual Makeup Operations, Rev. 13

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: P.T. Eisenmann \_\_\_\_\_  
Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-581		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 6
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 5 New Change #
List/Description of Change(s):  Updated for current revision of the procedures.		
Reason for Change (s):  JPM Enhancement.		
APPROVALS:		
P.T. Eisenmann Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> ) _____ Date _____		



## OPERATIONS JOB PERFORMANCE MEASURE (JPM)

JPM NUMBER: 2CR-581

JPM REVISION: 6

JPM TITLE: Perform Manual Makeup to the Charging Suction

K/A REFERENCE: 004A4.12 3.8/3.3

TASK ID: 0071-025-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING☒ FAULTED 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"/> OJT/TPE <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

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 (JPM)

JPM NUMBER: 2CR-581  
JPM REVISION: 6

JPM TITLE: Perform Manual Makeup to the Charging Suction

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Perform control board manipulations and calculations to perform a manual blender makeup to the VCT in accordance with 2OM-7.4.N, "Blender Manual Makeup Operations".  
Makeup secured after discovery of no boric acid flow.

**RECOMMENDED  
STARTING LOCATION:** Simulator

**DIRECTIONS:** Perform a manual makeup to the Charging Pump Suction.

**INITIAL CONDITIONS:**

- The plant is in Mode 1.
- The in service Boric Acid Tank concentration is 7487 ppm.
- VCT level is currently 22%.
- All initial conditions are satisfied.

**INITIATING CUE:** Your supervisor directs you to raise VCT level to 42% at 75 gpm, by performing a manual makeup to the VCT in accordance with 2OM-7.4.N, "Blender Manual Makeup Operations", beginning at step IV.A.6.

**REFERENCES:** 2OM-7.4.N, Blender Manual Makeup Operations, Rev. 13

**TOOLS:** None

**HANDOUT:** 2OM-7.4.N, Blender Manual Makeup Operations, Rev. 13, place kept up to Step IV. 6.

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**DIRECTIONS:** Perform a manual makeup to the Charging Pump Suction.

**INITIAL CONDITIONS:**

- The plant is in Mode 1.
- The in service Boric Acid Tank concentration is 7487 ppm.
- VCT level is currently 22%.
- All initial conditions are satisfied.

**INITIATING CUE:** Your supervisor directs you to raise VCT level to 42% at 75 gpm, by performing a manual makeup to the VCT in accordance with 2OM-7.4.N, "Blender Manual Makeup Operations", beginning at step IV.A.6.

☐ 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 NUMBER: 2CR-581 JPM REVISION: 6		JPM TITLE: Perform Manual Makeup to the Charging Suction	
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>            This is a FAULTED JPM.            When makeup is started, no boric acid flow is present.         </div>		START TIME: _____	
		<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> Simulator setup:            - Any Mode 1 IC.            - Expert command to set VCT level to 22%: Set AVCTLIQ=6720            - Mark in service BAST 7487 PPM; (RCS Cb=1460). Set BA &amp; Total flow totalizers to ZERO.             To fail 2CHS*FCV113A as-is (shut), go to Valves tab and select VLV-BAT010, Select 0-Fail As Is.             Set 2CHS*FCV114A Potentiometer for 100 gpm flow rate.         </div>	
1. Reviews 2OM-7.4.N, "Blender Manual Makeup Operation.		1.1 Reviews 2OM-7.4.N, "Blender Manual Makeup Operation.  COMMENTS:	
2. Place Boric Acid Makeup Blender Control switch in Stop.		<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR NOTE:</b> Candidate may perform flow setpoint calculations prior to making any control manipulations.         </div> 2.1 Places Boric Acid Makeup Blender Control switch in STOP position.  2.2 Verifies Green Light – LIT, Red Light – NOT LIT.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-581 JPM REVISION: 6	JPM TITLE: Perform Manual Makeup to the Charging Suction
--	--

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Determine desired boric acid flow.	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>EVALUATOR CUE:</b> If asked, provide BAST boron of 7487 ppm and RCS boron of 1460 ppm.         </div> 3.1C Calculates boric acid flow:  $\frac{1460 \text{ ppm} \times 75 \text{ gpm}}{7487 \text{ ppm}} = 14.62 \text{ gpm}$ COMMENTS:	
4.C Adjust [2CHS*FCV113A] Boric Acid to Blender to the calculated setpoint.	4.1C Calculates the desired flow setpoint:  $\frac{14.62 \text{ gpm}}{4 \text{ gpm}} \times 100 = 366$ 4.2C Adjusts [2CHS*FCV113A] for the desired flow setpoint, 366 units ±5 units.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-581  
JPM REVISION: 6

JPM TITLE: Perform Manual Makeup to the Charging Suction

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>5.C Set Boric Acid Flow to Blender Flow Totalizer.</p>	<p>5.1C Adjusts [2CHS-FQIS113] Boric Acid Flow to Blender Flow Totalizer to the desired value.</p> <p>5.2C Depresses "RESET" on 2CHS-FQIS113.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Batch amounts are at the operators discretion. Total volume change is approximately 280 gallons. Candidate must set the appropriate amount of BA volume for the batch amount. If performing full makeup (~280 gals) then the amount of BA is:  <math>14.62 \text{ gpm} \times (280 \text{ gals} / 75 \text{ gpm}) = 54.6 \text{ gal.}</math></p> </div> <p>COMMENTS:</p>	
<p>6.C Adjust [2CHS*FCV114A] setpoint.</p>	<p>6.1C Adjusts [2CHS*FCV114A] for 75 gpm,  <math>(75 \text{ gpm}/16) \times 100 = 468 \text{ units} \pm 5 \text{ units.}</math></p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-581  
JPM REVISION: 6

JPM TITLE: Perform Manual Makeup to the Charging Suction

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>7.C Set [2CHS-FQIS168] Total Makeup From Blender Flow Totalizer to the desired total volume in gallons of makeup water to be added.</p>	<p>7.1C Adjusts Total Makeup From Blender Flow Totalizer to the desired value (approximately 280 gallons)</p> <p>7.2C Depresses "RESET" on 2CHS-FQIS168.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Batch amounts are at the operator's discretion. Total volume change is approximately 280 gallons (~14-15 gal/%).</p> </div> <p>COMMENTS:</p>	
<p>8. Adjust [2CHS*HIC168] Blender Total Flow Auto Setpoint.</p>	<p>8.1 Adjusts [2CHS*HIC168] to 75 gpm, (75 gpm/16) x 100 = 468 units ±5 units.</p> <p>COMMENTS:</p>	
<p>9. Note flow totalizer indication and adds it to the gallon set on the batch integrators for 2CHS*FQIS113 and 2CHS*FQIS168.</p>	<p>9.1 Notes the Boric Acid Flow to Blender Flow Totalizer value on 2CHS*FQIS113 and adds the Boric Acid volume previously calculated (54.6 gallons)</p> <p>9.2 Notes the Blender Total Flow value on 2CHS*FQIS168 and adds the Total Volume previously calculated (280 gallons)</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-581  
JPM REVISION: 6

JPM TITLE: Perform Manual Makeup to the Charging Suction

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>10. Verify a Reactor Coolant Pump is operating in an unisolated loop and has <math>\geq</math> 3000 gpm flow through the core and records the commencement of makeup and flow verification in the Narrative Log.</p>	<p>10.1 Verifies that RCS flow is <math>\geq</math> 3000 gpm flow by observing RCP operation or flow indications.</p> <p>10.2 Records information in the Narrative Log.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>EVALUATOR CUE:</b> Inform the candidate that another operator will make the Narrative Log entry.</p> </div> <p>COMMENTS:</p>	
<p>11. Verify the inservice Boric Acid Pump in Auto.</p>	<p>11.1 Verifies the in-service Boric Acid Transfer Pump is in AUTO.</p> <p>COMMENTS:</p>	
<p>12.C Open [2CHS*FCV113B], Boric Acid Blender Disch to Chg Pumps (BB-A)</p>	<p>12.1C Places [2CHS*FCV113B] control switch to OPEN position.</p> <p>12.2 Verifies Red Light --LIT and Green Light -- NOT LIT</p> <p>COMMENTS:</p>	
<p>13.C Place Mode Selector in MAN. (BB-A)</p>	<p>13.1C Places the Mode Selector Switch in MAN position.</p> <p>COMMENTS:</p>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-581  
JPM REVISION: 6

JPM TITLE: Perform Manual Makeup to the Charging Suction

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>14.C Place Boric Acid Makeup Blender Control switch to Start.</p>	<p>14.1C Places Boric Acid Makeup Blender Control switch to START position.</p> <p>14.2 Verifies Boric Acid Transfer Pump that is in AUTO starts Red Light – LIT, Green Light – NOT LIT.</p> <p>COMMENTS:</p>	
<p>15.C Verify proper operation at recorder [2CHS-FR113] (VB-A).</p>	<div style="border: 1px solid black; padding: 5px;"> <p><b>FAULT STATEMENT:</b> Alternate path begins here. Candidate must take manual action to secure the dilution after discovering that no boric acid flow exists. It is expected that the operator will recognize and terminate w/in ~1min (~5-6% level rise)</p> </div> <p>15.1 Verifies Boric Acid to Blender and Total M/U Flow From Blender on [2CHS-FR113].</p> <p>15.2 Recognizes boric acid flow is Zero (0) GPM.</p> <p>15.3C Places Boric Acid Makeup Control Switch to STOP position prior to VCT level reaching 28%.</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p><b>EVALUATOR CUE:</b> That completes this JPM.</p> </div>	
	<p>STOP TIME: _____</p>	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE:      Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A

TRAINING MATERIAL NUMBER: 2CR-597

PROGRAM TITLE:                      Licensed Operator Training (Retraining)

COMPUTER CODE:                      2CR-597

REVISION NUMBER:                      0

TECHNICAL REFERENCES:

2OM-36.4.E, Transferring 4KV Emergency Bus 2AE to Bus 2A, Revision 10  
2OM-36.4.ACS Diesel Gen 2-1 Electrical Fault, Revision 10

INSTRUCTIONAL SETTING:              Simulator

APPROXIMATE DURATION:              15 Minutes

PREPARED BY:                      P. T. Eisenmann

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Date

APPROVED FOR USE:                      \_\_\_\_\_

\_\_\_\_\_  
Training Supervisor or Designee

\_\_\_\_\_  
Date

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-597		
Type of Change:		
<input checked="" type="checkbox"/> Major	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 0
<input type="checkbox"/> Minor	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # New Change #
List/Description of Change(s):  1. New, alternate path JPM, based upon 2CR-097. 2. New number is 2CR-597		
Reason for Change (s):  1. Expand Alternate path JPM bank.		
APPROVALS:		
P. T. Eisenmann		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR- 1104.
Prepared by	Date	
Training Superintendent/Supervisor/Peer (Minor Changes Only)	Date	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-597  
JPM REVISION: 0

JPM TITLE: Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A

K/A REFERENCE: 064A2.09 3.1/3.3 TASK ID: 0362-007-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING☒ FAULTED 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 checked="" type="checkbox"/> Initial Exam <input type="checkbox"/> OJT/TPE <input type="checkbox"/> Training <input type="checkbox"/> Other:	<input checked="" type="checkbox"/> BVT <input type="checkbox"/> NRC <input type="checkbox"/> Other:

## EVALUATION RESULTS

Performer Name:

Performer SSN:

Time ☐ Yes  
Critical: ☒ NoAllotted  
Time: 15 minutesActual  
Time: minutesJPM 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>	Bus 2AE is energized from Bus 2A. The 2-1 EDG output breaker is open and the EDG has been shutdown.
<b>RECOMMENDED STARTING LOCATION:</b>	SIMULATOR
<b>DIRECTIONS:</b>	You are to Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A.
<b>INITIAL CONDITIONS:</b>	Breaker 2A10 has spuriously tripped open. All normal 4KV busses are energized from USST's 2C and 2D. The 2-1 EDG is running and carrying loads on the 2AE Bus. The 4KV normal to emergency tie breakers, 2A10 and 2E7, are open. The relay crew has replaced a defective relay on breaker 2A10.
<b>INITIATING CUE:</b>	Your supervisor directs you to transfer Bus 2AE to Bus 2A and to open the 2-1 EDG Output Breaker in accordance with 2OM-36.4.E.
<b>REFERENCES:</b>	2OM-36.4.E, Revision 10, Transferring 4KV Emergency Bus 2AE to Bus 2A. 2OM-36.4.ACS Diesel Gen 2-1 Electrical Fault
<b>TOOLS:</b>	None
<b>HANDOUT:</b>	2OM-36.4.E, Revision 10, Transferring 4KV Emergency Bus 2AE to Bus 2A 2OM-36.4.ACS Diesel Gen 2-1 Electrical Fault (Do NOT provide initially)

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**DIRECTIONS:** You are to Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A.

**INITIAL CONDITIONS:** Breaker 2A10 has spuriously tripped open. All normal 4KV busses are energized from USST's 2C and 2D. The 2-1 EDG is running and carrying loads on the 2AE Bus. The 4KV normal to emergency tie breakers, 2A10 and 2E7, are open. The relay crew has replaced a defective relay on breaker 2A10.

**INITIATING CUE:** Your supervisor directs you to transfer Bus 2AE to Bus 2A and to open the 2-1 EDG Output Breaker in accordance with 2OM-36.4.E.

☐ 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 NUMBER: 2CR-597  
JPM REVISION: 0

JPM TITLE: Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTES:</b> Insert BKR-HIV01 to trip 2A10, wait for D/G sequencer to complete, then clear BKR-HIV01, allow plant to stabilize. Make annunciator A8-4C alarm when EDG load is ≤ 1000 KW by setting Trigger 1 as XX8D014M ≤ 1000 with command as Ensure Sync Scope rotating in SLOW direction. IMF A8-4C-Y2955D (0 0) 0 and SNAP. ENSURE "B" TRAIN PROTECTED PLACARD is</p> </div>	
<p>1. Review the procedure.</p>	<p>1.1 Reviews provided procedure, 2OM-36.4.E.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Provide candidate with copy of procedure 2OM-36.4.E.</p> </div> <p>COMMENTS:</p>	
<p>2.C Close breaker 2A10, 4KV Bus 2A to Emergency Bus 2AE.</p>	<p>2.1C Places breaker 2A10 control switch in the CLOSE position.</p> <p>2.2 Verifies the RED light above breaker 2A10 control switch LIT and WHITE Light NOT LIT.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Act as another operator and perform the independent verification.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-597  
JPM REVISION: 0

JPM TITLE: Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>3.C Place the 2-1 Diesel Generator synchronizing switch in the Bus 2A position.</p>	<p>3.1C Places 2-1 EMERG GEN SYNCHRONIZING SEL SW in the Bus 2A position.</p> <p>COMMENTS:</p>	
<p>4.C Adjust 2-1 EDG until the synchroscope needle is rotating in the SLOW DIRECTION.</p>	<p>4.1 Observes the 2-1 Emergency Diesel Generator synchroscope on the Vertical Board and notes it is rapidly rotating in the SLOW direction.</p> <p>4.2C Adjusts the 2-1 EMERG GEN GOVERNOR control switch to the RAISE position.</p> <p>4.3 Verifies the synchroscope rotating slowly in the fast direction.</p> <p>COMMENTS:</p>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-597  
JPM REVISION: 0

JPM TITLE: Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>5. Adjust 2-1 Diesel Generator voltage to be slightly higher than Bus 2A voltage by using voltage adjust switch.</p>	<p>5.1 Locates 2-1 EMERG GEN VOLTS meter and compares it to 4KV Bus 2A VOLTS meter.</p> <p>5.2. Verifies Diesel Generator volts slightly higher than bus volts and adjusts Emergency Generator 2-1 Voltage.</p> <p>COMMENTS:</p>	
<p>6.C Close breaker 2E7 when synchroscope, rotating SLOWLY in FAST DIRECTION.</p>	<p>6.1 Monitors the 2-1 Emergency Diesel Generator synchroscope on the Vertical Board.</p> <p>6.2C Momentarily places breaker 2E7 control switch in the CLOSE position when the synchroscope is at the 12 o'clock.</p> <p>6.3 Verifies the RED light above breaker 2E7 control switch LIT and WHITE light NOT LIT.</p> <p>COMMENTS:</p>	
<p>7. Place the 2-1 EDG synchronizing Switch in OFF.</p>	<p>7.1 Places 2-1 EMERG GEN SYNCHRONIZING SEL SW in the OFF position.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-597

JPM REVISION: 0

JPM TITLE: Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
8. Maintain generator power factor between 0.8 and 1.0 lagging, as indicated on Emergency Generator Power Factor, by adjusting Emergency Generator 2-1 Voltage Adjust.	8.1 Adjusts 2-1 EMERG GEN VOLTGE ADJUST as needed to maintain between 0.8 and 1.0 lagging PF as indicated on Power Factor meter on VB-C.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>FAULT STATEMENT:</b> At this point the JPM alternate path begins. Annunciator A8-4C, "DIESEL GEN 2-1 ELECTRICAL FAULT" will annunciate when EDG 2-1 loading reaches 1000 KW. Computer alarm DG 2-1 DIFF will also be received. Candidate should respond to ARP and Trip the 2-1 EDG and open ACB 2E10 which failed to automatically occur.             </div>	
9.C Reduce load on the EDG to <100 KW.	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> As Unit Supervisor, direct candidate to reduce load to 100 KW over a 5 minute period.             </div> 9.1C Intermittently places the 2-1 EMERG GEN GOVERNOR control switch in the LOWER Position. . 9.2 Monitors the following parameters during the load decrease: <ul style="list-style-type: none"> <li>a. EMERG GEN 2-1 VOLTS</li> <li>b. EMERG GEN 2-1 POWER FACTOR</li> <li>c. EMERG GEN 2-1 WATTS</li> </ul> 9.3 Intermittently places the 2-1 EMERG GEN VOLT ADJUST switch in LOWER.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-597  
JPM REVISION: 0

JPM TITLE: Transfer Bus 2AE from Emergency to Normal Feed/Bus 2A

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>10. Annunciator A8-4C, "DIESEL GEN 2-1 ELECTRICAL FAULT", alarms due to 2-1 DG DIFF, (Y2955D)</p>	<p>10.1 Acknowledges the alarm and responds by reviewing the ARP for A8-4C.</p> <p>10.2 Determines the alarm is indicative that an EDG Trip should have occurred.</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Provide the candidate a copy of the ARP for A8-4C once it is located.</p> </div>	
<p>11.C Trips 2-1 EDG and manually opens output breaker 2E10.</p>	<p>11.1 Momentarily places breaker 2E10 control switch in TRIP.</p> <p>11.2. Verifies the WHITE light above breaker 2E10 control switch is ON.</p> <p>11.3C Manually Trips EDG 2-1 by pushing the stop pushbuttons.</p> <p>11.4 Verifies EDG 2-1 is tripped by observing decreasing RPM's on BB-C tachometer.</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> After the candidate trips the EDG and opens the output breaker state, That completes this JPM.</p> </div>	
	<p>STOP TIME: _____</p>	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Containment Spray Manual Actuation- SWS and QSS Valve Malfunctions

TRAINING MATERIAL NUMBER: 2CR-656

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-656

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OM-53A.1.A-0.11, "Verification Of Automatic Actions", Issue 1C, Rev 6.

2OM-53A.1.A-0.5, "Containment Isolation Phase B Checklist", Issue 1C, Rev. 2

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 10 Minutes

PREPARED BY: P.T. Eisenmann

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Date

APPROVED FOR USE: \_\_\_\_\_

\_\_\_\_\_  
Training Supervisor or Designee

\_\_\_\_\_  
Date

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-656		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. #0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # New Change #
List/Description of Change(s):  New alternate path JPM based upon 2CR-573.		
Reason for Change (s):  Add to alternate path JPM bank.		
APPROVALS:		
<u>P.T. Eisenmann</u> Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
<u>Training Superintendent/Supervisor/Peer</u> ( <i>"Changes Not Requiring Revision" only</i> ) _____ Date _____		

JPM NUMBER: 2CR-656 JPM REVISION: 0	JPM TITLE: Containment Spray Manual Actuation- SWS and QSS Valve Malfunctions
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K/A REFERENCE: 026 A2.03 4.1/4.4 TASK ID: 0011-066-01-013  
026 A2.04 3.9/4.2

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☒ FAULTED 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"/> OJT/TPE <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: \_\_\_\_\_

**EVALUATOR DIRECTION SHEET**

<b>TASK STANDARD:</b>	Manually initiate CIB, align both trains of SWS to RSS heat exchangers and isolate SWS to CCP heat exchangers.
<b>RECOMMENDED STARTING LOCATION:</b>	Simulator
<b>DIRECTIONS:</b>	You are to Verify Containment Spray Actuation.
<b>INITIAL CONDITIONS:</b>	<ul style="list-style-type: none"><li>• A reactor trip and safety injection have occurred due to a large break LOCA.</li><li>• The actions of E-0 are being performed.</li></ul>
<b>INITIATING CUE:</b>	The Unit Supervisor directs you to perform Attachment A-0.11, "Verification Of Automatic Actions", Step 7 to check CIB and Containment Spray status.
<b>REFERENCES:</b>	2OM-53A.1.A-0.11, "Verification Of Automatic Actions", Issue 1C, Rev. 6 2OM-53A.1.A-0.5, "Containment Isolation Phase B Checklist", Issue 1C, Rev. 2
<b>TOOLS:</b>	None
<b>HANDOUT:</b>	2OM-53A.1.A-0.11, "Verification Of Automatic Actions", Issue 1C, Rev. 6, place kept up to step 7. 2OM-53A.1.A-0.5, "Containment Isolation Phase B Checklist", Issue 1C, Rev. 2

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**DIRECTIONS:**

You are to Verify Containment Spray Actuation.

**INITIAL CONDITIONS:**

- A reactor trip and safety injection have occurred due to a large break LOCA.
- The actions of E-0 are being performed.

**INITIATING CUE:**

The Unit Supervisor directs you to perform Attachment A-0.11, "Verification Of Automatic Actions", Step 7 to check CIB and Containment Spray status.

☐ 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 NUMBER: 2CR-656 JPM REVISION: 0	JPM TITLE: Containment Spray Manual Actuation
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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 any Mode 1 IC.            Insert MALF RCS03A            Insert MALF PPL09A            Insert MALF PPL09B            Train A CS - XA1I003A and XA1I004A OFF            Valve Malfunctions- CS:            2SWS*MOV106A VLV-SWS028(1) Close            XA1I084C            2SWS*MOV103A VLV-SWS018(2) Open            XA1I102P            2SWS*MOV106B VLV-SWS029(1) Close            XA2I068C            2SWS*MOV103B VLV-SWS019(2) Open            XA2I081P            Raise RWST level to avoid Transfer to Recirc Signal.            Secure all RCPs. Allow simulator to run until majority of alarms clear and snap into IC.</p> <p><b>EVALUATOR CUE:</b>            When the candidate is ready to begin the JPM, Place the simulator to RUN.</p>	
	START TIME: _____	
1. Reviews procedure.	1.1 Reviews 2OM-53A.1.A-0.11, "Verification Of Automatic Actions".  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-656  
JPM REVISION: 0

JPM TITLE: Containment Spray Manual Actuation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>2. Containment pressure - HAS REMAINED LESS THAN 11 PSIG.</p>	<p>2.1 Determines that containment pressure has <b>NOT</b> remained less than 11 psig by checking any of the following:</p> <ul style="list-style-type: none"> <li>• A1-2H, "CONTAINMENT ISOLATION PHASE B" in alarm.</li> <li>• 2LMS*PR950, Containment Pressure Recorder indicates greater than 11 psig.</li> <li>• Panel 464, High 3 CHM 1 Pressure CH I – IV Lights – LIT.</li> <li>• 2LMS-PI950, 951, 952, and 953 indicate greater than 11 psig.</li> </ul> <p>COMMENTS:</p>	
<p>3. Check BLUE CIB marks - LIT.</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>NOTE:</b> It is acceptable that the candidate completes this step out of order and may chose to perform 2OM-53A.1.A-0.5, "Containment Isolation Phase B Checklist".</p> </div> <p>3.1 Checks components properly aligned and determines CIB components not positioned as required, and CIB <b>NOT</b> actuated.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-656  
JPM REVISION: 0

JPM TITLE: Containment Spray Manual Actuation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>4.C <u>IF NOT, THEN</u> manually initiate CIB (both switches for both trains).</p>	<div style="border: 1px solid black; padding: 5px;"> <p><b>FAULT STATEMENT / EVALUATOR NOTE:</b> Either train switches may be actuated first, only "B" train switches will actuate. 2SWS*MOV103(s) and 2SWS*MOV106(s) will not automatically actuate.</p> </div> <p>4.1 Simultaneously ROTATES (Clockwise) both Train "A" CIB switches to ACTUATE position.</p> <p>4.2C Simultaneously ROTATES (Clockwise) both Train "B" CIB switches to ACTUATE position.</p> <p>COMMENTS:</p>	
<p>5. Check BLUE CIB marks - LIT.</p>	<p>5.1 Candidate checks all indicating lights with BLUE CIB marks LIT.</p> <p>5.2 Determines 2SWS*MOV106A / B and 2SWS*MOV103A / B not aligned.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> If requested, provide Candidate a copy of Attachment A-0.5.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-656  
JPM REVISION: 0

JPM TITLE: Containment Spray Manual Actuation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>6.C <u>IF</u> CIB <u>NOT</u> actuated, <u>THEN</u> manually align equipment. If necessary, refer to Attachment A-0.5, "Containment Isolation Phase B Checklist".</p>	<p>6.1C Places 2SWS*MOV106A control switch to CLOSE.</p> <p>6.2 Verifies GREEN light – LIT and RED light – NOT LIT.</p> <p>6.3C Places 2SWS*MOV103A control switch to OPEN.</p> <p>6.4 Verifies RED light – LIT and GREEN light – NOT LIT.</p> <p>6.5C Places 2SWS*MOV106B control switch to CLOSE.</p> <p>6.6 Verifies GREEN light – LIT and RED light – NOT LIT.</p> <p>6.7C Places 2SWS*MOV103B control switch to OPEN.</p> <p>6.8 Verifies RED light – LIT and GREEN light – NOT LIT.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-656  
JPM REVISION: 0

JPM TITLE: Containment Spray Manual Actuation

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
7. Stop all RCP's.	<p>7.1 Verifies control switches for 2RCS*P21A, 21B and 21C have been placed to STOP.</p> <p>7.2 Verifies 2RCS*P21A, 21B and 21C pump RED lights – NOT LIT and WHITE lights – LIT.</p> <p>7.3 Verifies 2RCS-FI414 (415)(416); 2RCS-FI424 (425)(426); 2RCS-FI434 (435)(436) flow has lowered.</p> <p>7.4 Verifies 2RCS-II21A(B)(C) amps zero.</p> <p>COMMENTS:</p>	
	<div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> That completes this JPM.</p> </div>	
	STOP TIME: _____	

### OPERATIONS JOB PERFORMANCE MEASURE (JPM)

<u>TRAINING MATERIAL TITLE:</u>	<u>Swap RHS Trains</u>
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TRAINING MATERIAL NUMBER: 2CR-636

PROGRAM TITLE: Licensed Operator Retraining

COMPUTER CODE: 2CR-636

REVISION NUMBER: 2

TECHNICAL REFERENCES:

## 2OM-10.4.B Revision 30, Residual Heat Removal System Running

### 2OM-53C.4.2.10.1, Loss of Residual Heat Removal

## Capability

**INSTRUCTIONAL SETTING:** Control Room/Simulator

**APPROXIMATE DURATION:** 25 Minutes

PREPARED BY:      P.T. Eisenmann

Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-636		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 2
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 1 New Change #
List/Description of Change(s):  Update to current procedure revision Added additional actions to strengthen Alternate path. Scripted to follow AOP flowpath Updated K/A per TAI 19418 Updated Task ID per TAI 19419 Updated duration to 25 minutes per validation		
Reason for Change (s):  JPM Enhancements		
APPROVALS:		
P. T. Eisenmann		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Prepared by	Date	
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> )	Date	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-636  
JPM REVISION: 2

JPM TITLE: Swap RHS Trains

K/A REFERENCE: 005 A4.01 3.6/3.4

TASK ID: 0101-031-04-012

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING☒ FAULTED 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"/> OJT/TPE <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  
Time: 25 MinutesActual  
Time: minutesJPM 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:** RHS Train B is placed in service, RHS Train A is placed in standby, then upon failure of B pump, RHS Train A returned to service.

**RECOMMENDED  
STARTING LOCATION:** Control Room

**DIRECTIONS:** You are to perform the task, transfer cooling trains of RHS.

**INITIAL CONDITIONS:**

- The plant is in Mode 5.
- RHS Train A is in service providing RCS cooling.
- RHS Train B is in standby.
- Both Pumps and Trains are Filled & Vented
- All P&L's and initial conditions are met.
- Operators in the field are standing by as required.
- 2OST-10.4 Already Completed

**INITIATING CUE:** Your supervisor directs you to place the B train of RHS in service and then place the A train of RHS in standby.

**REFERENCES:** 2OM-10.4.B, Parts D & E Revision 30  
2OM-53C.4.2.10.1 revision 11

**TOOLS:** None

**HANDOUT:** 2OM-10.4.B  
2OM-10.5 VOND

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

## TASK:

You are to perform the task, transfer cooling trains of RHS.

## INITIAL CONDITIONS:

- The plant is in Mode 5.
- RHS Train A is in service providing RCS cooling.
- RHS Train B is in standby.
- Both Trains are Filled & Vented
- All P&L's and initial conditions are met.
- Operators in the field are standing by as required.
- 2OST-10.4 Already Completed

## INITIATING CUE:

Your supervisor directs you to place the B train of RHS in service and then place the A train of RHS in standby.

☐ 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 NUMBER: 2CR-636  
JPM REVISION: 2

JPM TITLE: Swap RHS Trains

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p><b>EVALUATOR NOTE:</b> This is a FAULTED JPM. The candidate is expected to transition to AOP 2.10.1 following the loss of both RHS pumps.</p>	<p><b>EVALUATOR NOTE:</b> Simulator Setup:  <i>Init IC-232 Turn on recorders 2RHS*TR604A&amp;B.            Place/remove caution tags as needed.            Shutdown 'B' Train RHS LAW 2OM-10.4.B Part F.            Close 2RHS*MOV720B and 2CCP*MOV112B.            Set PLP RTC1=10. Balance Charging and Letdown via 2CHS*FCV122 and 2CHS*HCV 142.</i></p>	
	<p>START TIME: _____</p>	
<p>1. Reviews procedure.</p>	<p>1.1 Reviews Section D, "To Place RHS Train B in Service From A Standby Condition" of 2OM-10.4.B.</p> <p>COMMENTS:</p> <p><b>EVALUATOR CUE:</b> If asked, inform the candidate that ASME valve testing is not required and that RHS Train A has been filled and vented (per initial conditions)</p>	
<p>2. Verify CCP temperature &gt;50°F.</p>	<p>2.1 Checks temperature on 2CCP-TI100A(100B)(100C) &gt;50°F.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-636  
JPM REVISION: 2

JPM TITLE: Swap RHS Trains

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3. Check RCS temperature.	3.1. Determines RCS/RHS temperature > 120F.  3.2. Places control switch to open for 2CCP*MOV112B, RHR PP SEAL CLR 22B & HX21B COOLING WATER INLET VLV  3.3. Verifies Red Light - LIT and Green Light – NOT LIT.  COMMENTS:	
4.C Align RHS valves.	4.1. Checks OPEN [2RHS*MOV701B]. Verifies Red Light - LIT and Green Light – NOT LIT.  4.2. Checks OPEN [2RHS*MOV702B]. Verifies Red Light - LIT and Green Light – NOT LIT.  4.3C CLOSES [2RHS*FCV605B], demand at zero.  4.4. Verifies OPEN [2CHS*HCV142], demand not at zero.  4.5. Checks CLOSED [2RHS*MOV750B]. Verifies Red NOT Light - LIT and Green Light – LIT.  4.6C CLOSES [2RHS*HCV758B], demand at 100%.  4.7. Checks OPEN [2RHS*MOV720B], Red light lit, Green light not lit.  COMMENTS: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>EVALUATOR NOTE:</b> If candidate decides to open 2CHS*HCV142 further, cue as the supervisor to leave the valve as found.           </div>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-636  
JPM REVISION: 2

JPM TITLE: Swap RHS Trains

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>5. Monitor RHR Hx Diff Temp.</p>	<p>5.1 Monitors RHR Hx Diff Temp on [2RHS*TR604B] and/or (T0630A).</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Candidate may use computer PID to determine differential temperature. Computer point (T0630A) is only the heat exchanger inlet temperature.</p> </div> <p>COMMENTS:</p>	
<p>6. Vent [2RHS*P21B].</p>	<p>6.1 Determines step is N/A based on Attachment 1.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> [2RHS*P21B] venting not required per Attachment 1.</p> </div> <p>COMMENTS:</p>	
<p>7. Monitor [2RHS*P21B] for seal leakage during pump start.</p>	<p>7.1 Determines containment is at atmospheric pressure and monitoring of pump seal leakage on pump start is required.</p> <p>7.2 Requests local operator to monitor pump seal for leakage.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Local operator will monitor pump operation.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-636 JPM REVISION: 2	JPM TITLE: Swap RHS Trains
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
8.C Verify RHS temperature is within limits then start [2RHS*P21B].	8.1 Verifies RCS and RHS temperature indications on PCS or recorders, that temperature differential is $\leq 50$ °F or RHS temperature rate of increase is $< 5$ °F/Hr.  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR NOTE:</b> Candidate may have previously verified temperature is within limits.           </div> 8.2C Starts [2RHS*P21B].  COMMENTS:	
9. If required, maintain PRZR pressure between 275 and 350 psig by the following methods.	9.1 Marks step 16 as N/A.  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>EVALUATOR CUE:</b> RCP operation is not required at this time. You do NOT have to adjust pressure, step 16 is N/A.           </div> COMMENTS:	
10.C Adjust RHS system flow.	10.1C Throttles [2RHS*FCV605B] OPEN to establish a flowrate $< 4000$ GPM as indicated on [2RHS*FI605B].  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-636  
JPM REVISION: 2

JPM TITLE: Swap RHS Trains

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>11. Transfer [2RHS*FCV605B] to auto.</p>	<p>11.1 Adjusts auto flow setpoint to desired flowrate and places the controller in AUTO.</p> <p>COMMENTS:</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> RCS temperature is greater than 120 °F, step 19.a-f is N/A.</p> </div>	
<p>12. Maintain RCS temperature, verify flow is controlled in AUTO.</p>	<p>12.1 Throttles [2RHS*HCV758B] to maintain RCS temperature.</p> <p>12.2 Verify [2RHS*FCV605A/605B] modulate in AUTO to maintain RHS flow on 2RHS*FI605A/ B].</p> <p>12.3 OPENS [2RHS*MOV750B]. Verifies Red Light - LIT and Green Light – NOT LIT.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> You are to maintain RCS temperature stable at its current value. It is desired to Open [2RHS*MOV750B]. Then assume this section of the procedure is completed and routed as required. You are now to place RHS Train A in standby.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-636  
JPM REVISION: 2

JPM TITLE: Swap RHS Trains

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>13. Locate procedure.</p>	<p>13.1 Transitions to procedure Section E, To Place RHS Train A in Standby.</p> <p>COMMENTS:</p>	
<p>14.C Check [2RHS*P21A] stopped.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR NOTE:</b> Alternate path here. [2RHS*FCV605B] will ramp fully open and after full open, [2RHS*P21B] will trip. Candidate is expected to transition to AOP 2.10.1.</p> </div>	<p>14.1C STOPS [2RHS*P21A].</p> <p>14.1 CLOSES [2RHS*MOV750B]. Verifies Red Light – NOT LIT and Green Light – LIT.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>SIMULATOR OPERATOR CUES:</b> After candidate secures [2RHS*P21A], ramp OPEN [2RHS*FCV605B] and after full open, trip [2RHS*P21B]. [2RHS*P21B] also will not restart.</p> </div> <p>COMMENTS:</p>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2CR-636  
JPM REVISION: 2

JPM TITLE: Swap RHS Trains

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
15.C Transition to AOP 2.10.1.	<p>15.1 May attempt to restart [2RHS*P21A].</p> <p>15.2 May attempt to restart [2RHS*P21B].</p> <p>15.3 May refer to annunciator A1-5H ARP. If so, ensure proper steps are followed.</p> <p>15.4 Transitions to AOP 2.10.1.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> The local operator reports [2RHS*P21B] has an Overcurrent relay tripped.</p> </div> <p>15.5 CLOSES [2RHS*HCV758A], demand at 100%.</p> <p>15.5 CLOSES [2RHS*FCV605A] demand at zero.</p> <p>15.6 Verifies CLOSED [2CHS*HCV142], demand at zero.</p> <p>15.5C Restarts 2RHS-P21A.</p> <p>15.6C If closed prior to restarting 2RHS-P21A, reopens [2RHS*FCV758A] and [2RHS*FCV605A] to establish temperature and flow control.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> After the candidate reestablishes cooling state; "That completes this JPM".</p> </div> <p>COMMENTS:</p>	
	STOP TIME: _____	

### OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Align Service Water to [2FWE\*P23B] Motor Driven Auxiliary Feed Pump Suction

TRAINING MATERIAL NUMBER: 2PL-167

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2PL-167

REVISION NUMBER: 0

### TECHNICAL REFERENCES:

2OM-53A.1.A-1.8, "Makeup to PPDWST [2FWE\*TK210]", Rev. 5

**INSTRUCTIONAL SETTING:** In-Plant

**APPROXIMATE DURATION:** 15 Minutes

PREPARED BY:      Ian Forbes

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

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

OPERATIONS JOB PERFORMANCE MEASURE  
TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2PL-167		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 0
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. N/A New Change #
List/Description of Change(s):  New JPM Version.		
Reason for Change (s):  Initial Issue.		
APPROVALS:		
_____ Ian Forbes Prepared by	_____ Date	<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
_____ Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> )	_____ Date	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-167	JPM TITLE: Align Service Water to [2FWE*P23B] Motor Driven
JPM REVISION: 0	Auxiliary Feed Pump Suction

K/A REFERENCE: 061K1.07 3.6/3.8 TASK ID: 0241-054-04-012  
061A1.04 3.9/3.9 0532-010-05-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☒ TRAINING  
☐ FAULTED JPM ☐ ADMINISTRATIVE JPM

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

EVALUATION RESULTS			
Performer Name:		Performer SSN:	
Time <input type="checkbox"/> Yes	Allotted	Actual	
Critical: <input checked="" type="checkbox"/> No	Time: 15 Minutes	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-167	JPM TITLE: Align Service Water to [2FWE*P23B] Motor Driven
JPM REVISION: 0	Auxiliary Feed Pump Suction

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Service water vented and aligned to [2FWE\*P23B] Motor Driven Auxiliary Feed Pump suction.

**RECOMMENDED  
STARTING LOCATION:** In-Plant

**DIRECTIONS:** You are to align Service Water Supply to [2FWE\*P23B] Motor Driven Auxiliary Feed Pump Suction.

**INITIAL CONDITIONS:**

- The Control Room Team has responded to an Inadequate Core Cooling Accident and is now in E-1, "Loss of Reactor or Secondary Coolant".
- Containment Isolation Phase B actuation has occurred.
- PPDWST level has decreased to the low-level alarm setpoint.
- PPDWST level indicators [2FWE\*LI104A1] and [2FWE\*LI104A2] both indicate 20".
- Both Demineralized Water Pumps [2WTD-P23A and B] are unavailable, and [2WTD-TK23] is also unavailable.
- [2SWS\*MOV103B] Recirc. Spray HXs Service Water Sup "B" Isolation Valve has been verified OPEN.
- S/G Pressure is approximately 400 psig.

**INITIATING CUE:** Your supervisor directs you to supply [2FWE\*P23B] Motor Driven Auxiliary Feed Pump suction from Service Water by completing EOP Attachment A-1.8 beginning with step 10. Mechanical Maintenance and another operator are on station in South Safeguards ready to coordinate this evolution.

**REFERENCES:** 2OM-53A.1.A-1.8, "Makeup to PPDWST [2FWE\*TK210]", Rev. 5

**TOOLS:** Keys (simulated)

**HANDOUT:** 2OM-53A.1.A-1.8, "Makeup to PPDWST [2FWE\*TK210]", Rev. 5, place kept up to step 10.  
Ops Manual Figure 24-3 (provide if requested)

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

**TASK:** You are to align Service Water Supply to [2FWE\*P23B] Motor Driven Auxiliary Feed Pump Suction.

**INITIAL CONDITIONS:**

- The Control Room Team has responded to an Inadequate Core Cooling Accident and is now in E-1, "Loss of Reactor or Secondary Coolant".
- Containment Isolation Phase B actuation has occurred.
- PPDWST level has decreased to the low-level alarm setpoint.
- PPDWST level indicators [2FWE\*LI104A1] and [2FWE\*LI104A2] both indicate 20".
- Both Demineralized Water Pumps [2WTD-P23A and B] are unavailable, and [2WTD-TK23] is also unavailable.
- [2SWS\*MOV103B] Recirc. Spray HXs Service Water Sup "B" Isolation Valve has been verified OPEN.
- S/G Pressure is approximately 400 psig.

**INITIATING CUE:** Your supervisor directs you to supply [2FWE\*P23B] Motor Driven Auxiliary Feed Pump suction from Service Water by completing EOP Attachment A-1.8 beginning with step 10.  
Mechanical Maintenance and another operator are on station in South Safeguards ready to coordinate 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.

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-167 JPM REVISION: 0	JPM TITLE: Align Service Water to [2FWE*P23B] Motor Driven Auxiliary Feed Pump Suction
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STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b> Provide a procedure copy. Inform the candidate that you will role play any personnel they are required to interact with.         </div>	
1. IF PPDWST Level Drops to 25 inches, THEN align Service Water to the Auxiliary Feedwater Pumps by performing the following:  If Containment Isolation Phase B has <u>NOT</u> occurred, then perform the following:  Close [2SWS*MOV104B] Close [2SWS*MOV104D]	1.1 Recognizes from the Initial Conditions that CIB has occurred and performance of this step is not required.  COMMENTS:	
2. Verify Open [2SWS*MOV103B], Recirc Spray HX Service Water Supply Header B Isolation.	2.1 Recognizes from the Initial Conditions that this step has already been performed.  COMMENTS:	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-167	JPM TITLE: Align Service Water to [2FWE*P23B] Motor Driven Auxiliary Feed Pump Suction
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3.C Close [2FWE*356], Service Water Supply Tell Tale Drain. (North SFGDS above 2FWE*23B – 718')	3.1C Closes [2FWE*356], Service Water Supply Tell Tale Drain by rotating valve handwheel in the clockwise direction.  <div><b>EVALUATOR CUE:</b> [2FWE*356], Service Water Supply Tell Tale Drain has been rotated CLOCKWISE.</div>  COMMENTS:	
4. Vent SWS to AFW piping as follows:  Request Mechanical Maintenance Technician loosen flange at [2FWE-RV102], Emergency Water Supply Relief. (South SFGDS above 2FWE-P23A – 718)	4.1 Requests Mechanical Maintenance Technician loosen flange at [2FWE-RV102], Emergency Water Supply Relief.  <div><b>EVALUATOR CUE:</b> Flange at [2FWE-RV102], Emergency Water Supply Relief has been loosened.</div>  COMMENTS:	
5. With Key SR/14, Open [2FWE*98], Service Water Isolation. (North SFGDS above 2FWE*P23B – 718)	5.1 Removes locking device and opens [2FWE*98], Service Water Isolation by rotating valve handwheel chain operator in the counter-clockwise direction.  <div><b>EVALUATOR CUE:</b> [2FWE*98], Service Water Isolation has been unlocked and is indicating OPEN. A solid stream of water is issuing from the flange at [2FWE*RV102].</div>  COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-167	JPM TITLE: Align Service Water to [2FWE*P23B] Motor Driven
JPM REVISION: 0	Auxiliary Feed Pump Suction

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
6.C When a solid stream of water appears at the flange at [2FWE*RV102], then Close [2FWE*98].	<p>6.1C Closes [2FWE*98], Service Water Isolation by rotating valve handwheel chain operator in the clockwise direction.</p> <p><b>EVALUATOR CUE:</b> [2FWE*98], Service Water Isolation is indicating CLOSED.</p> <p>COMMENTS:</p>	
7. Request Mechanical Maintenance Technician tighten flange at [2FWE-RV102].	<p>7.1 Requests Mechanical Maintenance Technician tighten flange at [2FWE-RV102].</p> <p><b>EVALUATOR CUE:</b> Flange at [2FWE-RV102], Emergency Water Supply Relief has been tightened.</p> <p>COMMENTS:</p>	
8.C Open [2FWE*98], Service Water Isolation.	<p>8.1C Opens [2FWE*98], Service Water Isolation by rotating valve handwheel chain operator in the counter-clockwise direction.</p> <p><b>EVALUATOR CUE:</b> [2FWE*98], Service Water Isolation is indicating OPEN.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-167	JPM TITLE: Align Service Water to [2FWE*P23B] Motor Driven Auxiliary Feed Pump Suction
JPM REVISION: 0	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>9.C For [2FWE*P23B], Motor Driven AFW Pump, perform the following:</p> <p>Slowly Open [2FWE*92], Service Water Supply to [FWE*P23B] (South Safeguards 718')</p>	<p>9.1C Opens [2FWE*92], Service Water Supply to [FWE*P23B] by rotating valve handwheel in the counter-clockwise direction.</p> <div> <p><b>EVALUATOR CUE:</b> [2FWE*92] has been OPENED.</p> <p><b>EVALUATOR NOTE:</b> Valve position indication is on top of the valve and is difficult to observe.</p> </div> <p>COMMENTS:</p>	
<p>10.C With Key CRIT/19, close [2FWE*95], Primary DWST Supply to [2FWE*P23B].</p>	<p>10.1C Unlocks and Closes [2FWE*95], Primary DWST Supply to [2FWE*P23B] by rotating valve handwheel in the clockwise direction.</p> <div> <p><b>EVALUATOR CUE:</b> [2FWE*95] has been CLOSED. Valve position indicates CLOSE.</p> </div> <p>COMMENTS:</p>	
<p>11. Observe AFW pump discharge pressure to ensure proper operation.</p>	<p>11.1 Observes AFW pump discharge pressure to ensure proper operation by depressing the ON/OFF red pushbutton and reading displayed pressure.</p> <div> <p><b>EVALUATOR CUE:</b> When ON/OFF red pushbutton is depressed, [2FWE*P23B] discharge pressure is reading approximately 450 psig. That completes this JPM.</p> </div> <p>COMMENTS:</p>	
	STOP TIME: _____	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE:      Startup a Rod Drive MG Set

TRAINING MATERIAL NUMBER: 2PL-003

PROGRAM TITLE:                      Licensed Operator Training

COMPUTER CODE:                      2PL-003

REVISION NUMBER:                      7

TECHNICAL REFERENCES:

2OM-1.4.B Revision 13, "Reactor Rod Drive Control System Startup".

INSTRUCTIONAL SETTING:              In-Plant

APPROXIMATE DURATION:              15 Minutes

PREPARED BY:              Ian Forbes                      \_\_\_\_\_  
Date

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

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

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2PL-003		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 7
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 6 New Change #
List/Description of Change(s):  Changed instructional setting from classroom to in-plant. Updated JPM to reflect most current standards & expectations. Updated to reflect most current copy of procedure.		
Reason for Change (s):  Enhanced JPM for use on 2LOT8 Exam.		
APPROVALS:		
<u>Ian Forbes</u> Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
_____ Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> ) Date _____		

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-003  
JPM REVISION: 7

JPM TITLE: Startup a Rod Drive MG Set

K/A REFERENCE: 001 A4.08 3.7/3.4 TASK ID: 0011-001-01-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☒ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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  
Time: 15 MinutesActual  
Time: minutesJPM 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:** MG set #2 is running with [2RDS-MG22] Generator Output breaker CLOSED.

**RECOMMENDED  
STARTING LOCATION:** In plant

**DIRECTIONS:** You are to simulate starting #2 MG Set.

**INITIAL CONDITIONS:**

- The plant is in Mode 3.
- Reactor Rod Drive Control System Startup is in progress.
- MG Set #1 is operating and the reactor trip breakers are open.

**INITIATING CUE:**

- Your supervisor directs you to startup the #2 MG set and close the generator output breaker per procedure 2OM-1.4.B Part A, beginning with Step 7.
- All initial conditions are satisfied.
- Steps 1 through 6 were completed on the previous shift.
- Reactor Trip Breakers will be closed from the Control Room.

**REFERENCES:** 2OM-1.4.B Revision 13, "Reactor Rod Drive Control System Startup".

**TOOLS:** NONE

**HANDOUT:** Place kept copy of 2OM-1.4.B Revision 13, "Reactor Rod Drive Control System Startup" up to step #7.

## OPERATIONS JOB PERFORMANCE MEASURE

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

TASK: You are to simulate starting #2 MG Set.

INITIAL CONDITIONS:

- The plant is in Mode 3.
- Reactor Rod Drive Control System Startup is in progress.
- MG Set #1 is operating and the reactor trip breakers are open.

INITIATING CUE:

- Your supervisor directs you to startup the #2 MG set and close the generator output breaker per procedure 2OM-1.4.B Part A, beginning with Step 7.
- All initial conditions are satisfied.
- Steps 1 through 6 were completed on the previous shift.
- Reactor Trip Breakers will be closed from the Control Room.

☐ 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 NUMBER: 2PL-003  
JPM REVISION: 7

JPM TITLE: Startup a Rod Drive MG Set

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	START TIME: _____	
<p><b>1.C</b> At [PNL-2RD-2RD-CONT], Place [2RDS-MG22] Motor Circuit Breaker Control switch in CLOSE position, <b>AND</b> check MG set #2 starts.</p>	<p><b>1.1C</b> Places [2RDS-MG22] MOTOR Circuit Breaker Control switch to the closed position.</p> <p><b>1.2</b> Verifies Red Light – LIT and Green Light – NOT LIT.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Red Light – LIT, Green Light – NOT LIT. #2 MG set is accelerating.</p> </div> <p>COMMENTS:</p>	
<p><b>2.C</b> Depress <b>AND</b> Hold [2RDS-MG22] Gen. Field Flash pushbutton until the [2RDS-MG22] Generator Line Volts voltmeter indicates approximately 260 VAC, <b>THEN</b> release.</p>	<p><b>2.1C</b> Simulates depressing [2RDS-MG22] Gen. Field Flash pushbutton until [2RDS-MG22] Generator Line Volts voltmeter indicates approximately 260VAC.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> [2RDS-MG22] Generator Line Volts voltmeter increased to 260 VAC.</p> </div> <p>COMMENTS:</p>	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-003  
JPM REVISION: 7


JPM TITLE: Startup a Rod Drive MG Set

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p>3. Complete 2OM-1.4.Q, "Administrative Guidelines for Closing the Reactor Trip/Bypass Breakers".</p>	<p>3.1 Acknowledges the need to complete 2OM-1.4.Q.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> 2OM-1.4.Q Administrative Guidelines for closing the reactor Trip/Bypass breakers has been completed.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> CRDM cooling is in service per initial conditions.</p> </div> <p>COMMENTS:</p>	
<p>4. Close reactor trip breakers [RTA AND RTB] to provide load.</p>	<p>4.1 Requests that the RO close the reactor trip breakers from BB-B.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> The RO acknowledges the request to close reactor trip breakers and after several minutes you hear noise and the RO confirms the RTBs are CLOSED.</p> </div> <p>COMMENTS:</p>	
<p>5.C Place [2RDS-MG22] Generator Circuit Breaker control switch to CLOSE position.</p>	<p>5.1C Places [2RDS-MG22] GENERATOR Circuit Breaker control switch to CLOSE position.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> The Mechanical Flag (RED) is indicated and the GREEN indicating light is LIT.</p> </div> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-003  
JPM REVISION: 7

JPM TITLE: Startup a Rod Drive MG Set

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
<p><b>6.C</b> Place [2RDS-MG22] Synchronize switch in the ON position <b>AND</b> Check the two generators synchronize.</p>	<p><b>6.1C</b> Places [2RDS-MG22] Synchronize switch in the ON position.</p> <p><b>6.2</b> Checks [2RDS-MG22] GENERATOR Output breaker RED Light – LIT.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> A few moments after the Synchronize Switch is taken to ON, inform the candidate that [2RDS-MG22] Generator Output breaker RED Light – LIT, Green Light – NOT LIT.</p> </div> <p>COMMENTS:</p>	
<p><b>7.</b> When [2RDS-MG22] Generator circuit breaker CLOSES, <b>THEN</b> place [2RDS-MG22] Synchronize switch to the OFF position.</p>	<p><b>7.1</b> Places [2RDS-MG22] Synchronize switch to the OFF position.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>EVALUATOR CUE:</b> Acknowledges Synch switch in OFF position.</p> </div> <p><b>7.2</b> Informs supervisor that # 2 MG Set is running with output breaker closed or that the task is complete.</p> <p>COMMENTS:</p>	
	<p>STOP TIME: _____</p>	

OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Place a Reactor Protection Channel in the Tripped Condition

TRAINING MATERIAL NUMBER: 2PL-009

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2PL-009

REVISION NUMBER: 7

TECHNICAL REFERENCES:

2OM-53C.4.2.2.1C, "Power Range Channel Malfunction", Revision 10

INSTRUCTIONAL SETTING: In-Plant

APPROXIMATE DURATION: 7 Minutes

PREPARED BY: Ian Forbes

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Date

APPROVED FOR USE: \_\_\_\_\_

Training Supervisor or Designee

\_\_\_\_\_  
Date

## TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2PL-009		
Type of Change:		
<input checked="" type="checkbox"/> Changes Requiring Revision	Learning Objective Related Change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Rev. # 7
<input type="checkbox"/> Changes Not Requiring Revision	The Change Does Not Impact Learning Objectives or Material Quality.	Existing Rev. # 6 New Change #
List/Description of Change(s):  Changed step 4.2, 5, & 6 typos from C3 to proper nomenclature. Included information about protection cabinet doors having limit switches which send the control room an indication when the doors are opened. Modified starting location from control room to in-plant. Enhanced Task Standard to be more specific to the actual failed channel.		
Reason for Change (s):  Enhance JPM.		
APPROVALS:		
Ian Forbes Prepared by _____ Date _____		<b>NOTE:</b> Additions, deletions or changes to training materials must be reviewed for their possible impact to the Training Qualification Matrix. See Incumbent Impact Review, NOBP-TR-1104.
Training Superintendent/Supervisor/Peer ( <i>"Changes Not Requiring Revision" only</i> ) _____ Date _____		

JPM NUMBER: 2PL-009 JPM REVISION: 7	JPM TITLE: Place a Reactor Protection Channel in the Tripped Condition
--	--

K/A REFERENCE: 012A4.04 3.3/3.3

TASK ID: 0535-010-04-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING  
☐ FAULTED 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"/> OJT/TPE <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: 7 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: \_\_\_\_\_

**EVALUATOR DIRECTION SHEET**

**TASK STANDARD:** Power Range Channel N-43 bistables are in the test (tripped) position.

**RECOMMENDED  
STARTING LOCATION:** In-plant

**DIRECTIONS:** You are to simulate placing a reactor protection channel in the tripped condition.

**INITIAL CONDITIONS:**

- The plant is in Mode 1 at 100% power.
- Power Range Channel N-43 has malfunctioned.
- AOP-2.2.1C, "Power Range Channel Malfunction" has been performed through Step 1.h.

**INITIATING CUE:** Your supervisor directs you to trip the appropriate bistables in accordance with AOP-2.2.1C, Power Range Channel Malfunction, Step 1.i.

**REFERENCES:** 2OM-53C.4.2.2.1C, "Power Range Channel Malfunction", Revision 10

**TOOLS:** Key No. 117 (118)

**HANDOUT:** 2OM-53C.4.2.2.1C, "Power Range Channel Malfunction", place kept up to and including step 1.h.

**CANDIDATE DIRECTION SHEET**

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

☐ Read:

TASK:

You are to simulate placing a reactor protection channel in the tripped condition.

INITIAL CONDITIONS:

- The plant is in Mode 1 at 100% power.
- Power Range Channel N-43 has malfunctioned.
- AOP-2.2.1C, "Power Range Channel Malfunction" has been performed through Step 1.h.

INITIATING CUE:

Your supervisor directs you to trip the appropriate bistables in accordance with AOP-2.2.1C, Power Range Channel Malfunction, Step 1.i.

☐ 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 NUMBER: 2PL-009	JPM TITLE: Place a Reactor Protection Channel in the Tripped Condition
JPM REVISION: 7	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
	<div> <b>EVALUATOR NOTE:</b> Obtain Key # 117(118) prior to JPM performance and inform Shift Manager that Primary Process Rack No. 3 door(s) will be opened. These doors have limit switches which will provide the Control Room indication when the doors are opened and closed. </div> <div> <b>EVALUATOR CUE:</b> Provide the candidate a place kept copy of AOP 2.2.1C. </div>	
	START TIME: _____	
1. Reviews procedure. 2OM-53C.4.2.2.1C, Power Range Channel Malfunction.	1.1 Candidate reviews place kept copy of AOP 2.2.1C provided.  COMMENTS:	
2. Obtain Keys 117 (118) for process rack doors.	2.1 Obtains Key No. 117 (118) for process rack door by requesting keys from the evaluator or indicating that they will need to go to the Control Room to sign out these keys. <div> <b>EVALUATOR CUE:</b>  Provide the candidate the KEY 117(118) when they request the keys or begin to walk to the control room. </div> COMMENTS:	



## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-009	JPM TITLE: Place a Reactor Protection Channel in the Tripped Condition
JPM REVISION: 7	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
3. Open process rack door.	<p><b>EVALUATOR NOTE:</b> These are several blue cabinet doors that are marked the same. The candidate may need to open more than one door in order to locate the proper bistables.</p> <p>3.1 Opens the proper Protection Cabinet No. 3 door.</p> <p>COMMENTS:</p>	
4. Refer to Attachment 1, "Delta T Protection Bistable Switch List".	<p>4.1 Refers to Attachment 1 for bistables to trip.</p> <p>4.2 Determines bistables BS-3 and BS-4 on Card Frame 7/Slot 21 must be tripped.</p> <p>COMMENTS:</p>	
5.C Place 2TS/432C-1[BS-3] bistable on Card Frame 7/Slot 21 in the TEST position.	<p>5.1C Places 2TS/432C-1[BS-3] bistable in the TEST position located on Card Frame 7/Slot 21.</p> <p>5.2 Verifies the RED LED is ON.</p> <p><b>EVALUATOR CUE:</b> 2TS/432C-1 is in <b>TEST</b> and Red LED is <b>LIT</b>.</p> <p>COMMENTS:</p>	

## OPERATIONS JOB PERFORMANCE MEASURE

JPM NUMBER: 2PL-009	JPM TITLE: Place a Reactor Protection Channel in the Tripped Condition
JPM REVISION: 7	

STEP ( "C" Denotes CRITICAL STEP )	STANDARD (Indicate "S" FOR SAT or "U" FOR UNSAT)⇒	S/U
6.C Place 2TS/432C-2[BS-4] bistable on Card Frame 7/Slot 21 in the TEST position.	6.1C Places 2TS/432C-2[BS-4] bistable in the TEST position located on Card Frame 7/Slot 21.  6.2 Verifies the RED LED is ON.  <div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            2TS/432C-2 is in <b>TEST</b> and Red LED is <b>LIT</b>.         </div>  COMMENTS:	
7. Close and lock Protection Rack No. 3 door.	7.1 Closes and locks Protection Rack No. 3 door.  COMMENTS:	
	<div style="border: 1px solid black; padding: 5px;"> <b>EVALUATOR CUE:</b>            That Completes this JPM         </div>	
	STOP TIME: _____	

## Appendix D

## Scenario Outline

## Form ES-D-1

Facility:	<b>BVPS Unit 2</b>	Scenario No.:1	Op Test No.:	<u>2LOT8 NRC</u>
Examiners:	_____	Candidates:	_____	SRO
	_____		_____	ATC
	_____		_____	BOP

Initial Conditions: IC 211(7): 25% power, BOL, Xe increasing, CB "D" @ 121 steps, RCS boron - 1935 ppm.  
Main feed regulating valves in service

Turnover: Increase power to 100%. 2SAS-C21B OOS

Critical Tasks:

- 1. E-0.E Actuate 1 train of CNMT Spray**
- 2. E-0.P Manually actuate SLI**
- 3. E-2.A Isolate Faulted S/G**

Event No.	Malf. No.	Event Type	Event Description
1		(R) ATC (N) BOP, SRO	Raise power in accordance with reactivity plan.
2		(TS) SRO	2FWE*P22 (turbine driven Aux Feedwater pump) trips
3		(I) ATC, SRO	2CHS-PT145, fails high, ATC required to manually control letdown pressure via 2CHS-PCV145.
4		(C) BOP, SRO (TS) SRO (C) ATC	Loss of 2AE 4kv Emergency bus / 2-1 Emergency Diesel fails to auto start. BOP required to manually start EDG 2-1. ATC manually aligns cooling water flow to EDG 2-1
5		(C) BOP, SRO	2CCS-P21A sheared shaft, auto start failure of 2CCS-P21B, requires manually starting standby pump.
6		(M) ALL	Feedline break inside CNMT.
7		(C) ATC, SRO	CIB actuation failure
8		(C) BOP, SRO	MSLI actuation failure with 2SDS*AOV111's failing to auto close, requires BOP to manually actuate MSLI and close all 6 2SDS*AOV111's
9		(C) BOP, SRO	"B" train CREV's fails to actuate, requires BOP to manually actuate.

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

The crew will assume the shift at 25% power with instructions to raise power to 100% IAW 2OM-52.4.A and the reactivity plan.

When reactor power has increased to 27.5%, the linkage for the trip-throttle valve for the Turbine Driven Auxiliary Feedwater Pump, 2FWE\*P22, will fail, requiring the US to determine appropriate Tech Spec action.

When Tech Specs have been addressed, Letdown Pressure Transmitter, 2CHS\*PT145, will fail high, requiring the ATC to control letdown pressure by manually controlling the Letdown Pressure Control Valve, 2CHS\*PCV145.

After the crew has stabilized the plant, 4KV emergency bus 2AE will de-energize and EDG 2-1 will fail to automatically start. The crew will enter AOP 2.36.2, Loss of 4KV Emergency Bus, which requires a manual start to restore power to the bus. The SRO will determine appropriate Tech Spec actions.

Secondary Component Cooling Water Pump, 2CCS-P21A, will experience a sheared shaft, requiring the crew to enter AOP 2.28.1, Loss of Secondary Component Cooling Water, and the BOP to manually start the standby pump, 2CCS-P21B, which failed to auto start.

A Feedwater header rupture will occur inside containment. The reactor will trip. Upon the reactor trip, the crew will enter E-0.

MSLI will fail to automatically actuate, requiring the BOP to manually actuate a Steam Line Isolation. When MSLI is actuated, the main steam line drains (2SDS\*AOV111's) will fail to close requiring the BOP to manually close at least 1 train.

CIB will fail to automatically actuate, The ATC will identify the failure to actuate and manually actuate both trains of CIB.

The crew will identify the "C" S/G as faulted and transition to E-2 to isolate. Train "B" CREV's, Control Room Emergency Ventilation System, will fail to actuate requiring the BOP to manually initiate.

The crew will progress through E-2 and transition to E-1.

The scenario will be terminated after the crew transitions to ES-1.1 and isolates the HHSI flowpath by closing 2SIS\*MOV867A, B, C, D.

Expected procedure flow path is E-0 → E-2 → E-1 → ES-1.1.

## BEAVER VALLEY POWER STATION

**INITIAL CONDITIONS:** 25% Power, CBD = 121, Xe increasing BOL, 1935 PPM Boron, IC-211

<b><u>ADDITIONAL LINEUP CHANGES</u></b>	<b><u>STICKERS</u></b>	<b><u>MONITOR SETUP</u></b>
	YCT - 2SAS-C21B CS	ATC position – MID POWER display
<b><u>EQUIPMENT STATUS</u></b>	<b><u>DATE/TIME OOS</u></b>	<b><u>TECHNICAL SPECIFICATION(S)</u></b>
2SAS-C21B OOS, compressor overhaul	3 days ago	

### **SHIFT TURNOVER INFORMATION**

1. 25% power, BOL, Xe increasing, main feed regulating valves in service.
2. Shift goal is continue power increase in accordance with 2OM-52.4.A.

### **SCENARIO SUPPORT MATERIAL REQUIRED**

1. 2OM-52.4.A completed and place kept up through step IV.F.7.g (pg 65)
2. Reactivity plan
3. BOL reactivity placard

### **PROCEDURES NEEDED**

2OM-52.4.A  
AOP 2.28.1  
OM-7 IF, Attachment 3, 2CHS-PT145  
AOP 2.36.2  
E-0  
E-1  
E-2  
Attachment A-0.11  
Attachment A-1.6

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Initialize IC 211, and establish initial plant conditions.	Reactor plant at 25% power, BOL, Xe increasing, RCS boron =1935 PPM, CBD = 121 steps.	
Insert the following per the Simulator Setup section of the HTML file for this scenario:	Inserts all pre-loads required to support the scenario.	
<b>PRELOAD COMMANDS</b>		
<b>TRGSET 1 'JPPLP4(1)'</b>	Set trigger 1 on reactor trip	
<b>IMF PMP-CAS004 (0 0) 1</b>	2SAS-C21B OOS	
<b>IMF DSG01D</b>	Inhibit auto start of EDG 2-1	
<b>IMF PPL09A (0 0)</b>	Inhibit auto CIB TRN A, manual successful	
<b>IMF PPL09B (0 0)</b>	Inhibit auto CIB TRN B, manual successful	
<b>IMF PPL10A (0 0)</b>	Inhibit auto MSLI TRN A, manual successful	
<b>IMF PPL10B (0 0)</b>	Inhibit auto MSLI TRN B, manual successful	
<b>IMF BST-CCS006 (0 0) 2</b>	Inhibit auto start of 2CCS-P21B, manual start successful	
<b>IMF PMP-CCS001 (7 0) 0</b>	2CCS-P21A severed leads	
<b>IMF A6-3B-P0670D (7 0) 0</b>	Ann A6-3B Low CCS pump Disch Press	
<b>TRGSET 8 'XC1I076A == 0'</b>	Trigger 8 to clear Ann A6-3B	
<b>TRG 8 'DMF A6-3B-P0670D'</b>	Ann A6-3B clears on start 2CCS-P21B	
<b>IOR XBSI052P (0 0) ON</b>	2HVC*MOD201A failed open.	
<b>IOR XBSI065P (0 0) ON</b>	2HVC*MOD201B failed open.	
<b>TRGSET 6 'XBSI052C == 1'</b>	Set trigger 6 on 2HVC*MOD201A CS to close.	
<b>TRG 6 'DOR XBSI052P'</b>	DOR, 2HVC*MOD201A manually closes.	
<b>TRGSET 9 'XBSI025P == 1'</b>	Set trigger 9 on "B" Tm CREV'S PB depressed.	
<b>TRG 9 'DOR XBSI065P'</b>	DOR, 2HVC*MOD201B manually closes.	
<b>TRGSET 5 'FNISPR(1) &gt;= 27.5'</b>	Trigger 5 on reactor power > 27.5%	
<b>IRF LOA-AFW022 (5 0) 1</b>	2FWE*P22 trip throttle valve trips shut	
<b>IMF VLV-MSS032A (0 0) 100</b>	Fail 2SDS-AOV111A1 open	
<b>IMF VLV-MSS033A (0 0) 100</b>	Fail 2SDS-AOV111A2 open	
<b>IMF VLV-MSS034A (0 0) 100</b>	Fail 2SDS-AOV111B1 open	
<b>IMF VLV-MSS035A (0 0) 100</b>	Fail 2SDS-AOV111B2 open	

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b>IMF VLV-MSS036A (0 0) 100</b> <b>IMF VLV-MSS037A (0 0) 100</b> <b>TRGSET 10 'XA1I090C == 1'</b> <b>TRG 10 'DMF VLV-MSS032A'</b> <b>TRGSET 11 'XA1I077C == 1'</b> <b>TRG 11 'DMF VLV-MSS033A'</b> <b>TRGSET 12 'XA1I107C == 1'</b> <b>TRG 12 'DMF VLV-MSS034A'</b> <b>TRGSET 13 'XA1I095C == 1'</b> <b>TRG 13 'DMF VLV-MSS035A'</b> <b>TRGSET 14 'XA1I119C == 1'</b> <b>TRG 14 'DMF VLV-MSS036A'</b> <b>TRGSET 15 'XA1I110C == 1'</b> <b>TRG 15 'DMF VLV-MSS037A'</b>	Fail 2SDS-AOV111C1 open Fail 2SDS-AOV111C2 open Set trigger 10 on 2SDS-AOV111A1 CS to close. DMF, 2SDS-AOV111A1 manually closes. Set trigger 11 on 2SDS-AOV111A2 CS to close. DMF, 2SDS-AOV111A2 manually closes. Set trigger 12 on 2SDS-AOV111B1 CS to close. DMF, 2SDS-AOV111B1 manually closes. Set trigger 13 on 2SDS-AOV111B2 CS to close. DMF, 2SDS-AOV111B2 manually closes. Set trigger 14 on 2SDS-AOV111C1 CS to close. DMF, 2SDS-AOV111C1 manually closes. Set trigger 15 on 2SDS-AOV111C2 CS to close. DMF, 2SDS-AOV111C2 manually closes.	
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
--------------------------	------------------------------------	---------------------------

## **EVENT 1:**

Continue power increase per reactivity plan.

SRO directs the crew to continue power increase IAW 1OM-52.4.A.

RCS temperature rises in response to rod withdrawal and dilution.

IAW Reactivity plan, ATC dilutes/withdraws rods to raise reactor power to 100%.

BOP raises turbine load.

BOP raises turbine load at 12%/hour rate by;

- Adjusting “setter” as appropriate.
- Depressing “GO”.

BOP verifies/maintains the following while raising load,

- Valve position limiter ~5% above current valve position.
- Voltage regulator is maintaining power factor.

**NOTE:** Event 2 will occur automatically when Rx power reaches 27.5%.

## **EVENT 2:**

2FWE\*P22 Trip Throttle Valve trips (command preloaded)  
**IRF LOA-AFW022 (5 0) 1**

**ROLE PLAY:** 2 minutes after being dispatched to inspect 2FWE\*P22, report back that the trip throttle valve linkage rod is broken.

## **IMMEDIATE PLANT RESPONSE:**

Computer point Y5172D alarms, TURB DR  
AFW PP TRIPPED  
A2-3H, Safety System Train A Inoperable

BOP reports that 2FWE\*P22 is tripped.

SRO dispatches operator to investigate 2FWE\*P22.

SRO enters TS 3.7.5, condition B, w/in 2 hrs realign Operable pumps to separate hdrs, (for this failure this action is not required) 72 hrs to restore AFW train to operable status.



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
--------------------------	------------------------------------	---------------------------

Proceed with next event after power is raised above 30% as indicated by A12-2G (NOT P-8) status panel clearing or at LE discretion.

## **EVENT 3:**

2CHS\*PT145 fails high

**IMF XMT-LDS007A (0 0) 600**

## **IMMEDIATE PLANT RESPONSE:**

A2-3F, Letdown Flow Path Trouble  
2CHS-PI145 indication at 600 psig.  
2CHS\*PCV145 opens.  
Letdown flow rises.  
2CHS\*RV209 may lift.

SRO enters 2OM-7.4.IF, Attachment 3.

ATC reports unexpected letdown alarm.  
BOP refers to ARP.  
ATC notes 2CHS-PI145 at full scale and 2CHS\*PCV145 traveling open.

ATC places 2CHS\*PCV145 in manual and positions valve to stabilize net charging and restore letdown flow to pre-event value.

With 2CHS\*PCV145 in manual, SRO establishes a control band for manual control of letdown pressure.

ATC monitors for proper operation of 2CHS\*RV209.

SRO dispatches operator to check local l/d pressure on 2CHS-PI146.

**ROLE PLAY:** 3 minutes after being dispatched to check local pressure on 2CHS-PI146, report back that pressure indicates 110 psig.

After plant has been stabilized, continue with next event at LE discretion

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
--------------------------	------------------------------------	---------------------------

## **EVENT 4:**

Loss of 2AE 4kv emergency bus with an auto start failure of 2-1 EDG.

**IMF BKR-HIV01 (0 0) 0**

### **IMMEDIATE PLANT RESPONSE:**

4KV ACB 2A10 trips open

4KV bus 2AE voltage reduces to zero (VB-C)

Multiple electrical related annunciators.

SRO enters AOP 2.36.2 for Loss of 4KV Emergency Bus.

**ROLE PLAY:** If dispatched with Attachment A-1.6 to verify MCC feeder breakers are closed, wait 10 minutes then report all are closed.

BOP reports multiple unexpected electrical alarms.  
BOP identifies 4kv Bus 2AE is de-energized and that the 2-1 EDG has failed to start.  
BOP reports that 4kv Bus 2DF is energized.  
ATC verifies 2CHS\*P21B remains running, verifies primary plant is stable and begins referring to ARP's.

Crew verifies no overcurrent electrical alarms.  
SRO directs BOP to manually start EDG 2-1.  
BOP successfully starts EDG 2-1.  
ATC verifies 2SWS\*P21A is running and opens cooling water supply valve, 2SWS\*MOV113A.

Crew performs EOP Attachment A-1.6, IAW direction of AOP 2.36.2 to verify EDG auto loading is complete.

SRO evaluates TS for emergency bus and EDG 2-1.

SRO determines 2OST-36.7 is required within 1 hour to verify operability of remaining sources per TS 3.8.1, Conditions A and B.

# BEAVER VALLEY POWER STATION

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

Turbine Plant Component Cooling  
Water Trouble (2CCS-P21A sheared shaft)

**TRG! 7** (actuate trigger 7, all required commands are preloaded.)

### **IMMEDIATE PLANT RESPONSE:**

2CCS-P21A ammeter reduces to ~4 amps.  
A6-3B, CCS pump discharge press low  
A7-6F, Main Leads Cooling Trouble  
A7-2H, EHC Temperature High

BOP reports unexpected CCS related alarms.  
ATC refers to ARP's

2CCS-P21B fails to auto start when pressure reduces to < 75 psig.  
SRO enters AOP 2.28.1.

BOP recognizes failure of 2CCS-P21B to auto start on low pressure and manually starts 2CCS-P21B.

**NOTE:** If CCS cooling flow is not quickly re-established, station air compressor, 2SAS-C21A will trip on high temperature and will not be able to be recovered, the diesel air compressor will auto start and supply air as required.

A6-3D, STA and Cond Polishing Air Sys Trb, (alarms later depending on response time)

BOP recognizes 2SAS-C21A tripped.

SRO may enter AOP 2.34.1 for Loss of Station Air, no actions are required, AOP steps are not scripted.

Crew dispatches an operator to start diesel air comp.

**ROLE PLAY:** If dispatched to start 2IAS-C21, wait 2 minutes then insert .  
**IRF LOA-CAS011 (0 0) 1**, wait until compressor loads then report back.

**ROLE PLAY:** If dispatched to investigate 2SAS-C21A trip, wait 2 minutes then report 2SAS-C21A has tripped on high temperature.

Proceed with next event at LE discretion

# BEAVER VALLEY POWER STATION

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

Feed line break inside containment  
**IMF FLX-CFW33 (0 0) 8700**

Multiple malfunctions occur on reactor trip.

All commands preloaded

**IMF PPL09A**

**IMF PPL09B**

**IMF PPL10A**

**IMF PPL10B**

**TRGSET 1 'JPPLP4(1)'**

**IOR XBSI052P (0 0) ON**

**IOR XBSI065P (0 0) ON**

**TRGSET 6 'XBSI052C == 1'**

**TRG 6 'DOR XBSI052P'**

**TRGSET 7 'XBSI025P == 1'**

**TRG 7 'DOR XBSI065P'**

Feedwater header rupture inside containment causes an automatic reactor trip.

Additional failures that occur on the reactor trip; Automatic main steam line isolation actuation failure, when MSLI is manually initiated, 2SDS-AOV111's fail to automatically close, requiring manual closure.

CIB will fail to automatically actuate.

"B" train CREV's fails to automatically actuate.

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 POWER STATION

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

SI automatically actuated

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 either AE or DF has voltage indicated.

BOP identifies that AE bus remains energized from EDG 2-1 and DF bus remains energized from offsite power.

Check SI Status

Crew checks if SI is required

- ATC checks Cnmt press > 5psig
- ATC checks PRZR press < 1860 psig
- ATC/BOP checks Steamline press < 500 psig

Crew determines SI is Required; ATC manually actuates SI by turning both trains' control switches.

ATC/BOP, Sounds Standby Alarm, announces reactor trip and safety injection.

BOP verifies leak collection filtered exhaust fan 2HVS-FN204A or B running.

# BEAVER VALLEY POWER STATION

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

### **NOTE:**

Evaluation of BOP performing  
Attachment A-0.11 begins on page 21.

### List of Attachment A-0.11 Discrepancies:

Discrepancies:  
MSLI failed to automatically isolate.  
2SDS-AOV111's, steam line drains failed to automatically close.  
CIB failed to automatically actuate.  
"B" train CREV's failed to automatically actuate.

ATC verifies SI System Status.

- Both 2CHS\*P21A and P21B pumps running.
- HHSI Flow indicated,
- Both LHSI pumps running.

BOP verifies AFW System status.

- Motor-driven AFW Pumps – Both pumps RUNNING
- Turb driven AFW Pump Stm Supply Isol Valves – OPEN
- AFW Throttle Vlvs – FULL OPEN
- Total AFW Flow – > 340 GPM

SRO directs BOP to perform Attachment A-0.11.

## BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 7, 8, &amp; 9:</u></b> (continued)</p> <p><b>NOTE:</b> Automatic main steamline isolation was inhibited.</p> <p><b><u>Critical Task: E-0.P</u></b> <b>Crew manually actuates main steam line isolation before a Severe (orange path) challenge develops to either the Sub-criticality or Integrity CSF or before transition to ECA-2.1, whichever occurs first.</b></p> <p><b>Basis for Selection:</b> SAFETY SIGNIFICANCE -- Failure to close the MSIVs under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Additionally, such an omission constitutes a "demonstrated inability by the crew to recognize a failure of the auto actuation of an ESF system or component and to take an action that would prevent a challenge to plant safety."</p>	<p>RCS temperature &lt; 547°F and dropping due to Safety Injection flow.</p>	<p>ATC checks RCS Tavg stable at or trending to 547°F</p> <ul style="list-style-type: none"> <li>• ATC verifies no steam release is occurring. (Condenser steam dumps closed)</li> <li>• ATC verifies Reheat steam is isolated.</li> <li>• ATC reduces total feedflow to minimize C/D.</li> </ul> <p>Crew determines cooldown is continuing and determines SLI is required. If not previously actuated, BOP manually initiates MSLI and closes 2SDS-AOV111's.</p>
	<p>CIB not actuated at this time.</p>	<p>ATC checks recirc spray pumps – NONE RUNNING</p>

# BEAVER VALLEY POWER STATION

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

### **NOTE:**

When the crew recognizes Containment pressure has exceeded 11 psig and manually initiates CIB, the crew will shutdown all RCP's due to loss of cooling.

RCP's may be s/d at this time due to the operator action for the CIB, otherwise RCP's would remain running at this point.

SRO transitions to E-2.

ATC verifies PRZR isolated

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

ATC checks if RCPs should be stopped

- D/P between RCS pressure and highest S/G pressure – NOT LESS THAN 205 PSID
- Criteria for stopping is not met - Leaves RCPs running based upon DP requirements.

ATC/BOP checks if any S/Gs are faulted

- Pressures in all S/Gs – ANY DROPPING IN AN UNCONTROLLED MANNER  
OR
- ANY S/G COMPLETELY DEPRESSURIZED

Crew determines "C" S/G is faulted.



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 7, 8, &amp; 9:</u></b> (continued)            “B” Train CREV’s automatic actuation failed requiring the crew to manually initiate.</p> <p>All commands preloaded</p> <p><b>NOTE:</b>            Failure of MSLI should have been recognized by this time.</p>	<p>“C” S/G 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” S/G’s.</p> <p>“C” S/G pressure &amp; level lowering.</p>	<p>ATC/BOP actuates CREVS</p> <ul style="list-style-type: none"> <li>Verifies the control room air intake and exhaust Dampers are CLOSED.</li> </ul> <p>Crew determines “B” Train CREV’s failed to actuate, ATC/BOP manually actuates CREV’s.</p> <p>SRO requests a BV-1 operator to verify proper Unit 1 CREVS actuation.</p> <p>SRO directs STA to Commence Control Room ventilation actions. Refer to Attachment A-2.4.</p> <p>ATC/BOP verifies steamline isolation has occurred by checking all YELLOW SLI identified components are in the designated position. (previously verified)</p> <p>BOP identifies “A” &amp; “B” steam generator pressures are “Stable or rising”.</p> <p>Crew identifies “C” S/G as faulted.</p>

# BEAVER VALLEY POWER STATION

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

### Critical Task: E-2.A

**Crew isolates the faulted S/G and directs operator to close isolation valves operated from outside of the control room before transition out of E-2.**

### **Basis for Selection:**

SAFETY SIGNIFICANCE -- Failure to isolate a faulted S/G 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.

**ROLE PLAY:** 10 minutes after being dispatched close 2SVS-29, insert **IRF LOA-MSS011 (0 0) 0**, then report that 2SVS-29 is closed.

BOP isolates the faulted, "C" S/G as follows,

- Verifies FWI (previously verified via Attachment A-0.11)
- Closes AFW throttle valves on "C" S/G 2FWE\*HCV100A and 100B
- Verifies Residual Heat Release Valve is closed.
- Directs field operator to isolate 2SVS-29
- Isolates steam supply to turbine driven AFW pump, 2MSS\*SOV105C and 105F
- Verifies closed, "C" S/G Atmospheric steam dump valve.
- Verifies S/G blowdown isolated, 2BDG\*AOV100C1
- Verifies S/G Blowdown sample isolation valves, 2SSR\*AOV117A, B, C closed.

BOP verifies PPDWST level is > 85 inches.

# BEAVER VALLEY POWER STATION

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

### NOTE:

Due to timing, procedure progression and plant conditions (Adverse cnmt or not adverse), it is possible that the conditions may support direct transition to ES-1.1. If so, E-1 steps on pages 18 and 19 are not applicable.

SRO determines transition to E-1, Loss of Reactor or Secondary Coolant is appropriate.

Crew checks if S/G tubes are intact

- Check all S/G levels – NONE RISING IN AN UNCONTROLLED MANNER
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES

Determines no S/G levels are rising in an uncontrolled manner and Secondary Radiation – is CONSISTENT WITH PRE-EVENT VALUES;

Crew determines S/G Tubes ARE INTACT.

Crew checks if SI Flow should be Reduced

ATC verifies RCS Subcooling is  $> 41^{\circ}\text{F}$  [ $59^{\circ}\text{F}$  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 S/G  $> 12\%$  [ $31\%$  ADVERSE CNMT].

ATC confirms RCS pressure is stable or rising.

ATC reports Pzr level is  $< 17\%$  [ $38\%$  ADVERSE CNMT]

Crew determines that current plant conditions do not support SI reduction.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 7, 8, &amp; 9:</u></b> (continued)		<p>ATC checks if CREVS should be actuated:</p> <p>Checks EITHER of the following:</p> <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> <p>Crew reports CREV's required and previously actuated.</p> <p>ATC checks if RCPs should be stopped</p> <ul style="list-style-type: none"> <li>• D/P between RCS pressure and highest S/G pressure – LESS THAN 205 PSID [220 PSID ADVERSE CNMT]</li> <li>• DP Criteria for stopping RCPs is not met –</li> </ul> <p>RCP's previously shutdown due to CIB.</p> <p>ATC confirms CIB was previously manually initiated.</p> <p>ATC verifies SWS flow to all 4 Recirc Spray HX's.</p> <p>ATC verifies RWST level is NOT &lt; 381 inches.</p> <p>ATC/BOP checks if any S/Gs are faulted</p> <ul style="list-style-type: none"> <li>• Pressures in all S/Gs – ANY DROPPING IN AN UNCONTROLLED MANNER OR</li> <li>• ANY S/G COMPLETELY DEPRESSURIZED</li> </ul> <p>"C" S/G was previously identified as faulted and has been isolated.</p>

# BEAVER VALLEY POWER STATION

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

BOP Checks Intact S/G Levels

- Narrow range levels - GREATER THAN 12% [31% ADVERSE CNMT]

Controls feed flow to maintain narrow range level between 12% [31% ADVERSE CNMT] and 50%.

Crew checks if S/G tubes are intact

- Check all S/G levels – NONE RISING IN AN UNCONTROLLED MANNER
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES

Crew determines no S/G levels are rising in an uncontrolled manner and Secondary Radiation is consistent with pre-event values, therefore all S/G tubes are intact.

ATC checks PORV's and block valves.

- Power to block valves – AVAILABLE
- PORVs – CLOSED
- Block valves – AT LEAST ONE OPEN

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
--------------------------	------------------------------------	---------------------------

## EVENTS 7, 8, & 9: (continued)

Crew checks if SI Flow should be reduced

ATC verifies RCS Subcooling is greater than 41°F [59 °F 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 S/G > 12% [31% ADVERSE CNMT].

ATC confirms RCS pressure is stable or rising.

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

Crew determines that current plant conditions support SI reduction

SRO transitions to ES-1.1, SI Termination

Crew resets SI, CIA and CIB signals.

ATC stops 1 charging pump.

ATC verifies RCS pressure is stable or rising.

ATC closes 2SIS\*MOV867A,B,C, D.

Terminate scenario when the crew isolates the HHSI flowpath by closing 2SIS\*MOV867A, B, C, D in ES-1.1.

### Classify Event:

**Unusual Event**, Tab 2.10, Steam/Feed Line Break due to an Unplanned Rapid depressurization of the Main Steam System resulting in a rapid RCS cooldown AND Safety Injection.

# 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 as time & manpower permit

Ensure Reheat Steam Isolation

## **Critical Task E-0.P:**

**Crew manually actuates main steam line isolation before a Severe (orange path) challenge develops to either the Sub-criticality or Integrity CSF or before transition to ECA-2.1, whichever occurs first**

## **Basis for Selection:**

SAFETY SIGNIFICANCE -- Failure to close the MSIVs under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Additionally, such an omission constitutes a "demonstrated inability by the crew to recognize a failure of the auto actuation of an ESF system or component and to take an action that would prevent a challenge to plant safety."

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

Checks both EDGs running

Ensure reheat steam isolation

- Verify 2MSS-MOV100A and B - CLOSED
- Reset reheater controller.

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

Determines CNMT pressure is > 7 PSIG and Manually actuates steamline isolation by depressing all 4 SLI pushbuttons (BB-C)

Verifies SLI by checking all YELLOW SLI marks - LIT

Identifies 2SDS-AOV111A1,B1,C1, A2,B2,& C2 all failed to close. Manually closes all valves.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11 – (continued)</b></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>Critical Task E-0.E:</b> <b>Crew manually actuates at least the minimum required complement of containment cooling equipment before an Extreme (red path) challenge develops to the Containment CSF.</b></p> <p><b>Basis for Selection:</b> SAFETY SIGNIFICANCE -- Failure to manually actuate the minimum required complement of containment cooling equipment under the postulated conditions constitutes a "demonstrated inability by the crew to recognize a failure/incorrect auto actuation of an ESF system or component."</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>• Transfer [2NME-NR45] Nuclear Recorder to operable source and intermediate range displays.</li> </ul> <p>Check CIB And CNMT Spray Status</p> <ul style="list-style-type: none"> <li>• Containment pressure - HAS REMAINED LESS THAN 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 established to RSS HX(s)</li> </ul> <p>BOP manually initiates CIB if ATC did not previously identify and initiate.</p>



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> – (continued)</p>		<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>Verify both CNMT hydrogen analyzers running by 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 Power To Both AC Emergency Busses Restore power as required</p>
<p><b>Attachment A-0.11</b> – COMPLETE</p>	<p>Discrepancies: MSLI failed to automatically isolate 2SDS-AOV111's, steam line drains failed to automatically close CIB failed to automatically actuate. “B” train CREV's failed to automatically actuate.</p>	<p>Upon Completion, Report Any Discrepancies to SRO.</p>

**Appendix D****Scenario Outline****Form ES-D-1**

Facility: **BVPS Unit 2** Scenario No.:2 Op Test No.: **2LOT8 NRC**  
 Examiners: \_\_\_\_\_ Candidates: \_\_\_\_\_ SRO  
 \_\_\_\_\_ ATC  
 \_\_\_\_\_ BOP

Initial Conditions: IC 219(17): 72% power, MOL, Eq Xe, CB "D"@180 steps, RCS boron - 1140 ppm.

Turnover: Maintain steady state power at 72%, 2FWE\*P23A OOS, 2SAS-C21B OOS

Critical Tasks:

- 1. E-0.A Manually trip the Reactor**
- 2. E-0.Q Manually trip the turbine**
- 3. FR-H.1.A Establish feedwater flow before Feed and Bleed criteria**

Event No.	Malf. No.	Event Type	Event Description
1		(C) ATC, SRO (TS) SRO	N44 fails high, rods automatically step in.
2		(R) ATC (C) BOP, SRO	2FWS-P21B trips/ reduce power to 52%
3		(TS) SRO	Misaligned Rod
4		(M) ALL	2RCS*P21B locked rotor trip with Automatic Reactor trip failure and 400 gpm SBLOCA.
5		(C) BOP, SRO	Automatic turbine trip failure
6		(M) ALL	Loss of all auxiliary feed water, entry into FR-H.1
7		(C) BOP, SRO	Failure of 2FWS-P24, 2FWS-P21A and P21B (requires secondary depressurization and use of condensate pump.
8		(C) BOP, SRO	2HVS-FN204A and B trip, requires manual starting of at least 1 fan.
9			

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

The crew will assume the shift at 72% power with instructions to maintain steady state conditions.

N-44 will fail high causing the control rods to automatically insert. The crew will enter AOP 2.1.3, RCCA Control Bank Inappropriate Continuous Movement, verify no load rejection is occurring and then the ATC will place the control rods in Manual to stop rod insertion. The US will then enter AOP 2.2.1C, Power Range Channel Malfunction, to remove the channel from service and determine appropriate Tech Spec action.

Main Feedwater pump, 2FWS-P21B will then trip, the crew will enter AOP 2.24.1, Loss of Main Feedwater AOP, and begin an immediate power reduction to 52%. While the rods are inserting, 1 rod will experience a moveable gripper failure causing the rod to ratchet inward on each step demand. The crew will identify the misaligned rod and initiate boration for the remainder of the power reduction. After the plant has stabilized, the SRO will enter AOP 2.1.8, Rod Inoperability, and address Tech Spec's for the misaligned rod.

The "B" reactor coolant pump will then experience a locked rotor trip, the reactor will fail to automatically trip, the ATC will manually trip the reactor, a 400 gpm SBLOCA will occur on the Rx trip. The crew will enter E-0.

The turbine will fail to automatically trip, requiring the BOP to manually trip the turbine.

A loss of all aux feed water will then occur, the crew will recognize the loss and enter FR-H.1, Response to Loss of Secondary Heat Sink, to re-establish feedwater.

The crew will attempt to restore normal feedwater via the startup feedwater pump and the main feedwater pumps. Various failures will prevent each pump from starting. The crew will then depressurize the S/G's to establish feedwater flow from a condensate pump. When feedwater flow has been re-established, the SRO will return to E-0 and then transition to E-1.

The Ventilation fans, 2HVS-FN204A & B will trip on the reactor trip, the BOP will start at least 1 fan.

The scenario will be terminated after the crew transitions to ES-1.1.

Expected procedure flow path is E-0 → FR-H.1 → E-0 → E-1 → ES-1.1.

## BEAVER VALLEY POWER STATION

**INITIAL CONDITIONS:** 72% Power, CBD = 180, Equilibrium Xe, MOL, 1140 PPM Boron, IC-219

<b><u>ADDITIONAL LINEUP CHANGES</u></b>	<b><u>STICKERS</u></b>	<b><u>MONITOR SETUP</u></b>
	YCT - 2FWE*P23A CS	ATC position – HIGH POWER display
	YCT - 2SAS-C21B CS	
<b><u>EQUIPMENT STATUS</u></b>	<b><u>DATE/TIME OOS</u></b>	<b><u>TECHNICAL SPECIFICATION(S)</u></b>
2FWE*P23A OOS	4 hours ago	3.7.5 condition B
2SAS-C21B OOS	3 days ago	

### **SHIFT TURNOVER INFORMATION**

1. 72% power, MOL Equilibrium Xe, shift goal is to steady state conditions.

### **SCENARIO SUPPORT MATERIAL REQUIRED**

1. MOL Reactivity placard

### **PROCEDURES NEEDED**

AOP 2.1.3  
AOP 2.1.8  
AOP 2.2.1C  
AOP 2.24.1  
E-0  
E-1  
FR-H.1  
Attachment A-0.11  
Attachment A-1.10

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Initialize IC 219, and establish initial plant conditions.	Reactor plant at 72% power, MOL, Equilibrium Xe, RCS boron = 1140 PPM, CBD = 180 steps.	
Insert the following per the Simulator Setup section of the HTML File for this scenario: <b>PRELOAD COMMANDS</b> <b>TRGSET 1 'JPPLP4(1)'</b> <b>IMF RCS02B (1 0) 400 30</b> <b>IRF LOA-HIV055 (0 0) 1</b> <b>IMF PMP-CAS004 (0 0) 1</b> <b>IMF EHC08A (0 0)</b> <b>TRGSET 2 'OAFWT22 . 50'</b> <b>IFR LOA-AFW022 (2 0) 1</b> <b>IMF VLV-CFW027 (0 0) 0</b> <b>IMF PMP-AFW002 (1 15) 2</b> <b>TRGSET 5 'JP76OPT(2) == 1 .AND. FNISPR(1) &lt;= 62'</b> <b>IMF CRF03-F6 (5 0) 1</b> <b>IMF PPL01A (0 0) 0</b> <b>IMF PPL01B (0 0) 0</b> <b>IMF PPL10A (0 0) 0</b> <b>IMF PPL10B (0 0) 0</b> <b>IOR XC1I045T (0 0) OFF</b> <b>TRGSET 8 'OCFWP21B &gt;= 0.6 .AND. XC1I046T == 1'</b> <b>TRG 8 'IMF PMP-CFW005 (0 0) 2'</b> <b>IMF PMP-MSC036 (1 0) 1</b> <b>TRGSET 4 'XBSI071T == 1'</b> <b>TRG 4 'DMF PMP-MSC036'</b> <b>IMF PMP-MSC037 (1 0) 1</b> <b>TRGSET 6 'XBSI083T == 1'</b> <b>TRG 6 'DMF PMP-MSC037'</b>	Inserts all pre-loads required to support the scenario.  Set trigger 1 on reactor trip 400 gpm LOCA on Rx trip 2FWE*P23A breaker racked out 2SAS-C21B OOS Turbine fails to auto trip, manual successful Set trigger 2 on 2FWE*P22 start 2FWE*P22 trips during startup/sequencing Prevent 2FWS-P24 start, FR-H.1 conditions 2FWE*P23B trips 15 seconds after reactor trip  Trigger 5 on FWS-P21B trip and pwr < 62%  CBD rod F06 movable gripper coil failure Prevent AUTO Rx Trip TRN "A" Prevent AUTO Rx Trip TRN "B" Prevent AUTO MSLI TRN "A" Prevent AUTO MSLI TRN "B" 2FWS-P21A failure to start  Set trigger 8 on FWS-P21B start attempt.  2FWS-P21B, Trip after 2nd motor starts 2HVS*FN204A trips on Rx trip TRG 4 when 2HVS*FN204A CS taken to start 2HVS*FN204A starts 2HVS*FN204B trips on Rx trip TRG 6 when 2HVS*FN204B CS taken to start 2HVS*FN204B starts	

# 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
<b>EVENT 1:</b>  N-44 fails high <b>IMF NIS03D (0 0) 200 15</b>	Rods automatically step inward in response to N-44 failure.	ATC reports unexpected alarms and rod motion.
	Crew enters AOP 2.1.3 for Inappropriate Rod motion.	ATC verifies no load rejection in progress and places Rod control to manual to stop the rod insertion.
	SRO enters AOP 2.2.1C to address failed NI channel.	Crew removes N-44 from service.
		Within 1 hr, verifies P-8, P-9, & P-10 interlocks in required state for 72% power. Within 72 hrs, trips nuclear bistables by removing control power fuses from Drawer A for N44. ATC verifies Control rod group selector sw in manual. BOP verifies Bypass feedwater control valves in manual.  BOP turns Rod Stop Bypass switch for N44 on NIS Rack N50 to BYPASS. ATC verifies Status light for Overpwr Rod Stop Bypass for N44 is lit.  Crew verifies Rx power is > 50%. BOP determines all PR channel upper and lower detector inputs to QPTR are operable.  BOP turns "Comparator Channel Defeat Switch" on NIS rack N37/N46 to N44 position. ATC ensures VB recorders are selected to operable detectors.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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After removing Rod block, ATC withdraws control rods to restore Tavg.

SRO addresses TS for N-44 failure, determines TS 3.3.1, condition D is applicable.

Proceed with next event at LE discretion



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 2 & 3:**

2FWS-P21B trips/ Movable gripper failure on Rod F6 when < 62%.

**IMF PMP-CFW005 (0 0) 1**

**IMF CRF03-F6 (5 0) 1** (preloaded)

## **IMMEDIATE PLANT RESPONSE:**

Feed flows drop, S/G levels decrease, Main feed regulating valves open.

A6-9E, 10E, 11E S/G 21A(B)(C) Level

Deviation From Setpoint.

SRO enters AOP 2.24.1

Crew determines that 2FWS-P21B has tripped.

SRO directs an immediate power reduction to < 52%.

BOP depresses 1<sup>st</sup> STG IN PB then lowers turbine load at 5%/minute rate by,

- Adjusting “setter” to  $\leq 50\%$  power equivalent.
- Depressing “GO”

ATC inserts control rods and initiates emergency boration for an expected 20% power reduction by opening 2CHS\*MOV350 and starting the “A” Boric Acid pump.

BOP verifies all available pumps are running, Starts 2CNM-P21A.

When < 62% power, rod F6 will start to “ratchet” in on each rod step.

ATC identifies rod misalignment, stops inserting control rods and continues boration.

BOP verifies steam flow is less than available feed flow and that S/G levels are trending to 44%.

After plant is stable and S/G levels are recovering, SRO enters AOP 2.1.8 to address the misaligned rod.

SRO identifies TS 3.1.4, Condition B, as applicable for the misaligned rod.  
SRO identifies TS 3.4.1 for DNB.

Continue with next event at LE discretion

BVPS – 2L8 NRC Scenario 2, Rev AG

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 4, 5, 6, 7 & 8:**

2RCS-P21B locked rotor with an automatic reactor trip failure, turbine trip failure and 400 gpm SBLOCA.

### **IMF RCP05B (0 0)**

**CRITICAL TASK – E-0.A: Crew manually trips the reactor from the Control Room before performing the mitigation strategy of FR-S.1.**

#### **Basis for Selection:**

SAFETY SIGNIFICANCE -- Failure to manually trip the reactor causes a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an "incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy and demonstrates the inability by the crew to recognize a failure of the automatic actuation of the RPS."

## **IMMEDIATE PLANT RESPONSE:**

A5-2G, 1/3 Reactor Coolant Pump Loop Flow  
Low Reactor Trip

SRO enters E-0.

Automatic reactor trip failure.

ATC reports 2RCS-P21B has tripped and 1<sup>st</sup> out annunciator is in without an automatic reactor trip.

SRO directs ATC to manually trip the reactor

ATC and BOP commence IOA's of E-0.

ATC verifies Reactor trip after manually tripping reactor from either BB-B or BB-A

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

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 4, 5, 6, 7 &amp; 8:</u></b> (continued)</p> <p><b><u>Critical Task: E-0.Q</u></b>  <b>Crew manually trips the main turbine before a Severe (orange path) challenge develops to either the Sub-criticality or the Integrity CSF or before transition to ECA-2.1, whichever occurs first.</b></p> <p><b>Basis for Selection:</b>            SAFETY SIGNIFICANCE -- Failure to trip the main turbine under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Additionally, such an omission constitutes a demonstrated inability by the crew to "take an action...that would prevent a challenge to plant safety."</p>	<p>Automatic turbine trip failure.</p>	<p>BOP verifies Turbine trip did NOT occur</p> <ul style="list-style-type: none"> <li>• Throttle OR Governor valves NOT closed.</li> <li>• Main Generator output brks – Not open.</li> <li>• Exciter Circuit breaker – not open.</li> </ul> <p>BOP manually trips the turbine, then verifies;</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 either AE or DF has voltage indicated.</li> </ul> <p>BOP identifies that both AE and DF busses are energized from offsite power.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 4, 5, 6, 7 &amp; 8:</u></b> (continued)</p> <p><b>NOTE:</b> SI will be required due to 400 gpm SBLOCA, depending on timing, if SI has not actuated, the crew may initially enter ES-0.1 or may preemptively actuate SI at this time.</p>	<p>SI automatically actuated</p>	<p>Check SI Status</p> <p>Crew checks if SI is required</p> <ul style="list-style-type: none"> <li>• ATC checks Cnmt press &gt; 5psig</li> <li>• ATC checks PRZR press &lt; 1860 psig</li> <li>• ATC or BOP checks Steamline pressure &lt; 500 psig</li> </ul> <p>Crew determines SI is Required; ATC manually actuates SI by turning both trains' control switches.</p> <p>ATC/BOP, Sounds Standby Alarm, announces reactor trip and safety injection.</p> <p>BOP verifies neither leak collection filtered exhaust fan, 2HVS-FN204A nor B are running.</p> <p>BOP starts at least 1 leak collection filtered exhaust fan.</p> <p>ATC verifies SI System Status</p> <ul style="list-style-type: none"> <li>• Both 2CHS*P21A and P21B pumps running.</li> <li>• HHSI Flow indicated,</li> <li>• Both LHSI pumps running</li> </ul>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 4, 5, 6, 7 & 8: (continued)

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

### 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.

BOP verifies AFW System status

- Motor-driven AFW Pumps – NONE RUNNING
- Turb driven AFW Pump Stm Supply Isol Valves – OPEN but turbine is tripped.
- AFW Throttle Vlvs – FULL OPEN
- Total AFW Flow – < 340 GPM

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

ATC checks if secondary heat sink is required by:

- Verifying RCS press is > any non-faulted S/G.
- RCS Hot leg temperatures > 350°F.

Crew checks if RCS Bleed and Feed should be initiated.

- BOP verifies Wide Range level in at least 2 S/G's is > 14%.
- ATC verifies Pzr pressure is < 2330 psig.

SRO notifies crew that this is a continuous action step.

BOP checks Primary Plant Demineralized Water storage tank level is > 85 inches.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 4, 5, 6, 7 &amp; 8:</u></b> (continued)</p> <p><b>ROLE PLAY:</b>            When directed to investigate AFW pump status locally, wait 3 minutes then report:            2FWE*P23B is not running, nothing obvious wrong at pump.            2FWE*P22 is not running due to the trip throttle valve linkage rod being broken.            If dispatched to DF switchgear, wait 2 minutes then report that overcurrent relay 51-VF218 is tripped on ACB 2F18 for 2FWE*P23B.</p>		<p>Crew tries to establish AFW flow to at least 1 S/G.</p> <p>ATC/BOP verifies S/G Blowdown and blowdown sample lines are isolated.</p> <p>Crew confirms</p> <ul style="list-style-type: none"> <li>• “A” motor-driven pump is OOS</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.</p> <p>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. (“A” &amp; “C” RCP’s, “B” previously tripped.)</p> <p>BOP verifies all 3 condensate pumps are running.</p> <p>ATC verifies CNMT FWI valves are closed.            SRO directs crew to reset SI and FWI signals.            ATC/BOP resets;</p> <ul style="list-style-type: none"> <li>• SI signal – both trains</li> <li>• FWI signal – both trains.</li> </ul> <p>ATC/BOP opens all Feedwater CMNT isol valves, 2FWS*HYV157A, B, C.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 4, 5, 6, 7 &amp; 8:</u></b> (continued)	2FWS-P24 will not start due to failure of recirculation valve, 2FWR-FCV155 to open.	<p>BOP attempts to start the S/G Startup Feed pump by;</p> <ul style="list-style-type: none"> <li>• Verifying 2CNM-DCV100 is open</li> <li>• Placing CS for 2FWS-P24 to start and hold until 2FWR-FCV155 opens.</li> </ul>
<p><b>NOTE:</b>            2FWS-P21A will not start.            Crew may not attempt to start 2FWS-P21B since it had previously tripped, if the crew does attempt a start – it will trip immediately upon 2<sup>nd</sup> motor start.</p>		<p>BOP recognizes failure of 2FWR-FCV155 to open which prevents 2FWS-P24 from starting.</p> <p>BOP attempts to start a main feed pump.</p> <p>2FWS-P21A start attempt – unsuccessful</p> <p>2FWS-P21B starts but immediately trips.</p> <p>ATC depressurizes the RCS to &lt; 1950 psig by manually opening 1 PZR PORV.</p> <p>ATC closes PORV when pressure reduces to &lt; 1950 psig.</p> <p>If possible, ATC restores normal charging by;</p> <ul style="list-style-type: none"> <li>• Opening 2CHS*MOV310</li> <li>• Opening 2CHS*MOV289</li> <li>• Adjusting 2CHS*FCV122 to maintain PZR level.</li> </ul> <p>ATC blocks Low Steamline Pressure SI and Low Pressurizer Pressure SI signals.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 4, 5, 6, 7 & 8:** (continued)

**ROLE PLAY:** when dispatched with Attach A-1.10, wait 2 minutes then call in that you are in position at MCC to de-energize valves at his direction IAW Attach A-1.10. Report back verification of local valves as necessary.

Booth instructor NOTE:  
As directed, de-energize 2FWS-MOV150A/B.

**IMF VLV-CFW043 (0 0) 0**

**IMF VLV-CFW044 (0 0) 0**

### **Critical Task: FR-H.1.A**

**Crew establishes feedwater flow into at least one S/G before RCS feed and bleed is required.**

#### **Basis for Selection:**

SAFETY SIGNIFICANCE -- Failure to establish feedwater flow to any S/G 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."

BOP depressurizes at least 1 S/G to < 440 psig to establish condensate flow by;

- Verifying at least 1 MSIV is open.
- Verifying the condenser is available.
- Placing the condenser steam dumps in Stm Press mode.
- Gradually raising steam dump rate so as to NOT cause a high rate MSLI.
- When Tavg approaches/less than 541°F, defeats Tavg interlock.

Using Attachment A-1.10, Crew coordinates with a field operator to open and de-energize at least 1 main feed pump discharge valve.

BOP begins feeding S/G's by opening the Bypass Feed regulating valves and verifies that either

- Core Exit TC's are dropping
- OR
- S/G Wide Range levels are rising.

BOP verifies CETC are dropping and WR S/G levels are rising.



# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 4, 5, 6, 7 & 8: (continued)

### NOTE:

Evaluation of BOP performing  
Attachment A-0.11 begins on page 21.

SRO returns to E-0, Step 8 IAW FR-H-1, step 11.b.

### List of Attachment A-0.11 Discrepancies:

Discrepancies: NONE

RCS temperature < 547°F and dropping due to  
Safety Injection flow and Feedwater  
(condensate) flow.

CIB not actuated at this time.

Feedwater flow now verified.

SRO directs BOP to perform Attachment A-0.11.

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

- ATC verifies no steam release is occurring.  
(Condenser steam dumps closed)
- ATC verifies Reheat steam is isolated.
- ATC reduces total feedflow to minimize C/D.

Crew determines cooldown is continuing and verifies  
SLI has previously occurred.

ATC checks recirc spray pumps – NONE RUNNING

ATC verifies PRZR isolated

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

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 4, 5, 6, 7 & 8: (continued)

ATC checks if RCPs should be stopped.

- D/P between RCS pressure and highest S/G pressure – < 205 PSID

RCP's previously stopped in FR-H.1

ATC/BOP checks if any S/Gs are faulted.

- Pressures in all S/Gs – ANY DROPPING IN AN UNCONTROLLED MANNER  
OR
- ANY S/G COMPLETELY DEPRESSURIZED

Crew determines no S/G's are faulted.

Crew checks if S/G tubes are intact.

- Check all S/G levels – NONE RISING IN AN UNCONTROLLED MANNER
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES

Determines no S/G levels are rising in an uncontrolled manner and Secondary Radiation – is CONSISTENT WITH PRE-EVENT VALUES;

Crew determines S/G Tubes ARE INTACT.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
--------------------------	------------------------------------	---------------------------

## EVENTS 4, 5, 6, 7 & 8: (continued)

SRO transitions to E-1.

Crew checks if RCS is Intact by checking CNMT conditions consistent with pre-event values.

- CNMT radiation
- CNMT pressure
- CNMT sump level

Crew determines the RCS is NOT intact based on CNMT conditions and entry conditions for E-1 have been met.

ATC checks if CREVS should be actuated:

Checks EITHER of the following:

- Control Room Radiation Monitor  
2RMC\*RQ201,202 - NOT IN HIGH ALARM
- CIB - HAS NOT OCCURRED

Crew reports CREV's required and previously actuated.

ATC checks if RCPs should be stopped

- D/P between RCS pressure and highest S/G pressure – LESS THAN 205 PSID [220 PSID ADVERSE CNMT]
- DP Criteria for stopping RCPs is not met –

RCP's previously shutdown due per FR-H.1.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## EVENTS 4, 5, 6, 7 & 8: (continued)

ATC/BOP checks if any S/Gs are faulted

- Pressures in all S/Gs – ANY DROPPING IN AN UNCONTROLLED MANNER  
OR
- ANY S/G COMPLETELY DEPRESSURIZED

No S/G's are faulted.

BOP Checks Intact S/G Levels

- Narrow range levels - GREATER THAN 12% [31% ADVERSE CNMT]

Controls feed flow to maintain narrow range level between 12% [31% ADVERSE CNMT] and 50%.

Crew checks if S/G tubes are intact

- Check all S/G levels – NONE RISING IN AN UNCONTROLLED MANNER
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES

Crew determines no S/G levels are rising in an uncontrolled manner and Secondary Radiation is consistent with pre-event values, therefore all S/G tubes are intact.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
--------------------------	------------------------------------	---------------------------

## EVENTS 4, 5, 6, 7 & 8: (continued)

### **NOTE:**

Due to timing, procedure progression and plant conditions (Adverse cnmt or not adverse), it is possible that the conditions may support direct transition to ES-1.1 at this time.

Terminate scenario when the crew evaluates transition criteria and determines if transition to ES-1.1 is appropriate.

Classify Event:

**SAE, Site Area Emergency** is appropriate classification per the Fission Product Matrix; Tabs 1.1.1 and 1.2.1 – Potential Loss – Heat Sink Red Path.

SRO evaluates if transition to ES-1.1, SI Termination is appropriate.

ATC checks PORV's and block valves.

- Power to block valves – AVAILABLE
- PORVs – CLOSED
- Block valves – AT LEAST ONE OPEN

Crew checks if SI Flow should be Reduced

ATC verifies RCS Subcooling is greater than 41°F based on CETC's

BOP confirms secondary heat sink available by >370 gpm of feed flow available OR NR level in at least 1 S/G > 12%.

ATC confirms RCS pressure is stable or rising.

ATC confirms Pzr level is > 17%

Crew determines that current plant conditions support SI reduction.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> 'Verification of Automatic Actions' performed as time &amp; manpower permit</p> <p>Ensure Reheat Steam Isolation</p> <p><b>NOTE:</b> BOP may have already pre-emptively opened 2CCS-AOV118 to provide cooling to the Station Air compressors.</p>		<p>BOP performs <b>Attachment A-0.11</b>, 'Verification of Automatic Actions' as follows:</p> <p>Checks both EDGs running</p> <p>Ensure reheat steam isolation</p> <ul style="list-style-type: none"> <li>• Verify 2MSS-MOV100A and B - CLOSED</li> <li>• Reset reheater controller.</li> </ul> <p>Check If main steamline isolation required</p> <ul style="list-style-type: none"> <li>• CNMT pressure - &gt; 7 PSIG -OR-</li> <li>• Steamline pressure - &lt; 500 PSIG -OR-</li> <li>• Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS</li> </ul> <p>If steamline isolation IS required, Verifies SLI by checking all YELLOW SLI marks - LIT</p> <p>If steamline isolation is NOT required continues on.</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>

# BEAVER VALLEY POWER STATION

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

Align Neutron Flux Monitoring For Shutdown

- Transfer 2NME-NR45 Nuclear Recorder to operable source and intermediate range displays.

Check CIB And CNMT Spray Status.

- Containment pressure - HAS REMAINED LESS THAN 11 PSIG

If not – Actuate CIB if required by:

- Manually initiate CIB – BOTH SWITCHES FOR BOTH TRAINS
- Manually align equipment as required
- Verify all RCPs – STOPPED
- BV-1 operator verifies CREVS actuation
- Service water 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

Verify both CNMT hydrogen analyzers running by 2HCS\*SOV100A1, B1 – CNMT Sample amber lights – LIT.

# BEAVER VALLEY POWER STATION

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

Verify ESF Equipment Status

- Verify SI status by checking all RED SIS marks – LIT
- Verify CIA by checking all ORANGE CIA marks - LIT
- Verify FWI by checking all GREEN FWI marks – LIT

Verify Power To Both AC Emergency Busses

Restore power as required

**Attachment A-0.11** – COMPLETE

Discrepancies:

NONE

Upon Completion, Report Any Discrepancies to SRO.



**Appendix D****Scenario Outline****Form ES-D-1**Facility: **BVPS Unit 2**

Scenario No.:4

Op Test No.: 2LOT8 NRC

Examiners: \_\_\_\_\_

Candidates: \_\_\_\_\_

SRO

ATC

BOP

Initial  
Conditions:

IC 214(18): 100% power, MOL, Eq Xe, CB "D" @ 225 steps, RCS boron – 1044 ppm.

Turnover:

Maintain steady state power at 100%, 2FWE\*P23A OOS, 2SAS-C21B OOS

Critical Tasks:**1. E-0.O Close CNMT isolation valves****2. E-1.C Stop RCP's****3. FR-S.1.C Insert RCCA's**

Event No.	Malf. No.	Event Type	Event Description
1		(I) ATC, SRO (TS) SRO	2RCS*LT459 fails low.
2		(N) ATC, SRO	Restore letdown to service
3		(R) ATC (I) ATC, SRO	Valve position limiter failure causes load rejection with Auto rod malfunction, ATC required to insert negative reactivity.
4		(C) BOP, SRO	During load rejection, "A" Main Feed Regulating Valve controller holds valve in position, BOP required to manually control "A" S/G level.
5		(C) ATC, SRO (TS) SRO	2RCS*PT445 fails high, 2 PORV's open, 2RCS*PCV456 fails to 18% open with Block valve failed open, requiring crew to manually trip the reactor.
6		(M) ALL	ATWS, crew enters FR-S.1.
7		(M) ALL	2000 gpm SBLOCA on return to E-0.
8		(C) BOP, SRO	Train B CIA failure with 2CHS*MOV378 failing to auto close
9			

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

The crew will assume the shift at 100% power with instructions to maintain steady state conditions.

The controlling PZR level channel, 2RCS\*LT459 will fail low causing letdown to automatically isolate. The crew will enter the Instrument failure procedure to address the failed channel and place the alternate channel in service. The US will determine appropriate Tech Spec action.

After the alternate channel is placed in service, the crew will restore normal letdown to service.

When letdown has been restored, the valve position limiter will fail causing a load rejection with an Auto Rod malfunction requiring the ATC to manually insert control rods.

During the load rejection, the "A" Main feed regulating valve will fail to control in auto (the valve will remain in its 100% power position), The BOP will be required to recognize the malfunction and manually control the "A" S/G level.

Once the plant has stabilized, a RCS control pressure transmitter, 2RCS\*PT445 will fail high, causing 2 PORV's to open, 2RCS\*PCV456 will stick at 18% open, with the block valve failing to close. The SRO will address PORV Tech Spec. RCS pressure will continue to slowly decrease requiring the SRO to direct the crew to manually trip the reactor and enter E-0.

The reactor will fail to trip from the control room, the SRO will transition to FR-S.1 and the crew will dispatch an operator to locally trip the Rx. After the reactor is locally tripped, the crew will return to E-0.

1 minute after the reactor is locally tripped, a 2000 gpm LOCA will occur on the "A" loop, the crew will transition to E-1. The crew will be required to recognize that RCS / Secondary pressure DP requirements are met to require that the RCP's be manually tripped.

Train "B" CIA will fail to actuate along with 2CHS\*MOV378 failing to auto close on the Train "A" CIA signal.

The scenario will be terminated after the crew transitions to ES-1.2.

Expected procedure flow path is E-0 → FR-S.1 → E-0 → E-1 → ES-1.2.

## BEAVER VALLEY POWER STATION

**INITIAL CONDITIONS:** IC 214(18): 100% power, MOL, Eq Xe, CB “D” @ 225 steps, RCS boron – 1044 ppm.

<b><u>ADDITIONAL LINEUP CHANGES</u></b>	<b><u>STICKERS</u></b>	<b><u>MONITOR SETUP</u></b>
	YCT - 2FWE*P23A CS	ATC position – 100% POWER display
	YCT - 2SAS-C21B CS	
<b><u>EQUIPMENT STATUS</u></b>	<b><u>DATE/TIME OOS</u></b>	<b><u>TECHNICAL SPECIFICATION(S)</u></b>
2FWE*P23A OOS, motor bearing replacement.	4 hours ago	3.7.5 condition B
2SAS-C21B OOS, compressor overhaul.	3 days ago	

### **SHIFT TURNOVER INFORMATION**

1. 100% power, MOL, Equilibrium Xe, shift goal is to maintain steady state conditions.

### **SCENARIO SUPPORT MATERIAL REQUIRED**

1. MOL Reactivity placard

### **PROCEDURES NEEDED**

2OM-6.4.IF, attachment 1  
2OM-7.4.AB  
AOP 2.1.3  
AOP 2.35.2  
2OM-6.4.IF, attachment 2  
E-0  
FR-S.1  
E-1  
Attachment A-0.6  
Attachment A-0.11

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Initialize IC 214, and establish initial plant conditions.	Reactor plant at 100% power, MOL, Equilibrium Xe, RCS boron =1044 PPM, ARO.	
Insert the following per the Simulator Setup section of the HTML File for this scenario:	Inserts all pre-loads required to support the scenario	
<b>PRELOAD COMMANDS</b>		
IMF PPL01A (0 0) 1	Train A RTB failed closed	
IMF PPL01B (0 0) 1	Train B RTB failed closed	
IMF PPL08B (0 0) 0	Train B auto CIA actuation failure	
TRGSET 1 'XA4I106C'	Set trigger 1 on 2CHS*MOV378 switch to close	
IMF VLV-SEA015 (0 0) 1	2CHS*MOV378 failed open	
TRG 1 'DMF VLV-SEA015'	2CHS*MOV378 closes manually	
TRGSET 10 'JMLEHC6'	Trigger 10 = VPL failure	
TRG 10 'SET JWSF478_AUTO=TRUE'	2FWS*FCV478 controller failed as is in auto	
IMF CNH-CFW10C (10 45) 15 0 0	2FWS*FCV478 controller oscillation during load rejection.	
IMF PPL02A (8 120) 1	Train A trip BKR open	
IMF PPL02B (8 125) 1	Train B trip BKR open	
IRF LOA-CRF007 (8 140) 1	Trip A rod drive MG set	
IRF LOA-CRF008 (8 145) 1	Trip B rod drive MG set	
TRGSET 6 'RRCH456 > 0.0'	Set trigger 6 for PORV 456 position > 0	
IMF VLV-RCS034A (6 0) 18 0 0	2RCS*PCV456 PRZR PORV fails to 18% open	
TRGSET 7 'MCRFNS(41) <= 214'	Set trigger 7 for Rods < 214 steps	
IMF CRF01A (7 0) 1	Inhibit Auto Rod insertion	
IMF VLV-RCS012 (0 0) 1	2RCS*MOV536 failed open	
IMF RCS02A (8 180) 2000 30	2000 gpm loop A LOCA 1 min after Rx tripped	

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
--------------------------	------------------------------------	---------------------------

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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## **EVENTS 1 & 2:**

Pressurizer level transmitter  
2RCS\*LT459 fails low.

**IMF XMT-RCS019A (0 0) 0 4**

### **IMMEDIATE PLANT RESPONSE:**

#### **ALARMS:**

A4-1B, PZR Control Lvl High/Low,  
A4-1C, PZR Control Lvl Dev High/Low,  
A4-1G, PZR Control Htr Group Trouble,  
A4-2G, PZR B/U Htr Group Auto On/Off,  
A2-3E, Charging Flowpath Trouble.  
2RCS-LI459 indicates downscale.  
2CHS\*FCV122 opens to increase flow.  
Letdown isolates, 2CHS\*LCV460B and 2CHS-  
AOV200A & B close.  
All PZR heaters de-energize.

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

ATC reports multiple unexpected pressurizer alarms.  
ATC identifies 2RCS\*LT459 failed low and places  
2CHS\*FCV122 in manual to control PZR level.

SRO provides a control band and Rx trip criteria of  
14% low/85% high for manual PZR level control.

BOP begins referring to ARP's.

ATC places PZR level control channel selector to  
position II & III.

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

ATC verifies there is adequate makeup to the VCT.

ATC verifies PZR 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
--------------------------	------------------------------------	---------------------------

**EVENTS 1 & 2:** (continued)

SRO directs ATC to restore letdown IAW 2OM-7.4.AB.

ATC restores L/D flow.

SRO references Technical Specifications:  
3.3.1 (RTS Instrumentation) Condition A;  
immediately enter the Condition referenced in Table  
3.3.1-1 function 9 (PZR 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 POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **EVENTS 3 & 4:**

Turbine Runback due to Valve Position limiter failure, "A" main feed reg valve auto controller holds valve in position, Control rods step in until 214 steps then quit moving in Auto.

**IMF EHC06 (0 0) 79 0 ASIS**

### **IMMEDIATE PLANT RESPONSE:**

Rods begin stepping in,  
Megawatts decrease,  
RCS temperature and pressure rise accordingly.  
Rods stop moving at 214 steps.  
As power reduces "A" S/G level increases.

SRO enters AOP 2.35.2

IAW Immediate Operator Action of AOP 2.1.3, ATC announces unexpected rod motion, verifies megawatts decreasing and announces load rejection.

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.

BOP recognizes "A" S/G level is rising, takes manual control of "A" main feed reg valve and reduces flow to control level at 44%.

SRO provides a control band and Rx trip criteria of 25% low/85% high for manual S/G level control.

SRO contacts Operations management and notifies I&C of 2FWS\*FCV498 controller auto control failure with satisfactory manual control.

Continue with next event at LE discretion



# BEAVER VALLEY POWER STATION

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

2RCS\*PT445 fails high, 2 PORV's open, 2RCS\*PCV456 fails to 18% open with Block valve failed open, requiring crew to manually trip the reactor.

**IMF XMT-RCS031A (0 0) 2500 20**

## **NOTE:**

Due to dynamic nature of event, a followup question regarding applicable TS may be necessary.

## **IMMEDIATE PLANT RESPONSE:**

2 PORV's initially open, 456 sticks at 18% open, Other PORV will automatically close when pressure reduces to 2185 psig. RCS pressure continues to decrease.

ATC reports multiple unexpected pressurizer alarms. ATC identifies 2RCS\*PT445 has failed high and that 2 PORV's have opened. ATC reports that PORV, 2RCS\*PCV456 failed to automatically close on low pressure. ATC attempts to close 2RCS\*PCV456, PORV remains at dual position. ATC attempts to close block valve, 2RCS\*MOV536. ATC reports 2RCS\*MOV536 will not close.

SRO recognizes TS applicability for an inoperable PORV and Block valve. TS 3.4.11, Conditions B and C.

Crew determines failure will not support normal plant operations. SRO directs crew to manually trip and perform IOA's for E-0.

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

### **ATWS**

2000 gpm SBLOCA when Rx is tripped  
Train "B" CIA actuation failure with failure of 2CHS\*MOV378 to auto close.  
(all commands preloaded)

SRO enters E-0

ATC attempts a manual reactor trip, reports trip failure/ ATWS condition.

SRO enters FR-S.1

SRO directs operators to perform IOA's of FR-S.1, implements FR-S.1 at step 1 of E-0.

# BEAVER VALLEY POWER STATION

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

**Critical Task FR-S.1.C:**

**Crew inserts negative reactivity into the core by inserting RCCAs before completing the immediate action steps of FR-S.1.**

Crew performs IOA's of FR-S.1.  
BOP manually trips Turbine.

ATC manually begins inserting rods.

**Basis for Selection:**

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)."

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>EVENTS 6, 7, &amp; 8 (continued)</b></p> <p><b>NOTE:</b> Dependent upon crew response, SI may not be actuated at this time, if so the crew will initiate Emergency Boration flow by:</p> <ul style="list-style-type: none"> <li>Opening 2CHS*MOV350</li> <li>Starting "A" Boric Acid pump</li> <li>Verifying &gt; 30 GPM flow</li> <li>Adjusting 2CHS*FCV122 to establish &gt; 40 GPM flow.</li> </ul>		<p>BOP verifies AFW status. BOP manually starts 2FWE*P23B motor-driven AFW pump.</p> <p>BOP manually opens 2MSS*SOV105A-F to start Turbine-driven AFW pump, 2FWE*P22.</p> <p>BOP verifies all AFW throttle valves are open.</p> <p>BOP verifies AFW flow.</p> <p>Crew initiates Emergency Boration Flow by;</p> <p>Verifying at least 1 charging pump is running Checking Safety Injection is actuated and recognizes Emergency boration is not required due to SI flow. BOP verifies HHSI flow</p> <p>ATC verifies RCS pressure is &lt; 2330 psig.</p>

# BEAVER VALLEY POWER 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! 8

Following commands are preloaded, activate Trigger 2 as soon as requested, 1<sup>st</sup> Rx trip breaker will open 2 minutes after actuating Trigger 8. **(TRG! 8)**

**IMF PPL02A (8 120)**

**IMF PPL02B (8 125)**

**IRF LOA-CRF007 (8 140) 1**

**IRF LOA-CRF008 (8 145) 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, B automatically CLOSED.  
BOP depresses the RESET Pushbutton on the Reheater Controller.

ATC checks if SI is actuated.  
SI is actuated, first nine steps of E-0 have not been completed.

# 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.

### NOTE:

Event 7, 2000 gpm SBLOCA will occur 1 minute after the Rx is locally tripped. (command preloaded)

When the Rx is locally tripped.  
SRO returns to E-0, step 1.

ATC checks if Rx is subcritical:

- Power range channels < 5%.
- IR channels – negative startup rate.

ATC verifies Reactor trip:

- Rx trip and bypass breakers open.
- 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 either AE or DF has voltage indicated.

BOP identifies that both emergency busses are energized from off-site power.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
EVENTS 6, 7, & 8 (continued)	SI automatically actuated due to low pressurizer pressure from stuck open PORV.	<p>Check SI Status:</p> <ul style="list-style-type: none"> <li>• ATC checks that SI is actuated.</li> <li>• ATC manually actuates SI by turning both trains Control Switches.</li> </ul> <p>ATC/BOP, Sounds Standby Alarm, announces Unit 2 reactor trip and safety injection.</p> <p>BOP checks 2HVS*FN204A(B), Leak Collection Filtered Exhaust Fan – at least ONE RUNNING.</p> <p>ATC verifies SI System Status:</p> <ul style="list-style-type: none"> <li>• Both 2CHS*P21A and P21B pumps running.</li> <li>• HHSI Flow indicated.</li> <li>• Both LHSI pumps running.</li> </ul> <p>BOP verifies AFW System status:</p> <ul style="list-style-type: none"> <li>• Motor-driven AFW Pumps – “B” pump RUNNING.</li> <li>• Turb driven AFW Pump Stm Supply Isol Valves – OPEN.</li> <li>• AFW Throttle Vlvs – FULL OPEN.</li> <li>• Total AFW Flow – &gt; 340 GPM.</li> </ul>

# 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> Evaluation of BOP performing Attachment A-0.11 begins on page 21.</p>	<p>SRO directs BOP to perform Attachment A-0.11.</p> <p><u>List of Attachment A-0.11 Discrepancies:</u></p> <p>Discrepancies: “B” Train CIA failed to actuate along with failure of 2CHS*MOV378 failing to automatically close. Manual actuation successful.</p> <p>RCS temperature &lt; 547°F and dropping due to Safety Injection flow.</p> <p>CIB not actuated at this time.</p> <p>SRO transitions to E-1</p>	<p>ATC checks RCS Tavg stable at or trending to 547°F:</p> <ul style="list-style-type: none"> <li>• ATC verifies no steam release is occurring. (Condenser steam dumps closed)</li> <li>• ATC verifies Reheat steam is isolated.</li> <li>• ATC reduces total feedflow to minimize C/D.</li> </ul> <p>ATC checks recirc spray pumps – NONE RUNNING.</p> <p>ATC verifies PZR isolated:</p> <ul style="list-style-type: none"> <li>• PORVs – CLOSED</li> </ul> <p>ATC reports PORV 2RCS*PCV456 won’t close and block valve 2RCS*MOV536 also has failed to close.</p> <p>ATC checks if CREVS should be actuated.</p> <p>Checks EITHER of the following:</p> <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> <p>Crew reports CREV’s is NOT required.</p>

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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# BEAVER VALLEY POWER STATION

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

BOP Checks Intact S/G Levels.

- Narrow range levels - > 12% [31% ADVERSE CNMT]

Controls feed flow to maintain narrow range level between 12% [31% ADVERSE CNMT] and 50%.

Crew checks if S/G tubes are intact:

- Check all S/G levels – NONE RISING IN AN UNCONTROLLED MANNER.
- Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES.

Crew determines no S/G levels are rising in an uncontrolled manner and Secondary Radiation is consistent with pre-event values, therefore all S/G tubes are intact.

ATC checks PORV's and block valves.

- Power to block valves – AVAILABLE.
- PORVs – CLOSED, PORV 456 previously identified as not being closed with failure of block valve to close also.
- Block valves – AT LEAST ONE OPEN, ALL open.

# BEAVER VALLEY POWER STATION

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

Crew checks if SI Flow should be Reduced.

ATC verifies RCS Subcooling is NOT > 41°F [59°F ADVERSE CNMT] based on CETC's

Crew verifies subcooling is NOT greater than Attachment A-5.1.

Crew determines that current plant conditions do not support SI reduction and continues with next procedure step.

Check if CNMT spray should be stopped.

ATC verifies no Quench or Recirc Spray pumps are running.

ATC resets SI – both trains.  
ATC resets CIA – both trains.

ATC checks if LHSI pumps should be stopped.

ATC verifies RCS pressure is > 225 psig [250 psig ADVERSE CNMT] and NOT stable or rising.

ATC leaves both LHSI pumps running.

**NOTE:**

Due to timing, procedure progression and plant conditions, it is possible that the conditions may support shutdown of the LHSI pumps at this time.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b>EVENTS 6, 7, &amp; 8 (continued)</b>		Check RCS and S/G Pressures.
		BOP checks pressure in all S/G, NOT stable or rising.
		ATC checks RCS pressure is dropping.
		SRO determines S/G pressure dropping is NOT due to a faulted S/G and continues with procedure based upon preceding note.
		BOP verifies AC Emergency busses are energized by offsite power.
		SRO directs BOP to stop unloaded EDG's IAW 2OM-36.4.AF(AG) as time permits.
		BOP performs Attachment A-0.6 to verify power available to at least 1 train of Cold Leg Recirculation equipment.
		BOP reports Attachment A-0.6 completed SAT with no discrepancies.
		Crew evaluates Radiation monitors, determines Auxiliary building and Safeguards radiation is consistent with pre-event values.
		SRO determines TSC is not activated.
		SRO directs ATC to monitor nuclear instrumentation to ensure adequate Shutdown Margin.

# BEAVER VALLEY POWER STATION

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

Start additional Plant Equipment to assist in Recovery;

SRO directs a field operator to perform Attach. A-1.1

Check if RCS cooldown and depressurization is required.

ATC checks RCS pressure > 225 psig [250 psig ADVERSE CNMT].

SRO determines plant conditions support transition to ES-1.2.

SRO transitions to ES-1.2

Terminate scenario when the crew transitions to ES-1.2.

## **Classify Event:**

**SAE, SITE AREA EMERGENCY**  
due to Tab 2.3, Failure of Reactor Protection.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> ‘Verification of Automatic Actions’ performed as time &amp; manpower permit.</p> <p>Ensure Reheat Steam Isolation.</p> <p><b>NOTE:</b> BOP may have already pre-emptively opened 2CCS-AOV118 to provide cooling to the Station Air compressors.</p>		<p>BOP performs <b>Attachment A-0.11</b>, ‘Verification of Automatic Actions’ as follows:</p> <p>Checks both EDGs running.</p> <p>Ensure reheat steam isolation:</p> <ul style="list-style-type: none"> <li>• Verify 2MSS-MOV100A and B – CLOSED.</li> <li>• Reset reheater controller.</li> </ul> <p>Check If main steamline isolation required</p> <ul style="list-style-type: none"> <li>• CNMT pressure - &gt; 7 PSIG. -OR-</li> <li>• Steamline pressure - &lt; 500 PSIG. -OR-</li> <li>• Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS.</li> </ul> <p>If steamline isolation IS required, Verifies SLI by checking all YELLOW SLI marks – LIT.</p> <p>If steamline isolation is NOT required continues on.</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>

# BEAVER VALLEY POWER STATION

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

Align Neutron Flux Monitoring For Shutdown

- Transfer 2NME-NR45 Nuclear Recorder to operable source and intermediate range displays.

Check CIB And CNMT Spray Status:

- CNMT press - HAS REMAINED < 11 PSIG.

If not – Actuate CIB as required by:

- Manually initiate CIB – BOTH SWITCHES FOR BOTH TRAINS.
- Manually align equipment as required.
- Verify all RCPs – STOPPED.
- BV-1 operator verifies CREVS actuation.
- Service water 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.

Verify both CNMT hydrogen analyzers running by 2HCS\*SOV100A1, B – CNMT Sample amber lights – LIT.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11 – (continued)</b></p> <p><b><u>Critical Task E-0.O</u></b></p> <p><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.</b></p> <p><b>Basis for Selection:</b> SAFETY SIGNIFICANCE -- Failure to close at least one containment isolation valve on each critical phase-A penetration, under the postulated plant conditions and when it is possible to do so, constitutes "mis-operation or incorrect crew performance which leads to degradation of any barrier to fission product release." In this case, the containment barrier is needlessly left in a degraded condition.</p>	<p>“B” Train CIA failed to actuate, 2CHS*MOV378 failed to auto close. Manual actuations successful.</p> <p>Discrepancies: “B” Train CIA failed to actuate, 2CHS*MOV378 failed to auto close. Manual actuations successful.</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 Power To Both AC Emergency Busses Restore power as required.</p> <p>Upon Completion, Report Any Discrepancies to SRO.</p>
<p><b>Attachment A-0.11 – COMPLETE</b></p>		

**Appendix D**
**Scenario Outline**
**Form ES-D-1**

Facility: **BVPS Unit 2** Scenario No.: 5 Op Test No.: 2LOT8 NRC  
 Examiners: \_\_\_\_\_ Candidates: \_\_\_\_\_ SRO  
 \_\_\_\_\_ ATC  
 \_\_\_\_\_ BOP

Initial Conditions: IC 217(10): 100% power, BOL, Eq Xe, CB "D" @ 225 steps, RCS boron – 1458 ppm.

Turnover: Maintain steady state power at 100%, 2FWE\*P23A OOS, 2SAS-C21B OOS

Critical Tasks:

- 1. E-0.D Crew manually actuates at least one train of SIS**
- 2. E-0.F Crew establishes the minimum required AFW flow**
- 3. E-0.M Crew closes the upstream block MOV of the stuck open Pzr PORV**
- 4. E-0.I Establish flow from at least 1 High head ECCS pump**

Event No.	Malf. No.	Event Type	Event Description
1		(I) ATC, SRO	2RCS*PT444 drifts low, requires ATC to manually control RCS pressure.
2		(TS) SRO	2FWS-LT485 fails high
3		(C) BOP, SRO	Voltage regulator failure causes main generator over excitation, requires BOP to turn voltage regulator off and manually lower excitation.
4		(C) ATC, SRO (TS) SRO	25 gpm RCS leak on "A" Loop.
5		(M) ALL	500 gpm RCS leak on "A" Loop.
6		(C) ATC, SRO	2RCS-PCV455D fails open on Rx trip, requires ATC to close block valve.
7		(C) BOP, SRO	AFW malfunctions, 2FWE*P23A OOS on turnover, 2FWE*P23B auto start failure, requires BOP to manually start. 2FWE*P22 running with reduced flow (< 340 gpm)
8		(C) ATC, SRO	Auto SIS inhibited, requires ATC to manually actuate SIS.
9		(C) ATC, SRO	2SIS*MOV867's fail to open on SIS actuation signal, ATC required to manually open valves to initiate Safety Injection flow.

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



The crew will assume the shift at 100% power with instructions to maintain steady state conditions.

The controlling PZR pressure channel, 2RCS\*PT444 will drift low causing RCS pressure to rise due to the pressurizer spray valves closing and the heaters energizing. The crew will respond IAW 2OM-6.4.IF, attachment 2. The ATC controls PZR pressure by manually operating the PZR heaters and spray valves or manual control of the PZR pressure master controller.

When the plant has stabilized, 2FWS-LT485, S/G 21B Channel II Narrow Range level transmitter will fail high requiring use of 2OM-24.4.IF attachment 1, SRO will review TS.

After the SRO completes FWS LT Tech Spec determination, the voltage regulator will fail causing overexcitation of the MUG. IAW the alarm response procedure, the BOP will turn the voltage regulator off and manually restore power factor and excitation by lowering the base adjust.

A 25 gpm RCS leak will then occur on the "A" loop, the crew will recognize degrading parameters and enter AOP 2.6.7, Excessive Primary Plant Leakage, to address the primary plant leakage. The SRO will address RCS leakage Tech Spec.

The leak will then become a 500 gpm SBLOCA, RCS pressure and pressurizer level will decrease requiring the SRO to direct the crew to manually trip the reactor and enter E-0.

Upon the reactor trip, PORV 455D will fail partially open, the ATC will recognize PORV failure and close the block valve.

Auxiliary feedwater malfunctions also occur on the reactor trip, the turbine driven pump will start but provide insufficient flow and the remaining available Motor driven AFW pump will fail to auto start, the BOP will manually start 2FWE\*P23B.

SIS will fail to automatically actuate on low RCS pressure, the ATC will manually actuate SIS.

Upon SIS actuation, 2SIS\*MOV867's will fail to automatically open, the ATC will manually open valves to initiate SIS injection flow.

The crew will transition from E-0 to E-1 when checking if RCS is intact based on containment parameters. E-1 will then be performed until transition to ES-1.2.

The scenario will be terminated after the crew transitions to ES-1.2

Expected procedure flow path is E-0 → E-1 → ES-1.2.

## BEAVER VALLEY POWER STATION

**INITIAL CONDITIONS:** 100% Power, ARO, Equilibrium Xe, BOL, 1458 PPM Boron, IC-217 (10)

<b><u>ADDITIONAL LINEUP CHANGES</u></b>	<b><u>STICKERS</u></b>	<b><u>VOND MARKINGS</u></b>
	YCT - 2FWE*P23A CS	ATC position – 100% POWER display
	YCT - 2SAS-C21B CS	
<b><u>EQUIPMENT STATUS</u></b>	<b><u>DATE/TIME OOS</u></b>	<b><u>TECHNICAL SPECIFICATION(S)</u></b>
2FWE*P23A OOS, motor bearing replacement	4 hours ago	3.7.5 condition B
2SAS-C21B OOS, compressor overhaul	3 days ago	

### **SHIFT TURNOVER INFORMATION**

1. 100% power, BOL, Equilibrium Xe, shift goal is to maintain steady state 100% power conditions.

### **SCENARIO SUPPORT MATERIAL REQUIRED**

1. BOL reactivity placard

### **PROCEDURES NEEDED**

2OM-6.4.IF, Attachment 2  
2OM-24.4.IF, Attachment 1  
AOP 2.6.7  
E-0  
ES-0.1  
E-1  
Attachment A-0.6  
Attachment A-0.11

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
Initialize IC 217, and establish initial plant conditions.	Reactor plant at 100% power, BOL, Equilibrium Xe, RCS boron =1458 PPM, ARO.	
Insert the following per the Simulator Setup section of the HTML File for this scenario:	Inserts all pre-loads required to support the scenario	
<b>PRELOAD COMMANDS</b>		
<b>TRGSET 1 'JPPLP4(1)'</b>	Set trigger 1 on reactor trip	
<b>IRF LOA-AFW001 (0 0) 0.1 0</b>	2FWE*P22 low flow (discharge valve throttled)	
<b>IMF PPL07B (0 0) 5</b>	2FWE*P23B auto start failure	
<b>IRF LOA-HIV055 (0 0) 1</b>	2FWE*P23A breaker racked out	
<b>IMF PMP-CAS004 (0 0) 1</b>	2SAS-C21B OOS	
<b>IMF VLV-RCS033A (1 0) 20 0 ASIS</b>	2RCS*PCV455D fails to 20% open upon trip	
<b>IMF PPL05A (0 0) 0</b>	Train A auto SI actuation failure	
<b>IMF PPL05B (0 0) 0</b>	Train B auto SI actuation failure	
<b>TRGSET 3 'JMLRCS2A == 1 .AND. XB1I045P == 1'</b>	Set trigger 3 on 25 gpm leak and 2CHS*LCV460A CS to open.	
<b>TRG 3 'IMF RCS02A (0 0) 500 0 asis</b>	500 gpm SBLOCA "A" Loop when L/D begins to be re-established.	
<b>IMF VLV-SIS069 (0 0) 2</b>	2SIS*MOV867A failed closed	
<b>TRGSET 6 'XA4I081P'</b>	Set trigger 6 on 2SIS*MOV867A CS to open	
<b>TRG 6 'DMF VLV-SIS069'</b>	2SIS*MOV867A opens upon manual attempt	
<b>IMF VLV-SIS070 (0 0) 2</b>	2SIS*MOV867B failed closed	
<b>TRGSET 7 'XA4I076P'</b>	Set trigger 7 on 2SIS*MOV867B CS to open	
<b>TRG 7 'DMF VLV-SIS070'</b>	2SIS*MOV867B opens upon manual attempt	
<b>IMF VLV-SIS071 (0 0) 2</b>	2SIS*MOV867C failed closed	
<b>TRGSET 8 'XA4I094P'</b>	Set trigger 8 on 2SIS*MOV867C CS to open	
<b>TRG 8 'DMF VLV-SIS071'</b>	2SIS*MOV867C opens upon manual attempt	
<b>IMF VLV-SIS072 (0 0) 2</b>	2SIS*MOV867D failed closed	
<b>TRGSET 9 'XA4I090P'</b>	Set trigger 9 on 2SIS*MOV867D CS to open	
<b>TRG 9 'DMF VLV-SIS072'</b>	2SIS*MOV867D opens upon manual attempt	

# 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:**

Pressurizer Pressure control channel  
fails low

**IMF XMT-RCS030A (0 0) 1700 240**

### **IMMEDIATE PLANT RESPONSE:**

2RCS-PT444 drifts low

PZR htr grps A & D, Backup grps B & E turn  
on.

Pzr htr Control grp C modulates high  
Spray valves, 2RCS\*PCV455A & 455B  
modulate closed.

A4-1E, PZR Control Press Dev High/Low  
A4-2G, PZR B/U Htr Group Auto On/Off

SRO enters 2OM-6.4.IF, Attachment 2

ATC reports unexpected alarm, A4-1E.

ATC identifies 2RCS\*PT444 failing low.

ATC controls PZR pressure by operating Master  
Pressure controller in manual or manually operating  
individual PZR heaters and spray valves.

BOP refers to ARP.

With Pzr htrs and spray valve control in Manual, SRO  
establishes a control band and Rx trip criteria 2100  
psig low / 2340 psig high for manual Pzr pressure  
control.

SRO evaluates applicable TS;  
TS 3.3.4 for Remote Shutdown Instrumentation – for  
Info Only.

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

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 2:**

21B S/G Channel II level transmitter,  
2FWS\*LT485 fails high.

**IMF XMT-MSS006A (0 0) 100 60**

**NOTE:** No system response occurs on failure of a single channel due to median signal select feature.

Continue with next event at LE discretion

## **IMMEDIATE PLANT RESPONSE:**

2FWS\*LT485 fails high  
A6-10D, S/G 21B Level High/Low

SRO enters 2OM-24.4.IF, Attachment 1

BOP reports unexpected alarm, A6-10D  
BOP verifies actual S/G parameters, steam flow/feed flow and S/G level are stable.

ATC refers to ARP.

BOP reports failure of 2FWS\*LT485.

SRO refers to  
T.S. 3.3.1, function 14, condition E, place channel to trip within 72hrs. and  
TS 3.3.2, functions 5b and 6b, condition D, place channel to trip within 72 hrs.

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

# BEAVER VALLEY POWER STATION

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

Voltage Regulator Failure  
**IMF GEN02 (0 0) 26 20 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.

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.

Continue with next event at LE discretion

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

# BEAVER VALLEY POWER STATION

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

25 gpm leak on "A" RCS loop inside CNMT.

**IMF RCS02A (0 0) 25 0 0**

## **IMMEDIATE PLANT RESPONSE:**

PZR pressure begins decreasing.  
A4-5A/5C, DRMS Trouble / High Alarm  
CNMT Radiation monitors;  
2RMR-RQ303A, B HIGH alarms  
CNMT humidity increasing

SRO enters AOP 2.6.7 for excessive primary plant leakage.

ATC reports indications of a RCS leak inside CNMT.

ATC confirms VCT / PZR level can be maintained.

Crew checks if leakage is RCS/CVCS;

Crew confirms CNMT radiation and humidity are not consistent with pre-event values.

ATC verifies RCS temperature is stable.

ATC checks 2CHS\*FCV122 is in AUTO and PZR level is NOT stable.

ATC places 2CHS\*FCV122 in MANUAL and adjusts to maintain a constant PZR level.

ATC checks VCT level trend.

ATC identifies VCT level is dropping at > 0.7%/min and reports to SRO that leak rate is > 10 gpm.

SRO recognizes TS 3.4.13 Condition A, is applicable for unidentified leakage.

## **NOTE:**

Due to dynamic nature of event, a followup question regarding applicable TS may be necessary.



# BEAVER VALLEY POWER STATION

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

ATC quantifies leak rate, checks if leakage is in CVCS

Isolates letdown by closing 2CHS\*AOV200A, 200B and 2CHS\*LCV460A and 460B.  
Isolates charging by closing 2CHS\*FCV122.  
Adjusts 2CHS\*HCV186 to obtain net input of 20 gpm.

ATC trends PZR level and verifies PZR level is dropping.

ATC verifies VCT level can be maintained > 5% with normal makeup.

ATC manually controls 2CHS\*FCV122 to maintain PZR level at approximately program level.

ATC confirms leakage is not in the CVCS system and restores Charging and Letdown by;

Adjusting 2CHS\*FCV122 for 30-50 gpm flow.  
Verifying PZR level > 14%.  
Placing 2CHS\*PCV145 in MAN & 50% open.  
Opening 2CHS\*LCV460A and B  
Opening 2CHS\*AOV200A and/or 200B/C.  
Adjusting 2CHS\*PCV145 to 260 psig then returning to AUTO.  
When level is approx at program, places 2CHS\*FCV122 in AUTO.

ATC reports degrading primary plant conditions.

## **EVENT 5:**

500 gpm SBLOCA on "A" RCS Loop

**NOTE:** Command is preloaded to occur when 2CHS\*LCV460A is opened during l/d restoration step of AOP 2.6.7

PZR level and pressure decreases

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (all preloaded to occur on the reactor trip)</p>	<p>SI Auto actuation failure 2RCS*PCV455D fails to 20% open – block valve can be closed to stop leak. 2FWE*P22 running with minimal flow (~105 gpm to each S/G) 2FWE*P23B Auto start failure (P23A – OOS) 2SIS*MOV867's fail to open on SIS Signal</p> <p>SRO enters E-0.</p>	<p>SRO directs ATC to trip the reactor.</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 either AE or DF has voltage indicated.</li> </ul> <p>BOP identifies that both AE and DF busses are energized from offsite power.</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)</p> <p><b><u>Critical Task: E-0.D</u></b></p> <p><b>Crew manually actuates at least one train of SIS-actuated safeguards before transition to any ORP.</b></p> <p><b>Basis for Selection:</b> SAFETY SIGNIFICANCE -- Failure to manually actuate SI under the postulated conditions constitutes "misoperation or incorrect crew performance that leads to degraded ECCS capacity."</p>	<p>PORV failing to 20% open on the reactor trip will reduce PZR pressure below Auto SI setpoint.</p>	<p>Check SI Status.</p> <p>Crew checks if SI is required.</p> <ul style="list-style-type: none"> <li>• ATC checks Cnmt press &gt; 5psig</li> <li>• ATC checks PZR press &lt; 1860 psig</li> <li>• ATC/ BOP checks Steamline press &lt; 500 psig</li> </ul> <p>Crew determines SI is Required based on PZR pressure being &lt; 1860 psig.</p> <p>ATC manually actuates SI – both trains by turning Control switches (BB-A).</p> <p>ATC/BOP, Sounds Standby Alarm, announces reactor trip and safety injection.</p> <p>BOP checks 2HVS*FN204A(B), Leak Collection Filtered Exhaust Fan – at least ONE RUNNING.</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)</p> <p><b><u>Critical Task: E-0.I</u></b>  <b>Crew establishes flow from at least one high head ECCS pump before transition out of E-0.</b></p> <p><b>Basis for Selection:</b>  SAFETY SIGNIFICANCE -- Failure to manually start at least one high-head ECCS pump under the postulated conditions constitutes "misoperation or incorrect crew performance which leads to degraded ECCS capacity."</p> <p>The critical task could be restated as "manually open valve(s) to establish injection flow from at least one high-head ECCS pump."</p>		<p>ATC verifies SI System Status</p> <ul style="list-style-type: none"> <li>• Both 2CHS*P21A and P21B pumps running.</li> <li>• HHSI Flow indicated,</li> <li>• Both LHSI pumps running</li> </ul> <p>ATC notes zero HHSI flow, identifies 2SIS-MOV867A, B, C &amp; D all failed to open on the SIS actuation.</p> <p>SRO directs ATC to align valves to establish flow.</p> <p>ATC manually opens 2SIS*MOV867A, B, C, &amp; D and confirms HHSI flow exists.</p>

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
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## **Critical Task: E-0.F**

**Crew establishes the minimum required AFW flow rate to the SGs before transition out of E-0, unless the transition is to FR-H.1, in which case the task must be initiated before RCPs are manually tripped in accordance with FR-H.1.**

## **Basis for Selection:**

SAFETY SIGNIFICANCE -- Failure to establish the minimum required AFW flow rate, under the postulated plant conditions, results in "adverse consequence(s) or a significant degradation in the mitigative capability of the plant." In this case, the minimum required AFW flow rate can be established by performing the appropriate manual action. Therefore, failure to manually establish the minimum required AFW flow rate also represents a "demonstrated inability by the crew to:

Take an action or combination of actions that would prevent a challenge to plant safety

Effectively direct/manipulate ESF controls

Recognize a failure/incorrect auto actuation of an ESF system or component"

BOP verifies AFW System status

- Motor-driven AFW Pumps – NONE running
- Turb driven AFW Pump Stm Supply Isol Valves – OPEN
- AFW Throttle Vlvs – FULL OPEN
- Total AFW Flow – < 340 gpm (~300)

BOP starts 2FWE\*P23B and verifies total AFW flow is > 340 gpm.

# 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> Evaluation of BOP performing Attachment A-0.11 begins on page 23.</p>	<p><u>List of Attachment A-0.11 Discrepancies:</u></p> <p>Discrepancies:</p> <p>SIS failed to automatically actuate on low PZR pressure. 2SIS*MOV867A, B, C, &amp; D all failed to open on SIS actuation, successfully opened manually. 2FWE*P23B failed to auto start, manual start was successful.</p> <p>RCS temperature &lt; 547°F and dropping due to Safety Injection flow.</p> <p>CIB not actuated at this time.</p>	<p>SRO directs BOP to perform Attachment A-0.11.</p> <p>ATC checks RCS Tav<sub>g</sub> stable at or trending to 547°F.</p> <ul style="list-style-type: none"> <li>• ATC verifies no steam release is occurring. (Condenser steam dumps closed)</li> <li>• ATC verifies Reheat steam is isolated.</li> <li>• ATC reduces total feedflow to minimize C/D.</li> </ul> <p>ATC checks recirc spray pumps – NONE RUNNING</p>

# BEAVER VALLEY POWER STATION

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

### **Critical Task: E-0.M**

**Crew closes the upstream block MOV of the stuck open Pzr PORV prior to completion of the “Prz PORV check” step of E-0.**

### **Basis for Selection:**

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 verifies PZR isolated

- PORVs – CLOSED

ATC reports PORV 2RCS\*PCV455D indicates dual position and won't close.

ATC closes block valve 2RCS\*MOV537 to isolate stuck open PORV.

ATC continues verifying PZR isolated

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

ATC checks if RCPs should be stopped

- D/P between RCS pressure and highest S/G pressure – NOT LESS THAN 205 PSID
- Criteria for stopping is not met - Leaves RCPs running

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (continued)	<p>SRO determines transition to E-1, Loss of Reactor or Secondary Coolant is appropriate.</p>	<p>ATC/BOP checks if any S/Gs are faulted</p> <ul style="list-style-type: none"> <li>• Pressures in all S/Gs – ANY DROPPING IN AN UNCONTROLLED MANNER</li> <li>OR</li> <li>• ANY S/G COMPLETELY DEPRESSURIZED</li> </ul> <p>Crew determines no S/G's are faulted.</p> <p>Crew checks if S/G tubes are intact</p> <ul style="list-style-type: none"> <li>• Check all S/G levels – NONE RISING IN AN UNCONTROLLED MANNER</li> <li>• Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES</li> </ul> <p>Crew determines no S/G levels are rising in an uncontrolled manner and Secondary Radiation is consistent with pre-event values, therefore all S/G tubes are intact.</p> <p>Crew checks if RCS is intact</p> <ul style="list-style-type: none"> <li>• CNMT pressure</li> <li>• CNMT Sump Level</li> <li>• CNMT Radiation</li> </ul> <p>All CNMT parameters are increasing from pre-event values.</p>



# BEAVER VALLEY POWER STATION

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

ATC checks if CREVS should be actuated:

Checks EITHER of the following:

- Control Room Radiation Monitor  
2RMC\*RQ201,202 - NOT IN HIGH ALARM
- CIB - HAS NOT OCCURRED

Crew reports CREV's is NOT required.

ATC checks if RCPs should be stopped

- D/P between RCS pressure and highest S/G pressure – LESS THAN 205 PSID [220 PSID ADVERSE CNMT]
- DP Criteria for stopping RCPs is not met –

ATC leaves RCP's in service.

ATC verifies CIB not actuated and is NOT required.

ATC/BOP checks if any S/Gs are faulted

- Pressures in all S/Gs – ANY DROPPING IN AN UNCONTROLLED MANNER  
OR
- ANY S/G COMPLETELY DEPRESSURIZED

Crew determines no S/G's are faulted.

# BEAVER VALLEY POWER STATION

INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<b><u>EVENTS 6, 7, 8, &amp; 9:</u></b> (continued)		<p>BOP Checks Intact S/G Levels</p> <ul style="list-style-type: none"> <li>Narrow range levels - &gt; 12% [31% ADVERSE CNMT]</li> </ul> <p>BOP maintains AFW flow &gt; 340 gpm until &gt; 12% in at least 1 S/G then controls feed flow to maintain narrow range level between 12% [31% ADVERSE CNMT] and 50%.</p> <p>Crew checks if S/G tubes are intact</p> <ul style="list-style-type: none"> <li>Check all S/G levels – NONE RISING IN AN UNCONTROLLED MANNER</li> <li>Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES</li> </ul> <p>Crew determines no S/G levels are rising in an uncontrolled manner and Secondary Radiation is consistent with pre-event values, therefore all S/G 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</li> <li>Block valves – AT LEAST ONE OPEN</li> </ul> <p>ATC reports power available to all block valves and 2 block valves are open.          PORV 2RCS*PCV455D was previously identified as being stuck open and is isolated with block valve, 2RCS*MOV537.</p>

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## EVENTS 6, 7, 8, & 9: (continued)

Crew checks if SI Flow should be Reduced

ATC verifies RCS Subcooling is greater than 41°F [59 °F 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 S/G > 12% [31% ADVERSE CNMT].

ATC reports RCS pressure is NOT stable or rising.

Crew determines that current plant conditions, PZR level, does NOT support SI reduction.

Check if CNMT spray should be stopped;

ATC verifies no Quench or Recirc Spray pumps are running.

ATC resets SI – both trains.  
ATC resets CIA – both trains.

ATC checks if LHSI pumps should be stopped.

ATC verifies RCS pressure is > 225 psig and stable or rising.

ATC stops both LHSI pumps and places CS in Auto.

### **NOTE:**

Due to timing, procedure progression and plant conditions, it is possible that the conditions may not support shutdown of the LHSI pumps at this time.

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## EVENTS 6, 7, 8, & 9: (continued)

Check RCS and S/G Pressures

BOP checks Pressure in all S/G NOT stable or rising.  
ATC checks RCS pressure is dropping.

SRO determines S/G pressure dropping is NOT due to a faulted S/G and continues with procedure based upon preceding note.

BOP verifies AC Emergency busses are energized by offsite power.

SRO directs BOP to stop unloaded EDG's IAW 2OM-36.4.AF(AG) as time permits.

BOP performs Attachment A-0.6 to verify power available to at least 1 train of Cold Leg Recirculation equipment.

BOP reports Attachment A-0.6 completed SAT with no discrepancies.

BOP evaluates Radiation monitors, determines Auxiliary building and Safeguards radiation is consistent with pre-event values.

SRO determines TSC is not activated.

SRO directs ATC to monitor nuclear instrumentation to ensure adequate Shutdown Margin.

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## **EVENTS 6, 7, 8, & 9:** (continued)

Start additional Plant Equipment to assist in Recovery.

SRO directs a field operator to perform Attach. A-1.1

Check if RCS cooldown and depressurization is required;

ATC checks RCS pressure > 225 psig.

SRO determines plant conditions support transition to ES-1.2.

SRO transitions to ES-1.2

Terminate scenario when the crew transitions to ES-1.2.

### **Classify Event:**

**ALERT**, Tab 1.2.3, Potential Loss of RCS Barrier due to RCS Leak Rate.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11</b> 'Verification of Automatic Actions' performed as time &amp; manpower permit</p>	<p>Ensure Reheat Steam Isolation</p>	<p>BOP performs <b>Attachment A-0.11</b>, 'Verification of Automatic Actions' as follows:</p> <p>Checks both EDGs running</p> <p>Ensure reheat steam isolation</p> <ul style="list-style-type: none"> <li>• Verify 2MSS-MOV100A and B - CLOSED</li> <li>• Reset reheater controller.</li> </ul> <p>Check If main steamline isolation required</p> <ul style="list-style-type: none"> <li>• CNMT pressure - &gt; 7 PSIG -OR-</li> <li>• Steamline pressure - &lt; 500 PSIG -OR-</li> <li>• Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS</li> </ul> <p>If steamline isolation IS required, Verifies SLI by checking all YELLOW SLI marks - LIT</p> <p>If steamline isolation is NOT required continues on.</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>

## NOTE:

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

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**Attachment A-0.11** – (continued)

Align Neutron Flux Monitoring For Shutdown

- Transfer 2NME-NR45 Nuclear Recorder to operable source and intermediate range displays.

Check CIB And CNMT Spray Status

- Containment pressure - HAS REMAINED LESS THAN 11 PSIG

If not – Actuate CIB if required by:

- Manually initiate CIB – BOTH SWITCHES FOR BOTH TRAINS
- Manually align equipment as required
- Verify all RCPs – STOPPED
- BV-1 operator verifies CREVS actuation
- Service water 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

Verify both CNMT hydrogen analyzers running by 2HCS\*SOV100A1, B1 – CNMT Sample amber lights – LIT

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INSTRUCTIONAL GUIDELINES	PLANT STATUS / PROCEDURAL GUIDANCE	EXPECTED STUDENT RESPONSE
<p><b>Attachment A-0.11 – (continued)</b></p> <p><b><u>Critical Task: E-0.I</u></b>  <b>Crew establishes flow from at least one high head ECCS pump before transition out of E-0.</b></p> <p><b><u>Critical Task: E-0.F</u></b>  <b>Crew establishes the minimum required AFW flow rate to the SGs before transition out of E-0, unless the transition is to FR-H.1, in which case the task must be initiated before RCPs are manually tripped in accordance with FR-H.1.</b></p>	<p>SIS failed to automatically actuate on low PZR pressure.  2SIS*MOV867A, B, C, &amp; D all failed to open on SIS actuation, successfully opened manually.</p> <p>2FWE*P23B auto start failed, required to be manually started.</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><b>Attachment A-0.11 – COMPLETE</b></p>	<p>Discrepancies:  SIS failed to automatically actuate on low PZR pressure.  2SIS*MOV867A, B, C, &amp; D all failed to open on SIS actuation, successfully opened manually.  2FWE*P23B auto start failed, required to be manually started</p>	<p>Verify Power To Both AC Emergency Busses  Restore power as required</p> <p>Upon Completion, Report Any Discrepancies to SRO.</p>