# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Plot and Evaluate 1/M Data

TRAINING MATERIAL NUMBER: 2AD-016

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-016

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OM-50.4.F, Perform An ECP Calculation Rev. 7

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 30 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

REVISION VERIFIED

# TRAINING MATERIAL CHANGE FORM

| | | |
|---|---|---|
| Affected Training Materials: 2AD-016 | | |
| Type of Change: | | |
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |
| List/Description of Change(s): | | |
| Reason for Change (s): | | |

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2AD-016<br>JPM REVISION: 0 | JPM TITLE: Plot and Evaluate 1/M Data |
|---|---|

K/A REFERENCE: 2.1.43 4.1/4.3 TASK ID: 0011-003-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ FAULTED JPM ☒ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ No | Allotted Time: 30 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: _____

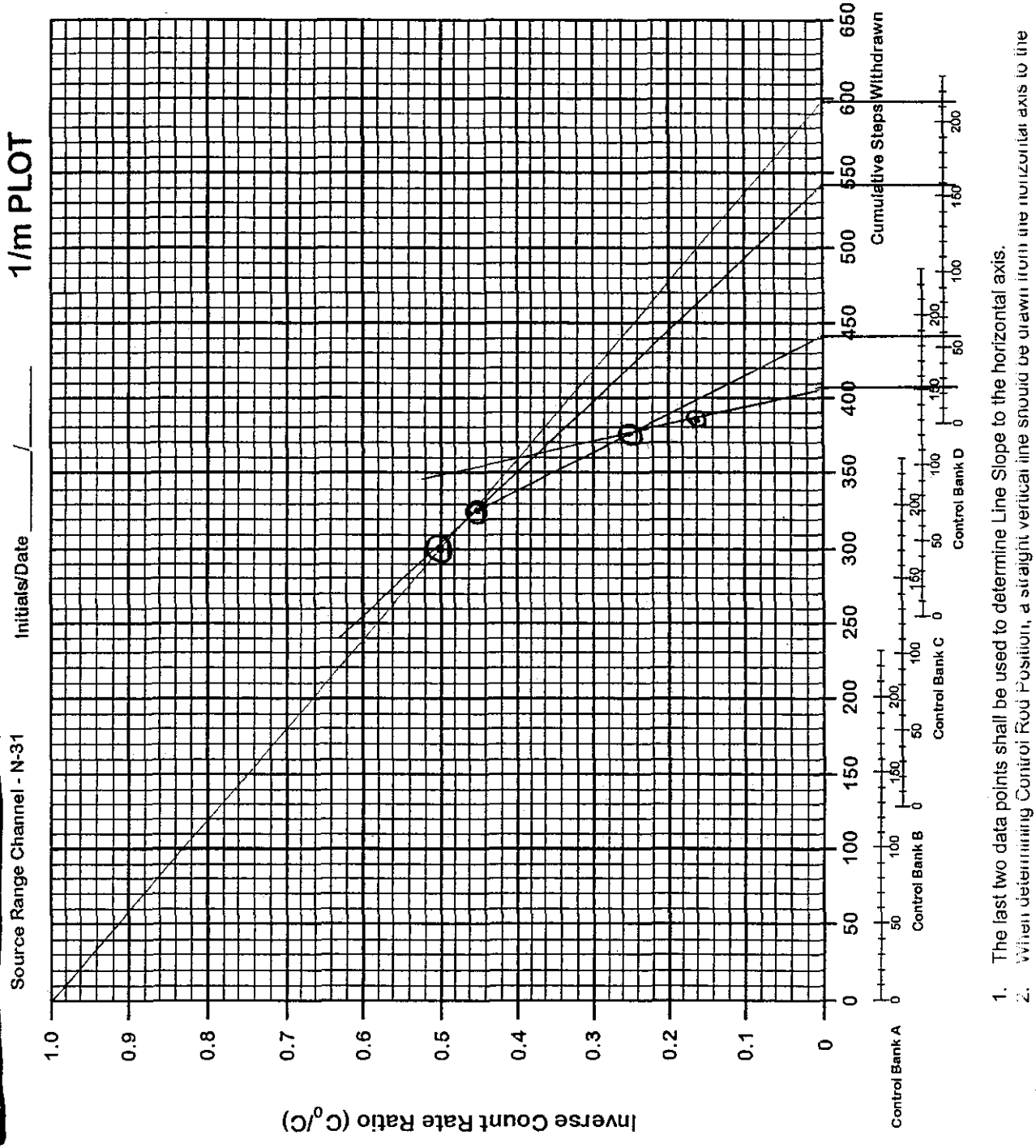
Evaluator Signature: _____

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | Determine that 1/M data predicts >500 pcm below ECP value for critical rod height. Notify SM/US that appropriate actions of 2OM-50.4.D must be taken. (No further rod withdrawal) |
| RECOMMENDED STARTING LOCATION: | Classroom |
| **DIRECTIONS:** | You are to perform the task Evaluate 1/M data |
| **INITIAL CONDITIONS:** | The unit is in Mode 2.<br>A reactor startup is in progress.<br>Control Bank C is at 129 steps.<br>Control Bank D is at 1 step.<br>RCS Boron concentration is 1875 ppm. |
| **INITIATING CUE:** | The Unit Supervisor directs you to complete the 1/M plot per 2OM-50.4.F data sheet 3 using the SR count rate data provided. Compare the 1/M data with the predicted ECP data and make a recommendation for further rod withdrawal. Document your recommendation in the box below. (Located on candidate direction sheet ) |
| REFERENCES: | 2OM-50.4.F, Performing An Estimated Critical Position Calculation, Rev. 7 |
| TOOLS: | Calculator; Ruler/straight edge. |
| HANDOUT: | 2OM-50.4.F, Performing An Estimated Critical Position Calculation, Rev. 7 partially completed Data Sheet 3 & Figure 1 |

**FIGURE 1**

ANSWER KEY




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

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task Evaluate 1/M data

INITIAL CONDITIONS: The unit is in Mode 2.
A reactor startup is in progress.
Control Bank C is at 129 steps.
Control Bank D is at 1 step.
RCS Boron concentration is 1875 ppm.

INITIATING CUE: The Unit Supervisor directs you to complete the 1/M plot per 2OM-50.4.F data sheet 3 using the SR count rate data provided. Compare the 1/M data with the predicted ECP data and make a recommendation for further rod withdrawal. Document your recommendation in the box below.

**RECOMMENDATION:**

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

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

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

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

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-016<br>JPM REVISION: 0 | JPM TITLE: Plot and Evaluate 1/M Data |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| 1. Refer to data sheet 3 | 1.1 Applicant refers to data sheet 3 for count rate data.<br><br>COMMENTS: | |
| 2.C Refer to 1/M plot | 2.1C Candidate evaluates count rate data from data sheet 3 and plots on the 1/M for 300, 325, 375, AND 385 total steps.<br><br>**EVALUATOR NOTE: See attached Answer Key for 1/M plot values.**<br><br>*COMMENTS:* | |
| 3.C Evaluate 1/M plot data | 3.1C Applicant determines that the 1/M plot predicts criticality >500 pcm below ECP. Maximum rod height is Bank D at 40 steps versus ECP of Bank D 101 steps.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-016<br>JPM REVISION: 0 | JPM TITLE: Plot and Evaluate 1/M Data |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 4.C Inform SM/US | 4.1C Applicant informs SM/US that 1/M data indicates that criticality will occur >500 pcm below the ECP. Recommend NO FURTHER ROD WITHDRAWALS.<br><br>COMMENTS:<br><br>**TERMINATING CUE: When the applicant makes a recommendation on continued startup, the evaluation for this JPM is complete.** | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Perform the Daily Heat Balance

TRAINING MATERIAL NUMBER: 2CR-558

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 2CR-558

REVISION NUMBER: 1

TECHNICAL REFERENCES:

2OM-54.4.C1, Rev 19
Steam Tables

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 30 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-558 | | |
| Type of Change: | | |
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 1 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #0<br>New Change # |

List/Description of Change(s):

Updated JPM to current JPM format.
Added data sheet C which forces a gain adjustment for N41, N42, and N43.

Reason for Change (s):

Increase "Faulted" JPM bank

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

K/A REFERENCE: 015 A1.01 3.5/3.8
193007K1.08 3.1/3.4
2.1.7 4.4/4.7

TASK ID: 0021-009-06-013

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

EVALUATION RESULTS

| Performer Name: | Performer SSN: |
|---|---|

| Time Critical: ☐ Yes ☒ No | Allotted Time: 30 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: | The daily heat balance calculation is calculated and the required Power Range instrument gain adjustments are identified as specified in the Answer Key. |
| RECOMMENDED STARTING LOCATION: | Control Room |
| **DIRECTIONS:** | You are to perform the task Calculating the Daily Heat Balance. |
| **INITIAL CONDITIONS:** | The Unit is in Mode 1. Tavg matches Tref and power has been stable for at least 30 minutes. The plant computers are unavailable. |
| **INITIATING CUE:** | The Unit Supervisor directs you to perform a daily heat balance in accordance with 2OM-54.4.C1, Daily Heat Balance, Part D, to comply with the Tech Spec Surveillance Logs. Perform steps D1 thru D6 and report the results. The LEFM Channel Check has been performed satisfactorily. |
| REFERENCES: | 2OM-54.4.C1, Daily Heat Balance, Rev. 19 |
| TOOLS: | Calculator<br>Steam Tables |
| HANDOUT: | 2OM-54.4.C1, Daily Heat Balance, Rev. 19<br>Plant Parameters Data Sheet |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task of Calculating a Daily Heat Balance.

**INITIAL CONDITIONS:** The Unit is in Mode 1. Tavg matches Tref and power has been stable for at least 30 minutes. The plant computers are unavailable.

**INITIATING CUE:** The Unit Supervisor directs you to perform a daily heat balance in accordance with 2OM-54.4.C1, Daily Heat Balance, Part D, to comply with the Tech Spec Surveillance Logs. Perform steps D1 thru D6 and report the results. The LEFM Channel Check has been performed satisfactorily.

☐ 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-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| | **Simulator Setup:** Simulator is not required for this JPM performance, a Plant Parameter Data sheet is to be provided to each candidate.<br><br>**EVALUATOR NOTE:**<br>Plant Parameter Data Sheet to contain the following;<br>▪ S/G Blowdown flow ΔP in Inches $H_2O$<br>▪ Power Range NI indications<br>▪ Feedwater Temperature from LEFM<br>▪ 10 min avg Feedwater Mass Flow rate from LEFM<br>▪ S/G Steam Pressures | |
| 1. Candidate locates appropriate procedure. | 1.1 Provide candidate with a copy of 2OM-54.4.C1 and a plant parameter data sheet.<br><br>**EVALUATOR NOTE:** Procedure can be provided to candidate, if provided, N/A this JPM step.<br><br>COMMENTS: | |
| 2. Gathers the necessary data. | 2.1. Candidate records ΔP's from plant parameter data sheet.<br>2.2. Candidate records NIS Indicated power levels from the plant parameter data sheet.<br><br>**EVALUATOR NOTE:** Part "A" of procedure can be completed prior to providing to candidate, if previously completed, N/A this JPM step.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 3. Candidate notes that a LEFM Channel check is required. | 3.1 Candidate notes that per the initial conditions, a Channel Check has been performed.<br><br>**EVALUATOR CUE:** If candidate asks question, restate that a Channel Check has been previously performed per the initial conditions.<br><br>COMMENTS: | |
| 4. Converts S/G blowdown flow from ΔP in Inches $H_2O$ to "lbm/hr" | 4.1 Candidate converts each S/G blowdown flow from ΔP in Inches $H_2O$ to "lbm/hr"<br><br>COMMENTS: | |
| 5. Obtain and record appropriate plant data.<br><br>All required data is provided on the plant parameter data sheet. | 5.1 Candidate records data from the plant parameter data sheet<br>5.2 Records the LEFM Feedwater temperature.<br>5.3 Records the LEFM Feedwater Mass Flow Rate.<br>5.4 Records the S/G Steam pressures and converts to PSIA.<br>5.5 Records the S/G Blowdown flowrates previously calculated.<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 6.C Perform calculations. | 6.1C Candidate calculates the average steam pressure for all 3 S/G's by adding all 3 indications and dividing by 3.<br>6.2C Candidate calculates the total S/G Blowdown mass flowrate by adding all 3 S/G blowdown flowrates together.<br>6.3C Candidate calculates the total Steam Mass flowrate by subtracting the total blowdown mass flowrate from the feedwater mass flowrate.<br><br>COMMENTS: | |
| 7.C Obtain Enthalpy's | 7.1C Candidate obtains the steam enthalpy ($h_{ST}$) from the saturated steam table using "$h_g$" at the calculated average steam pressure.<br>7.2C Candidate obtains blowdown enthalpy ($h_{BD}$) of the blowdown from each steam generator by determining "$h_f$" for saturated fluid, based on the respective steam generator steam pressure.<br>7.3C Candidate obtains feedwater enthalpy ($h_{FW}$) by determining the "$h_f$" for saturated fluid, based on the LEFM feedwater temperature<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 8.C Determine the Heat Transfer | 8.1C Candidate multiplies the total steam mass flow rate times the steam enthalpy.<br>8.2C Candidate multiplies the blowdown mass flow rate from each steam generator times the respective blowdown enthalpy for each steam generator.<br>8.3C Candidate adds the blowdown mass flow rates for each steam generator<br>8.4 C Candidate multiplies the total feedwater mass flow rate times the feedwater enthalpy.<br><br>COMMENTS: | |
| 9.C Determine the NET reactor power. | 9.1C Candidate calculates the RCS Output by adding the Steam and blowdown heat transfers **AND THEN** subtracting the Feedwater heat transfer.<br>9.2C Candidate calculates the Net Reactor Power by subtracting "33.105" from the RCS Output.<br>9.3C Candidate calculates the Megawatt Thermal by multiplying the Net Reactor Power times "$10^{-6}$" **AND** then dividing the resultant by "3.413".<br>9.4C Candidate calculates the "% Reactor Power" by dividing the Megawatt Thermal by "2900" **AND** then Multiplying the resultant by "100%".<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 10. Review the results | 10.1 Candidate compares the calculated power level to 2900 MWt and determines that 2OM-52.2.A does not need to be referred to for limitations on power.<br>**EVALUATOR CUE:** Power is less than 2900 MWt.<br>COMMENTS: | |
| 11.C Determine if Power Range Channels gain adjustment s necessary.<br>**EVALUATOR NOTE:** Alternate Path, Gain adjustment will be required to successfully complete JPM. | 11.1C Candidate reviews criteria and determines that a gain adjustment will be required.<br>**EVALUATOR NOTE:** The Criteria and required NI(s) needing gain adjustment is dependant upon the data given in the particular plant parameter data sheet.<br>COMMENTS: | |
| 12. Determine if calculated power is less than 70% | 12.1 Candidate determines that calculated power level is greater than 70% therefore I&C does NOT need to reduce the Setpoints to 85%.<br>**EVALUATOR NOTE:** Candidate should N/A the step.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 13.C Complete table check marks for NI's needing adjustment. | 13.1C Candidate completes procedure table with check marks in the appropriate locations for each NI.<br><br>**EVALUATOR NOTE:** The required NI(s) needing gain adjustment is dependant upon the data given in the particular plant parameter data sheet.<br><br>COMMENTS: | |
| 14. Candidate requests review and approval of Heat Balance results. | 14.1 Candidate reports to the SM/US the results of the Heat Balance and which specific NI's need gain adjustment.<br>14.2 Candidate requests that the results be reviewed and approved prior to NI Gain adjustment.<br><br>**EVALUATOR CUE:** Report to candidate that another operator will review the heat balance results prior to performing NI Gain adjustment.<br><br>**EVALUATOR NOTE:** Grader discretion is required when evaluating calculations.<br><br>COMMENTS: | |
| | STOP TIME: _____ | |

| JPM NUMBER: 2CR-558<br>JPM REVISION: 1 | JPM TITLE: Perform the Daily Heat Balance |
|---|---|

## Plant Parameter Data Sheet - C

| | "A" | "B" | "C" | |
|---|---|---|---|---|
| Feedwater Temperature (LEFM) | | | | 432°f |
| Feedwater mass flowrate ($10^6$ PPH) | | | | 12.58 |
| S/G Blowdown Flow, (in $H_20$) | 4.50 | 4.50 | 4.50 | |
| Steam Pressure (psig) | 826.20 | 826.20 | 826.20 | |
| | | | | |
| Power Range N41 indication (%) | 99.00 | | | |
| Power Range N42 indication (%) | 99.10 | | | |
| Power Range N43 indication (%) | 99.10 | | | |
| Power Range N44 indication (%) | 99.40 | | | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Prepare a Clearance Tagout (2SWE*P21B)

TRAINING MATERIAL NUMBER: 2AD-017

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-017

REVISION NUMBER: 0

TECHNICAL REFERENCES:

NOBP-OP-1001, Clearance Program, Rev. 0
NOP-OP-1001, Clearance/Tagging Program, Rev. 9

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 25 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

| | | |
|---|---|---|
| Affected Training Materials: 2AD-017 | | |
| Type of Change: | | |
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |
| List/Description of Change(s): | | |
| Reason for Change (s): | | |

APPROVALS:

R. J. Brooks
Prepared by Date

Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2AD-017<br>JPM REVISION: 0 | JPM TITLE: Prepare a Clearance Tagout (2SWE*P21B) |
|---|---|

K/A REFERENCE: 2.2.13 (3.6) TASK ID: 0481-020-03-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ FAULTED JPM ☒ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ 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

| | |
|---|---|
| TASK STANDARD: | Identify the tags and sequence of placement for a tagout of 2SWE*P21B Standby Service Water Pump. |
| RECOMMENDED STARTING LOCATION: | Classroom |
| **DIRECTIONS:** | You are to perform the task Prepare a Clearance Tagout |
| **INITIAL CONDITIONS:** | The plant is in Refueling Mode, no fuel is in the reactor. 2SWE*P21B Standby Service Water Pump is to be placed on clearance. Service Water Pumps 2SWS*P21A **AND** B are Operable and running. 2SWE*P21A Standby Service Water Pump is operable. |
| **INITIATING CUE:** | You are to identify the required clearance points (equipment), position (placement configuration), and sequence for clearing 2SWE*P21B Standby Service Water Pump, for pump inspection. NO seal cooler work **OR** motor work will be performed. SOMS is out of service. Document your results on the table provided. |
| REFERENCES: | NOBP-OP-1001, Clearance Program, Rev. 0<br>NOP-OP-1001, Clearance/Tagging Program, Rev. 9 |
| TOOLS: | None |
| HANDOUT: | NOBP-OP-1001, Clearance Program, Rev. 0<br>NOP-OP-1001, Clearance/Tagging Program, Rev. 9<br>OP Manual Fig. No. 30-1A, 10080-RM-430-1A, Rev. 4<br>OM Chapter 2OM-30.3.C, Power Supply and Control Switch Checklist. |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task Prepare a Clearance Tagout

INITIAL CONDITIONS: The plant is in Refueling Mode, no fuel is in the reactor. 2SWE*P21B Standby Service Water Pump is to be placed on clearance. Service Water Pumps 2SWS*P21A **AND** B are Operable and running. 2SWE*P21A Standby Service Water Pump is operable.

INITIATING CUE: You are to identify the required clearance points (equipment), position (placement configuration), and sequence for clearing 2SWE*P21B Standby Service Water Pump, for pump inspection. NO seal cooler work **OR** motor work will be performed. SOMS is out of service. Document your results on the table provided.

☐ 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-017<br>JPM REVISION: 0 | JPM TITLE: Prepare a Clearance Tagout (2SWE*P21B) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| | **EVALUATOR NOTE: This task is normally performed using the SOMS clearance computer and signed electronically. For this JPM, the SOMS computer is NOT available.**<br><br>**EVALUATOR NOTE: Provide JPM handout and student copy of table.** | |
| 1.**C** Candidate completes the table. | 1.1**C** Candidates table matches the ANSWER KEY.<br><br>COMMENTS:<br><br>**TERMINATING CUE: When the candidate identifies and reports that all tags are identified, the evaluation for this JPM is complete.** | |
| | STOP TIME: _____ | |

# ANSWER KEY (DO NOT GIVE TO STUDENTS)

| Component ID | Component Description | Position | Sequence |
|---|---|---|---|
| 2SWE*P21B-CS (AE) | Control Switch for Standby Service Water Pump 2SWS*P21C (AE) | Pull-To-Lock (PTL) | 1 |
| 4KVS-2DF-2F19 | Supply to Standby Service Water Pump 2SWE*P21B | Racked Out | 2 |
| SWE-224 | Disch Isol Valve | Shut | 3 |
| SWE-260 | Seal WTR Supply to STBY SW PP (2SWE-P21B) Isol | Shut | 3 |
| SWE-228 | Disch Isol Valve To Screen Wash | Shut | 3 |
| SWE-308 | Drain Isol On Discharge At 2SWE-P21B | Open | 4 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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

# STUDENT COPY

| Component ID | Component Description | Position | Sequence |
|---|---|---|---|
| | | | |
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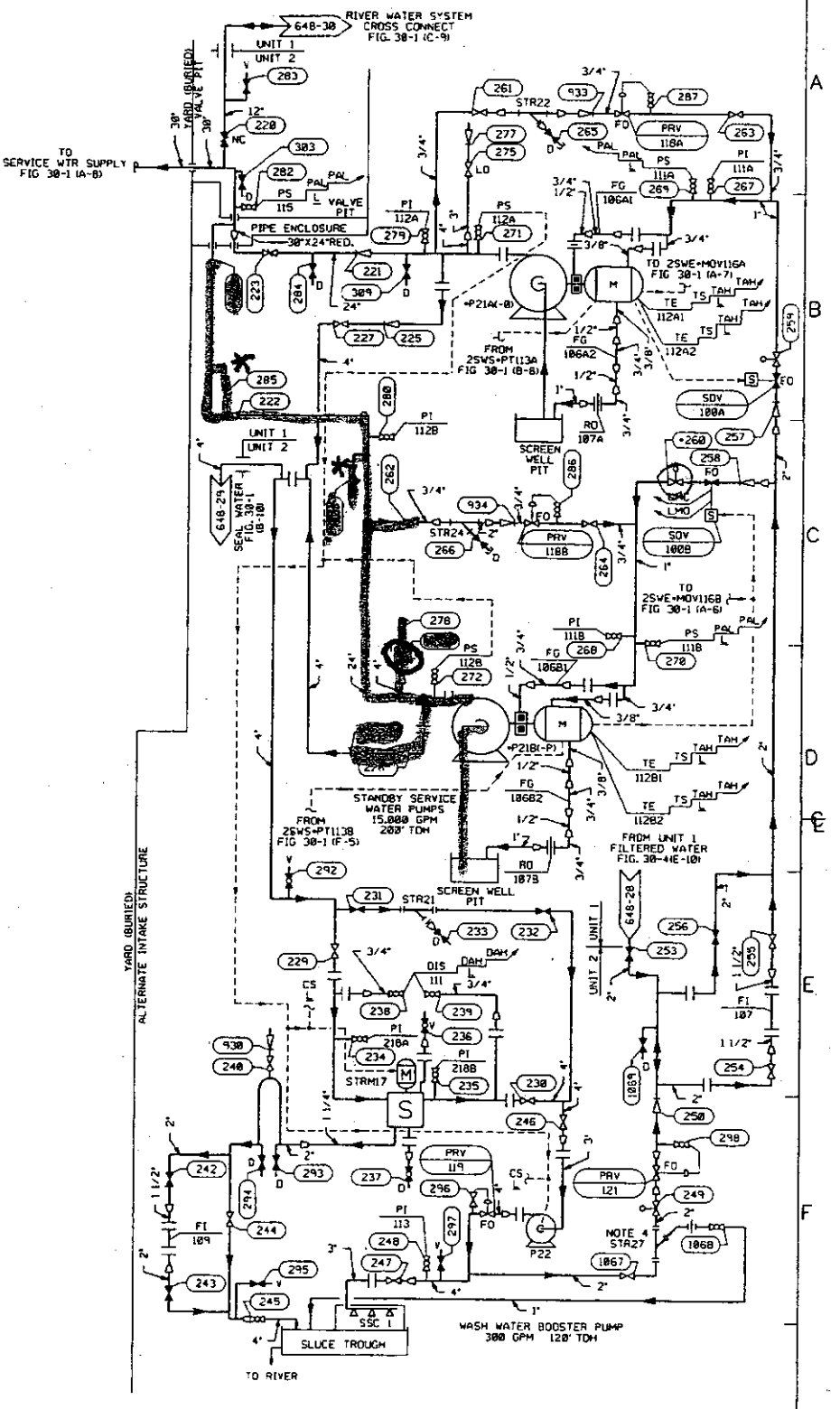



OP MANUAL FIG NO 30-1A

| | | |
|---|---|---|
| Duquesne Light Company NUCLEAR GROUP | PITTSBURGH,PA | BEAVER VALLEY POWER STATION UNIT NO. 2 |
| NONE | 9-9-93 MVF MVF JMP | VALVE OPER NO DIAGRAM STANDBY SERVICE WTR SUPPLY |
| | 10014 | AA 10080-RM-430-1A 4 |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Respond to a Radiation Monitor Alarm

TRAINING MATERIAL NUMBER: 2AD-018

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-018

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OM-43.4.AEE Rev. 5
2OM-43.4.AAC Rev. 1
2OM-43.4.ACC Rev. 4
2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown. Rev. 24

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 10 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2AD-018

Type of Change:

| | | |
|---|---|---|
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |

List/Description of Change(s):

Original issue

Reason for Change (s):

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2AD-018<br>JPM REVISION: 0 | JPM TITLE: Respond to a Radiation Monitor Alarm |
|---|---|

K/A REFERENCE: 2.3.11 3.8 TASK ID: 0171-016-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ FAULTED JPM ☒ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ 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

| | |
|---|---|
| TASK STANDARD: | Liquid Waste Eff Isol Vlv 2SGC-HCV100 is CLOSED and SG Blowdown Test Tank Pump 2SGC-P26B is stopped. RWDA-L Discharge Stop Data is documented. |
| RECOMMENDED STARTING LOCATION: | Simulator |
| **DIRECTIONS:** | You are to perform the task Respond to a Radiation Monitor Alarm. |
| **INITIAL CONDITIONS:** | Unit 2 is Mode 3 with the Shutdown banks withdrawn. A liquid waste discharge of Steam Generator Blowdown Test Tank 2SGC-TK23B is in progress to Unit 1 blowdown. A Discharge permit (RWDA-L – 99999T) has been issued for this discharge. A4-5C, Radiation Monitoring Level High alarm has been received in the control room. |
| **INITIATING CUE:** | The Unit Supervisor directs you to respond to the Radiation Monitoring Level High alarm in accordance with plant procedures. |
| REFERENCES: | 2OM-43.4.AEE Rev. 5<br>2OM-43.4.AAC Rev. 1<br>2OM-43.4.ACC Rev. 4 |
| TOOLS: | None |
| HANDOUT: | RWDA-L-99999T filled out up to the discharge in progress point.<br>2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown filled out up to the discharge in progress point. |

## 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: Unit 2 is Mode 3 with the Shutdown banks withdrawn. A liquid waste discharge of Steam Generator Blowdown Test Tank 2SGC-TK23B is in progress to Unit 1 blowdown. A Discharge permit (RWDA-L – 99999T) has been issued for this discharge. A4-5C, Radiation Monitoring Level High alarm has been received in the control room.

INITIATING CUE: The Unit Supervisor directs you to respond to the Radiation Monitoring Level High alarm in accordance with plant procedures.

☐ 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-018<br>JPM REVISION: 0 | JPM TITLE: Respond to a Radiation Monitor Alarm |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| | START TIME: _____ | |
| | **Simulator Setup:**<br><br>**POST GREEN MAGNETIC PLACARD FOR SITE LIQUID WASTE DISCHARGE IN PROGRESS**<br><br>Mode 3 Snap (IC-240 for 2LOT6 NRC exam)<br>1. Setup a LW discharge of 2SGC-TK23B using 2SGC-P26B, SG Blowdown Test Tank Pump.<br>2. Set ALERT setpoint of 2SGC-RQ100 to 1.22E-3 µCi/ml<br>(1065 sel; channel items; 122-3 enter)<br>3. Set HIGH setpoint of 2SGC-RQ100 to 1.74E-3 µCi/ml.<br>(174-3 enter)<br>4. Start sample pump.<br>5. Insert a failure to prevent 2SGC-HCV100 Liquid Waste Eff Isol Vlv. from AUTO closing on HIGH alarm from 2SGC-RQ100.<br>6. Insert malfunction to raise 2SGC-RQ100 above the high alarm setpoint.<br>7. Verify A4-5C, Radiation Monitoring Level High alarms<br><br>Items 2, 3, and 4 will need to be done each time the simulator is reset. (they do not carryover in the IC) | |
| 1. Applicant refers to ARP for A4-5C, Radiation Monitoring Level High 2OM-43.4.AAC. | 1.1 Locates and refers to 2OM-43.4.AAC.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-018<br>JPM REVISION: 0 | JPM TITLE: Respond to a Radiation Monitor Alarm |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 2. Perform the following at the RM-11 operators console:<br><br>Press the grid 6 pushbutton AND Determine which radiation monitor in alarm (blinking and has turned red). | 2.1 At DRMS panel depresses Grid 6<br>2.2 Verifies 1LX065 is blinking and RED<br><br>COMMENTS: | |
| | **EVALUTOR NOTE:**<br>The four digit number is the radiation monitor number less the letters (i.e. 1PA234 will be 1234). | |
| 3. Type in the 4-digit numerical code number of the alarming monitor **AND** Press the SEL pushbutton. | 3.1 Types 1065 on DRMS keyboard **AND** depresses the SEL pushbutton<br><br>COMMENTS: | |
| 4. Press the STATUS pushbutton. | 4.1 Depresses the STATUS pushbutton on the DRMS keyboard.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-018<br>JPM REVISION: 0 | JPM TITLE: Respond to a Radiation Monitor Alarm |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| 5. Press SYSTEM ACK to silence the console alarm. | 5.1 Depresses the SYSTEM ACK pushbutton on the DRMS keyboard.<br><br>COMMENTS: | |
| 6. If any radiation monitor is at **OR** approaching, 1000 times normal background, Immediately notify the SM/US **AND** Refer to 1/2OM-57, "Emergency Preparedness Plan" for further actions. | 6.1 N/A<br><br>**EVALUTOR CUE:**<br>Role-play SM/US and inform the candidate that 2SGC-RQ100 is **NOT** 1000 times normal background.<br><br>COMMENTS: | |
| 7. Refer to local alarm response procedures 2OM-43.4.ACN through 2OM-43.4.AEJ and 2OM-43.4.AEL for corrective actions. | **EVALUTOR NOTE:**<br>Candidate may also refer to 2OM-43.4.ACC in the next step. This would be acceptable. (This procedure also contains the "Critical" steps necessary to isolate the LW discharge).<br><br>7.1 Refers to 2OM-43.4.AEE.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-018<br>JPM REVISION: 0 | JPM TITLE: Respond to a Radiation Monitor Alarm |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| 8.C If a high radiation condition is suspected in [2SGC-TK23B]:<br><br>Verify Closed [2SGC-HCV100], Liquid Waste Eff Isol Vlv. (BB-A). | 8.1 Verifies 2SGC-HCV100 Liquid Waste Eff High Rad Isol Vlv Green light NOT LIT and RED light LIT<br>8.2C Rotates 2SGC-HIC100 Liquid Waste Eff High Rad Isol Vlv Controller counterclockwise until demand output is ZERO.<br>8.3 Verifies 2SGC-HCV100 Liquid Waste Eff High Rad Isol Vlv Green light - LIT and RED light - NOT LIT<br><br>COMMENTS: | |
| 9.C Stop [2SGC-P26A(B)], SG Blowdown Test Tank Pumps (BB-A). | 9.1C Places CS for SG Blowdown Test Tank Pump 2SGC-P26B to STOP<br><br>COMMENTS: | |
| 10. Notify Health Physics. | 10.1 Contacts Health Physics to inform them that the discharge was secured due to High Alarm on 2SGC-RQ100.<br><br>**EVALUTOR CUE:**<br>Role-play Health Physic and acknowledge the report.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-018<br>JPM REVISION: 0 | JPM TITLE: Respond to a Radiation Monitor Alarm |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 11. Have chemistry sample the contents of the in service SG Blowdown Test Tank to verify high radiation condition. | 11.1 Contacts Chemistry to inform them that the discharge was secured due to High Alarm on 2SGC-RQ100 AND request SG Blowdown Test Tank to verify high radiation condition.<br>**EVALUTOR CUE:**<br>Role-play Chemistry and acknowledge the report.<br>COMMENTS: | |
| | **EVALUTOR CUE:**<br>Role-play SM/US and direct the candidate to complete the required documentation on the RWDA-L for stopping the discharge.<br>**EVALUTOR NOTE:**<br>The guidance for completing the RWDA-L documentation is contained in 2OM-25.4.L Attachment D. | |
| 12.C Record the following on the RWDA-L at the "Discharge Stop"<br>• Date<br>• Time<br>• Tank Level | 12.1C Records the following information on space provided on the RWDA-L<br>• Date<br>• Time<br>• Tank Level equal to ~95 inches<br>• Initials<br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-018<br>JPM REVISION: 0 | JPM TITLE: Respond to a Radiation Monitor Alarm |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 13.C Calculates the volume discharged and records on the RWDA-L at the "Discharge Stop" | 13.1 Determines volume discharged by subtracting current volume for 95 inches from original volume of 17, 705<br>13.2 IAW Table 1 on page 29 of 2OM-25.4.L 95 inches is 13,341 gals.<br>13.3 17705 – 13341 = 4, 364 gals<br>13.4C Records 4, 364 gals on RWDA-L<br><br>COMMENTS: | |
| | **EVALUTOR CUE:**<br>That completes this JPM. | |
| | STOP TIME: _____ | |

RTL#A9.520A
RWDA L-99999T

This permit authorizes the discharge of a maximum of 17705.3 gallons from tank 2SGC-TK23B at a maximum discharge rate of 85.0 gpm to the environment via U1 blowdown with a minimum total cooling tower blowdown of 4000.0 gpm at Unit 1 and Unit 2 with a monitor ALERT alarm setpoint of 1.22E-03 uCi/ml and a monitor HIGH alarm setpoint of 1.74E-03 uCi/ml on 2SGC-RQ100 (See Below for Alternate Alarm Setpoints)

This tank was recirculated YESTERDAY 0001 hours to YESTERDAY 2001 hours (at which time it was sampled) for a total of 1200 minutes.

| Prepared By | Reviewed By | Remarks: |
|---|---|---|
| D. B. Gamma TODAY<br>Signature Date | J. B. Beta TODAY<br>Peer Review Sig Date | |

| Cooling Tower Flow Set | Monitor Source |
|---|---|
| Unit 1 NCO Init U1&U2 N/A Init | Check N/A Init |

| Monitor Alarms Adjusted | Approved By | Approved By |
|---|---|---|
| ALERT N/A Init HIGH N/A Init | D. M. Shifty TODAY<br>U1 Shift Mgr Sig Date | D. M. Shifter TODAY<br>U2 Shift Mgr Sig Date |

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

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

HIGH X 0.70 = ALERT = ( N/A uCi/ml)

Discharge Record

| Discharge Start | | | | | Discharge Stop | | | | | Vol. | CT Flow, gpm |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mo | dy | yr | hr | mn | levl | ini | mo | dy | yr | hr | mn | levl | ini | gal. | TOTAL |
| TODAY | | | 1 HOUR AGO | | 130 | JJZ | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Discharge Time, min = Discharged Volume, gal =

| Monitor Alarms Reset | Reviewed By | Reviewed By |
|---|---|---|
| ALERT NA Init HIGH NA Init | U1 Shift Mgr Sig Date | U2 Shift Mgr Sig Date |

Post Release Review

( gpm) C.T. Flow X ( min) Discharge Time = ( gal) Dilution Volume

( gal) Discharge Vol / ( gpm) C.T. Flow = ( min) Post Time / 4.43E+00 = ( ) Dose Corr.

| Composite Size | File Update | Post Review |
|---|---|---|
| ml -----/----- Init date | -----/----- Init date | Signature Date |

EXERCISE MODE ONLY

RTL#A9.520A
RWDA-L-99999T

TANK: 2SGC-TK23B TANK VOLUME: 17705.3 gal, 6.70E+07 ml LEVEL: 130.0 in
SAMPLE IDENTIFICATION: 20080422005 TOTAL C.T. FLOW: 4000.0 gpm

| NUCLIDE | Concentration uCi/ml | ORC Fraction* | Count Rate | EPA-RQ Fraction |
|---|---|---|---|---|
| CR-51 | 5.32E-06 | 1.06E-03 | 1.07E+02 | 3.56E-07 |
| CO-58 | 3.96E-05 | 1.98E-01 | 7.21E+03 | 2.65E-04 |
| CO-60 | 1.47E-06 | 4.90E-02 | 3.50E+02 | 9.86E-06 |
| FE-59 | 1.45E-06 | 1.45E-02 | 1.83E+02 | 9.72E-06 |
| AG-110M | 5.20E-07 | 8.66E-03 | 2.22E+02 | 3.48E-06 |
| SB-124 | 8.82E-06 | 1.26E-01 | 2.37E+03 | 5.91E-05 |
| SB-125 | 1.11E-05 | 3.70E-02 | 1.68E+03 | 7.44E-05 |
| H-3 | 1.40E-02 | 1.40E+00 | | 9.38E-03 |
| TOTALS | 1.41E-02 | 1.83E+00 | 1.21E+04 | 9.81E-03 |

* undiluted

Total Activity = 9.43E+05 uCi

MAXIMUM DISCHARGE FLOW RATE = 8.50E+01 gpm ***SET TO MAXIMUM***

Dilution Factor = 4.71E+01

NOBLE GAS CONCENTRATION IN RIVER = 0.00E+00 uCi/ml

EXERCISE MODE ONLY

RTL#A9.52.0A
RWDA-L-99-099T

(All Dose Values in mRem)

| NUCLIDE | CONCENTRATION | BONE | LIVER | TOTAL BODY | THYROID | KIDNEY | LUNG | GI-LL |
|---|---|---|---|---|---|---|---|---|
| CR-51 | 5.32E-06 | 0.00E+00 | 0.00E+00 | 1.67E-07 | 9.96E-08 | 3.67E-08 | 2.21E-07 | 4.19E-05 |
| CO-58 | 3.96E-05 | 0.00E+00 | 8.71E-05 | 1.95E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.77E-03 |
| CO-60 | 1.47E-06 | 0.00E+00 | 9.31E-06 | 2.05E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.74E-04 |
| FE-59 | 1.45E-06 | 3.71E-05 | 8.73E-05 | 3.34E-05 | 0.00E+00 | 0.00E+00 | 1.98E-05 | 2.91E-04 |
| AG-110M | 5.20E-07 | 1.21E-08 | 1.12E-08 | 6.65E-09 | 0.00E+00 | 2.20E-08 | 0.00E+00 | 4.58E-06 |
| SB-124 | 8.82E-06 | 1.71E-06 | 3.23E-08 | 6.75E-07 | 4.14E-09 | 0.00E+00 | 1.33E-06 | 4.84E-05 |
| SB-125 | 1.11E-05 | 1.37E-06 | 1.53E-08 | 3.28E-07 | 1.40E-09 | 0.00E+00 | 1.06E-06 | 1.51E-05 |
| FE-55 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| H-3 | 1.40E-02 | 0.00E+00 | 9.30E-05 | 9.30E-05 | 9.30E-05 | 9.30E-05 | 9.30E-05 | 9.30E-05 |
| G.ALPHA | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PROJECTED RELEASE DOSE = | | 4.02E-05 | 2.77E-04 | 3.43E-04 | 9.31E-05 | 9.30E-05 | 1.15E-04 | 2.44E-03 |
| UNIT 1/2 PROJECTED RELEASE DOSE = | | 2.01E-05 | 1.38E-04 | 1.71E-04 | 4.65E-05 | 4.65E-05 | 5.77E-05 | 1.22E-03 |
| Unit 1 Current Month Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 1 PROJECTED MONTH DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 2 Current Month Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 2 PROJECTED MONTH DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 1 Current Quarter Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 1 PROJECTED QUARTER DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 2 Current Quarter Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 2 PROJECTED QUARTER DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 1 Current Year Dose = | | 2.82E-02 | 5.95E-02 | 3.82E-02 | 8.84E-03 | 3.23E-02 | 1.26E-02 | 2.92E-02 |
| UNIT 1 PROJECTED YEAR DOSE = | | 2.83E-02 | 5.96E-02 | 3.84E-02 | 8.89E-03 | 3.23E-02 | 1.26E-02 | 3.05E-02 |
| Unit 2 Current Year Dose = | | 2.82E-02 | 5.95E-02 | 3.82E-02 | 8.84E-03 | 3.23E-02 | 1.26E-02 | 2.92E-02 |
| UNIT 2 PROJECTED YEAR DOSE = | | 2.83E-02 | 5.96E-02 | 3.84E-02 | 8.89E-03 | 3.23E-02 | 1.26E-02 | 3.05E-02 |

The sum of the RQ's is < 1; this is not considered a Reportable Quantity.

EXERCISE MODE ONLY

FTL A9.520A

## RWDA-L: Part 4, Checklist, Pre-Release Data and Alternate Alarm Setpoint Determination

**RWDA-L-9999 T**

Beaver Valley Power Station - 1 / 2

| | |
|---|---|
| Initials PaB | : Pre-Release Data obtained from Operations [Ref: procedure 1/2-ENV-05.04] |
| Initials PaB | : Samples obtained & Valve Verifications performed [Ref: procedure 1/2-ENV-05.01] |
| Initials PaB | : Samples analyzed [Ref: procedure 1/2-ENV-05.25] |
| Initials PaB | : Sample bottles marked with the RWDA-L number [Ref: procedure 1/2-ENV-05.01] |
| Initials PaB | : RWDA-L prepared via the LIQDIS computer Code [Ref: procedure 1/2-ENV-05.04] |
| Initials PaB | : Alarm Setpoints adjusted [Form 1-HPP-4.02.001.F01 & 1-HPP-4.02.040.F01 or 2-HPP-4.02.022.F01 & 2-HPP-4.02.037.F01] |
| Initials PaB | : RWDA-L turned-over to Control Room Shift Manager or Unit Supervisor [Ref: procedure 1/2-ENV-05.04] |
| Initials | : Effluent Monitor Readings obtained during discharge [Ref: Form 1/2-ENV-05.04.F01 (page 5 of 5)] |

**RWDA-L Pre-Release Data: Complete this portion of the form PRIOR to entrance into the LIQDIS Computer Code**

| | | |
|---|---|---|
| Source of Discharge: | [ ] <U1> Unit 1 | [Y] <U2> Unit 2 |
| Tank Identification: | [ ] <1> for 1LW-TK-6A, or [ ] <2> for 6B | [ ] <1> for 2LWS-TK21A, or [ ] <2> for 21B |
| | [ ] <3> for 1LW-TK-3A, or [ ] <4> for 3B | [ ] <3> for 2SGC-TK21A, or [ ] <4> for 21B |
| | [ ] <5> for 1LW-TK-5A, or [ ] <6> for 5B | [ ] <5> for 2SGC-TK23A, or [Y] <6> for 23B |
| | [ ] <7> for 1LW-TK-7A, or [ ] <8> for 7B | [ ] <7> for Not Applicable, or [ ] <8> for N/A |
| Note: Use [ ] <7> for Other Releases (e.g.: Chemical Waste Sump) | | Note: Use [ ] <1> for Other Releases (e.g.: Fire Sump) |
| Tank Volume: 17705.3 gallons | | Tank Level: 130.0 [ ] feet, or [Y] inches |
| Recirculation Start: YESTERDAY 0001 to YESTERDAY 2001 hours | | Sample Time: YESTERDAY 2001 hours |

Sample ID: [ ] Unit 1 Sample ID No. _____, or [Y] Unit 2 Sample ID No. 20080422005

Minimum CT Flow from Unit 1 and Unit 2: 4000 gpm (As a Guide, Operations will provide this value based on the "Low Alarm Setpoint" minus ~ 500 gpm)

Discharge Path: [Y] <U1> Send Liquid Waste to Unit 1 CT Blowdown, or [ ] <U2> Send Liquid Waste to Unit 2 CT Blowdown

**Sample Concentrations** — NOTE: For independent sampling, record the highest nuclide concentration from each sample

| Particulates | uCi/ml | Noble Gas | uCi/ml |
|---|---|---|---|
| Na-24 | | Ar-41 | |
| Cr-51 | 5.319 E-6 | Kr-85 | |
| Mn-54 | | Xe-131m | |
| Co-57 | | Xe-133 | |
| Co-58 | 3.961 E-5 | Xe-133m | |
| Co-60 | 1.471 E-6 | Xe-135 | |
| Fe-59 | 1.450 E-6 | Xe-135m | |
| Zn-65 | | | |
| Zr-97 / Nb-97 | | | |
| Mo-99 / Tc-99m | | | |
| Ag-110m | 5.198 E-7 | | |
| Sb-124 | 8.821 E-6 | | |
| Sb-125 | 1.110 E-5 | | |
| I-131 | | | |
| Zr-95 / Nb-95 | If ≥1E-4, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | | |
| Cs-134 | If ≥3E-6, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | | |
| Cs-137 | If ≥4E-6, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | | |
| Total Particulate | 7.19 E-5 | If ≥1E-4, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | |

Sb-122 3.343E-6
Sn-117m 2.455E-7
These radionuclides are not in LIQDIS data base. Values were entered into Form 1/2-ENV-01.05.F02 for release activity determination. pdb 4-23-08

**Independent / Replicate Sample Comparison:**

[ ] No radiation monitor available for the discharge path.
(See ODCM procedure 1/2-ODC-3.03, Table 3.3-12, Action 23)

[ ] Replicate sample was requested by Chemistry supervision:
(See NRC Regulatory Guide 4.15, Section C.5)

uCi/ml = Total gamma concentration from 1st Sample

uCi/ml = Total gamma concentration from 2nd Sample

% Diff = 100 [ (1st ) minus (2nd ) ] / (2nd )

**The total gamma concentration of the 1st & 2nd samples shall agree within a factor of 2 (i.e., % Diff is between -50% to +100%).**

**ADMINISTRATIVE GUIDE RELIEF:**

Reprocessing is not practical per Shift Manager _____

*IF Administrative Guide Relief is obtained from Shift Manager, THEN CR _____ was generated to address the need to reduce existing Administrative Guide values for future discharges during the applicable calendar month, quarter(s), and year.*

Prepared By: P. Bte SAP ID No.: 12345 Date: TODAY

Peer Review Signature: SPowell-Campbell SAP ID No.: 45678 Date: TODAY

**Alternate Alarm Setpoint Determination: Complete this portion of the form AFTER exit from the LIQDIS Computer Code**

| | | |
|---|---|---|
| [ ] RM-1LW-104: Is Total Particulate >3.14E-3 uCi/ml ? | [ ] YES [ ] NO | [ ] IF YES, THEN Alternate Alarm Setpoints SHALL NOT be usec |
| [ ] RM-1LW-116: Is Total Particulate >7.33E-3 uCi/ml ? | [ ] YES [ ] NO | [X] IF NO, THEN Alternate Alarm Setpoints MAY be used |
| [X] 2SGC-RQ100: Is Total Particulate >1.14E-3 uCi/ml ? | [ ] YES [X] NO | See procedure 1/2-ENV-05.04 for additional guidance |

Prepared By: P. Bte SAP ID No. 12345 Date: TODAY

Peer Review Signature: SPowell-Campbell SAP ID No 45678 Date: TODAY

Form 1/2-ENV-05.04.F01, Rev 0 (page 5 of 5)

RTL# A[illegible].520A

## RWDA-L: Part 5, Effluent Radiation Monitor Tracking

**Beaver Valley Power Station - 1 / 2**

**RWDA-L-99999T**

**Tank Identification:** 2SGC-TK23B

**Discharge Period** — See RWDA Cover Sheet for Actual Times

**Initial Start Date/Time:** TODAY 1hOUR AGO

**Final Stop Date/Time:** /

**Effluent Radiation Monitor & Determination of Acceptable Range of Readings During Discharge:**

**[ ] Unit 1 Liquid Waste Tank Discharge via [RM-1LW-104]:**

RWDA-L Count Rate: Form 1/2-ENV-05.04.F01 (page 2 of 5) = ____ net cpm

NOTE: MDCR = Minimum Detectable Count Rate

RM-1LW-104 bkgd = ____ cpm

RM-1LW-104 Gross HSP = ____ cpm

RM-1LW-104 Gross HHSP = ____ cpm

[ ] IF the RWDA-L Count Rate is ≤1,141 net cpm (MDCR), THEN the discharge is controlled by the alarm setpoints (No further calculations required.

[ ] IF the RWDA-L Count Rate is >1,141 net cpm, THEN determine the **Acceptable Range of Readings** for control of the discharge, as follows:

Maximum = (RWDA-L Count Rate ____ cpm) x (2) + (bkgd ____ cpm) = ____ cpm

Minimum = (RWDA-L Count Rate ____ cpm) / (2) + (bkgd ____ cpm) = ____ cpm

**[ ] Unit 1 Laundry & Shower Drain Tank Discharge via [RM-1LW-116]:**

RWDA-L Count Rate: Form 1/2-ENV-05.04.F01 (page 2 of 5) = ____ net cpm

NOTE: MDCR = Minimum Detectable Count Rate

RM-1LW-116 bkgd = ____ cpm

RM-1LW-116 Gross HSP = ____ cpm

RM-1LW-116 Gross HHSP = ____ cpm

[ ] IF the RWDA-L Count Rate is ≤236 net cpm (MDCR), THEN the discharge is controlled by the alarm setpoints (No further calculations required).

[ ] IF the RWDA-L Count Rate is >236 net cpm, THEN determine the **Acceptable Range of Readings** for control of the discharge, as follows:

Maximum = (RWDA-L Count Rate ____ cpm) x (2) + (bkgd ____ cpm) = ____ cpm

Minimum = (RWDA-L Count Rate ____ cpm) / (2) + (bkgd ____ cpm) = ____ cpm

**[ ] Unit 2 Liquid Waste Tank Discharge via [2SGC-RQ100]:**

RWDA-L Count Rate: Form 1/2-ENV-05.04.F01 (page 2 of 5) = ____ net cpm

NOTE: MDCR = Minimum Detectable Count Rate

2SGC-RQ100 bkgd = ____ uCi/ml

2SGC-RQ100 Gross ASP = ____ uCi/ml

2SGC-RQ100 Gross HSP = ____ uCi/ml

[ ] IF the RWDA-L Count Rate is ≤247 net cpm (MDCR), THEN the discharge is controlled by the alarm setpoints (No further calculations required).

[ ] IF the RWDA-L Count Rate is >247 net cpm, THEN determine the **Acceptable Range of Readings** for control of the discharge, as follows:

Maximum = (RWDA-L Count Rate ____ cpm) x (5.61E-9 uCi/ml/cpm) x (2) + (bkgd ____ uCi/ml) = ____ uCi/ml

Minimum = (RWDA-L Count Rate ____ cpm) x (5.61E-9 uCi/ml/cpm) / (2) + (bkgd ____ uCi/ml) = ____ uCi/ml

**Gross Effluent Radiation Monitor Readings:** NOTE: Record actual reading (ie; Do Not Round Down)

Obtain At Least 2 Effluent Monitor Readings Per Discharge, AND At Least 1 Per 8 hr Shift For the Applicable Monitor:

Date / Time ____ / ____: Reading ____: Is reading within range? Yes[ ] No[ ]: RT Initials ____: SAP No. ____

Date / Time ____ / ____: Reading ____: Is reading within range? Yes[ ] No[ ]: RT Initials ____: SAP No. ____

Date / Time ____ / ____: Reading ____: Is reading within range? Yes[ ] No[ ]: RT Initials ____: SAP No. ____

Date / Time ____ / ____: Reading ____: Is reading within range? Yes[ ] No[ ]: RT Initials ____: SAP No. ____

Date / Time ____ / ____: Reading ____: Is reading within range? Yes[ ] No[ ]: RT Initials ____: SAP No. ____

Date / Time ____ / ____: Reading ____: Is reading within range? Yes[ ] No[ ]: RT Initials ____: SAP No. ____

[ ] IF Effluent Monitor Readings are not within the **Acceptable Range of Readings**, THEN contact Chemistry Supervision

[ ] Chemistry Supervision has determined that the discharge should be terminated; and Operations has been notified to terminate the discharge.

[ ] Chemistry Supervision has determined that the discharge may continue. Reasoning: ____

**Final Review of all Monitor Readings by Chemistry Supervision:**

**Gross Calculated Monitor Reading = ____ [ ] cpm, [ ] uCi/ml**

**% Difference = (Max Obs Reading - Calc Reading) / Calc Reading = ____ % [ ] Sat [ ] Unsat**

**NOTES:** Sat = SATISFACTORY: % Difference is Within a Factor of 2 ( -50% to +100%)

Unsat = UNSATISFACTORY: % Difference is Outside the "Sat" Range.

Generate a Condition Report

**Reviewed By:** ____ **SAP No:** ____ **Date:** ____

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

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

TRAINING MATERIAL NUMBER: 2AD-019

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-019

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OM-50.4.D
2OM-50.4.F

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-019

Type of Change:

| | | |
|---|---|---|
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |

List/Description of Change(s):

Reason for Change (s):

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2AD-019<br>JPM REVISION: 0 | JPM TITLE: Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only) |
|---|---|

K/A REFERENCE: 2.1.43 4.3 TASK ID: 1340-007-03-023

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | | Performer SSN: |
| Time Critical: ☐ Yes ☒ No | Allotted Time: 20 Minutes | Actual Time: minutes |

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

Comments: _____

_____

| OBSERVERS | |
|---|---|
| Name/SSN: | Name/SSN: |
| Name/SSN: | Name/SSN: |

EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

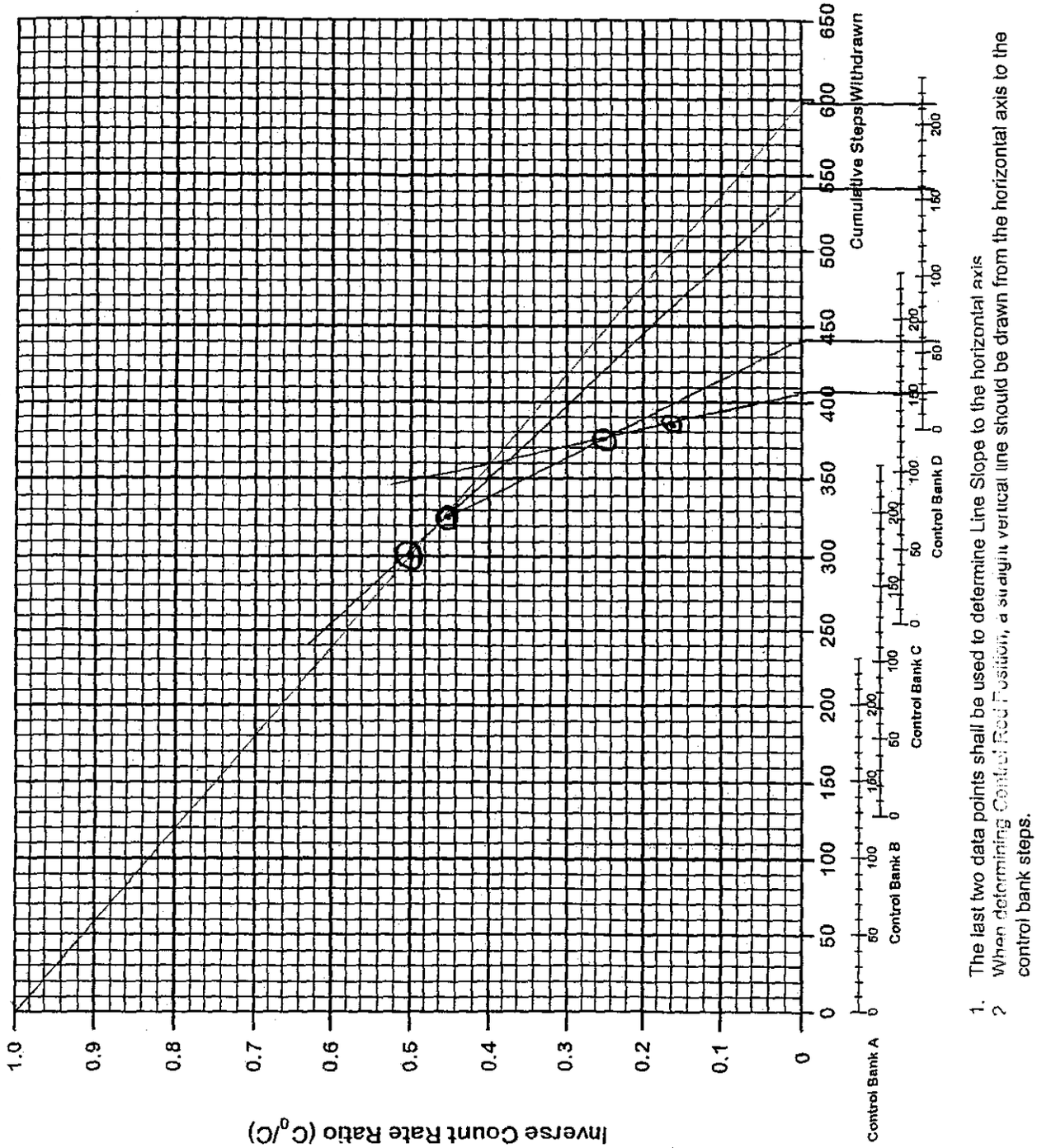
## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | Determine that 1/M data predicts >500 pcm below ECP value for critical rod height. Determines No further rod withdrawal will be allowed, and the following actions must be taken:<br>• Insert all control rods to 0 Steps.<br>• Verify RCS Boron Concentration.<br>• Verify SDM<br>• DO NOT recommence S/U without Plant Manager approval. |
| RECOMMENDED STARTING LOCATION: | Classroom |
| **DIRECTIONS:** | You are to perform the task Evaluate 1/M data. |
| **INITIAL CONDITIONS:** | The Unit is in Mode 2.<br>A reactor startup is in progress.<br>Control Bank C is at 129 steps.<br>Control Bank D is at 1 step.<br>RCS Boron concentration is 1875 ppm. |
| **INITIATING CUE:** | The Unit Supervisor directs you to complete the 1/M plot per 2OM-50.4.F data sheet 3 using the SR count rate data provided. Compare the 1/M data with the predicted ECP data and determine actions related to further rod withdrawal. Document any recommended actions in the box below. (Located on the candidate direction sheet) |
| REFERENCES: | 2OM-50.4.D, Reactor Startup From Mode 3 To Mode 2, Rev. 49<br>2OM-50.4.F, Performing An Estimated Critical Position Calculation Rev. 7 |
| TOOLS: | None |
| HANDOUT: | 2OM-50.4.F, Performing An Estimated Critical Position Calculation Rev. 7 partially completed<br>Data Sheet 3 & Figure 1<br>2OM-50.4.D, Reactor Startup From Mode 3 To Mode 2, Rev. 49 |

**FIGURE 1**

ANSWER KEY

Source Range Channel - N-31 Initials/Date ____/____ 1/m PLOT




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

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task Evaluate 1/M data.

INITIAL CONDITIONS: The Unit is in Mode 2.
A reactor startup is in progress.
Control Bank C is at 129 steps.
Control Bank D is at 1 step.
RCS Boron concentration is 1875 ppm.

INITIATING CUE: The Unit Supervisor directs you to complete the 1/M plot per 2OM-50.4.F data sheet 3 using the SR count rate data provided. Compare the 1/M data with the predicted ECP data and determine actions related to further rod withdrawal. Document any recommended actions in the box below.

**RECOMMENDED ACTIONS:**

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

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

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

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

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-019<br>JPM REVISION: 0 | JPM TITLE Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | √/U |
|---|---|---|
| | START TIME: _____ | |
| 1. Refer to Data sheet 3. | 1.1 Applicant refers to data sheet 3 for count rate data.<br><br>COMMENTS: | |
| 2.C Refer to 1/M plot. | 2.1C Candidate evaluates count rate data from data sheet 3 and plots on the 1/M for 300, 325, 375, AND 385 total steps.<br><br>**EVALUATOR NOTE: See Attached Answer Key for 1/M plot values.**<br><br>COMMENTS: | |
| 3.C Evaluate 1/M plot data | 3.1C Applicant determines that the 1/M plot predicts criticality >500 pcm below ECP. Maximum rod height is Bank D at 40 steps versus ECP of Bank D 101 steps.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-019<br>JPM REVISION: 0 | JPM TITLE Plot and Evaluate 1/M Data and Determine Required Actions (SRO Only) |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| | **EVALUATOR CUE:**<br>If necessary ask candidate to provide specific actions required. | |
| 4.C Determines action for continued startup IAW 2OM-50.4.D Attachment 3 Action #4. | 4.1C Applicant determines that 1/M data indicates that criticality will occur >500 pcm below the ECP.<br>• Insert all control rods to 0 steps.<br>• Verify RCS boron concentration.<br>• Verify SDM<br>• Do not continue without Plant Manager approval. | |
| | **TERMINATING CUE: When the applicant makes a recommendation on continued startup, the evaluation for this JPM is complete.** | |
| | COMMENTS: | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Prepare Partial OST [2OST-6.6] for Performance (SRO ONLY)

TRAINING MATERIAL NUMBER: 2AD-025

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-025

REVISION NUMBER: 0

TECHNICAL REFERENCES:

NOP-LP-2601, Procedure Use And Adherence (Rev. 1)
2OST-6.6, PORV Isolation Valve Test and Position Check (Rev. 18)

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

| | | |
|---|---|---|
| Affected Training Materials: 2AD-025 | | |
| Type of Change: | | |
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |
| List/Description of Change(s): | | |
| Reason for Change (s): | | |

APPROVALS:

_____

Prepared by Date

_____

Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2AD-025<br>JPM REVISION: 0 | JPM TITLE: Prepare Partial OST [2OST-6.6] for Performance (SRO ONLY) |
|---|---|

K/A REFERENCE: 2.1.20 4.6 TASK ID: 1320-006-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ FAULTED JPM ☒ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ 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: _____

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | All steps of 2OST-6.6 that relate specifically to 2RCS*MOV537 are omitted or marked N/A. (Answer Key provided to assist in this evaluation) |
| RECOMMENDED STARTING LOCATION: | Classroom |
| **DIRECTIONS:** | You are to perform the task Prepare a Partial OST for Performance. |
| **INITIAL CONDITIONS:** | Unit 2 is at 100% power. 2OST-6.6, PORV Isolation Valve Test and Position Check is on the Work Implementation Schedule (WIS) and is scheduled to be performed on your shift. PRZR PORV 2RCS*PCV455D is INOPERABLE but CAPABLE of being manually cycled. Technical Specification 3.4.11 required action A.1 has been completed and PORV 455D Motor Operated Isol Vlv 2MOV*MOV537 is CLOSED. All PORV Motor Operated Isol Vlvs were last stroked 70 days ago. The last ASME Valve remote position indication verification was performed 90 days ago on ALL PORV Motor Operated Isol Vlv. |
| **INITIATING CUE:** | As the Shift manager, IAW the guidance provided in NOP-LP-2601, Procedure Use And Adherence, Prepare 2OST-6.6, PORV Isolation Valve Test and Position Check for a Partial OST Performance. PORV 455D Motor Operated Isol Vlv 2MOV*MOV537 will NOT be tested. Return the marked-up OST to the evaluator. (Assume the evaluator will perform the second licensed SRO concurrence of your mark-ups). |
| REFERENCES: | NOP-LP-2601, Procedure Use And Adherence (Rev. 1)<br>2OST-6.6, PORV Isolation Valve Test and Position Check (Rev. 18) |
| TOOLS: | None |
| HANDOUT: | NOP-LP-2601, Procedure Use And Adherence (Rev. 1)<br>2OST-6.6, PORV Isolation Valve Test and Position Check (Rev. 18) |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task Prepare a Partial OST for Performance.

INITIAL CONDITIONS: Unit 2 is at 100% power. 2OST-6.6, PORV Isolation Valve Test and Position Check is on the Work Implementation Schedule (WIS) and is scheduled to be performed on your shift. PRZR PORV 2RCS*PCV455D is INOPERABLE but CAPABLE of being manually cycled. Technical Specification 3.4.11 required action A.1 has been completed and PORV 455D Motor Operated Isol Vlv 2MOV*MOV537 is CLOSED. All PORV Motor Operated Isol Vlvs were last stroked 70 days ago. The last ASME Valve remote position indication verification was performed 90 days ago on ALL PORV Motor Operated Isol Vlv.

INITIATING CUE: As the Shift manager, IAW the guidance provided in NOP-LP-2601, Procedure Use And Adherence, Prepare 2OST-6.6, PORV Isolation Valve Test and Position Check for a Partial OST Performance. PORV 455D Motor Operated Isol Vlv 2MOV*MOV537 will NOT be tested. Return the marked-up OST to the evaluator. (Assume the evaluator will perform the second licensed SRO concurrence of your mark-ups).

☐ 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-025<br>JPM REVISION: 0 | JPM TITLE: Prepare Partial OST [2OST-6.6] for Performance (SRO ONLY) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| 1. The Shift Manager or designated SRO shall determine if the section or step will be designated as N/A or whether the section or step shall be performed.<br><br>The Shift Manager or designated SRO shall document the decision in the official record copy of the procedure. | 1.1 Determines based on initial conditions that, All steps related specifically to PORV 455D Motor Operated Isol Vlv 2MOV*MOV537 shall be omitted or marked N/A<br><br>1.2 Documents the following on page 3 of the OST under test results:<br>• Circles Partial OST<br>• Writes an explanation documenting why PORV 455D Motor Operated Isol Vlv 2MOV*MOV537 will NOT be performed.<br><br>**EVALUTOR NOTE:**<br>Completing Test Results section may be deferred until test completion; therefore candidate may NOT perform this step as part of the JPM. This is acceptable.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-025<br>JPM REVISION: 0 | JPM TITLE: Prepare Partial OST [2OST-6.6] for Performance (SRO ONLY) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 2.C If the Shift Manager or designated SRO has granted approval, the performer or responsible supervisor shall ensure that the procedure section or step is designated as N/A, initialed and dated. | 2.1 Candidate performs the following:<br>• On Page 9 item VII.A.1- places 70 days ago and initials in the space provided.<br>• On Page 9 item VII.A.2- places 90 days ago and initials in the space provided.<br>• On Page 9 item VII.A.3.a- places N/A.<br><br>2.2C On Page 10 item VII.A.3.c- places N/A.<br>2.3 On Page 13 item VII.C.1.b.1 places N/A.<br>2.4 On Page 14 places N/A on ALL items.<br>2.5 On Page 15 items g and h places N/A.<br>2.6 On Page 16 items 2, 3, 4, 5, and 2.b.1 places N/A.<br>2.7 On Page 17 places N/A on ALL items.<br>2.8 On Page 18 items g and h places N/A.<br>2.9 On Page 19 items 2, 3, 4, and 5, places N/A.<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-025<br>JPM REVISION: 0 | JPM TITLE: Prepare Partial OST [2OST-6.6] for Performance (SRO ONLY) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 3.C Marks all of step 3 N/A and initials and dates | 3.1C On pages 19 through 22 places N/A for all of step 3, initials and dates.<br><br>COMMENTS: | |
| | **EVALUTOR NOTE:**<br>Grader discretion may be required. The "critical" portions of this JPM are to clearly document the steps that are to be performed and the steps that are NOT to be performed. An answer key is provided to assist in evaluating this JPM.<br><br>**EVALUTOR CUE:**<br>That completes this JPM. | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Review/Approve Completed Surveillance of RHS Pump (SRO ONLY)

TRAINING MATERIAL NUMBER: 2AD-026

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-026

REVISION NUMBER: 0

TECHNICAL REFERENCES:

OST-10.2 Residual Heat Removal Pump [2RHS*P21B] Performance Test Rev. 10

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 10 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-026

Type of Change:

| | | |
|---|---|---|
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |

List/Description of Change(s):

New JPM

Reason for Change (s):

APPROVALS:

R. J. Brooks

Prepared by Date

Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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.

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-026<br>JPM REVISION: 0 | JPM TITLE: Review/Approve Completed Surveillance of RHS Pump |
|---|---|

K/A REFERENCE: 2.2.37 4.6 TASK ID: 1320-011-03-023

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

## EVALUATION RESULTS

| Performer Name: | Performer SSN: |
|---|---|

| Time Critical: ☐ Yes ☒ No | Allotted Time: 10 Minutes | Actual Time: minutes |
|---|---|---|

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

Comments: _____

_____

## OBSERVERS

| Name/SSN: | Name/SSN: |
|---|---|
| Name/SSN: | Name/SSN: |

## EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | 2RHS*P21B is declared inoperable based on unacceptable Δ P and vibrations. |
| RECOMMENDED STARTING LOCATION: | Classroom |
| **DIRECTIONS:** | You are to perform the task Review/Approve completed Surveillance of RHR Pump 2RHS*P21B to determine operability as defined by the acceptance criteria. |
| **INITIAL CONDITIONS:** | Unit 2 is in Mode 5 with RCS core exit thermocouple temperatures at 110°F. Surveillance 2OST-10.2 Residual Heat Removal Pump [2RHS*P21B] Performance Test has been completed by the RO and reviewed by the STA. |
| **INITIATING CUE:** | Review/Approve completed Surveillance of RHR Pump 2RHS*P21B to determine operability as defined by the acceptance criteria. Document the results of your review in the comments section of the cover page. |
| REFERENCES: | 2OST-10.2 Residual Heat Removal Pump [2RHS*P21B] Performance Test. Rev. 10 |
| TOOLS: | None |
| HANDOUT: | 2OST-10.2 Residual Heat Removal Pump [2RHS*P21B] Performance Test (Rev. 10) completed **With unacceptable Δ P and vibrations.** |

OPERATIONS JOB PERFORMANCE MEASURE

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

| | |
|---|---|
| TASK: | You are to perform the task Review/Approve completed Surveillance of RHR Pump 2RHS*P21B to determine operability as defined by the acceptance criteria. |
| INITIAL CONDITIONS: | Unit 2 is in Mode 5 with RCS core exit thermocouple temperatures at 110°F. Surveillance 2OST-10.2 Residual Heat Removal Pump [2RHS*P21B] Performance Test has been completed by the RO and reviewed by the STA. |
| INITIATING CUE: | Review/Approve completed Surveillance of RHR Pump 2RHS*P21B to determine operability as defined by the acceptance criteria. Document the results of your review in the comments section of the cover page. |

☐ 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-026<br>JPM REVISION: 0 | JPM TITLE: Review/Approve Completed Surveillance of RHS Pump |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| 1. Refers to appropriate procedure step. | 1.1 Consult the Acceptance Criteria for acceptable performance.<br><br>COMMENTS: | |
| 2.C [2RHS*P21B], Residual Heat Removal Pump: Operates within the limits of ASME XI IST Program (**[ITS]** T.S.5.5.4) as follows: Motor Vibration (Data Sheet 1) | 2.1 Compares Actual Motor Vibrations on Data Sheet 1 to Acceptable and Alert range.<br>2.2C Determines Motor Inboard (2) Axial is **GREATER THAN** Acceptable and Alert Range<br><br>COMMENTS: | |
| 3.C [2RHS*P21B], Residual Heat Removal Pump: Operates within the limits of ASME XI IST Program (**[ITS]** T.S.5.5.4) as follows: Pump Vibration (Data Sheet 1) | 3.1. Compares Actual Pump Vibrations on Data Sheet 1 to Acceptable and Alert range.<br>3.2C Determines Pump Inboard (3) Horizontal and Vertical are **BOTH** greater than Acceptable and Alert Range.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-026<br>JPM REVISION: 0 | JPM TITLE: Review/Approve Completed Surveillance of RHS Pump |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 4.C [2RHS*P21B], Residual Heat Removal Pump: Operates within the limits of ASME XI IST Program ([ITS]T.S. 5.5.4) as follows: Delta-P (Data Sheet 2) | 4.1 Compares calculated Delta P on Data Sheet 2 to Acceptable Range.<br>4.2C Determines calculated Delta P is **LESS THAN** Acceptable Range.<br><br>COMMENTS: | |
| 5. [2RHS*4], Residual Heat Removal Pump 21B Disch Check Vlv, operates within the requirements of ASME XI IST Program ([ITS] T.S. 5.5.4) for forward flow (full-stroke) at a flowrate of 4000 gpm (Step VII.B.9). | 5.1 Reviews step VII.B.9 of OST to determine if 4000 gpm was achieved.<br>5.2 Determines step was completed satisfactorily.<br><br>COMMENTS: | |
| 6.C [2SIS*141], SI Accum Tank 21C Check to Loop C Cold Leg, partial stroke forward flow test. (Check valve operation is acceptable **IF** III.A.1 above is met.) ([ITS] T.S. 5.5.4) | 6.1C Determines **DOES NOT MEET** Acceptance criteria based on unacceptable Δ P and vibrations.<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-026<br>JPM REVISION: 0 | JPM TITLE: Review/Approve Completed Surveillance of RHS Pump |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 7. RHR heat exchanger outlet temperature indication conforms with the expected temperature based on current plant conditions. (Data Sheet 3) | 7.1 Compares the Data from Data sheet 3 to initial conditions of core exit thermocouples of 110°F.<br><br>7.2 Determines that these are as expected.<br><br>COMMENTS: | |
| 8. RHR heat exchanger outlet temperatures and RCS cold leg temperature are within 25°F of each other. (Data Sheet 3). | 8.1 Compares Data from Data sheet 3; and, determines that RHR heat exchanger outlet temperatures and RCS cold leg temperature are within 25°F of each other.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-026<br>JPM REVISION: 0 | JPM TITLE: Review/Approve Completed Surveillance of RHS Pump |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 9.C Complete the front cover sheet. | 9.1 Places a checkmark in the Problems encountered block of cover page.<br><br>9.2C Lists the following problems on OST problem sheet:<br>• Motor Inboard (2) Axial vibration is **GREATER THAN** Acceptable and Alert Range<br>• Pump Inboard (3) Horizontal and Vertical vibrations are **BOTH** greater than Acceptable and Alert Range.<br>• Calculated Delta P is **LESS THAN** Acceptable Range.<br>• [2SIS*141], SI Accum Tank 21C Check to Loop C Cold Leg, partial stroke forward flow test. (Check valve operation is unacceptable (Due to problems listed above).<br><br>COMMENTS: | |
| | **EXAMINER CUE:**<br>That completes this JPM | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Review/Approve LW Discharge (SRO ONLY)

TRAINING MATERIAL NUMBER: 2AD-023

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-023

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown. Rev. 24

INSTRUCTIONAL SETTING: Classroom

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Training Supervisor or Designee _____ Date

RELEASED

# TRAINING MATERIAL CHANGE FORM

| | | |
|---|---|---|
| Affected Training Materials: 2AD-023 | | |
| Type of Change: | | |
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |
| List/Description of Change(s): | | |
| Reason for Change (s): | | |
| APPROVALS:<br><br>_____<br>Prepared by Date<br><br>_____<br>Training Superintendent/Supervisor/Peer Date<br>*("Changes Not Requiring Revision" only)* | | **NOTE**: 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: 2AD-023<br>JPM REVISION: 0 | JPM TITLE: Review/Approve LW Discharge (SRO ONLY) |
|---|---|

K/A REFERENCE: 2.3.11 4.3 TASK ID: 1300-009-03-023

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ FAULTED JPM ☒ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | | Performer SSN: |
| Time Critical: ☐ Yes ☒ 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: _____

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | RWDA-L-99999T is **NOT** approved for the following reasons: Wrong tank volume and Wrong alternate radiation monitor alarm setpoint calculation. |
| RECOMMENDED STARTING LOCATION: | Classroom |
| **DIRECTIONS:** | You are to perform the task Review/Approve LW Discharge. |
| **INITIAL CONDITIONS:** | *Unit 2 is at* 100% power. RWDA-L-99999T has been prepared for discharging Steam Generator Blowdown Evaporator Test Tank 2SGC-TK23B. Steam Generator Blowdown Evaporator Test Tank 2SGC-TK23B level is 130 inches. Procedure 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown has been completed through step IV.A.11. |
| **INITIATING CUE:** | Approve RWDA-L-99999T IAW procedure 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown step IV.A.12.<br>Document the results of your approval in appropriate steps of 2OM-25.4.L AND in the block below. (Located on candidate direction sheet) |
| REFERENCES: | 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown Rev. 24<br>Curve Book for 2SGC-TK23B |
| TOOLS: | Calculator |
| HANDOUT: | RWDA-L-99999T filled out with the following errors:<br>18,000 gal volume for the tank instead of 17,705 gals.<br>Wrong alternate radiation monitor alarm setpoint calculation. ($1.88E^{-3}$ instead of $1.88E^{-4}$<br>2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown filled out up to step IV.A.12 |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task Review/Approve LW Discharge.

INITIAL CONDITIONS: Unit 2 is at 100% power. RWDA-L-99999T has been prepared for discharging Steam Generator Blowdown Evaporator Test Tank 2SGC-TK23B. Steam Generator Blowdown Evaporator Test Tank 2SGC-TK23B level is 130 inches. Procedure 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown has been completed through step IV.A.11.

INITIATING CUE: Approve RWDA-L-99999T IAW procedure 2OM-25.4.L, Discharging Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B)] Contents To Cooling Tower Blowdown step IV.A.12.
Document the results of your approval in appropriate steps of 2OM-25.4.L AND in the block below.

**RESULTS:**

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

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

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

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

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-023<br>JPM REVISION: 0 | JPM TITLE: Review/Approve LW Discharge (SRO ONLY) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| | START TIME: _____ | | |
| 1. After the RWDA-L is approved by Radiation Protection AND Chemistry, have the SM or US review the RWDA-L to confirm the following:<br>Verify that the Unit 1 SM **OR** US has signed the RWDA-L at "Approved By". | 1.1 Verifies Unit 1 Shift Manager has signed the appropriate block on the RWDA-L<br><br>COMMENTS: | | |
| 2.**C** The tank data is correct. | 2.1**C** Refers to Tank Curve book and determines that the tank data is **INCORRECT**. The correct volume for 130 inches should be 17,705 gals. **NOT** 18,000 gals.<br><br>**EVALUTOR NOTE:**<br>Candidate may also refer to recirculation time of the tank. The recirculation time is more than the minimum required.<br><br>COMMENTS: | | |
| 3. Verify Chemistry has authorized the RWDA-L. | 3.1 Verifies Chemistry has signed the appropriate block on the RWDA-L<br><br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-023<br>JPM REVISION: 0 | JPM TITLE: Review/Approve LW Discharge (SRO ONLY) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 4. Verify Radiation Protection has authorized the RWDA-L. | 4.1 Verifies Rad Pro has signed the appropriate block on the RWDA-L<br><br>COMMENTS: | |
| 5.C All hand calculations are correct. | 5.1C Determines that the alternate radiation Alarm setpoint calculation is **INCORRECT**.<br><br>**EVALUTOR NOTE:**<br>4000/85 X $4.0E^{-6}$ should equal $1.88E^{-4}$ NOT $1.88E^{-3}$<br>AND this also makes $1.88E^{-4}$ X .7 INCORRECT.<br><br>COMMENTS: | |
| 6. Verify the effective period for the RWDA-L has **NOT** expired. | 6.1 Determines RWDA-L is still effective.<br><br>**EVALUTOR NOTE:**<br>IAW P&L I on page 3 the RWDA-L is effective for 72 hours from the time the sample was drawn<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-023<br>JPM REVISION: 0 | JPM TITLE: Review/Approve LW Discharge (SRO ONLY) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| 7.C If the tank is NOT acceptable for discharge, an approval signature is NOT required.<br>Mark the RWDA-L VOID, state reason, initial, AND Return the RWDA-L to Radiation Protection.<br>(Otherwise N/A this step). | 7.1C In the remarks section places the following information:<br>• Mark the RWDA-L VOID<br>• Tank volume is incorrect.<br>• Radiation monitor alarm setpoint calculations are incorrect<br>• Candidate initials<br><br>**EVALUTOR NOTE:**<br>Some discretion is required when grading this step of the JPM. It is NOT required to place the exact words listed here for the tank volume and radiation monitor alarm setpoint. However, it is critical the candidate documents all the errors on the form.<br><br>COMMENTS: | | |
| | **EVALUTOR CUE:**<br>That completes this JPM. | | |
| | STOP TIME: _____ | | |

Form 1/2-ENV-05.04.F01, Rev 0 (Page 1 of 5)
RWDA-L: Part 1, Summary of Discharge Data
Beaver Valley Power Station-2

RTL#A9.520
RWDA-L-99999T

This permit authorizes the discharge of a maximum of 18,000 gallons from tank 2SGC-TK23B at a maximum discharge rate of 85.0 gpm to the environment via U1 blowdown with a minimum total cooling tower blowdown of 4000.0 gpm at Unit 1 and Unit 2 with a monitor ~~ALERT alarm setpoint of 1.22E-03 uCi/ml and a monitor HIGH alarm setpoint of 1.74E-03 uCi/ml~~ DBG TODAY on 2SGC-RQ100 (See Below for Alternate Alarm Setpoints)

This tank was recirculated from Yesterday 0001 hours to Yesterday 2001 hours (at which time it was sampled) for a total of 1200 minutes.

| Prepared By | Reviewed By | Remarks: |
|---|---|---|
| D. B. Gamma TODAY<br>Signature Date | D. B. Beta TODAY<br>Peer Review Sig Date | |

| Cooling Tower Flow Set | Monitor Source |
|---|---|
| Unit 1 NCO Init U1&U2 N/A Init | Check HPT Init |

| Monitor Alarms Adjusted | Approved By | Approved By |
|---|---|---|
| ALERT DBG Init HIGH DBG Init | D.M. Shifty (U1) TODAY<br>U1 Shift Mgr Sig Date | U2 Shift Mgr Sig Date |

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

( Alarm CT B/D) / (Max Exp Disch) = ( 4000 gpm) / ( 85 gpm) X 4.00E-06=HIGH =( 1.88 $E^{-3}$ uCi/ml)

HIGH X 0.70 = ALERT = ( 1.32 $E^{-3}$ uCi/ml)

ischarge Record

| Discharge Start | | | | | | Discharge Stop | | | | | | Vol. | CT Flow, gpm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mo | dy | yr | hr | mn | levl | ini | mo | dy | yr | hr | mn | levl | ini | gal. | TOTAL |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Discharge Time, min = Discharged Volume, gal =

| Monitor Alarms Reset | Reviewed By | Reviewed By |
|---|---|---|
| ALERT NA Init HIGH NA Init | U1 Shift Mgr Sig Date | U2 Shift Mgr Sig Date |

Post Release Review

( C.T. Flow gpm) X ( Discharge Time min) = ( Dilution Volume gal)

( Discharge Vol gal) / ( C.T. Flow gpm) = ( Post Time min) / 4.43E+00 = ( Dose Corr.)

| Composite Size | File Update | Post Review |
|---|---|---|
| ml -----/----- Init date | -----/----- Init date | Signature Date |

EXERCISE MODE ONLY

RTL#A9.520A
RWDA-L-99999T

TANK: 2SGC-TK23B TANK VOLUME: 17705.3 gal, 6.70E+07 ml LEVEL: 130.0 in
SAMPLE IDENTIFICATION: 20080422005 TOTAL C.T. FLOW: 4000.0 gpm

| NUCLIDE | Concentration uCi/ml | OEC Fraction* | Count Rate | EPA-RQ Fraction |
|---|---|---|---|---|
| CR-51 | 5.32E-06 | 1.06E-03 | 1.07E+02 | 3.56E-07 |
| CO-58 | 3.96E-05 | 1.98E-01 | 7.21E+03 | 2.65E-04 |
| CO-60 | 1.47E-06 | 4.90E-02 | 3.50E+02 | 9.86E-06 |
| FE-59 | 1.45E-06 | 1.45E-02 | 1.83E+02 | 9.72E-06 |
| AG-110M | 5.20E-07 | 8.66E-03 | 2.22E+02 | 3.48E-06 |
| SB-124 | 8.82E-06 | 1.26E-01 | 2.37E+03 | 5.91E-05 |
| SB-125 | 1.11E-05 | 3.70E-02 | 1.68E+03 | 7.44E-05 |
| H-3 | 1.40E-02 | 1.40E+00 | | 9.38E-03 |
| TOTALS | 1.41E-02 | 1.83E+00 | 1.21E+04 | 9.81E-03 |

* undiluted

Total Activity = 9.43E+05 uCi

MAXIMUM DISCHARGE FLOW RATE = 8.50E+01 gpm ***SET TO MAXIMUM***

Dilution Factor = 4.71E+01

NOBLE GAS CONCENTRATION IN RIVER = 0.00E+00 uCi/ml

EXERCISE MODE ONLY

RTL#A9.520A
RWDA-L-99999 [illegible]

(All Dose Values in mRem)

| NUCLIDE | CONCENTRATION | BONE | LIVER | TOTAL BODY | THYROID | KIDNEY | LUNG | GI-LLI |
|---|---|---|---|---|---|---|---|---|
| CR-51 | 5.32E-06 | 0.00E+00 | 0.00E+00 | 1.67E-07 | 9.96E-08 | 3.67E-08 | 2.21E-07 | 4.19E-05 |
| CO-58 | 3.96E-05 | 0.00E+00 | 8.71E-05 | 1.95E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.77E-03 |
| CO-60 | 1.47E-06 | 0.00E+00 | 9.31E-06 | 2.05E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.74E-04 |
| FE-59 | 1.45E-06 | 3.71E-05 | 8.73E-05 | 3.34E-05 | 0.00E+00 | 0.00E+00 | 1.98E-05 | 2.91E-04 |
| AG-110M | 5.20E-07 | 1.21E-08 | 1.12E-08 | 6.65E-09 | 0.00E+00 | 2.20E-08 | 0.00E+00 | 4.58E-06 |
| SB-124 | 8.82E-06 | 1.71E-06 | 3.23E-08 | 6.75E-07 | 4.14E-09 | 0.00E+00 | 1.33E-06 | 4.84E-05 |
| SB-125 | 1.11E-05 | 1.37E-06 | 1.53E-08 | 3.28E-07 | 1.40E-09 | 0.00E+00 | 1.06E-06 | 1.51E-05 |
| FE-55 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| H-3 | 1.40E-02 | 0.00E+00 | 9.30E-05 | 9.30E-05 | 9.30E-05 | 9.30E-05 | 9.30E-05 | 9.30E-05 |
| G.ALPHA | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PROJECTED RELEASE DOSE = | | 4.02E-05 | 2.77E-04 | 3.43E-04 | 9.31E-05 | 9.30E-05 | 1.15E-04 | 2.44E-03 |
| UNIT 1/2 PROJECTED RELEASE DOSE = | | 2.01E-05 | 1.38E-04 | 1.71E-04 | 4.65E-05 | 4.65E-05 | 5.77E-05 | 1.22E-03 |
| Unit 1 Current Month Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 1 PROJECTED MONTH DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 2 Current Month Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 2 PROJECTED MONTH DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 1 Current Quarter Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 1 PROJECTED QUARTER DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 2 Current Quarter Dose = | | 6.31E-04 | 4.73E-03 | 3.82E-03 | 2.77E-03 | 3.94E-03 | 2.80E-03 | 6.28E-03 |
| UNIT 2 PROJECTED QUARTER DOSE = | | 6.51E-04 | 4.86E-03 | 3.99E-03 | 2.81E-03 | 3.99E-03 | 2.86E-03 | 7.50E-03 |
| Unit 1 Current Year Dose = | | 2.82E-02 | 5.95E-02 | 3.82E-02 | 8.84E-03 | 3.23E-02 | 1.26E-02 | 2.92E-02 |
| UNIT 1 PROJECTED YEAR DOSE = | | 2.83E-02 | 5.96E-02 | 3.84E-02 | 8.89E-03 | 3.23E-02 | 1.26E-02 | 3.05E-02 |
| Unit 2 Current Year Dose = | | 2.82E-02 | 5.95E-02 | 3.82E-02 | 8.84E-03 | 3.23E-02 | 1.26E-02 | 2.92E-02 |
| UNIT 2 PROJECTED YEAR DOSE = | | 2.83E-02 | 5.96E-02 | 3.84E-02 | 8.89E-03 | 3.23E-02 | 1.26E-02 | 3.05E-02 |

[illegible] sum of the RQ's is < 1; this is not considered a Reportable Quantity.

EXERCISE MODE ONLY

RTL A9.520A

## RWDA-L: Part 4, Checklist, Pre-Release Data and Alternate Alarm Setpoint Determination

**Beaver Valley Power Station - 1 / 2**

**RWDA-L-99999T**

| | |
|---|---|
| Initials PAB | : Pre-Release Data obtained from Operations [Ref: procedure 1/2-ENV-05.04] |
| Initials PAB | : Samples obtained & Valve Verifications performed [Ref: procedure 1/2-ENV-05.01] |
| Initials PAB | : Samples analyzed [Ref: procedure 1/2-ENV-05.25] |
| Initials PAB | : Sample bottles marked with the RWDA-L number [Ref: procedure 1/2-ENV-05.01] |
| Initials PAB | : RWDA-L prepared via the LIQDIS computer Code [Ref: procedure 1/2-ENV-05.04] |
| Initials PAB | : Alarm Setpoints adjusted [Form 1-HPP-4.02.001.F01 & 1-HPP-4.02.040.F01 or 2-HPP-4.02.022.F01 & 2-HPP-4.02.037.F01 |
| Initials PAB | : RWDA-L turned-over to Control Room Shift Manager or Unit Supervisor [Ref: procedure 1/2-ENV-05.04] |
| Initials | : Effluent Monitor Readings obtained during discharge [Ref: Form 1/2-ENV-05.04.F01 (page 5 of 5)] |

**RWDA-L Pre-Release Data: Complete this portion of the form PRIOR to entrance into the LIQDIS Computer Code**

| | | |
|---|---|---|
| Source of Discharge: | [ ] <U1> Unit 1 | [X] <U2> Unit 2 |
| Tank Identification: | [ ] <1> for 1LW-TK-6A, or [ ] <2> for 6B | [ ] <1> for 2LWS-TK21A, or [ ] <2> for 21B |
| | [ ] <3> for 1LW-TK-3A, or [ ] <4> for 3B | [ ] <3> for 2SGC-TK21A, or [ ] <4> for 21B |
| | [ ] <5> for 1LW-TK-5A, or [ ] <6> for 5B | [ ] <5> for 2SGC-TK23A, or [X] <6> for 23B |
| | [ ] <7> for 1LW-TK-7A, or [ ] <8> for 7B | [ ] <7> for Not Applicable, or [ ] <8> for N/A |
| | Note: Use [ ] <7> for Other Releases (e.g.: Chemical Waste Sump) | Note: Use [ ] <1> for Other Releases (e.g.: Fire Sump) |
| Tank Volume: 17705.3 gallons | | Tank Level: 130.0 [ ] feet, or [X] inches |
| Recirculation Start: YESTERDAY 0001 to YESTERDAY 2001 hours | | Sample Time: YESTERDAY 2001 hours |

Sample ID: [ ] Unit 1 Sample ID No. _____ or [X] Unit 2 Sample ID No. 20080422005

Minimum CT Flow from Unit 1 and Unit 2: 4000 gpm (As a Guide, Operations will provide this value based on the "Low Alarm Setpoint" minus ~ 500 gpm)

Discharge Path: [X] <U1> Send Liquid Waste to Unit 1 CT Blowdown, or [ ] <U2> Send Liquid Waste to Unit 2 CT Blowdown

**Sample Concentrations** — NOTE: For independent sampling, record the highest nuclide concentration from each sample

| Particulates | uCi/ml | Noble Gas | uCi/ml |
|---|---|---|---|
| Na-24 | | Ar-41 | |
| Cr-51 | 5.319 E-6 | Kr-85 | |
| Mn-54 | | Xe-131m | |
| Co-57 | | Xe-133 | |
| Co-58 | 3.961 E-5 | Xe-133m | |
| Co-60 | 1.471 E-6 | Xe-135 | |
| Fe-59 | 1.450 E-6 | Xe-135m | |
| Zn-65 | | Sb-122 | 3.343E-6 |
| Zr-97 / Nb-97 | | Sn-117m | 2.455E-7 |
| Mo-99 / Tc-99m | | These radionuclides are not in LIQDIS data base. Values were entered into Form 1/2-ENV-01.05.F02 for release content determination. | |
| Ag-110m | 5.198E-7 | | |
| Sb-124 | 8.821E-6 | | |
| Sb-125 | 1.110 E-5 | | |
| I-131 | | | |
| Zr-95 / Nb-95 | | If ≥1E-4, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | |
| Cs-134 | | If ≥3E-6, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | |
| Cs-137 | | If ≥4E-6, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | |
| Total Particulate | 7.19 E-5 | If ≥1E-4, reprocess, or obtain Administrative Guide Relief, as shown >>>>> | |

**Independent / Replicate Sample Comparison:**

[ ] No radiation monitor available for the discharge path.
(See ODCM procedure 1/2-ODC-3.03, Table 3.3-12, Action 23)

[ ] Replicate sample was requested by Chemistry supervision:
(See NRC Regulatory Guide 4.15, Section C.5)

uCi/ml = Total gamma concentration from 1st Sample

uCi/ml = Total gamma concentration from 2nd Sample

% Diff = 100 [ (1st _____ ) minus (2nd _____ ) ]
(2nd _____ )

**The total gamma concentration of the 1st & 2nd samples shall agree within a factor of 2 (i.e., % Diff is between -50% to +100%).**

**ADMINISTRATIVE GUIDE RELIEF:**

Reprocessing is not practical per Shift Manager

*IF Administrative Guide Relief is obtained from Shift Manager, THEN CR _____ was generated to address the need to reduce existing Administrative Guide values for future discharges during the applicable calendar month, quarter(s), and year.*

Prepared By: P. Bamford SAP ID No.: 12345 Date: TODAY

Peer Review Signature: Sowell-Campbell SAP ID No.: 45678 Date: TODAY

**Alternate Alarm Setpoint Determination: Complete this portion of the form AFTER exit from the LIQDIS Computer Code**

| | | |
|---|---|---|
| [ ] RM-1LW-104: Is Total Particulate >3.14E-3 uCi/ml ? | [ ] YES [ ] NO | [ ] IF YES, THEN Alternate Alarm Setpoints SHALL NOT be used |
| [ ] RM-1LW-116: Is Total Particulate >7.33E-3 uCi/ml ? | [ ] YES [ ] NO | [X] IF NO, THEN Alternate Alarm Setpoints MAY be used |
| [X] 2SGC-RQ100: Is Total Particulate >1.14E-3 uCi/ml ? | [ ] YES [X] NO | See procedure 1/2-ENV-05.04 for additional guidance |

Prepared By: P. Bamford SAP ID No. 12345 Date: TODAY

Peer Review Signature: Sowell-Campbell SAP ID No 45678 Date: TODAY

Form 1/2-ENV-05.04.F01, Rev 0 (page 5 of 5)

RTL# A9 520A

## RWDA-L: Part 5, Effluent Radiation Monitor Tracking

**Beaver Valley Power Station - 1 / 2**

**RWDA-L-99999T**

Tank Identification: 2SGC - TK23B

**Discharge Period** See RWDA Cover Sheet for Actual Times

**Initial Start Date/Time:** /

**Final Stop Date/Time:** /

**Effluent Radiation Monitor & Determination of Acceptable Range of Readings During Discharge:**

**[ ] Unit 1 Liquid Waste Tank Discharge via [RM-1LW-104]:**

RWDA-L Count Rate: Form 1/2-ENV-05.04.F01 (page 2 of 5) = ____________ net cpm

NOTE: MDCR = Minimum Detectable Count Rate

RM-1LW-104 bkgd = ____________ cpm

RM-1LW-104 Gross HSP = ____________ cpm

RM-1LW-104 Gross HHSP = ____________ cpm

[ ] IF the RWDA-L Count Rate is ≤1,141 net cpm (MDCR), THEN the discharge is controlled by the alarm setpoints (No further calculations required).

[ ] IF the RWDA-L Count Rate is >1,141 net cpm, THEN determine the **Acceptable Range of Readings** for control of the discharge, as follows:

Maximum = (RWDA-L Count Rate ____________ cpm) x (2) + (bkgd __________ cpm) = ____________ cpm

Minimum = (RWDA-L Count Rate ____________ cpm) / (2) + (bkgd __________ cpm) = ____________ cpm

**[ ] Unit 1 Laundry & Shower Drain Tank Discharge via [RM-1LW-116]:**

RWDA-L Count Rate: Form 1/2-ENV-05.04.F01 (page 2 of 5) = ____________ net cpm

NOTE: MDCR = Minimum Detectable Count Rate

RM-1LW-116 bkgd = ____________ cpm

RM-1LW-116 Gross HSP = ____________ cpm

RM-1LW-116 Gross HHSP = ____________ cpm

[ ] IF the RWDA-L Count Rate is ≤236 net cpm (MDCR), THEN the discharge is controlled by the alarm setpoints (No further calculations required).

[ ] IF the RWDA-L Count Rate is >236 net cpm, THEN determine the **Acceptable Range of Readings** for control of the discharge, as follows:

Maximum = (RWDA-L Count Rate ____________ cpm) x (2) + (bkgd __________ cpm) = ____________ cpm

Minimum = (RWDA-L Count Rate ____________ cpm) / (2) + (bkgd __________ cpm) = ____________ cpm

**[ ] Unit 2 Liquid Waste Tank Discharge via [2SGC-RQ100]:**

RWDA-L Count Rate: Form 1/2-ENV-05.04.F01 (page 2 of 5) = ____________ net cpm

NOTE: MDCR = Minimum Detectable Count Rate

2SGC-RQ100 bkgd = ____________ uCi/ml

2SGC-RQ100 Gross ASP = ____________ uCi/ml

2SGC-RQ100 Gross HSP = ____________ uCi/ml

[ ] IF the RWDA-L Count Rate is ≤247 net cpm (MDCR), THEN the discharge is controlled by the alarm setpoints (No further calculations required).

[ ] IF the RWDA-L Count Rate is >247 net cpm, THEN determine the **Acceptable Range of Readings** for control of the discharge, as follows:

Maximum = (RWDA-L Count Rate __________ cpm) x (5.61E-9 uCi/ml/cpm) x (2) + (bkgd __________ uCi/ml) = ____________ uCi/ml

Minimum = (RWDA-L Count Rate __________ cpm) x (5.61E-9 uCi/ml/cpm) / (2) + (bkgd __________ uCi/ml) = ____________ uCi/ml

**Gross Effluent Radiation Monitor Readings:** NOTE: Record actual reading (ie; Do Not Round Down)

Obtain At Least 2 Effluent Monitor Readings Per Discharge, AND At Least 1 Per 8 hr Shift For the Applicable Monitor:

Date / Time __________ / ______: Reading ______________: Is reading within range? Yes[ ] No[ ]: RT Initials _______: SAP No.________

Date / Time __________ / ______: Reading ______________: Is reading within range? Yes[ ] No[ ]: RT Initials _______: SAP No.________

Date / Time __________ / ______: Reading ______________: Is reading within range? Yes[ ] No[ ]: RT Initials _______: SAP No.________

Date / Time __________ / ______: Reading ______________: Is reading within range? Yes[ ] No[ ]: RT Initials _______: SAP No.________

Date / Time __________ / ______: Reading ______________: Is reading within range? Yes[ ] No[ ]: RT Initials _______: SAP No.________

Date / Time __________ / ______: Reading ______________: Is reading within range? Yes[ ] No[ ]: RT Initials _______: SAP No.________

[ ] IF Effluent Monitor Readings are not within the **Acceptable Range of Readings**, THEN contact Chemistry Supervision

[ ] Chemistry Supervision has determined that the discharge should be terminated, and Operations has been notified to terminate the discharge.

[ ] Chemistry Supervision has determined that the discharge may continue. Reasoning:

**Final Review of all Monitor Readings by Chemistry Supervision:**

**Gross Calculated Monitor Reading = ____________ [ ] cpm, [ ] uCi/ml**

**% Difference = (Max Obs Reading - Calc Reading) / Calc Reading = _________ % [ ] Sat [ ] Unsat**

**NOTES: Sat = SATISFACTORY: % Difference is Within a Factor of 2 ( -50% to +100%)**

**Unsat = UNSATISFACTORY: % Difference is Outside the "Sat" Range.**

**Generate a Condition Report**

**Reviewed By:** ______________________________ **SAP No:** _________ **Date:** ______________

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

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

TRAINING MATERIAL NUMBER: 2AD-021

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2AD-021

REVISION NUMBER: 0

TECHNICAL REFERENCES:

EPP/I-1a, Recognition and Classification of Emergency Conditions, Rev. 10

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-021

Type of Change:

| | | |
|---|---|---|
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |

List/Description of Change(s):

Reason for Change (s):

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2AD-021<br>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: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ 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

| | |
|---|---|
| TASK STANDARD: | The correct EPP classification is made for the associated scenario **AND** all "critical" steps of the initial notification form are correctly completed. |
| RECOMMENDED STARTING LOCATION: | Simulator |
| **DIRECTIONS:** | You are to perform the task Classify An Emergency Event and complete the initial notification form. |
| **INITIAL CONDITIONS:** | The simulator scenario just completed.(2LOT6 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.<br>For the purpose of filling out the initial notification form the following conditions exist:<br>• The code word is "TANGO"<br>• Unit 1 is at 100% steady state power<br>• Wind direction at 150' is 65°<br>• Wind speed at 35' is 7 mph |
| REFERENCES: | EPP/I-1a, Recognition and Classification of Emergency Conditions, Rev. 10 |
| TOOLS: | None |
| HANDOUT: | EPP/I-1a, Recognition and Classification of Emergency Conditions, Rev. 10 |

## 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.(2LOT6 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 "TANGO"
- Unit 1 is at 100% steady state power
- Wind direction at 150' is 65°
- Wind speed at 35' is 7 mph

☐ 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.

1/2-EPP-IP-1.1.F01
Rev. 2

# ANSWERKEY SCENARIO #1

RTL# A5.715DP

## NUCLEAR POWER PLANT INITIAL NOTIFICATION FORM

1. Call Status ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

2. This is: _____ At: **Beaver Valley Power Station**

My Telephone Number is: 724-643-8000 The Code Word is: TANGO Notification Time is: _____

3. Emergency Classification:

"C" ☒ Unusual Event ☐ Site Area Emergency

☐ Alert ☐ General Emergency ☐ This event has been terminated

Unit(s): 2 Declaration Time: Time Date: DATE

All Units Power Level at time of Notification UNIT 1 100%, UNIT 2 0%

This represents a/an: "C" ☒ Initial Declaration ☐ Escalation ☐ No Change — In Classification Status

"C" 4. The Emergency Action Level (EAL) number is: TAB 2.10

Brief non-technical description of the event below:

UNPlanned rapid depressurization of The MAIN steAm System resulting in a rapid RCS cooldown AND SAFety INJECTION ACtuation

"C" 5. There is: ☐ No Radiological Release in Progress due to the event ☒ An Airborne Radiological Release in Progress due to the event ☐ A Liquid Radiological Release in Progress due to the event

"C" 6. Wind Direction is from: 65° degrees at 150' Wind Speed is: 7. mph at 35'

7. Protective Action Recommendation (PAR): NONE

8. Conclusion: ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

APPROVED: NAME DATE: DATE

"C" Denotes "Critical" step

1/2-EPP-IP-1.1.F01
Rev. 2

# ANSWER KEY
# SCENARIO #2

RTL# A5.715DP

## NUCLEAR POWER PLANT INITIAL NOTIFICATION FORM

1. Call Status ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

2. This is: _____ At: **Beaver Valley Power Station**

My Telephone Number is: 724-643-8000 The Code Word is: TANGO Notification Time is: _____

"C" 3. Emergency Classification:

☐ Unusual Event ☒ Site Area Emergency

☐ Alert ☐ General Emergency ☐ This event has been terminated

Unit(s): 2 Declaration Time: TIME Date: DATE

All Units Power Level at time of Notification UNIT 1 100%, UNIT 2 0%

This represents a/an: "C" ☒ Initial Declaration ☐ Escalation ☐ No Change — In Classification Status

"C" 4. The Emergency Action Level (EAL) number is: TAB 2.3

Brief non-technical description of the event below:

Reactor trip Failure After a VALid trip signAl(s) With reactor Power >5% And Attempts to CAuse a MANUAL trip from the CR Are UNsuccessful.

"C" 5. There is: ☐ No Radiological Release in Progress due to the event ☒ An Airborne Radiological Release in Progress due to the event ☐ A Liquid Radiological Release in Progress due to the event

"C" 6. Wind Direction is from: 65° degrees at 150' Wind Speed is: 7 mph at 35'

7. Protective Action Recommendation (PAR): NONE

8. Conclusion: ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

APPROVED: NAME DATE: DATE

"C" Denotes "CritiCAL" step

1/2-EPP-IP-1.1.F01
Rev. 2

ANSWER KEY
SCENARIO #3

RTL# A5.715DP

# NUCLEAR POWER PLANT INITIAL NOTIFICATION FORM

1. Call Status ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

2. This is: _____ At: **Beaver Valley Power Station**

My Telephone Number is: 724-643-8000 The Code Word is: TANGO Notification Time is: _____

"C" 3. Emergency Classification:

☐ Unusual Event ☒ Site Area Emergency

☐ Alert ☐ General Emergency ☐ This event has been terminated

Unit(s): 2 Declaration Time: Time Date: DATE

All Units Power Level at time of Notification UNIT 1 100%, Unit 2 0%

This represents a/an: "C" ☒ Initial Declaration
☐ Escalation
☐ No Change
In Classification Status

"C" 4. The Emergency Action Level (EAL) number is: TAB 2.2

Brief non-technical description of the event below:
Loss of Function needed to Achieve or Maintain hot shutdown

"C" 5. There is: ☐ No Radiological Release in Progress due to the event ☒ An Airborne Radiological Release in Progress due to the event ☐ A Liquid Radiological Release in Progress due to the event

"C" 6. Wind Direction is from: 65° degrees at 150' Wind Speed is: 7 mph at 35'

7. Protective Action Recommendation (PAR): NONE

8. Conclusion: ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

APPROVED: NAME DATE: DATE

"C" Denotes critical step

1/2-EPP-IP-1.1.F01
Rev. 2

# ANSWER KEY SCENARIO #4

RTL# A5.715DP

# NUCLEAR POWER PLANT INITIAL NOTIFICATION FORM

1. Call Status ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

2. This is: _____ At: **Beaver Valley Power Station**

My Telephone Number is: 724-643-8000 The Code Word is: TANGO Notification Time: _____

"C" 3. Emergency Classification:

☐ Unusual Event ☐ Site Area Emergency

☒ Alert ☐ General Emergency ☐ This event has been terminated

Unit(s): 2 Declaration Time: Time Date: DATE

All Units Power Level at time of Notification UNIT 1 100%; UNIT 2 0%

This represents a/an: "C" ☒ Initial Declaration ☐ Escalation ☐ No Change — In Classification Status

"C" 4. The Emergency Action Level (EAL) number is: TAB 2.3 OR 1.2.4

Brief non-technical description of the event below:

Automatic Reactor trip did not occur AFTER Valid trip Signal And MANUAL trip from CR WAS Successful. OR Loss of RCS Barrier due to Primary to secondary Leak

"C" 5. There is: ☐ No Radiological Release in Progress due to the event ☒ An Airborne Radiological Release in Progress due to the event ☐ A Liquid Radiological Release in Progress due to the event

"C" 6. Wind Direction is from: 65° degrees at 150' Wind Speed is: 7 mph at 35'

7. Protective Action Recommendation (PAR): NONE

8. Conclusion: ☒ THIS IS A DRILL ☐ *THIS IS AN ACTUAL EVENT*

APPROVED: NAME DATE: DATE

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-021<br>JPM REVISION: 0 | JPM TITLE: Classify an Emergency Event (Scenario Specific) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" **FOR SAT** or **"U" FOR UNSAT)⇒** | S | U |
|---|---|---|---|
| | START TIME: _____ | | |
| | **EVALUATOR NOTE: The Candidate is being evaluated on classifying the events in the scenario just completed. (2LOT6 NRC Exam) It may be necessary to review the events before beginning the JPM.** | | |
| 1.**C** Classify the event in accordance with the Emergency Plan. | 1.1**C** Candidate correctly classifies the event.<br>• Scenario #1: Unusual Event, Tab 2.10 Steam/Feed Line Break<br>• Scenario #2: Site Area Emergency, Tab 2.3, Failure of Reactor Protection<br>• Scenario #3: Site Area Emergency, Tab 2.2, CSF Red Path on Heat Sink<br>• Scenario #4: Alert, Tab 2.3, Failure of Reactor Protection<br>**OR**<br>Alert, Tab 1.2.4 Loss of RCS Barrier<br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-021<br>JPM REVISION: 0 | JPM TITLE: Classify an Emergency Event (Scenario Specific) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 2.C Completes the initial notification form. | 2.1 Places the following information on the space provided on the initial notification form.<br><br>• Item 1 places a checkmark in the this is a drill box<br>• Item 2 leaves name and notification time blank (this is for the communicator) places the word TANGO in the code space.<br>• **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<br>• Item 3 places a 2 in the Unit space, places current time in the declaration time space, places the date in the date space, places Unit 1 at 1005 and Unit 2 at 0% in the all units power level space.<br>• **C** Item 4 places the appropriate **EAL tab number** in the EAL number space (as identified in step 1 of the JPM above).<br>• Item 4 places the appropriate EAL description in the space provided (as identified in step 1 of the JPM above)<br>• **C** Item 5 places a **checkmark** in the an airborne radiological release in progress due to this event box.<br>• **C** Item 6 places **65°** and **7** mph in the wind speed and direction spaces<br>• Item 7 is left blank or NONE<br>• Item 8 places a checkmark in the this is a drill box | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2AD-021<br>JPM REVISION: 0 | JPM TITLE: Classify an Emergency Event (Scenario Specific) |
|---|---|

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

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Perform Partial Movement Test (CB-D)

TRAINING MATERIAL NUMBER: 2CR-647

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 2CR-647

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OST-1.1, Control Rod Assembly Partial Movement Test Rev 10

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 10 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

RELEASED

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-647

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |

List/Description of Change(s):

Original issue

Reason for Change (s):

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-647<br>JPM REVISION: 0 | JPM TITLE: Perform Partial Movement Test (CB-D) |
|---|---|

K/A REFERENCE: 001 A3.05 3.5/3.5 TASK ID: 0010010201
0011-002-06-013

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | | Performer SSN: |
| Time Critical: ☐ Yes ☒ 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

| | |
|---|---|
| TASK STANDARD: | Control Bank 'D' is verified operable (moved 10 steps) AND Rod H is identified as NOT aligned by ± 12 steps. |
| RECOMMENDED STARTING LOCATION: | CONTROL ROOM |
| **DIRECTIONS:** | You are to perform the task of Control Rod Assembly Partial Movement Test. |
| **INITIAL CONDITIONS:** | The reactor is in Mode 1, 100% power. All procedural Initial Conditions are satisfied. |
| **INITIATING CUE:** | Your supervisor directs you to verify Control Bank 'D' is operable by performing Section VII.B of 2OST-1.1, Control Rod Assembly Partial Movement Test, and report your results to your supervisor. |
| REFERENCES: | 2OST-1.1, Control Rod Assembly Partial Movement Test Rev. 10 |
| TOOLS: | NONE |
| HANDOUT: | 2OST-1.1 filled out up to step VII.B |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

| | |
|---|---|
| TASK: | You are to perform the task of Control Rod Assembly Partial Movement Test. |
| INITIAL CONDITIONS: | The reactor is in Mode 1, 100% power. All procedural Initial Conditions are satisfied. |
| INITIATING CUE: | Your supervisor directs you to verify Control Bank 'D' is operable by performing Section VII.B of 2OST-1.1, Control Rod Assembly Partial Movement Test, and report your results to your supervisor. |

☐ 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.

# 2LOIT-08-NRC JPMs S1 & S2

## Initial conditions/simulator setup

| | |
|---|---|
| [redacted] | Initialize |
| | Run |
| | LRTIC file commands |
| | Horns, Printers, Sounds ready |
| | Trg 1 to actuate dropped rod |
| | Dropped rod |
| | Trg 2 to clear dropped rod |
| | Dropped rod cleared |

NO ACTION REQUIRED FOR S-2

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-647<br>JPM REVISION: 0 | JPM TITLE: Perform Partial Movement Test (CB-D) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| | **SIMULATOR SET-UP:** Initialize IC-10.<br>Turn on all PRZR heaters<br>Stick rod H2 such that it ratchets down when outward rod motion is attempted.<br>Rods in Auto | |
| 1. Record the Rod Step Counter Control Bank 'D' Group 1 and 2 readings. | 1.1 Logs Control Bank 'D' Group 1 and 2 Readings.<br><br>COMMENTS: | |
| 2. Using the DRPI, Record the rod height of the Control Bank D rods listed below:<br>Rod H2_____Rod F6_____<br>Rod B8_____Rod F10_____<br>Rod H14_____Rod K10_____<br>Rod P8_____Rod K6_____ | 2.1 Records the rod height of the Control Bank D rods<br><br>**EVALUATOR NOTE:**<br>Although the Rods are at 229 steps, DRPI will only indicate 228 steps<br><br>COMMENTS: | |
| 3.**C** Place the Control Rod Bank Sel SW to MAN position. | 3.1**C** Places the Control Rod Bank Sel SW to MAN position<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-647<br>JPM REVISION: 0 | JPM TITLE: Perform Partial Movement Test (CB-D) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 4.C Using the IN-HOLD-OUT lever, drive CB 'D' 10 steps into the core until verification of individual rod movement is obtained by observation of the DRPIs. | 4.1C Places the IN-HOLD-OUT lever to IN and Inserts rods 10 steps in 5 step increments as indicated by the Group Step Demand counters, and verifies individual rod motion on DRPI.<br>**EVALUATOR NOTE:**<br>Annuciator A4-9G, Computer Monitored Alarm is expected each time rod motion is demanded.<br>COMMENTS: | |
| 5. Record the Control Bank 'D' step counter position. | 5.1 Records the Control Bank 'D' step counter position for Group 1 and 2.<br>COMMENTS: | |
| 6. Record the Control Bank 'D' rod position as indicated by DRPI. | 6.1 Candidate locates each individual rod DRPI indication and records the rod height.<br>COMMENTS: | |
| 7. Compare the step counter indication for each rod group (from Step VII.B.5) with the DRPI indication for each RCCA (from Step VII.B.6). Verify the step counter and DRPI indications are within ± 12 steps as stated in T.S. 3.1.4. | 7.1 Candidate compares the Group Step Demand counters against the DRPIs for Control Bank 'D'. Determines all rods are within ± 12 steps.<br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-647<br>JPM REVISION: 0 | JPM TITLE: Perform Partial Movement Test (CB-D) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| | **FAULT STATEMENT:**<br>**The next step of the JPM is Faulted. When the candidate begins to withdraw the control rods, Rod H2 will ratchet inward such that it will be misaligned by more than 12 steps from the rest of the bank.**<br><br>**EVALUATOR NOTE:**<br>Candidate may immediately STOP rod motion before achieving 229 steps. | |
| 8.C Return Control Bank D rods (in 5 step increments) to the group positions recorded in Step VII.B.1. | 8.1 Candidate locates the IN-HOLD-OUT lever.<br><br>8.2C Candidate places it to the OUT direction AND attempts to withdraw the Group Step Demand counters to 229 steps.<br><br>8.3C Candidate recognizes Rod H2 is ratcheting inward and stops rod motion.<br><br>**EVALUATOR NOTE:**<br>Candidate may refer to Annuciator A4-8G, Rod Position Deviation<br><br>COMMENTS: | |
| | **EVALUATOR CUE:**<br>If necessary Role-play the Unit Supervisor and instruct the candidate to **STOP** rod withdrawal **AND** remain here until further instructions.<br>It may also be necessary to ask the candidate to re-perform step 7 of the JPM to verify rod alignment. | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-647<br>JPM REVISION: 0 | JPM TITLE: Perform Partial Movement Test (CB-D) |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S U |
|---|---|---|
| 9.**C** Compare the step counter indication for each rod group (from Step VII.B.5) with the DRPI indication for each RCCA (from Step VII.B.6). Verify the step counter and DRPI indications are within ± 12 steps as stated in T.S. 3.1.4. | 9.1**C** Candidate compares the Group Step Demand counters against the DRPIs for Control Bank 'D'. Determines rod H2 is **NOT** within ± 12 steps of the other rods in the bank.<br><br>COMMENTS: | |
| | **EVALUATOR CUE:** Terminate JPM at this point. | |
| | STOP TIME: _____ | |

# OPERATINS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Perform a Hot Bus Transfer

TRAINING MATERIAL NUMBER: 2CR-023

PROGRAM TITLE: Licensed Operator Retraining

COMPUTER CODE: 2CR-023

REVISION NUMBER: 9

TECHNICAL REFERENCES:

OM-36.4.C, Transferring 4KV System from US SERV TFMR to SS SERV TFMR, Rev 9

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

PROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-023

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. #9 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 8<br>New Change # |

List/Description of Change(s):

1. Updated to reflect actual control room mark numbers and nomenclature.
2. Update to current procedure revision, Rev 9

Reason for Change (s):

1. Improve JPM accuracy.

APPROVALS:

R. J. Brooks

Prepared by Date

Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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.

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-023<br>JPM REVISION: 9 | JPM TITLE: Perform a Hot Bus Transfer |
|---|---|

K/A REFERENCE: 062K1.04 3.7/4.2 TASK ID: 0361-013-01-013
062A4.01 3.3/3.1

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

## EVALUATION RESULTS

| Performer Name: | Performer SSN: |
|---|---|

| Time Critical: ☐ Yes ☒ No | Allotted Time: 15 minutes | Actual Time: minutes |
|---|---|---|

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

Comments: _____

_____

## OBSERVERS

| Name/SSN: | Name/SSN: |
|---|---|
| Name/SSN: | Name/SSN: |

## EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

OPERATIONS JOB PERFORMANCE MEASURE

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | The 4kv Bus 2B is being supplied by the System Station Service Transformer. |
| RECOMMENDED STARTING LOCATION: | Control Room |
| **DIRECTIONS:** | You are to perform the task Perform a Hot Bus Transfer |
| **INITIAL CONDITIONS:** | The plant is at 100% power with all systems in NSA. It is desired to place the 2B 4KV bus on offsite power to allow for a relay check on ACB-142C. |
| **INITIATING CUE:** | Your supervisor directs you to transfer the 2B 4KV bus to the 2A SSST, but do not set it up for auto transfer back to the 2C USST. |
| REFERENCES: | 2OM-36.4.C, Transferring 4KV system from USST to SSST, Rev 9 |
| TOOLS: | None |
| HANDOUT: | 2OM-36.4.C |

OPERATIONS JOB PERFORMANCE MEASURE

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: Perform a Hot Bus Transfer

INITIAL CONDITIONS: The plant is at 100% power with all systems in NSA. It is desired to place the 2B 4KV bus on offsite power to allow for a relay check on ACB-142C.

INITIATING CUE: Your supervisor directs you to transfer the 2B 4KV bus to the 2A SSST, but do not set it up for auto transfer back to the 2C USST.

☐ 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.

# 2LOIT-08-NRC JPMs S1 & S2

| Initial conditions/simulator setup | |
|---|---|
| [redacted] | Initialize |
| | Run |
| | LRTIC file commands |
| | Horns, Printers, Sounds ready |
| | Trg 1 to actuate dropped rod |
| | Dropped rod |
| | Trg 2 to clear dropped rod |
| | Dropped rod cleared |

NO ACTION REQUIRED FOR S-2

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-023<br>JPM REVISION: 9 | JPM TITLE: Perform a Hot Bus Transfer |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S | U |
|---|---|---|---|
| | START TIME: _____ | | |
| | **SIMULATOR SETUP:**<br>Init in LRT 100% power IC set. | | |
| 1. Obtain procedure 2OM-36.4.C, Transferring 4kv system from USST to SSST. | 1.1 Candidate locates procedure.<br><br>COMMENTS: | | |
| 2. Verify voltages on the 2B 4kv bus are approximately the same on all phases as on SSST 2A. | 2.1 Candidate locates the 4KV Common volts meter, 4KV Bus 2B Volts meter, and 2A SS Serv Tmr Voltmeter Phase selector switch.<br><br>2.2 Checks all phases and verifies 2B bus and 2A SSST are within 2.0 volts.<br><br>COMMENTS: | | |
| 3.C Place Live Bus Transfer Switch to ON. | 3.1 Candidate locates Live bus Transfer Switch.<br><br>3.2C Turns switch to the ON position.<br><br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-023<br>JPM REVISION: 9 | JPM TITLE: Perform a Hot Bus Transfer |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 4.C Close ACB-142A. | 4.1 Candidate locates control switch for 2A SS SERV TFMR TO 4KV BUS 2B ACB-142A.<br>4.2C Turns switch to the CLOSE position.<br>4.3 Verifies BOTH Red lights are – LIT and the white light is – NOT LIT<br>COMMENTS: | |
| 5. Verify that amps increase on Bus 2B Tfmr 2A ammeter. | 5.1 Candidate locates 4KV BUS 2B TFMR 2A ammeter.<br>5.2 Verifies it indicates greater than ZERO amps.<br>COMMENTS: | |
| 6.C Open ACB-142C. | 6.1 Candidate locates control switch for 2C US SERV TFMR TO 4KV BUS 2B ACB-142C.<br>6.2C Places it in the OPEN/TRIP position.<br>6.3 Verifies BOTH Red lights are – NOT LIT and the white light is – LIT<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-023<br>JPM REVISION: 9 | JPM TITLE: Perform a Hot Bus Transfer |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT or "U" FOR UNSAT)⇒** | S U |
|---|---|---|
| 7. Place the Live Bus Transfer Switch to OFF. | 7.1 Candidate locates Live Bus Transfer Switch.<br>7.2 Places it in the OFF position.<br>COMMENTS: | |
| 8. Place Load Tap Changer in AUTO (only necessary if voltage adjusted earlier). | 8.1 N/A<br>8.2 Places it in the AUTO position.<br>COMMENTS:<br>**EVALUATOR CUE:**<br>That completes this JPM | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Transfer to Cold Leg Recirculation (ES-1.3)

TRAINING MATERIAL NUMBER: 2CR-529

PROGRAM TITLE: Licensed Operator Retraining

COMPUTER CODE: 2CR-529

REVISION NUMBER: 3

TECHNICAL REFERENCES:

2OM-53A.1.ES-1.3 (Issue 1C), Revision 5

INSTRUCTIONAL SETTING: Control Room

APPROXIMATE DURATION: 10 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-529

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 3 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 2<br>New Change # |

List/Description of Change(s):

Updated procedure to current revision.
Updated JPM to reflect actual control room mark numbers and nomenclature.
Added Evaluator Cue to step 5 of JPM (2LOT6 NRC exam validation comment)
Modified setup force a different procedural flowpath

Reason for Change (s):

Improve JPM clarity and to reflect current procedure revision.

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-529<br>JPM REVISION: 3 | JPM TITLE: Transfer to Cold Leg Recirculation (ES-1.3) |
|---|---|

K/A REFERENCE: 006K4.08 3.4/3.6
006A4.02 4.0/3.8
006 A4.05 3.9/3.8

TASK ID: 0111-019-01-013

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

EVALUATION RESULTS

| Performer Name: | Performer SSN: |
|---|---|

| Time Critical: ☐ Yes ☒ 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

| | |
|---|---|
| TASK STANDARD: | Parallel redundant Cold Leg Recirculation flowpaths are established according to Step 5 of 2OM-53A, Procedure ES-1.3. |
| RECOMMENDED STARTING LOCATION: | CONTROL ROOM |
| **DIRECTIONS:** | You are to simulate (perform) the task Transfer to Cold Leg Recirculation (ES-1.3). |
| **INITIAL CONDITIONS:** | The plant is recovering from a Loss of Coolant Accident. The Control Room Operators are now at step 5 of ES-1.3, Transfer to Cold Leg Recirc. |
| **INITIATING CUE:** | Your supervisor directs you to perform Step 5 of ES-1.3 'Transfer to Cold Leg Recirc'. |
| REFERENCES: | 2OM-53A.1.ES-1.3 (Issue 1C), Revision 5 |
| TOOLS: | 4 Shorting Bars |
| HANDOUT: | 2OM-53A.1.ES-1.3 |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

| | |
|---|---|
| TASK: | Transfer to Cold Leg Recirculation (ES-1.3) |
| INITIAL CONDITIONS: | The plant is recovering from a Loss of Coolant Accident. The Control Room Operators are now at step 5 of ES-1.3, Transfer to Cold Leg Recirc. |
| INITIATING CUE: | Your supervisor directs you to perform Step 5 of ES-1.3 'Transfer to Cold Leg Recirc'. |

☐ 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.

# 2LOIT-08-NRC JPM S3

## Initial conditions/simulator setup

[redacted]

Initialize

Run

LRTIC file commands

Horns, Printers, Sounds ready

Transfer to Cold Leg Recirc

[redacted]

DBA LOCA on "C" loop

[2RSS*P21D] Tripped

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-529<br>JPM REVISION: 3 | JPM TITLE: Transfer to Cold Leg Recirculation (ES-1.3) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| | **SIMULATOR SETUP:**<br><br>Malf RCS03C,<br>Open 2CCS*AOV118 Start an Air compressor.<br><br>Reset SI both trains. Stop both EDG's.<br>Wait until RWST level <400 inches.<br>Reset CIA & CIB.<br>Ensure 2CHS*P21A/C running.<br>Place both LHSI pumps in PTL. Energize charging pump suction and discharge valves via LOA-LOV093 thru 096, and LOV102 thru 105,<br>Insert following to trip [2RSS*P21D]<br>PMP-CSS010<br><br>**EVALUATOR NOTE:** Have 4 shorting bars available for candidate to perform this JPM | |
| 1. Obtain a copy of procedure ES-1.3 of 2OM-53A. | 1.1 Candidate locates ES-1.3 of 2OM-53A<br><br>**EVALUATOR NOTE:** Procedure can be provided to Candidate, if provided, N/A this JPM step.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-529<br>JPM REVISION: 3 | JPM TITLE: Transfer to Cold Leg Recirculation (ES-1.3) |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S | U |
|---|---|---|---|
| 2. Verify TWO charging/HHSI pumps running. | 2.1 Verifies Charging Pump High Head Safety Inj 2CHS*P21A and C Red lights are – LIT and the white lights are – NOT LIT.<br><br>COMMENTS: | | |
| 3.**C** Insert shorting bar into (2SIS*MOV836) High Head SI Cold Leg Isol. Valve Jack. | 3.1**C** Candidate locates jack for High Head SI Cold Leg Isol Vlv 2SIS*MOV836 and inserts shorting bar.<br><br>COMMENTS: | | |
| 4.**C** Open 2SIS*MOV836 HHSI Cold Leg Isol. Valve. | 4.1 Candidate locates control switch for High Head SI Cold Leg Isol Vlv 2SIS*MOV836.<br><br>4.2**C** Candidate places CS to OPEN<br><br>4.3 Candidate verifies Red light is – LIT and green light is - NOT LIT<br><br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-529<br>JPM REVISION: 3 | JPM TITLE: Transfer to Cold Leg Recirculation (ES-1.3) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 5. Verify Recirc Spray pumps 21C and 21D – Both Running. | 5.1 Candidate verifies Recirc Spray Pump 2RSS*P21C red light is – LIT and white light is – NOT LIT<br><br>5.2. Candidate verifies Recirc Spray Pump 2RSS*P21D red light is – NOT LIT and white light is – LIT<br><br>**EVALUATOR CUE:**<br>If necessary inform the candidate that Recirc Spray Pump 2RSS*P21D will **NOT START.**<br><br>5.3 Candidate verifies HHSI pumps 2CHS*P21 A and C red lights are – LIT and white lights are – NOT LIT<br><br>COMMENTS: | |
| 6.**C** Insert shorting bar into appropriate jacks and then close appropriate HHSI pump discharge isolation valves 2CHS*MOV8132A & B. | 6.1**C** Candidate locates jacks for Charging Pump Disch Isol Vlv 2CHS*MOV8132A & B and inserts shorting bars.<br><br>6.2 Candidate locates control switches for Charging Pump Disch Isol Vlv 2CHS*MOV8132A & B.<br><br>6.3**C** Candidate places Control switches to CLOSE<br><br>6.4 Candidate verifies green lights are – LIT and red lights are – NOT LIT<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-529<br>JPM REVISION: 3 | JPM TITLE: Transfer to Cold Leg Recirculation (ES-1.3) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| 7. Verify 2SIS*F1945, (946) LHSI Train A & B flow is indicated. | 7.1 Verifies 21A LHSI Pump Disch Flow 2SIS-F945 indicates greater than ZERO flow<br><br>COMMENTS: | |
| 8. Verify [2SIS*FI940, 943] Train A, B flow – indicated. | 8.1 Candidate locates HHSI TRN A 2SIS*FI940 indicates greater than ZERO flow<br><br>COMMENTS: | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Establish RCS Bleed and Feed per FR-H.1

TRAINING MATERIAL NUMBER: 2CR-624

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 2CR-624

REVISION NUMBER: 5

TECHNICAL REFERENCES:

2OM-53A.1.FR-H.1, Issue 1C, Response To Loss Of Secondary Heat Sink, Rev. 7

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 10 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 2CR-624

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 5 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 4<br>New Change # |

List/Description of Change(s):

Updated JPM to current JPM format.
Modified failure. (PCV455C and D will not open)

Reason for Change (s):

JPM Enhancement

APPROVALS:

R. J. Brooks
Prepared by Date

Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-624<br>JPM REVISION: 5 | JPM TITLE: Establish RCS Bleed and Feed per FR-H.1 |
|---|---|

K/A REFERENCE: E05 EA1.1 4.1/4.0 TASK ID: 0533-006-05-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ FAULTED JPM ☐ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ 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

| | |
|---|---|
| TASK STANDARD: | RCS Bleed and Feed are initiated (SI flow, one PRZR PORV open, all RX vessel head vents open). At least one SG isolated and depressurizing for low pressure water injection. |
| RECOMMENDED STARTING LOCATION: | Simulator |
| **DIRECTIONS:** | You are to perform the task of Establishing RCS Bleed and Feed per FR-H.1, Response To Loss of Secondary Heat Sink. |
| **INITIAL CONDITIONS:** | The plant has tripped from 100% power. FR-H.1, Response To Loss of Secondary Heat Sink has been entered. Steps 1 through 5 are complete. While performing step 6, the RCS bleed and feed criteria of continuous action Step 2 are met due to S/G WR levels dropping to less than 14%. |
| **INITIATING CUE:** | Your supervisor directs you to establish RCS bleed and feed by performing steps 13 through 16 of FR-H.1, Response To Loss of Secondary Heat Sink. |
| REFERENCES: | 2OM-53A.1.FR-H.1, Issue 1C, Response To Loss of Secondary Heat Sink, Rev. 7 |
| TOOLS: | None |
| HANDOUT: | 2OM-53A.1.FR-H.1, Issue 1C, Response To Loss of Secondary Heat Sink, Rev. 7 |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK:

You are to perform the task of Establishing RCS Bleed and Feed per FR-H.1, Response To Loss of Secondary Heat Sink.

**INITIAL CONDITIONS:**

The plant has tripped from 100% power. FR-H.1, Response To Loss of Secondary Heat Sink has been entered. Steps 1 through 5 are complete. While performing step 6, the RCS bleed and feed criteria of continuous action Step 2 are met due to S/G WR levels dropping to less than 14%.

**INITIATING CUE:**

Your supervisor directs you to establish RCS bleed and feed by performing steps 13 through 16 of FR-H.1, Response To Loss of Secondary Heat Sink.

☐ 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.

# 2LOIT-08-NRC JPM S4

## Initial conditions/simulator setup

| | |
|---|---|
| [redacted] | Initialize |
| | Run |
| | LRTIC file commands |
| | Horns, Printers, Sounds ready |

Initiate Bleed/Feed per FR-H.1

| | |
|---|---|
| [redacted] | [2FWS-P21B Trip] |
| | [2FWS-P21A Trip] |
| | [2FWE*P23A Trip] |
| | [2FWE*P23A Trip] |
| | Failure of AUTO reactor trip train A, manual successful |
| | Failure of AUTO reactor trip train B, manual successful |
| | [2RCS*PCV455C] failed shut |
| | [2RCS*PCV455D] failed shut |
| | [2FWE*P22] Trip |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-624<br>JPM REVISION: 4 | JPM TITLE: Establish RCS Bleed and Feed per FR-H.1 |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| | START TIME: _____ | | |
| | **SIMULATOR SETUP:**<br>Init **IC-237 for 2LOT6 NRC Exam**<br>Defeat 2FWE-P22, 23A, & 23B. Fail 2FWS-HYV157A, B, & C closed.<br>To establish conditions for JPM, trip 2FWS-P21A & B, place steam dumps in STM PRESS Mode at ~1005 psig. Stop 2RCS-P21A, B, & C. Allow SG levels to drop to < 13% and SNAP IC.<br>Fail PRZR PORVs PCV455C and D from opening. | | |
| 1. Obtain procedure. | 1.1 Candidate locates procedure FR-H.1<br><br>COMMENTS: | | |
| 2.C Actuate SI. | 2.1C Candidate locates and actuates control switches for Train A and Train B Safety Injection.<br><br>2.2 Verifies alarm A12-1D "Safety Injection Signal" is - LIT<br><br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-624<br>JPM REVISION: 4 | JPM TITLE: Establish RCS Bleed and Feed per FR-H.1 |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 3. Verify RCS Feed Path<br>• HHSI Flow Indicated. | 3.1 Candidate locates HHSI Train "B" flow indicator – [2SIS-FI943] and verifies HHSI flow is greater than ZERO.<br><br>COMMENTS: | |
| | **FAULT STATEMENT:**<br>The next step begins the alternate path for this JPM. There will only be ONE PRZR PORV available as a bleed path. The candidate will be required to OPEN all RX Vessel head vents to obtain adequate bleed flow. | |
| 4. Establish RCS Bleed Path<br>• Power to PRZR PORV block valves AVAILABLE. | 4.1 Candidate verifies the following indicating lights:<br>• 2RCS-MOV535, 536 and 537 red lights – LIT<br>green lights – NOT LIT<br><br>COMMENTS: | |
| 5. Establish RCS Bleed Path<br>• Verify block valves – ALL OPEN. | 5.1 N/A Previously verified<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-624<br>JPM REVISION: 4 | JPM TITLE: Establish RCS Bleed and Feed per FR-H.1 |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S U |
|---|---|---|
| | **FAULT STATEMENT:**<br>**ONLY** PRZR PORV, 2RCS-PCV456 will open in the next step. This will require the candidate to Open RCS vent paths. | |
| 6.C Establish RCS Bleed Path<br>• Open all PORVs. | 6.1 Candidate locates PRZR PORV Control Switches.<br>6.2C Places CS for PRZR PORV, 2RCS-PCV455C, 455D and 456 to OPEN.<br>6.3 Verifies PRZR PORV, 2RCS-PCV456 red light – LIT green light – NOT LIT<br>6.4 Recognizes/verifies PRZR PORV, 2RCS-PCV455C and 455D red lights – NOT LIT green lights – LIT<br>COMMENTS: | |
| 7.C Verify Adequate RCS Bleed Path.<br>• PRZR PORV's and associated block valves – AT LEAST TWO OPEN | 7.1C Determines that ONLY ONE PRZR PORV and associated block valve is open and Places all reactor vessel head vent control switches to OPEN.<br>[2RCS-SOV200A, B]<br>[2RCS-SOV201A, B]<br>7.2 Verifies red lights – LIT green lights – NOT LIT<br>7.3C Depresses Δ PB for 2RCS-HCVC250A and B<br>7.4 Verifies 2RCS-HCVC250A and B at 100% demand.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-624<br>JPM REVISION: 4 | JPM TITLE: Establish RCS Bleed and Feed per FR-H.1 |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| 8. Align any available low pressure water source. | 8.1 Attempts to align a low press. water source to an intact SG.<br>No action needed.<br><br>**EVALUATOR CUE:** Another operator will work on a low pressure water source using Attachment A-1.10.<br><br>COMMENTS:<br><br>**EVALUATOR CUE:**<br>In the next step, Role-play the Unit Supervisor and direct the candidate to use SG 21A for depressurization. | | |
| 9.C Isolate steam supply to Turbine driven Aux feed pump from S/G selected for depressurization. | 9.1C Places CS for 2MSS*SOV105A and D to CLOSE.<br><br>9.2 Verifies red lights – NOT LIT green lights – LIT.<br><br>COMMENTS: | | |
| 10.C Close MSIV on selected S/G. | 10.1C Places CS for 21A SG MSIV 2MSS-AOV101A to CLOSE.<br><br>10.2 Verifies red lights – NOT LIT green lights – LIT.<br><br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-624<br>JPM REVISION: 4 | JPM TITLE: Establish RCS Bleed and Feed per FR-H.1 |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 11.C Open Atm Steam dump valve on selected SG to depressurize. | 11.1C Places 21A S/G Atm Stm Dump Control 2SVS*PCV101A to MAN and depresses the output Δ PB<br><br>11.2 Verifies red light – LIT green light – NOT LIT and 100% demand on controller<br><br>COMMENTS:<br><br>**EVALUATOR CUE:**<br>That completes this JPM | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Respond to PRT Trouble

TRAINING MATERIAL NUMBER: 2CR-155

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2CR-155

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OM-6.4.AAY, Rev. 8

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-155

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. #<br>New Change # |

List/Description of Change(s):

Original issue

Reason for Change (s):

APPROVALS:

R. J. Brooks
Prepared by — Date

Training Superintendent/Supervisor/Peer — Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-155<br>JPM REVISION: 0 | JPM TITLE: Respond to PRT Trouble |
|---|---|

K/A REFERENCE: 007 A2.02 2.6 / 3.2 TASK ID: 007-003-0101
007 A2.05 3.2 / 3/6

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

EVALUATION RESULTS

| Performer Name: | Performer SSN: |
|---|---|

| Time Critical: ☐ Yes ☒ 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: _____

_____

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | PRT High Temperature alarm is cleared and PRT level is dropping. |
| RECOMMENDED STARTING LOCATION: | Control Room |
| **DIRECTIONS:** | You are to perform the task respond to Pressurizer Relief Tank Trouble. |
| **INITIAL CONDITIONS:** | • The plant is operating at 25% power.<br>• A PRZR PORV was leaking BUT is NOW NO LONGER LEAKING.<br>• The Pressurizer Relief Tank Trouble annunciator [A4-3H] has just actuated as a result of this leakage. |
| **INITIATING CUE:** | Your supervisor directs you to respond to Annunciator A4-3H "Pressurizer Relief Tank Trouble" and take action to clear the annunciator. |
| REFERENCES: | 2OM-6.4.AAY, Revision 8 |
| TOOLS: | NONE |
| HANDOUT: | 2OM-6.4.AAY, Revision 8 |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task respond to Pressurizer Relief Tank Trouble.

INITIAL CONDITIONS:

- The plant is operating at 25% power.
- A PRZR PORV was leaking BUT is NOW NO LONGER LEAKING.
- The Pressurizer Relief Tank Trouble annunciator [A4-3H] has just actuated as a result of this leakage.

INITIATING CUE: Your supervisor directs you to respond to Annunciator A4-3H "Pressurizer Relief Tank Trouble" and take action to clear the annunciator.

☐ 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.

# 2LOIT-08-NRC JPMs S5 & S6

| Initial conditions/simulator setup | |
|---|---|
| [redacted] | Initialize<br>Run<br>LRTIC file commands<br>Horns, Printers, Sounds ready |

S5 – Respond to PRT Problems

| | |
|---|---|
| [redacted] | Trg 2 when [2RCS*AOV519] placed to open<br>Reduce PRT temperature indication |

S6 Transfer from MFRVs to BPFRVs

| | |
|---|---|
| [redacted] | Trg 1 when "A" BPFRV placed in AUTO<br>Open [2FWS*FCV479] |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-155<br>JPM REVISION: 0 | JPM TITLE: Respond to PRT Trouble |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| | **Simulator Setup:** Initialize Simulator IC 238 for 2LOT6 NRC exam. Mode 1 ~ 25% power.<br>TRGSET 2 XA1I097P ==1'<br>IMFXMT RCS078A (2 0) 110 120<br>Trg2 When 2RCSAOV519 is opened reduce PRT temperature indication | |
| | START TIME: _____ | |
| 1. Obtain copy of 2OM-6.4.AAY. | 1.1 Candidate locates 2OM-6.4.AAY, reviews and determines proper procedure section is PRT temperature is > 125°F and level is > 78%<br><br>1.2 Determines 2OM-6.4.AAY Part A for High temp and Part D for High level are both applicable.<br><br>COMMENTS: | |
| | **EVALUATOR NOTE:** Candidate may address the actions in either order. The JPM is formatted to address High temperature first. Step 6 of the JPM begins to address the high level. | |
| 2.C Reduce PRZR Relief Tank Temperature < 125F as follows:<br>• Open [2RCS-MOV516], PRZR Relief Tank Spray Vlv. | 2.1C Places CS for PRZR Relief Tank Spray Vlv 2RCS-MOV516 to OPEN<br><br>2.2 Verifies red light – LIT and green light – NOT LIT<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-155<br>JPM REVISION: 0 | JPM TITLE: Respond to PRT Trouble |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S | U |
|---|---|---|---|
| 3.C Open [2RCS-AOV519], PRZR Relief Tank Pri Grade M/U Wtr Inlet. | 3.1C Places CS for PRZR Relief Tank Pri Grade M/U Wtr Inlet2RCS-AOV519 to OPEN<br>3.2 Verifies red light – LIT and green light – NOT LIT<br>COMMENTS: | | |
| 4.C When the desired PRT temperature is achieved,<br>• Close [2RCS-AOV519], PRZR Relief Tank Pri Grade M/U Wtr Inlet.<br>• Close [2RCS-MOV516], PRZR Relief Tank Spray Vlv. | 4.1C Monitors PRT temperature to verify it has decreased below 125°F<br>**EVALUATOR CUE:** If necessary, inform candidate that it is desired to reduce temperature below 120°F<br>4.2C Places CS for PRZR Relief Tank Pri Grade M/U Wtr Inlet2RCS-AOV519 to CLOSE<br>4.3 Verifies red light – NOT LIT and green light – LIT<br>4.4C Places CS for PRZR Relief Tank Spray Vlv 2RCS-MOV516 to CLOSE<br>4.5 Verifies red light – NOT LIT and green light – LIT<br>COMMENTS: | | |
| 5. Independently verify [2RCS-AOV519] closed and log in the Narrative Log. | 5.1 N/A<br>**EVALUATOR CUE:** Inform the candidate that another operator will perform the independent verification.<br>COMMENTS: | | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-155<br>JPM REVISION: 0 | JPM TITLE: Respond to PRT Trouble |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | **EVALUATOR NOTE:** Candidate should proceed to 2OM-6.4.AAY Part D to address the PRT High level. | |
| 6.C Lower PRZR Relief Tank level to < 72%, ([2RCS-LI470], VB-B):<br>• Open [2RCS-MOV523], PRZR Relief Tank Drain Vlv, (BB-A) | 6.1C Places CS for PRZR Relief Tank Drain Vlv 2RCS-MOV523 to OPEN<br>6.2 Verifies red light – LIT and green light – NOT LIT<br>COMMENTS: | |
| 7.C Start [2DGS-P21A(B)], Primary Drains Tfr Pump. | 7.1C Places CS for Primary Drains Tfr Pump. 2DGS-P21A(B) to START<br>7.2 Verifies red light – LIT and green light – NOT LIT<br>COMMENTS: | |
| 8.C When PRZR Relief Tank level to < 72%, Stop [2DGS-P21A(B)], Primary Drains Tfr Pump AND Return control switch to AUTO. | 8.1 Monitors PRT level to verify level is dropping and has dropped below 72%.<br>8.2C Places CS for Primary Drains Tfr Pump. 2DGS-P21A(B) to AUTO<br>8.3 Verifies red light – NOT LIT and green light – LIT<br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-155<br>JPM REVISION: 0 | JPM TITLE: Respond to PRT Trouble |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S U |
|---|---|---|
| 9.C Close [2RCS-MOV523], PRZR Relief Tank Drain Vlv. | 9.1C Places CS for PRZR Relief Tank Drain Vlv 2RCS-MOV523 to CLOSE<br><br>9.2 Verifies red light – NOT LIT and green light – LIT<br><br>COMMENTS: | |
| | **EVALUATOR CUE:**<br>That completes this JPM | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

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

TRAINING MATERIAL NUMBER: 2CR-572

PROGRAM TITLE: Licensed Operator Retraining

COMPUTER CODE: 2CR-572

REVISION NUMBER: 1

TECHNICAL REFERENCES:

2OM-52.4.R.1.F, Station Shutdown From 100% Power To Mode 5, Revision 9

INSTRUCTIONAL SETTING: Control Room

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

REVISION REQUIRED

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-572

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 1 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 0<br>New Change # |

List/Description of Change(s):

Updated to reflect current procedure

Reason for Change (s):

Updated to reflect current procedure

APPROVALS:

R. J. Brooks _____

Prepared by Date

_____

Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-572<br>JPM REVISION: 1 | JPM TITLE: Shift From Main Feedwater Reg Valves to Bypasses |
|---|---|

K/A REFERENCE: 035A4.01 3.7/3.6 TASK ID: 0241-004-01-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☒ FAULTED JPM ☐ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | | Performer SSN: |
| Time Critical: ☐ Yes ☒ 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<br>JPM REVISION: 1 | JPM TITLE: Shift From Main Feedwater Reg Valves to Bypasses |
|---|---|

**EVALUATOR DIRECTION SHEET**

TASK STANDARD:

The "A" Bypass Feed Regulating Valve has been placed in service in automatic mode and then, after candidate recognizes failure of automatic control, returned to Manual mode with candidate controlling steam generat r level.

RECOMMENDED STARTING LOCATION:

CONTROL ROOM

**DIRECTIONS:**

You are to perform the task Transfer from Main Feed Regulating Valve to Bypass.

**INITIAL CONDITIONS:**

- A plant shutdown is in progress
- 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 IV.D.5.
- The 21B and C S/G main Feed Reg Valves have been removed from service.
- The 21A main Feed Reg Valve [2FWS-FCV478] operated erratically during the shutdown and is currently in "AUTO" for observation.

**INITIATING CUE:**

- Your supervisor directs you to place 21A S/G Bypass Feed Reg Valve [2FWS-FCV479] in service in accordance with 2OM-52.4.R.1.F, Station Shutdown From 100% Power To Mode 5 Attachment 10 step A.
- [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, Station Shutdown From 100% Power To Mode 5, Revisior 9

TOOLS:

None

HANDOUT:

2OM-52.4.R.1.F, Station Shutdown From 100% Power To Mode 5, Attachment 10 Revision 9

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task Transfer from Main Feed Regulating Valve to Bypass.

INITIAL CONDITIONS:

- A plant shutdown is in progress
- 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 IV.D.5.
- The 21B and C S/G main Feed Reg Valves have been removed from service.
- The 21A main Feed Reg Valve [2FWS-FCV478] operated erratically during the shutdown and is currently in "AUTO" for observation.

INITIATING CUE:

- Your supervisor directs you to place 21A S/G Bypass Feed Reg Valve [2FWS-FCV479] in service in accordance with 2OM-52.4.R.1.F, Station Shutdown From 100% Power To Mode 5 Attachment 10 step A.
- [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.

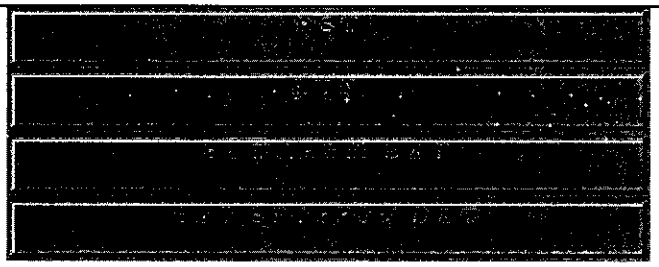
☐ Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been met announce " I have completed the JPM".

☐ Then hand this sheet to the evaluator.

# 2LOIT-08-NRC JPMs S5 & S6

## Initial conditions/simulator setup



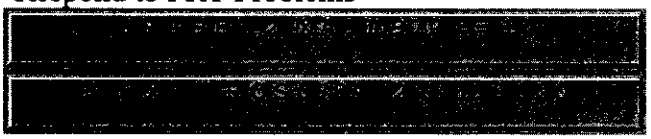
Initialize

Run

LRTIC file commands

Horns, Printers, Sounds ready

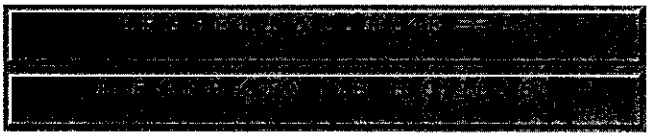
S5 – Respond to PRT Problems



Trg 2 when [2RCS*AOV519] placed to open

Reduce PRT temperature indication

S6 Transfer from MFRVs to BPFRVs



Trg 1 when "A" BPFRV placed in AUTO

Open [2FWS*FCV479]

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-572<br>JPM REVISION: 1 | JPM TITLE: Transfer from Main Feedwater Reg Valves to Bypasses |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| | START TIME: _____ | |
| | **EVALUATOR NOTE:**<br>**Initialize IC-238 for 2LOT6 NRC Exam,**<br>Set Bank D Control Rods to 126 steps. Put "SGWIDE" trend up on BOP's PCS screen.<br>Open MFRV isolation valve 2FWS-MOV154A.<br>Place 2FWS-FCV478 in AUTO, place 2FWS-FCV479 in MANUAL and close valve.<br>To set up alternate path, set Trigger 1 to actuate when the Bypass controller AUTO pushbutton is depressed<br>**TRGSET 1 'XC1I064E'**<br>Insert command to fail Bypass to full open over 60 seconds from Trigger 1, (PB in AUTO)<br>**IMF CNH-CFW11B (1 0) 100 60 ASIS** | |
| 1. Obtain a copy of 2OM-52.4.R.1.F, Station Shutdown From 100% Power To Mode 5, Attachment 10 | 1.1 Candidate locates a copy of 2OM-52.4.R.1.F, Station Shutdown From 100% Power To Mode 5, Attachment 10<br>**EVALUATOR NOTE:**<br>Procedure can be provided to candidate, if provided, N/A this JPM Step.<br>COMMENTS: | |
| 2.C Place controller in MANUAL **AND** Slowly Open the 21A Bypass FCV. | 2.1C Intermittently depresses the Bypass Control Valve [2FWS-FCV479] up pushbutton.<br>2.2 Verifies feed flow increases<br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-572<br>JPM REVISION: 1 | JPM TITLE: Transfer from Main Feedwater Reg Valves to Bypasses |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| 3. As the 21A Bypass FCV is being opened, close [2FWS-FCV 478], 21A Main Feedwater Reg Valve, in MANUAL **OR** AUTO to maintain 21A SG level **WITHIN** 39% to 49%. | 3.1 Verifies 21A Main Feedwater Reg Valve 2FWS-FCV 478 demand signal is decreasing and feed flow is reducing.<br><br>COMMENTS: | |
| 4.**C** Continue to Open the 21A Bypass FCV **UNTIL** the 21A Main Feed Reg Valve is closed. | 4.1**C** Intermittently depresses the Bypass Control Valve [2FWS-FCV479] up pushbutton.<br><br>4.2 Verifies 21A Main Feed Reg Valve green light – LIT and red light – NOT LIT<br><br>COMMENTS: | |
| 5.**C** WHEN the 21A Main Feed Reg Valve is fully closed, perform the following:<br>• Verify the 21A Main Feed Reg Valve controller in MAN. | 5.1**C** Places 21A Main Feed Reg Valve controller to MAN<br><br>5.2 Verifies MAN light – LIT and AUTO light is – NOT LIT<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-572<br>JPM REVISION: 1 | JPM TITLE: Transfer from Main Feedwater Reg Valves to Bypasses |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 6. Observe Feedwater flow, steam flow and SG level for evidence of leakage past the 21A Main Feed Reg Valve. | 6.1 Verifies feed flow, steam flow, and NR level are stable<br><br>COMMENTS: | |
| 7.C Close [2FWS-MOV154A], 21A SG Main Feedwater Isol Vlv. | 7.1C Places CS for 21A SG Main Feedwater Isol Vlv 2FWS-MOV154A to CLOSE<br><br>7.2 Verifies green light – LIT and red light – NOT LIT<br><br>COMMENTS: | |
| | **FAULT STATEMENT:**<br>This is where the alternate path will begin; valve will trend open to 100% over 60 seconds as soon as the controller PB is placed in AUTO. | |
| 8.C Place controller for the 21A Bypass FCV in AUTO **AND** Monitor SG level **AND** flow. | 8.1C Places controller for the 21A Bypass FCV in AUTO<br><br>8.2 Verifies MAN light – NOT LIT and AUTO light is – LIT<br><br>8.3 Determines valve is failing OPEN in Automatic.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-572<br>JPM REVISION: 1 | JPM TITLE: Transfer from Main Feedwater Reg Valves to Bypasses |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S | U |
|---|---|---|---|
| 9.C If level control is **NOT** stable, restore the valve controller to MANUAL **AND** Maintain SG NR level between 39% and 49%. | 9.1C Places controller for the 21A Bypass FCV in MAN<br><br>9.2 Verifies MAN light – LIT and AUTO light is – NOT LIT<br><br>9.3C Intermittently depresses the Bypass Control Valve [2FWS-FCV479] up/down pushbutton to regain manual control of SG level with NR level between 39% and 49%.<br><br>COMMENTS: | | |
| | **EVALUATOR CUE:**<br>That completes this JPM | | |
| | STOP TIME: _____ | | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Perform Nuclear Intermediate Range Channel Functional Test

TRAINING MATERIAL NUMBER: 2CR-646

PROGRAM TITLE: License Operator Training (Retraining)

COMPUTER CODE: 2CR-646

REVISION NUMBER: 0

TECHNICAL REFERENCES:

2OST-2.2, Nuclear Intermediate Range Channel Functional Test

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 10 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-646

Type of Change:

| | | |
|---|---|---|
| ☐ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☐ No | New Rev. # 0 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # N/A<br>New Change # |

List/Description of Change(s):

- Initial issue of JPM

Reason for Change (s):

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

K/A REFERENCE: 015 A3.03 3.9/3.9 TASK ID: 0021-011-06-013

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ FAULTED JPM ☐ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ 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

| | |
|---|---|
| TASK STANDARD: | Hi level Rod stop is tested satisfactorily and the surveillance is **STOPPED** when the high level trip will not reset. |
| RECOMMENDED STARTING LOCATION: | Simulator |
| **DIRECTIONS:** | You are to perform the task of Nuclear Intermediate Range Channel Functional Test. |
| **INITIAL CONDITIONS:** | *The plant is in Mode 2 with reactor power ~ 3%. 2OST-2.2, Nuclear* Intermediate Range Channel Functional Test has been completed through step VII.B.9. |
| **INITIATING CUE:** | Your supervisor directs you to complete 2OST-2.2, Nuclear Intermediate Range Channel Functional Test Beginning at step VII.B.10. |
| REFERENCES: | 2OST-2.2, Nuclear Intermediate Range Channel Functional Test Revision 7 |
| TOOLS: | None |
| HANDOUT: | 2OST-2.2, Nuclear Intermediate Range Channel Functional Test completed through step VII.B.9. |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

| | |
|---|---|
| TASK: | You are to perform the task of Nuclear Intermediate Range Channel Functional Test. |
| INITIAL CONDITIONS: | The plant is in Mode 2 with reactor power ~ 3%. 2OST-2.2, Nuclear Intermediate Range Channel Functional Test has been completed through step VII.B.9. |
| INITIATING CUE: | Your supervisor directs you to complete 2OST-2.2, Nuclear Intermediate Range Channel Functional Test Beginning at step VII.B.10. |

☐ 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.

# 2LOIT-08-NRC JPMs S7 & S8

| Initial conditions/simulator setup | |
|---|---|
| [redacted] | Initialize<br>Run<br>LRTIC file commands<br>Horns, Printers, Sounds ready |
| S7 Perform IRNI Functional Test | |
| [redacted] | Trg 1 to fail N35 Bistable (Rx trip) 'as is' when actuated<br>Fails N35 (Rx trip) bistable 'as is' |
| ADMIN JPM | |
| [redacted] | Fail [2GS-HCV100] open<br>Trg 5 to remove failure of [2GS-HCV100]<br>Clear malfunction of [2GS-HCV100]<br>High failure of liquid waste discharge rad monitor |
| Makeup to the RWST | |
| [redacted] | Close [2CHS*79]<br>Open [2chs*87] |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S U |
|---|---|---|
| | START TIME: _____ | |
| | **SIMULATOR SETUP:**<br>Initialize IC-**Mode 2 ~ 3% power**<br><br>FAULT by making Hi flux trip NOT reset | |
| 1.C Perform the test of the IRN-35 High Level Rod Stop as follows:<br>• Place the Test Mode Switch in VARIABLE.<br>• Verify that the "HIGH LEVEL ROD STOP" Drawer Status Light is OFF. | 1.1C Rotates the Test Mode Variable control switch clockwise to the VARIABLE position.<br>1.2 Verifies N35 Drawer Status Light "HIGH LEVEL ROD STOP" is NOT LIT.<br><br>COMMENTS: | |
| 2.C Turn the Variable control knob clockwise until the "HIGH LEVEL ROD STOP" Drawer Status Light turns ON. | 2.1C **SLOWLY** rotates the Test Mode Variable control knob clockwise UNTIL the "HIGH LEVEL ROD STOP" Drawer Status Light is LIT.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 3.C Record the neutron level indication on the NIS Drawer meter when the Drawer Status Light turns ON:<br>Verify the NIS Drawer indication satisfies the Acceptance criteria. | 3.1 Records, in the space provided the neutron level indication on the N35 Drawer meter when the Drawer Status Light turns ON.<br>3.2C Verifies the value recorded is between the Low and High limits listed in the surveillance and initials the space provided.<br><br>COMMENTS: | |
| 4.C Record the neutron level indication on [2NMI-NI35B], Intermediate Range Current, when the Drawer Status Light turns ON:<br>Verify the indication on [2NMI-NI35B] is within the high and low limits. | 4.1 Records, in the space provided the neutron level indication on [2NMI-NI35B], Intermediate Range Current when the Drawer Status Light turns ON.<br>4.2C Verifies the value recorded is between the Acceptance Criteria Low and High limits listed in the surveillance and initials the space provided.<br><br>**EVALUATOR CUE:**<br>If necessary to avoid contact with other candidates,<br><br>CUE candidate that Benchboard [2NMI-NI35B], Intermediate Range Current is the **SAME AS** the drawer meter.<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| 5.C Turn the Variable control knob counterclockwise until the "HIGH LEVEL ROD STOP" Drawer Status Light turns OFF. | 5.1C **SLOWLY** Rotates Variable control knob counterclockwise until the "HIGH LEVEL ROD STOP" Drawer Status Light is NOT LIT.<br><br>COMMENTS: | |
| 6.C Record the neutron level indication on the NIS Drawer meter when the Drawer Status Light turns OFF:<br>Verify the NIS Drawer indication is satisfies the Acceptance criteria. | 6.1 Records, in the space provided the neutron level indication on the N35 Drawer meter when the Drawer Status Light is NOT LIT.<br>6.2C Verifies the value recorded is between the Low and High limits listed in the surveillance and initials the space provided.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| 7. Perform the test of the Intermediate Range Neutron Flux High Reactor Trip Setpoint as follows:<br>Verify the following:<br>• Status Light C-9, "INT RNG N35 RX TRIP", is OFF.<br>• PCS Point N0020D, "INT RNG CHAN 1 HIGH FLUX", indicates NORMAL. | 7.1 Verifies the following:<br>• Status Light C-9, "INT RNG N35 RX TRIP", is NOT LIT.<br>• PCS Point N0020D, "INT RNG CHAN 1 HIGH FLUX", indicates NORMAL.<br>**EVALUATOR CUE:**<br>If necessary to avoid contact with other candidates,<br>CUE candidate that Benchboard Status Light C-9, "INT RNG N35 RX TRIP", is NOT LIT.<br>**AND**<br>PCS Point N0020D, "INT RNG CHAN 1 HIGH FLUX", indicates NORMAL.<br>COMMENTS: | | |
| 8.C Turn the Variable control knob clockwise until the "HIGH LEVEL TRIP" Drawer Status Light turns ON. | 8.1C **SLOWLY** Rotates Variable control knob clockwise until the "HIGH LEVEL TRIP" Drawer Status Light is LIT.<br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | **EVALUATOR NOTE:**<br>In the next step, the IRN-35 Trip Setpoint (recorded in Instruction A.4) High Limit has already been recorded in the space provided as part of a previously performed step in the initial conditions. | |
| 9.C Record the neutron level indication on the NIS Drawer meter when the Drawer Status Light turns ON:<br>Verify the NIS Drawer indication satisfies the Acceptance criteria. | 9.1 Records, in the space provided the neutron level indication on the N35 Drawer meter when the Drawer Status Light is LIT.<br>9.2C Verifies the value recorded below the High limit listed in the surveillance and initials the space provided.<br>COMMENTS: | |
| 10. If the NIS Drawer indication for the setpoint is NOT within the Acceptance Criteria, Refer to Attachment A, "Measurement of the [2NMI NM35A(36A)], Log Current Amplifier Output". (Otherwise N/A) | 10.1 Determines reference to Attachment A, "Measurement of the [2NMI NM35A(36A)], Log Current Amplifier Output" is N/A based on values being within limits.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| 11.C Record the neutron level indication on the [2NMI-NI35B], Intermediate Range Current, when the Drawer Status Light turns ON:<br>• Verify the indication on [2NMI-NI35B] is within the high and low limits. | 11.1C Records, in the space provided the neutron level indication on [2NMI-NI35B], Intermediate Range Current when the Drawer Status Light turns ON.<br>11.2 Verifies the value recorded is between the Acceptance Criteria Low and High limits listed in the surveillance and initials the space provided.<br>**EVALUATOR CUE:**<br>If necessary to avoid contact with other candidates,<br>CUE candidate that Benchboard [2NMI-NI35B], Intermediate Range Current is the **SAME AS** the drawer meter.<br>COMMENTS: | | |
| 12. If necessary, turn the Variable control knob clockwise until the "HIGH LEVEL TRIP" Drawer Status Light remains ON AND does NOT reset. (Otherwise N/A) | 12.1 Determines N/A.<br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S U |
|---|---|---|
| 13. Verify Status Light C-9, "INT RNG N35 RX TRIP", is ON **AND NOT** flashing. (Status Panel 308)<br>Verify PCS Point N0020D, "INT RNG CHAN 1 HIGH FLUX", indicates TRIP. | 13.1 Verifies the following:<br>Status Panel 308 -9, "INT RNG N35 RX TRIP", is LIT **AND NOT** flashing.<br>PCS Point N0020D, "INT RNG CHAN 1 HIGH FLUX", indicates TRIP.<br>**EVALUATOR CUE:**<br>If necessary to avoid contact with other candidates,<br>CUE candidate that Benchboard Status Panel 308 - 9, "INT RNG N35 RX TRIP", is LIT **AND NOT** flashing.<br>**AND**<br>PCS Point N0020D, "INT RNG CHAN 1 HIGH FLUX", indicates TRIP.<br>COMMENTS: | |
| | **FAULT STATEMENT:**<br>The High level trip bistable WILL NOT reset in the next step. | |
| 14.C Turn the Variable control knob counterclockwise until the "HIGH LEVEL TRIP" Drawer Status Light turns OFF. | 14.1C **SLOWLY** Rotates Variable control knob fully counter clockwise.<br>14.2C Determines "HIGH LEVEL TRIP" Drawer Status Light **REMAINS LIT**.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-646<br>JPM REVISION: 0 | JPM TITLE: Perform Nuclear Intermediate Range Channel Functional Test |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| | **EVALUATOR NOTE:**<br>At this point the Surveillance **CANNOT** be completed without support from the I&C department. If the Level Trip Switch is returned to NORMAL, the reactor will trip.<br><br>**EVALUATOR NOTE:**<br>The candidate SHOULD recognize the impact of returning the level trip switch to normal.<br><br>**EVALUATOR CUE:**<br>That completes this JPM. | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Batch To The Refueling Water Storage Tank

TRAINING MATERIAL NUMBER: 2CR-537

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 2CR-537

REVISION NUMBER: 1

TECHNICAL REFERENCES:

2OM-7.4.O, Makeup To The Refueling Water Storage Tank, Rev. 13

INSTRUCTIONAL SETTING: Simulator

APPROXIMATE DURATION: 15 minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2CR-537

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 1 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 0<br>New Change # |

List/Description of Change(s):

Update JPM to current procedure and JPM format

Reason for Change (s):

JPM Enhancement

APPROVALS:

R. J. Brooks _____

Prepared by Date

_____

Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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-537<br>JPM REVISION: 1 | JPM TITLE: Batch To The Refueling Water Storage Tank |
|---|---|

K/A REFERENCE: 004 A4.01 (3.8/3.9)
004 A4.04 (3.2/3.6)
004 A4.07 (3.9/3.7)

TASK ID: 0071-025-01-013

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

EVALUATION RESULTS

| Performer Name: | Performer SSN: |
|---|---|

| Time Critical: ☐ Yes ☒ 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: _____

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | Makeup flow to the RWST is initiated AND terminated after discovery of no boric acid flow. |
| RECOMMENDED STARTING LOCATION: | Control Room |
| **DIRECTIONS:** | You are to perform the task Batch To The Refueling Water Storage Tank. |
| **INITIAL CONDITIONS:** | The plant is in Mode 2 with reactor power at ~ 3%. The Refueling Water Storage Tank level is currently at 717.5". RWST boron concentration is 2500 ppm and Boric Acid Storage Tank concentration is 7500 ppm. The Spent Fuel Pool was being filled from the RWST. This operation has been secured. Annunciator A6-1D, RWST LEVEL OFF NORMAL has alarmed. Actual RWST level is just below the narrow range low level alarm setpoint. |
| **INITIATING CUE:** | Your supervisor directs you to batch 300 gallons of borated water at current RWST boron concentration to the RWST by manual blender operation in accordance with 2OM-7.4.O, Makeup To The Refueling Water Storage Tank, beginning at step IV.B.5. |
| REFERENCES: | 2OM-7.4.O, Makeup To The Refueling Water Storage Tank, Rev. 13 |
| TOOLS: | Calculator |
| HANDOUT: | 2OM-7.4.O, Makeup To The Refueling Water Storage Tank |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to perform the task Batch To The Refueling Water Storage Tank.

**INITIAL CONDITIONS:** The plant is in Mode 2 with reactor power at ~ 3%. The Refueling Water Storage Tank level is currently at 717.5". RWST boron concentration is 2500 ppm and Boric Acid Storage Tank concentration is 7500 ppm. The Spent Fuel Pool was being filled from the RWST. This operation has been secured. Annunciator A6-1D, RWST LEVEL OFF NORMAL has alarmed. Actual RWST level is just below the narrow range low level alarm setpoint.

**INITIATING CUE:** Your supervisor directs you to batch 300 gallons of borated water at current RWST boron concentration to the RWST by manual blender operation in accordance with 2OM-7.4.O, Makeup To The Refueling Water Storage Tank, beginning at step IV.B.5.

☐ 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.

# 2LOIT-08-NRC JPMs S7 & S8

## Initial conditions/simulator setup

[redacted]

Initialize

Run

LRTIC file commands

Horns, Printers, Sounds ready

S7 Perform IRNI Functional Test

[redacted]

Trg 1 to fail N35 Bistable (Rx trip) 'as is' when actuated

Fails N35 (Rx trip) bistable 'as is'

ADMIN JPM

[redacted]

Fail [2GS-HCV100] open

Trg 5 to remove failure of [2GS-HCV100]

Clear malfunction of [2GS-HCV100]

High failure of liquid waste discharge rad monitor

S8 Makeup to the RWST

[redacted]

Close [2CHS*79]

Open [2chs*87]

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-537<br>JPM REVISION: 1 | JPM TITLE: Batch To The Refueling Water Storage Tank |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| | START TIME: _____ | |
| | **SIMULATOR SETUP:** Init IC-_____.<br>Verify RWST level set to 717' 5" (ASISRWST = 7.43E6). Update RWST boron concentration placard to 2500 ppm and BA Storage Tank concentration placard to 7500 ppm. Verify LOA BAT6 to open 2CHS*87. Verify 2CHS*79 is overridden in the closed position LOA BAT 004. Set BA & Total Flow totalizers to ZERO and reset. | |
| | **EVALUATOR NOTE:** This step is optional. Evaluator may elect to provide procedure. If provided, N/A this JPM step ⇒. | |
| 1. Obtain procedure. | 1.1 Candidate locates 2OM-7.4.O, Makeup To The Refueling Water Storage Tank.<br>**EVALUATOR CUE:** After candidate locates the procedure, provide a copy of 2OM-7.4.O, Makeup To The Refueling Water Storage Tank.<br>COMMENTS: | |
| 2. Place the Boric Acid Makeup Blender Control Switch in STOP. | 2.1 Candidate locates and places Boric Acid Makeup Blender Control Switch in Stop.<br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-537<br>JPM REVISION: 1 | JPM TITLE: Batch To The Refueling Water Storage Tank |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| 3.**C** Place the Mode Selector Switch in MAN. | 3.1**C** Candidate locates and places Mode Selector Switch in Manual.<br><br>COMMENTS: | |
| 4. Verify the following valves are in the closed position.<br>a. [2CHS*FCV113B], Boric Acid Blender Disch To Chg Pumps<br>b. [2CHS*FCV114B], Blender Outlet To Volume Control Tank<br>c. [2CHS*SOV206], Alt Emergency Boration Vlv<br>d. [2CHS*MOV350], Emergency Boration Isol Vlv | 4.1 Candidate locates and verifies valves closed.<br>4.2 Candidate verifies green closed light lit and red open light not lit for each valve.<br><br>COMMENTS: | |
| 5. If this section is being performed for testing of the blender, THEN perform the following: (otherwise N/A) | 5.1 Candidate N/A's step.<br>**EVALUATOR NOTE:** If asked, inform the Candidate that no testing is being performed.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-537<br>JPM REVISION: 1 | JPM TITLE: Batch To The Refueling Water Storage Tank |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| | **EVALUATOR CUE:** If asked, inform the Candidate that Desired flowrate is 75 gpm. | |
| 6. Determine Boric Acid Flow from the following calculation:<br>$BoricAcidFlow = \frac{a \times b}{c}$ | 6.1. Candidate calculates boric acid flow:<br>$\frac{2500\,ppm \times 75\,gpm}{7500} = 25.0\,gpm\ (\pm 1\ \text{gpm})$<br>COMMENTS: | |
| 7.C Set [2CHS*FCV113A] as follows:<br>$Pot\ Setting = \frac{Boric\ Acid\ Flow}{4\ gpm}$ | 7.1C Candidate calculates and adjusts 2CHS*FCV113A to desired pot setting.<br>$6.25\ (\pm 0.25) = \frac{25.0}{4 gpm}$<br>COMMENTS: | |
| 8.C Adjust [2CHS*HIC168], Blender Total Flow Auto Setpoint, to the blender total flow used in Step IV.A.9.<br>$Pot\ Setting = \frac{Total\ Makeup\ Flow}{16\ gpm}$ | 8.1C Candidate locates and adjusts 2CHS*HIC168 to desired pot setting.<br>$4.69\ (4.6 - 4.8) = \frac{75}{16\ gpm}$<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-537<br>JPM REVISION: 1 | JPM TITLE: Batch To The Refueling Water Storage Tank |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| 9.C Adjust [2CHS*FCV114A] pot setting to the blender total flow used in Step IV.A.9.<br><br>$Pot\ Setting = \frac{Total\ Makeup\ Flow}{16\ gpm}$ | 9.1C Candidate locates and adjusts 2CHS*FCV114A to desired pot setting.<br><br>$4.69\,(4.6 - 4.8) = \frac{75}{16\ gpm}$<br><br>COMMENTS: | | |
| 10.C Set [2CHS-FQIS113], Boric Acid Flow To Blender Flow Totalizer, to the total volume in gallons of boric acid to be added from the following equation:<br><br>$B.A.Vol = \frac{B.A\ Flow}{Total\ Makeup\ Flow} \times Total\ Makeup\ Vol$ | 10.1C Candidate locates and sets 2CHS-FQIS113 for the desired total volume of boric acid.<br><br>$100\,(96 - 104) = \frac{25 \pm 1}{75\ gpm} \times 300$<br><br>10.2 Candidate locates and resets 2CHS-FQIS113.<br><br>COMMENTS: | | |
| 11.C Set [2CHS-FQIS168], Total Makeup From Blender Flow Totalizer, to the desired total volume in gallons of makeup to be added. | 11.1C Candidate locates and sets 2CHS-FQIS168 to 300 gallons.<br>11.2 Candidate locates and resets 2CHS-FQIS168.<br><br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-537<br>JPM REVISION: 1 | JPM TITLE: Batch To The Refueling Water Storage Tank |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S | U |
|---|---|---|---|
| 12. Record the following information into the Narrative Log:<br>Total Makeup + Total Makeup From Blender Flow Totalizer = Total | 12.1 Candidate indicates the values to be recorded in the Narrative Log.<br>**EVALUATOR CUE:** Inform the Candidate that another operator will make the log entry.<br>COMMENTS: | | |
| 13. Establish communications with an operator at the blender room (Aux. Bldg. 710') | 13.1 Candidate uses page party to contact local operator in the blender room.<br>**EVALUATOR CUE:** Inform the Candidate that an operator is standing by in the blender room.<br>COMMENTS: | | |
| 14.C Open the following valves: (Aux. Bldg. Blender Rm, 710')<br>a. [2CHS*87], Blender To Refueling Cavity Isolation<br>b. [2CHS*89], Blender To RWST Isolation | 14.1C Candidate directs local operator to open 2CHS*87 and 2CHS*89.<br>**EVALUATOR CUE:** Report as local operator that 2CHS*87 and 2CHS*89 are open.<br>COMMENTS: | | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2CR-537<br>JPM REVISION: 1 | JPM TITLE: Batch To The Refueling Water Storage Tank |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| 15.C To initiate makeup, place the Boric Acid Makeup Blender Control Switch to START. | 15.1C Candidate locates and places Boric Acid Makeup Control Switch in Start.<br>15.2. Candidate verifies red makeup light lit.<br><br>COMMENTS: | |
| | **FAULT STATEMENT:** 2CHS*79 is failed closed. In the next step Boric acid flow will be zero with total flow indicating 75 gpm. | |
| 16.C Verify expected flows for the following parameters are being recorded at [2CHS-FR113], Boric Acid To Blender Total M/U Flow From Blender:<br>a. Boric Acid To Blender (red pen)<br>b. Total M/U Flow From Blender (green pen) | 16.1 Candidate locates 2CHS-FR113 and verifies boric acid flow and total makeup flow.<br>16.2C Candidate takes immediate action to terminate dilution by placing Boric Acid Makeup Control Switch in STOP.<br><br>**EVALUATOR NOTE:** Stop the JPM after the Candidate secures the dilution.<br><br>COMMENTS: | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Safeguards Test of FWI

TRAINING MATERIAL NUMBER: 2PL-048

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 2PL-048

REVISION NUMBER: 11

TECHNICAL REFERENCES:

2OST-1.11A, Rev 15
2OST-1.12A, Rev 19

INSTRUCTIONAL SETTING: In-Plant

APPROXIMATE DURATION: 20 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

Affected Training Materials: 2PL-048

Type of Change:

| | | |
|---|---|---|
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 11 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 10<br>New Change # |

List/Description of Change(s):

Updated to current procedure revisions.
Added 2LOT6 NRC Exam Validation comments.

- Split JPM into 2 separate sections for ease of performance
- Added Cabinet mark numbers to first evaluator note
- Added evaluator cue for annunciator A2-2H

Reason for Change (s):

JPM Enhancement

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

K/A REFERENCE: 013A3.01 3.7/3.9 TASK ID: 0011-024-06-013
2.1.23 3.9/4.0

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | | |
|---|---|---|---|
| Performer Name: | | Performer SSN: | |
| Time Critical: ☐ Yes ☒ No | Allotted Time: 10 Minutes (TRN A) 20 Minutes (TRN B) | 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: | Relay K622A (K601B and K620B) are tested IAW the surveillance procedure and determined to meet the acceptance criteria. |
| EVALUATOR NOTE: | This JPM is formatted to use either SSPS Train.<br>During "Protected Train A" weeks, use 2OST 1.12A, Train B test and JPM pages 12-23.<br>During "Protected Train B" weeks, use 2OST 1.11A, Train A test and JPM pages 6-11 |
| RECOMMENDED STARTING LOCATION: | In Plant |
| **DIRECTIONS:** | You are to simulate the Main Feedwater Isolation safeguards test. Following completion of this portion of the OST, determine if the test results satisfy the acceptance criteria. |
| **INITIAL CONDITIONS:** | The plant is operating under steady-state conditions at 100% power. All plant systems are configured in their normal system arrangement. 2OST 1.11A, Safeguards Protection System Train A Blockable Test, (or 2OST 1.12A, Safeguards Protection System Train B Blockable Test) is in progress and has been completed up to the beginning of Section VII.B. Communications have been established with the control room and the front panel of the Safeguards Test Cabinet is unlocked and open. |
| **INITIATING CUE:** | Your supervisor directs you continue with the test by completing Section VII.B, and when complete, determine if the test results satisfy the acceptance criteria. |
| REFERENCES: | 2OST-1.11A Revision 15<br>2OST-1.12A Revision 19 |
| TOOLS: | Key #79 Train A SSPS<br>-or-<br>Key #126 Train B SSPS |
| HANDOUT: | 2OST-1.11A pages 1-16 (content) and 45-46 (table 1 & table 2)<br>-or-<br>2OST-1.12A pages 1-21 (content) and 51-52 (table 1 & table 2) |

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

| | |
|---|---|
| TASK: | You are to simulate the Main Feedwater Isolation safeguards test. Following completion of this portion of the OST, determine if the test results satisfy the acceptance criteria. |
| INITIAL CONDITIONS: | The plant is operating under steady-state conditions at 100% power. All plant systems are configured in their normal system arrangement. 2OST 1.11A, Safeguards Protection System Train A Blockable Test, (or 2OST 1.12A, Safeguards Protection System Train B Blockable Test) is in progress and has been completed up to the beginning of Section VII.B. Communications have been established with the control room and the front panel of the Safeguards Test Cabinet is unlocked and open. |
| INITIATING CUE: | Your supervisor directs you continue with the test by completing Section VII.B. and when complete, determine if the test results satisfy the acceptance criteria. |

☐ 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-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| **EVALUATOR NOTE:**<br>**This JPM is formatted to use either SSPS Train.**<br><br>**During "Protected Train A" weeks, use 2OST 1.12A, Train B test and JPM pages 12-23.**<br><br>**During "Protected Train B" weeks, use 2OST 1.11A, Train A test and JPM pages 6-11** | **EVALUATOR NOTE:**<br>Normally two operators are assigned to perform this task. One is the performer and the other is the peer checker/placekeeper. It may be necessary to clarify the expectation that the candidate will be the performer, and the other operator will assist in placekeeping.<br><br>**EVALUATOR CUE:**<br>Unlock and open the Safeguards Test Cabinet [2RK*2P-TST-A]. Provide cues as appropriate. Provide a copy of 2OST-1.11A to the candidate. | |
| 1. Notify SM/US to make a narrative log entry of relay inoperability and Tech Spec entry. | 1.1 Candidate notifies SM/US to make a narrative log entry of relay inoperability and entry into Tech Spec.<br><br>**EVALUATOR CUE:**<br>Role-play SM/US and acknowledge the report **AND** inform the candidate that the appropriate log entries have been made<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 2. Verify white test lamps ON. | 2.1. Candidate verifies white test lamps 040, 041, 042 ON.<br><br>**EVALUATOR CUE:**<br>White test lamps are **ON**.<br><br>COMMENTS: | |
| 3.C Rotate test switch to the PUSH TO TEST position. | 3.1.C Candidate rotates test switch TRN A S811 to the PUSH TO TEST position.<br><br>**EVALUATOR CUE:**<br>Test switch is in the **PUSH TO TEST** position.<br><br>3.2. Candidate contacts the control room to verify annunciator A2-2H is in alarm.<br><br>**EVALUATOR CUE:**<br>Role-play control room operator and inform the candidate that Annunciator A2-2H is **IN ALARM**.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 4. Verify red test lamp 081 is ON. | 4.1. Candidate verifies red test lamp 081 is ON.<br><br>**EVALUATOR CUE:**<br>Red test lamp is **ON**.<br><br>COMMENTS: | |
| 5. Verify white test lamps are OFF. | 5.1. Candidate verifies white test lamps 040, 041, 042 are OFF.<br><br>**EVALUATOR CUE:**<br>White test lamps are **OFF**.<br><br>COMMENTS: | |
| 6.C Depress and release test switch. | 6.1C Candidate depresses and then releases test switch TRN A S811.<br><br>**EVALUATOR CUE:**<br>Test switch has been depressed and released.<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| 7.C Depress each white test lamp individually and verify each is ON as depressed and OFF when released. | 7.1C Candidate depresses and then releases each lamp 040, 041, 042 and verifies each is ON when depressed and OFF when released.<br>**EVALUATOR CUE:**<br>Lamps **ON** when depressed and **OFF** when released.<br>COMMENTS: | |
| 8.C Place reset test switch to RESET and allow it to spring return to NORMAL. | 8.1C Candidate places reset test switch TRN A S821 to RESET and allows it to spring return to NORMAL.<br>**EVALUATOR CUE:**<br>Test switch has been **RESET** and has spring returned to **NORMAL.**<br>COMMENTS: | |
| 9.C Verify white test lamps. | 9.1C Candidate depresses and then releases each lamp 040, 041, 042 and verifies each remains OFF when depressed.<br>**EVALUATOR CUE:**<br>Lamps remain **OFF** when depressed.<br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| 10. Check for stuck relays. | 10.1. Candidate determines that no stuck relays are indicated and proceeds to the next step.<br><br>COMMENTS: | |
| 11.C Place test switch in NORMAL. | 11.1C Candidate places test switch TRN A S811 in NORMAL<br><br>**EVALUATOR CUE:**<br>Test switch is in **NORMAL.**<br><br>COMMENTS: | |
| 12. Verify test/blocking lamps. | 12.1. Candidate verifies white test lamps 040, 041, 042 ON.<br><br>**EVALUATOR CUE:**<br>White test lamps are **ON.**<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 13. Verify red test lamp 081 is OFF. | 13.1. Candidate verifies red test lamp 081 is OFF.<br>**EVALUATOR CUE:**<br>Red test lamp 081 is **OFF**.<br>13.2. Candidate contacts the control room to verify annunciator A2-2H is OFF.<br>**EVALUATOR CUE:**<br>Role-play control room operator and inform the candidate that Annunciator A2-2H is **OFF**.<br>COMMENTS: | |
| 14.C Evaluate results against acceptance criteria. | 14.1C Candidate evaluates results against OST acceptance criteria and determines that this portion of the OST meets the acceptance criteria.<br>COMMENTS:<br>**EVALUATOR CUE:**<br>That completes this JPM. | |
| | STOP TIME: _____ | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| | START TIME: _____ | |
| **EVALUATOR NOTE:**<br>**This JPM is formatted to use either SSPS Train.**<br><br>**During "Protected Train A" weeks, use 2OST 1.12A, Train B test and JPM pages 12-23.**<br><br>**During "Protected Train B" weeks, use 2OST 1.11A, Train A test and JPM pages 6-11** | **EVALUATOR NOTE:**<br>Normally two operators are assigned to perform this task. One is the performer and the other is the peer checker/placekeeper. It may be necessary to clarify the expectation that the candidate will be the performer, and the other operator will assist in placekeeping.<br><br>**EVALUATOR CUE:**<br>Unlock and open the Safeguards Test Cabinet [2RK*2P-TST-B]. Provide cues as appropriate. Provide a copy of 2OST-1.12A to the candidate. | |
| 1. Notify SM/US to make a narrative log entry of relay inoperability and Tech Spec entry. | 1.1 Candidate notifies SM/US to make a narrative log entry of relay inoperability and entry into Tech Spec.<br><br>**EVALUATOR CUE:**<br>Role-play SM/US and acknowledge the report **AND** inform the candidate that the appropriate log entries have been made<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 2. Determine if the Reactor Trip Breakers are OPEN. | 2.1. Candidate determines that the reactor trip breakers are closed (given in initial conditions), N/As steps B.2.a & B.2.b, and proceeds to step B.3.<br><br>**EVALUATOR CUE:**<br>If asked, reactor trip breakers are **CLOSED**.<br><br>COMMENTS: | |
| 3. Verify white test lamps ON. | 3.1. Candidate verifies white test lamps 002, 004, 006 ON.<br><br>**EVALUATOR CUE:**<br>White test lamps are **ON**.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 4.C Rotate test switch to the PUSH TO TEST position. | 4.1C Candidate rotates test switch TRN B S801 to the PUSH TO TEST position.<br><br>**EVALUATOR CUE:**<br>Test switch is in the **PUSH TO TEST** position.<br><br>4.2 Candidate contacts the control room to verify annunciator A2-2H is in alarm.<br><br>**EVALUATOR CUE:**<br>Role-play control room operator and inform the candidate that Annunciator A2-2H is **IN ALARM**.<br><br>COMMENTS: | |
| 5. Verify red test lamp 081 is ON. | 5.1. Candidate verifies red test lamp 081 is ON.<br><br>**EVALUATOR CUE:** Red test lamp is **ON**.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 6. Verify green blocking lamps are ON. | 6.1. Candidate verifies green blocking lamps 001, 003, 005 are ON.<br><br>**EVALUATOR CUE:** Green blocking lamps are **ON**.<br><br>COMMENTS: | |
| 7.**C** Depress and release test switch. | 7.1**C** Candidate depresses then releases test switch TRN B S801.<br><br>**EVALUATOR CUE:**<br>Test switch has been depressed and released.<br><br>COMMENTS: | |
| 8. Verify white test lamps are OFF. | 8.1. Candidate verifies white test lamps 002, 004, 006 are OFF.<br><br>**EVALUATOR CUE:**<br>White test lamps are **OFF**.<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 9.C Depress each white test lamp individually and verify each is ON as depressed and OFF when released. | 9.1C Candidate depresses and then releases each lamp 002, 004, 006 and verifies each is ON when depressed and OFF when released.<br><br>**EVALUATOR CUE:**<br>Lamps **ON** when depressed and **OFF** when released.<br><br>COMMENTS: | |
| 10.C Place reset test switch to RESET and allow it to spring return to NORMAL. | 10.1C Candidate places reset test switch TRN B S821 to RESET and allows it to spring return to NORMAL<br><br>**EVALUATOR CUE:**<br>Test switch has been **RESET** and has spring returned to **NORMAL**.<br><br>COMMENTS: | |
| 11.C Verify white test lamps. | 11.1C Candidate verifies white test lamps 002, 004, 006 ON.<br><br>**EVALUATOR CUE:**<br>White test lamps are **ON**.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 12. Check for stuck relays. | 12.1. Candidate determines that no stuck relays are indicated and proceeds to the next step.<br><br>COMMENTS: | |
| 13.C Place test switch in NORMAL. | 13.1C Candidate places test switch TRN B S801 in NORMAL.<br><br>**EVALUATOR CUE:**<br>Test switch is in **NORMAL.**<br><br>COMMENTS: | |
| 14. Verify test/blocking lamps. | 14.1. Candidate verifies green blocking lamps 001, 003, 005 are OFF.<br><br>**EVALUATOR CUE:**<br>Green Blocking lamps are **OFF.**<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 15.C Rotate test switch to the PUSH TO TEST position. | 15.1C Candidate rotates test switch TRN B S802 to the PUSH TO TEST position.<br><br>**EVALUATOR CUE:**<br>Test switch is in the **PUSH TO TEST** position.<br><br>COMMENTS: | |
| 16. Verify red test lamp 081 is ON. | 16.1. Candidate verifies red test lamp 081 is ON.<br><br>**EVALUATOR CUE:**<br>Red test lamp is **ON**.<br><br>COMMENTS: | |
| 17. Verify green blocking lamps are ON. | 17.1. Candidate verifies green blocking lamps 001, 003, 005 are ON.<br><br>**EVALUATOR CUE:**<br>Green blocking lamps are **ON**.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 18.C Depress and hold test switch depressed. | 18.1C Candidate depresses and holds test switch TRN B S802.<br>**EVALUATOR CUE:**<br>*Test switch is being held depressed.*<br>COMMENTS: | |
| 19. Verify white test lamps are OFF. | 19.1 Candidate verifies white test lamps 002, 004, 006 are OFF.<br>**EVALUATOR CUE:**<br>White test lamps are **OFF**.<br>COMMENTS: | |
| 20.C While holding the test switch depressed, depress each white test lamp individually and verify each is ON as depressed and OFF when released. | 20.1C Candidate holds test switch TRN B S802 depressed AND depresses and then releases each lamp 002, 004, 006 and verifies each is ON when depressed and OFF when released.<br>**EVALUATOR CUE:**<br>Lamps **ON** when depressed and **OFF** when released.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 21.C Release test switch. | 21.1C Candidate releases test switch TRN B S802.<br><br>**EVALUATOR CUE:**<br>Test switch released.<br><br>COMMENTS: | |
| 22.C Place reset test switch to RESET and allow it to spring return to NORMAL. | 22.1C Candidate places reset test switch TRN B S821 to RESET and allows it to spring return to NORMAL.<br><br>**EVALUATOR CUE:**<br>Test switch has been **RESET** and has spring returned to **NORMAL**.<br><br>COMMENTS: | |
| 23. Verify white test lamps ON. | 23.1. Candidate verifies white test lamps 002, 004, 006 ON.<br><br>**EVALUATOR CUE:**<br>White test lamps are **ON**.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 24. Check for stuck relays. | 24.1 Candidate determines that no stuck relays are indicated, and proceeds to the next step.<br><br>COMMENTS: | |
| 25.C Place test switch in NORMAL. | 25.1C Candidate places test TRN B S802 in NORMAL.<br><br>**EVALUATOR CUE:**<br>Test switch is in **NORMAL**.<br><br>COMMENTS: | |
| 26. Verify green blocking lamps OFF. | 26.1. Candidate verifies green blocking lamps 001, 003, 005 are OFF.<br><br>**EVALUATOR CUE:**<br>Green blocking lamps are **OFF**.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 27. Verify red test lamp 081 is OFF. | 27.1. Candidate verifies red test lamp 081 is OFF.<br><br>**EVALUATOR CUE:**<br>Red test lamp 081 is **OFF**.<br><br>27.2. Candidate contacts the control room to verify annunciator A2-2H is OFF.<br><br>**EVALUATOR CUE:**<br>Role-play control room operator and inform the candidate that Annunciator A2-2H is **OFF**.<br><br>COMMENTS: | |
| 28. Step 28 should be N/A. | 28.1. Candidate determines step B.2 was not performed and documents step 28 N/A.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-048<br>JPM REVISION: 11 | JPM TITLE: Safeguards Test of FWI |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 29. Step 29 should be N/A. | 29.1. Candidate determines step B.2 was not performed and documents step 29 N/A.<br><br>COMMENTS: | |
| 30.C Evaluate results against acceptance criteria. | 30.1C Candidate evaluates results against OST acceptance criteria and determines that this portion of the OST meets the acceptance criteria.<br><br>COMMENTS:<br><br>**EVALUATOR CUE:**<br>That completes this JPM. | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A)

TRAINING MATERIAL NUMBER: 2PL-069

PROGRAM TITLE: Licensed Operator Training (Retraining)

COMPUTER CODE: 2PL-069

REVISION NUMBER: 4

TECHNICAL REFERENCES:

2OST-24.4A, Steam Driven Auxiliary Feed Pump [2FWE*P22] Full Flow Test, Rev. 19
2OM-24.4.R, Resetting And Opening TDAFW Pump Trip And Throttle Valve, Rev. 20

INSTRUCTIONAL SETTING: Plant (Auxiliary Feed Pump Room)

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks _____ Date

PEER REVIEW BY: _____ Date

APPROVED FOR USE: _____ Date
Training Supervisor or Designee

# TRAINING MATERIAL CHANGE FORM

| | | |
|---|---|---|
| Affected Training Materials: | | |
| Type of Change: | | |
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 4 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 3<br>New Change # |

List/Description of Change(s):

Updated to current procedure revision and JPM format.
Revised initial conditions to address full flow testing of 2FWE*P22

Reason for Change (s):

Add critical steps
Enhance JPM

APPROVALS:

R. J. Brooks _____
Prepared by Date

_____
Training Superintendent/Supervisor/Peer Date
*("Changes Not Requiring Revision" only)*

**NOTE**: 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: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

K/A REFERENCE: 061A2.04 3.4/3.8 TASK ID: 0241-024-01-043

JPM APPLICATION: ☒ REQUALIFICATION ☒ INITIAL EXAM ☐ TRAINING

☐ FAULTED JPM ☐ ADMINISTRATIVE JPM

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

| EVALUATION RESULTS | | |
|---|---|---|
| Performer Name: | Performer SSN: | |
| Time Critical: ☐ Yes ☒ 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: _____

_____

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | 2FWE*P22 tripped and Reset |
| RECOMMENDED STARTING LOCATION: | Auxiliary Feed Pump Room |
| **DIRECTIONS:** | You are to simulate the task Local Shutdown of [2FWE*P22]. |
| **INITIAL CONDITIONS:** | • The Plant is in Mode 3 with SG pressures at 700 psig.<br>• 2OST-24.4A Steam Driven Auxiliary Feed Pump [2FWE*P22] Full Flow Test, is in progress and completed satisfactory through Part V.F.**(THE PUMP IS CURRENTLY RUNNING)**<br>• **NO RWDA-G Discharge Authorization** was required for this evolution. |
| **INITIATING CUE:** | Your supervisor directs you to perform Part G Pump Shutdown step 1.a through step 1.e of 2OST-24.4A Steam Driven Auxiliary Feed Pump [2FWE*P22] Full Flow Test, to shutdown [2FWE*P22]. |
| REFERENCES: | 2OST-24.4A, Rev. 19<br>2OM-24.4.R, Rev.20 |
| TOOLS: | Hardhat, safety glasses, gloves, and Dosimetry |
| HANDOUT: | 2OST-24.4A, Part G step 1.a through 1.e (Rev. 19)<br>2OM-24.4.R, Rev.20 |

OPERATIONS JOB PERFORMANCE MEASURE

## CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: You are to simulate the task Local Shutdown of [2FWE*P22].

INITIAL CONDITIONS:

- The Plant is in Mode 3 with SG pressures at 700 psig.
- 2OST-24.4A Steam Driven Auxiliary Feed Pump [2FWE*P22] Full Flow Test, is in progress and completed satisfactory through Part V.F.**(THE PUMP IS CURRENTLY RUNNING)**
- **NO RWDA-G Discharge Authorization** was required for this evolution.

INITIATING CUE: Your supervisor directs you to perform Part G Pump Shutdown step1.a through step 1.e of 2OST-24.4A Steam Driven Auxiliary Feed Pump [2FWE*P22] Full Flow Test, to shutdown [2FWE*P22].

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

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

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

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

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| 1. Obtain procedure 2OM-24.4.A. | **EVALUATOR CUE:**<br>For exam sequencing this step may be omitted, the evaluator may provide a copy of the procedure.<br>1. Candidate locates 2OM-24.4.A.<br>COMMENTS: | |
| 1.C Stop [2FWE*P22] by pressing the Emergency Trip Manual Lever. | 1.1 Locates the Emergency Trip Manual Lever.<br>1.2C Presses the Emergency Trip Manual Lever.<br>1.3 Verifies that the pump shaft has stopped rotating.<br>**EVALUATOR CUE:**<br>The pump shaft has stopped rotating.<br>COMMENTS: | |
| 2.C Close the following valves: (BB-C)<br>[2MSS*SOV105A], Turb Driven AFW Pump Stm Hdr A Supply Isol Vlv.<br>[2MSS*SOV105D], Turb Driven AFW Pump Stm Hdr A Supply Isol Vlv. | 2.1 C Contacts the control room and requests operator to close [2MSS*SOV105A], Turb Driven AFW Pump Stm Hdr A Supply Isol Vlv.<br>[2MSS*SOV105D], Turb Driven AFW Pump Stm Hdr A Supply Isol Vlv.<br>**EVALUATOR CUE:**<br>Role-play the control room operator and inform the candidate that [2MSS*SOV105A], Turb Driven AFW Pump Stm Hdr A Supply Isol Vlv. **AND** [2MSS*SOV105D], Turb Driven AFW Pump Stm Hdr A Supply Isol Vlv. are **CLOSED**.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| 3. Initiate Part I, "Plant Restoration", concurrently with the remaining steps in this part of the test (Part G) and Part H, "Remote Closed Position Verification of [2MSS*SOV105A, B and C]". | **EVALUATOR CUE:**<br>Role-play the Unit supervisor and inform the candidate that another operator will complete (Part G) and Part H, "Remote Closed Position Verification of [2MSS*SOV105A, B and C]". | |
| 4. Record the necessary information for stopping the discharge on the RWDA-G, Discharge Authorization. (N/A if RWDA-G is NOT required) | N/A NO RWDA-G in progress.<br><br>COMMENTS: | |
| 5. WHEN the pump shaft has come to a complete stop, Reset [2FWE*TTV22], Trip and Throttle Valve for 2FWE*P22, in accordance with 2OM-24.4.R, "Resetting and Opening TDAFW Pump Trip and Throttle Valve". | N/A Pump previously verified to be stopped.<br><br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 6. Locates procedure 2OM-24.4.R, "Resetting and Opening TDAFW Pump Trip and Throttle Valve" and reviews initial conditions, and P&Ls | 6.1 Candidate locates 2OM-24.4.R.<br><br>COMMENTS: | |
| 7. Verify closed [2MSS*SOV105A-F]. | 7.1 Candidate contacts Control Room to determine valve positions.<br>**EVALUATOR CUE:**<br>All of the steam supply SOV's, [2MSS*SOV105A, B. C. D. E. Fl. are **CLOSED.**<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 8. Verify tripped or depress Manual Emergency Trip Lever. | 8.1 N/A Previously performed<br><br>COMMENTS: | |
| 9. Verify [2FWE*TTV22] Trip Throttle valve is unlatched. | 9.1 Candidate locates latch hook and verifies that the trip lever is not engaged.<br><br>**EVALUATOR CUE:**<br>Trip Throttle Valve is **NOT ENGAGED**. (Brass sleeve is full down)<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S U |
|---|---|---|
| | **EVALUATOR CUE:**<br>The Turbine Driven Aux Feed pump will **NOT** be started within the next 15-20 minutes. | |
| 10.C Reset and latch the overspeed trip device. | 10.1C Candidate turns the handwheel CLOCKWISE until the sliding nut and lever raise to the trip hook. | |
| | **EVALUATOR CUE:**<br>Brass Sliding nut and lever are all the way up. | |
| | 10.2C Candidate locates and holds the overspeed trip connecting rod to the left, while ensuring the overspeed tappet washer flat side directly faces the overspeed trip lever. | |
| | **EVALUATOR CUE:**<br>Trip Lever is to the **LEFT** and **ENGAGED** in the trip hook with flat side tappet washer directly facing the Overspeed Trip Lever. | |
| | 10.3C Candidate releases the connecting rod, allowing spring tension to maintain the reset condition. | |
| | **EVALUATOR CUE:**<br>After candidate releases the connecting rod the Overspeed Trip remains **RESET**. | |
| | 10.4 Candidate ensures the washer flat side is flush against the vertical side overspeed trip lever. | |
| | **EVALUATOR CUE:**<br>Washer flat side is flush against the overspeed trip lever vertical side. | |
| | 10.5 Candidate verifies valve is latched by observing that the latch on the right side of the valve is fully engaged. | |
| | **EVALUATOR CUE:**<br>The latch is **FULLY ENGAGED**. | |
| | COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 11.C Reopen Trip Throttle Valve. | 11.1C Candidate locates [2FWE*TTV22] and turns handwheel CCW until it stops in the full open position.<br><br>**EVALUATOR CUE:**<br>[2FWE*TTV22] is **FULL OPEN**.<br><br>11.2 Candidate verifies that the pump does not accelerate in an uncontrolled manner.<br><br>**EVALUATOR CUE:**<br>The pump slowly rotates as you open the Trip<br><br>**EVALUATOR CUE:**<br>Acknowledge request for concurrent verification of the valve, inform candidate that other operators will perform this function using step 11 of the procedure. **Direct candidate to continue with step 8.**<br><br>11.3 Candidate adjusts the valve 1/4 turn off the backseat.<br><br>**EVALUATOR CUE:**<br>Valve is 1/4 Turn off its backseat.<br><br>11.4 Candidate verifies that the overspeed trip mechanism is reset by observing that the flat side of the washer remains engaged with the trip lever.<br><br>**EVALUATOR CUE:**<br>Flat side of the washer remains engaged with the trip lever<br><br>11.5 Candidate contacts the control room to verify that computer point Y5172D indicates OPER.<br><br>**EVALUATOR CUE:**<br>Role-play Control Room operator and inform the candidate that Y5172D indicates **OPER**.<br><br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-069<br>JPM REVISION: 4 | JPM TITLE: Local Shutdown of 2FWE*P22 (IAW 2OST-24.4A) |
|---|---|

| STEP<br>( **"C"** Denotes CRITICAL STEP ) | STANDARD<br>(Indicate **"S" FOR SAT** or **"U" FOR UNSAT)⇒** | S/U |
|---|---|---|
| | **EVALUATOR CUE:**<br>IF necessary, Role-play the Unit Supervisor and inform the candidate that the Governor Oil Pressure was **NOT** previously relieved. | |
| 12.**C** Relieve governor oil pressure. | 12.1 Candidate removes access cover to [2FWE-2CSSOV101]. | |
| | **EVALUATOR CUE:**<br>Cover is removed. | |
| | 12.2**C** Candidate simultaneously depresses both pushbuttons until governor linkage movement has ceased and pushbuttons have been held for 15 seconds. | |
| | **EVALUATOR CUE:**<br>All linkage movement has stopped, 15 seconds has elapsed. | |
| | 12.3 Candidate replaces access cover to [2FWE-2CSSOV101]. | |
| | **EVALUATOR CUE:**<br>Cover is re-installed. | |
| | 12.4 Candidate notifies Control Room that [2FWE*P22] is available. | |
| | COMMENTS: | |
| | **EVALUATOR CUE:**<br>That completes this JPM. | |
| | STOP TIME: _____ | |

# OPERATIONS JOB PERFORMANCE MEASURE (JPM)

TRAINING MATERIAL TITLE: Locally Start the No.1(2) Emergency Diesel Generator

TRAINING MATERIAL NUMBER: 2PL-606

PROGRAM TITLE: Licensed Operator Training

COMPUTER CODE: 2PL-606

REVISION NUMBER: 1

TECHNICAL REFERENCES:

2OM-53A.1.A-1.5, Local Action to Restore AC Power, Issue 1C, Revision 5

INSTRUCTIONAL SETTING: In Plant

APPROXIMATE DURATION: 15 Minutes

PREPARED BY: R. J. Brooks _____ _____
Date

PEER REVIEW BY: _____ _____
Date

APPROVED FOR USE: _____ _____
Training Supervisor / Designee Date

# TRAINING MATERIAL CHANGE FORM

| | | |
|---|---|---|
| Affected Training Materials: 2PL-606 | | |
| Type of Change: | | |
| ☒ Changes Requiring Revision | Learning Objective Related Change?<br>☐ Yes ☒ No | New Rev. # 1 |
| ☐ Changes Not Requiring Revision | The Change Does Not Impact Learning Objectives or Material Quality. | Existing Rev. # 0<br>New Change # |
| List/Description of Change(s):<br>Renumbered incorrect steps<br>Re-formatted JPM to match current JPM format. | | |
| Reason for Change (s):<br>JPM Enhancement | | |
| APPROVALS:<br>R. J. Brooks<br>Prepared by Date<br>Training Superintendent/Supervisor/Peer Date<br>*("Changes Not Requiring Revision" only)* | | **NOTE**: 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. |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-606<br>JPM REVISION: 1 | JPM TITLE: Locally Start the No. 1(2) Emergency Diesel Generator |
|---|---|

K/A REFERENCE: 064A4.01 4.0/4.3
055EA1.01 4.3/4.4

TASK ID: 0362-003-01-043

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

| EVALUATION METHOD: | LOCATION: | TYPE: | ADMINISTERED BY: |
|---|---|---|---|
| ☐ Perform<br>☐ Simulate | ☐ Plant Site<br>☐ Simulator<br>☐ Classroom | ☐ Annual Requal Exam<br>☐ Initial Exam<br>☐ OJT/TPE<br>☐ Training<br>☐ Other: | ☐ BVT<br>☐ NRC<br>☐ Other: |

## EVALUATION RESULTS

| Performer Name: | Performer SSN: |
|---|---|

| Time Critical: ☐ Yes ☒ No | Allotted Time: 20 minutes | Actual Time: minutes |
|---|---|---|

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

Comments: _____

_____

## OBSERVERS

| Name/SSN: | Name/SSN: |
|---|---|
| Name/SSN: | Name/SSN: |

## EVALUATOR

Evaluator (Print): _____ Date: _____

Evaluator Signature: _____

## EVALUATOR DIRECTION SHEET

| | |
|---|---|
| TASK STANDARD: | Locally start the No. 1(2) Diesel Generator. |
| RECOMMENDED STARTING LOCATION: | In Plant |
| EVALUATOR NOTE: | This JPM is designed for either Train. Perform on Diesel Generator #2 if Protected Train A and on Diesel Generator #1 if Protected Train B. Train B equipment in parentheses. |
| **DIRECTIONS:** | You are to simulate the task locally start the No. 1(2) Emergency Diesel Generator. |
| **INITIAL CONDITIONS:** | A station blackout has occurred. OM-53A Procedure ECA-0.0, "Loss of All AC Power," has led the crew to the step which requires local action to restore power. 2SWS*P21A(B) control switch is in AUTO. |
| **INITIATING CUE:** | Your supervisor directs you to use Attachment A-1.5 of ECA-0.0 to locally start the No. 1(2) Diesel Generator and energize the 2AE(2DF) bus, but to not load equipment onto the bus. You are given the key for the Diesel Generator (use of keys will be simulated). |
| REFERENCES: | 2OM-53A.1.A-1.5, Local Actions to Restore AC Power, Issue 1C, Revision 5 |
| TOOLS: | Key 138 for Excitation Panel will be provided when needed<br>Key for Local Start will be simulated (SR 27/28) |
| HANDOUT: | 2OM-53A.1.A-1.5, Local Actions to Restore AC Power, Issue 1C, Revision 5 |

OPERATIONS JOB PERFORMANCE MEASURE

## CANDIDATE DIRECTION SHEET

**Use this sheet if Protected Train "A"**

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: Locally start No. 2 Diesel Generator

INITIAL CONDITIONS: A station blackout has occurred. OM-53A Procedure ECA-0.0, "Loss of All AC Power," has led the crew to the step which requires local action to restore power. 2SWS*P21B control switch is in AUTO.

INITIATING CUE: Your supervisor directs you to use Attachment A-1.5 of ECA-0.0 to locally start the No. 2 Diesel Generator and energize the 2DF bus, but do not load equipment onto the bus. You are given the key for the Diesel Generator (use of keys will be simulated).

☐ 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

## CANDIDATE DIRECTION SHEET

**Use this sheet if Protected Train "B"**

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

TASK: Locally start No. 1 Diesel Generator

INITIAL CONDITIONS: A station blackout has occurred. OM-53A Procedure ECA-0.0, "Loss of All AC Power," has led the crew to the step which requires local action to restore power. 2SWS*P21A control switch is in AUTO.

INITIATING CUE: Your supervisor directs you to use Attachment A-1.5 of ECA-0.0 to locally start the No. 1 Diesel Generator and energize the 2AE bus, but do not load equipment onto the bus. You are given the key for the Diesel Generator (use of keys will be simulated).

☐ 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-606<br>JPM REVISION: 1 | JPM TITLE: Locally Start the No. 1(2) Emergency Diesel Generator |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | START TIME: _____ | |
| | **EVALUATOR NOTE:**<br>A copy of the procedure can be given to the candidate if starting in plant. Key #138 will be needed for the Excitation Panel. Provide key when candidate needs to get into the panel. Uses of Auto/Local key will be simulated. | |
| 1. Place Auto-Local Selector Switch in the LOCAL position. | 1.1 Candidate locates Auto-Local Control key switch.<br>1.2 Inserts key and places in the LOCAL position.<br>**EVALUATOR CUE:**<br>Diesel Generator is in **LOCAL.**<br>COMMENTS: | |
| 2. Verify following alarms are not lit: Engine Overspeed and Start Failure. | 2.1 Candidate locates Alarm Panel.<br>2.2 Verifies Engine Overspeed and Start Failure alarms not lit.<br>**EVALUATOR CUE:**<br>No alarms present.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-606<br>JPM REVISION: 1 | JPM TITLE: Locally Start the No. 1(2) Emergency Diesel Generator |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| | **EVALUATOR NOTE:**<br>Candidate may depress both pushbuttons, although only one is needed. | |
| 3. Depress one local start pushbutton and maintain it depressed until the diesel starts and is self-sustaining and then release pushbutton. | 3.1 Candidate locates Start Pushbutton, Start 1 or Start 2<br>3.2 Depresses it until engine starts and is self-sustaining and then releases.<br>**EVALUATOR CUE:**<br>Diesel starts and is self-sustaining at 525 rpm.<br>COMMENTS: | |
| 4.C Adjust Diesel Generator speed using governor raise-lower control to establish an operating speed of approximately 514 rpm (510 to 520 rpm) | 4.1 Candidate locates Governor Raise-Lower control and speed indication.<br>4.2C Candidate simulates turning Governor Raise-Lower to "Lower" position to decrease speed to 514 rpm.<br>4.3 Verifies Engine speed at appx. 514 rpm.<br>**EVALUATOR CUE:**<br>Diesel speed is **514 rpm**. (510-520).<br>COMMENTS: | |

# OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-606<br>JPM REVISION: 1 | JPM TITLE: Locally Start the No. 1(2) Emergency Diesel Generator |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 5. Verify Diesel Generator Volts greater than 4160 VAC. | 5.1 Candidate locates Diesel Generator Voltmeter.<br>5.2 Verifies Engine voltage greater than 4160 VAC.<br>**EVALUATOR CUE:**<br>Diesel Generator Voltage is **ZERO**.<br>COMMENTS: | |
| 6.C Response to failure of Automatic Field Flash. | 6.1 Candidate calls control room.<br>6.2. Candidate has operator flash generator field from bench board<br>**EVALUATOR CUE:**<br>Role-play Control room operator and inform the candidate the control room has attempted to flash the field, **HOWEVER**, Diesel Generator Voltage is still **ZERO**.<br>6.3 Candidate locates the K2 field flash contactor inside cab. [PNL-2DIGEN-1A (2A)]<br>6.4C Candidate simulates DEPRESSING the White Stabs on the K2 Field Flash Contactor until the voltmeter shows a rapid rise.<br>**EVALUATOR CUE:**<br>Diesel Generator Voltage is now indicating **~4160 VAC** and stable.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-606<br>JPM REVISION: 1 | JPM TITLE: Locally Start the No. 1(2) Emergency Diesel Generator |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 7. Attempt to Restore Diesel Generator Control to the Control Room. | 7.1 Candidate locates Auto-Local key switch.<br>7.2 Verifies/Places it to AUTO.<br>**EVALUATOR CUE:**<br>Auto-Local key switch is in **AUTO**.<br>IF necessary, Role-play the Control Room and confirm control of Diesel Generator in the control room.<br>COMMENTS: | |
| 8. Request Control Room Operator verify open or open emergency bus tie breaker. | 8.1 Candidate contacts Control Room.<br>8.2 Has operator open or verify open 2E7(2F7) and 2A10(2D10)<br>**EVALUATOR CUE:**<br>Control Room reports both breakers open.<br>COMMENTS: | |

OPERATIONS JOB PERFORMANCE MEASURE

| JPM NUMBER: 2PL-606<br>JPM REVISION: 1 | JPM TITLE: Locally Start the No. 1(2) Emergency Diesel Generator |
|---|---|

| STEP<br>( "C" Denotes CRITICAL STEP ) | STANDARD<br>(Indicate "S" FOR SAT or "U" FOR UNSAT)⇒ | S/U |
|---|---|---|
| 9.C Request Control Room operator close Diesel Generator Output Breaker 2E10(2F10). | 9.1 Candidate contacts Control Room.<br><br>9.2C Candidate has operator close Diesel Generator Output breaker.<br><br>**EVALUATOR CUE:**<br>ACB 2E10(2F10) is closed.<br><br>COMMENTS: | |
| | STOP TIME: _____ | |

| | | | | | |
|---|---|---|---|---|---|
| Facility: | BVPS 2 | Scenario No.: | 1 | Op Test No.: | NRC |
| Examiners: | _____ | Candidates: | _____ | | SRO |
| | _____ | | _____ | | ATC |
| | _____ | | _____ | | BOP |

Initial Conditions: BOL, ~5% power following Xe free S/U, CB D = 104, 2003 PPM IC-165

Turnover: Continue plant startup IAW 2OM-52.4.A. [2SAS-C21B] Station Air Compressor OOS, will not be returned this shift

Critical Tasks:

1. E-0.I Crew establishes flow from at least one high head ECCS pump before transition out of E-0.
2. 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.
3. E-2.A Crew isolates the faulted SG and directs operator to close isolation valve(s) operated from outside of the control room before transition out of E-2.

| Event No. | Malf. No. | Event Type | Event Description |
|---|---|---|---|
| 1 | | R(RO)<br>N(ALL) | Crew raises power IAW procedure<br>(Must raise power above 10% before N-36 failure) |
| 2 | NIS07B | *SRO T.S.* | IRNI N-36 Intermediate Range Nuclear Instrument Inst Pwr fuse blows |
| 3 | XMT-RCS019A | I(RO/SRO)<br>*SRO T.S.* | [2RCS*LT459] Controlling PRZR Level Channel fails low, L/D isolates |
| 4 | | N(RO/SRO) | Alternate channel selected and L/D restored |
| 5 | CNH-CFW15B | C(BOP/SRO) | 'C' BPFRV fails open in auto, manual control required |
| 6 | MSS01C | M(ALL) | Steam leak inside CNMT slowly progresses to Steam line RUPTURE inside CNMT, SI, CIA, CIB |
| 7 | PMP-CHS002<br>PPL07A | C(RO/SRO) | [2CHS*P21B] HHSI Pump trips on SI<br>[2CHS*P21A] HHSI pump Fails to AUTO, requires manual start on SI |
| 8 | PPL10A<br>PPL10B | C(BOP/SRO) | AUTO MSLI failure BOTH Trains, requires manual actuation |

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

The crew will assume the shift at approximately 5% power BOL, with station air compressor 2SAS-C21B OOS. Crew instructions are to continue the plant start-up. The crew will perform a Normal Power Increase to > 10%. When power is greater than 10%, the instrument power fuse will fail on Intermediate Range Channel N-36. The crew will respond to the annunciators and implement the actions of AOP 2.2.1B, Intermediate Range Channel Malfunction. After the US implements the required Technical Specification actions, the controlling channel of PRZR level [2RCS*LT459] will FAIL LOW causing letdown isolation. The crew will respond to the annunciators and implement the actions of instrument failure procedure OM 2.6.4.IF ATT #1. After stabilizing the plant, letdown will be restored IAW normal operating procedure 2OM-7.4.AB, Restoring Charging and Letdown. After the US implements the required Technical Specification actions "C" BPFRV will FAIL OPEN in automatic. The crew will be required to take manual control of "C" BPFRV to restore and maintain SG level. After SG levels are stabilized, a steam leak will develop inside containment. The leak will slowly progress to a full steam line RUPTURE causing RX TRIP, SI, CIA and CIB. The crew will respond by implementing the actions of E-0, Reactor Trip or Safety Injection. The actions of E-0, Reactor Trip or Safety Injection will be complicated by HHSI pump 21B tripping after the SI start signal and HHSI pump 21A failing to automatically start on the receipt of the SI signal. The crew must identify these failures and manually start the 21A HHSI pump. The crew must then diagnosis the faulted SG and transition into E-2, Faulted SG Isolation. The actions of E-2, Faulted SG Isolation will be complicated by a failure of SLI. The crew must identify this failure and manually initiate SLI. After completing the actions of E-2, Faulted SG Isolation the crew must determine that the SI termination criteria have been met and transition into ES-1.1, SI Termination. After the crew has terminated HHSI flow the scenario will be terminated.

**EOP Flow Path:**
E-0, Reactor Trip or Safety Injection → E-2, Faulted Steam Generator Isolation → ES-1.1, SI Termination.

**INITIAL CONDITIONS:** Approx 5% Power, CBD = 104, XE increasing from XE free S/U, BOL, 2003 PPM Boron, IC-165

| ADDITIONAL LINEUP CHANGES | STICKERS | VOND MARKINGS |
|---|---|---|
| [2SAS-C21B] – PTL | DANGER | |
| **EQUIPMENT STATUS** | **DATE/TIME OOS** | **TECHNICAL SPECIFICATION(S)** |
| [2SAS-C21B] | 1 week ago | N/A |
| | | |

## SHIFT TURNOVER INFORMATION

1. Protected Train is Train "B"
2. [2SAS-C21B] undergoing a compressor overhaul, will not be returned until 3 days from now
3. [2FWS-P21A] operating, SG levels maintained via BPFRVs operating in AUTO
4. Continue plant S/U IAW **2OM-52.4.A step 6**
5. Reactor Engineering has provided the reactivity plan for the continuation of the startup

## SCENARIO SUPPORT MATERIAL REQUIRED

Reactivity plan placard for BOL
**2OM-52.4.A** signed-off through step 5.
Placard for [2FWE*P22] position stating [2FWE*P22] is aligned to "A" header
Place plaque on wall for Protected Train "B"

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Initialize IC Set 165, and establish initial plant conditions. | Reactor plant at approx 5% power, BOL, equilibrium conditions. RCS boron 2003 PPM, CBD = 104 steps. | | |
| Insert the following per the Simulator Setup section of the HTML File for this drill: | Inserts all pre-loads required to support the drill | | |
| **IMF PMP-CAS004 (0 0) 1** | [2SAS-C21B] OOS | | |
| **IMF PPL10A (0 0)** | Prevent auto MSLI Trn "A" | | |
| **IMF PPL10B (0 0)** | Prevent auto MSLI Trn "B" | | |
| **TRGSET 1 'JPPLSI(1) == 1'** | Set trigger 1 on SI actuation | | |
| **IMF PMP-CHS002 (1 0) 1** | [2CHS*P21B] trips on SI initiation | | |
| **IMF PPL07A (0 0) 0** | [2CHS*P21A] fails to auto start on SI initiation, manual start required | | |
| **TRG 1 'IMF MSS01C 1E7'** | 'C' Steam line rupture inside CNMT on SI actuation | | |
| **TRGSET 2 'MCRFNS(3) <= 225'** | Set trigger 2 on reactor trip | | |
| **TRG 2 'IMF MSS01C 1E7'** | 'C' Steam line rupture inside CNMT on reactor trip | | |
| **TRGSET 3 'TPCSTAAU <= 547'** | Set trigger 3 on Tavg < 547F | | |
| **TRG 3 'IMF MSS01C 1E7'** | 'C' Steam line rupture inside CNMT when Tavg decreases below 547F | | |
| **BAT STUFFON.DAT** | Horns, Printers, Sounds ready | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Assign shift positions<br><br>SM:_____<br><br>US:_____<br><br>RO:_____<br><br>BOP:_____<br><br>STA:_____ | | | |
| 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 drill. | Simulator running. | | Crew assumes control of the Unit. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

**EVENT #1:**

Normal Power Increase to > 10%

US directs crew to conduct power increase IAW **2OM-52.4.A** and the reactivity plan provided by Reactor Engineering

BOP Raises turbine reference and setter to raise turbine power.

RO dilutes/withdraws rods to raise reactor power.

Continue with next event **AFTER** IRNI High Flux Trip has been blocked above 10% **AND** LE discretion

**EVENT #2:**

IRNI N-36 Instrument power fuse blows

**IMF NIS07B (0 0) 0**

**IMMEDIATE PLANT RESPONSE:**

A4-4E NIS DETECTOR COMPENSATOR TROUBLE (V0139D, V0132D)

[2NMI-NI36B] Intermediate range current indicates low (BB B)

N-36 meter at NIS racks indicates low

N-36 Inst Pwr fuse indicates blown

RO verifies alarms, diagnose failure of N-36 IRNI

Crew identifies blown fuse

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Light on N-36 rack drawer:<br>CONTROL POWER ON – LIT<br>HIGH LEVEL TRIP – LIT<br>HIGH LEVEL ROD STOP – LIT<br>POWER ABOVE P-6 PERMISSIVE – LIT | | |
| | LOSS OF DETECTOR VOLTS – LIT<br>LOSS OF COMP VOLTS – LIT<br>BB B Status panel 308 – LIGHT C-10 – LIT<br>NO PLANT TRANSIENT | | Crew refers to **ARP and AOP 2.2.1B** |
| | Operable recorders selected on VB B | | RO verifies operable recorders selected to VB B recorders |
| | MODE 1 operation | | US refers to TS 3.3.3 for post acc monitoring (when time permits) |
| | Plant is above P10 | | US directs actions IAW **step 6** based on current plant operating conditions |
| | Both IRNIS block switches to BLOCK position | | RO blocks both IRNIS Rod Stop and Reactor Trip functions (previously performed) |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Caution tags in place to prompt MANUAL Unblock of SRNI on plant S/D | | RO places caution tags on both SRNI Block/Reset switches |
| | | | US directs continued plant operations and continue power increase |
| | Ann A4-5F NIS INT RANGE HIGH FLUX ROD WITHDRAWL STOP actuates<br>Ann A4-5E NIS SOURCE/INT RANGE HIGH FLUX TRIP BYPASS – LIT<br>(N0096D) – TRIPPED<br>Status light "LEVEL TRIP BYPASS" – LIT | | Crew bypasses reactor trip function by placing LEVEL TRIP switch of inoperable channel in BYPASS position |
| | Caution tag in place | | BOP places Caution Tag on Level Trip switch for N-35 |
| | Power increase continues | | Crew continues power increase IAW **2OM-52.4.A** and reactivity plan |

**EVENT #3:**

Power increase continues

Continue with next event at LE discretion

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

**EVENT #4:**

PZR level Xmitter [2RCS*LT459] fails low

**IMF XMT RCS019A (0 0) 0**

PZR level transmitter [2RCS*LT459] fails low.

**IMMEDIATE PLANT RESPONSE:**

A4-1C PZR CONTROL LEVEL DEVIATION LOW (L0493D)

A4-1B PZR CONTROL LEVEL LOW (L0491D)

[2CHS*LCV460A], [2CHS*AOV200A,B,C] close

PZR heaters off.

RO recognizes problem with PZR level channel, informs US that [2RCS*LT459] failed low.

RO places [2CHS*FCV122] in manual to reduce charging flow and control PZR level

Crew refers to ARP and **OM 2.6.4.IF ATT #1**, US directs operator to defeat level control input with PZR level channel and recorder selector switches.

Level alarms clear, charging flow reduces, high flow alarm clears.

RO places Channels 460 and 461 in service.

Adequate M/U to VCT exists

RO verifies M/U to VCT

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | PZR heaters energized as desired | | RO places PZR heaters in operation as necessary to restore normal PZR pressure control |
| | | | US directs operators to restore Letdown flow IAW **2OM-7.4.AB** |
| | [2CHS*FCV122] - CLOSED | | RO places [2CHS*FCV122] in manual and closes the valve |
| | [2CHS*MOV289] - OPEN | | RO verifies [2CHS*MOV289] open |
| | [2CHS*MOV310] - OPEN | | RO verifies [2CHS*MOV310] open |
| | [2CHS*FCV122] throttled to obtain 30 – 50 gpm on [2CHS*FI122] (VB A) | | RO throttles charging pump discharge flow control valve open to provide 30 – 50 gpm flow as indicated on [2CHS*FI122] (VB A) |
| | [2CHS*AOV200A, B, C] - CLOSED | | RO verifies 3 L/D isolation valves are closed |
| | [2CHS*AOV204] - OPEN | | RO verifies the NRHX L/D inlet valve is open (BB A) |
| | [2CHS*PCV145] – IN MANUAL AND ADJUSTED TO 50% OPEN DEMAND SIGNAL (BB A) | | RO place NRHX Disch Pres control valve in MANUAL and adjusts for 50% output demand |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2CHS*MOV100A] – OPEN<br>[2CHS*MOV100B] – CLOSED | | RO verifies positions of [2CHS*MOV100A], [2CHS*MOV100B] |
| | [2CHS*LCV460A, B] - OPEN | | RO verifies Regen HX L/D Inlet valves open |
| | [2CHS*AOV200A, B] - OPEN | | RO opens L/D isol valves to establish L/D flow at previous value |
| | [2CHS*PCV145] adjusted to maintain 260 psig as indicated on [2CHS*PI145]<br>SETPOINT of [2CHS*PCV145] – SET FOR 260PSIG<br>[2CHS*PCV145] – PLACED IN AUTO<br>[2CHS*FCV122] – PLACED IN AUTO | | RO establishes automatic control of letdown flow |
| | PZR level trending to normal | | RO monitors PZR level for proper response |
| | | | US refers to **TS. 3.3.1 Table 3.3.1-1 Function 9, Condition K:** Place channel in trip W/I 6 hrs **<u>OR</u>** Reduce THERMAL POWER to <P7 W/I 12 hrs<br>**TS 3.3.4 and Bases Table B3.3.4 Function 4.a:** Remote S/D Indication and Controls requires 1 channel of PZR level operable |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | **TS 3.3.3 Table 3.3.3-1 Function 11**<br>**Condition E:** As required by Action D.1 and referenced in Table 3.3.1-1<br>**Condition E.1:** Be in MODE 3 - 6 hrs<br>**AND**<br>**Condition E.2:** Be in MODE 4 – 12 hrs |
| | | | RO informs the US that letdown has been reestablished. |
| **IF DESIRED** use the following to trip bistable per **2MSP-6.23-I:** | | | US directs operators to trip appropriate bistable. |
| **IRF LOA-PCS001 (0 0) 1**<br>**IMF BST-PCS097 (0 0) 0**<br>**IRF LOA-PCS001 (0 0) 0** | Protection rack C1 door open.<br>2LS/459A-1 (442, BS-1) hi level trip.<br>Protection rack C1 door closed. | | US notifies I&C of problem. |
| Inform crew that bistable is tripped. | | | US is informed that bistable is tripped. |
| Continue next event when letdown is reestablished **OR** at LE discretion | | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

**EVENT #5:**

'C' BPFRV Controller fails to 100%

**IMF CNH-CFW15B (0 0) 100**

'C' BPFRV Controller fails to 100%

**IMMEDIATE PLANT RESPONSE:**

[2FWS*FCV499] travels to the fully open position

A6-11F LOOP C FEEDWATER FLOW > STEAM FLOW (F0477D)

'C'SG NR LEVEL (3 indicators VB C) increases rapidly

RCS Tavg begins to reduce (3 indicators, 1 recorder VB B)

A6-11E SG 21C LEVEL DEVIATION FROM SETPOINT (L0479D)

BOP identifies problem with "C" SG level control, reports to the crew

[2FWS*FCV499] in manual & throttled closed

"C" SG level returning to normal

US directs BOP to take manual control of "C" BPFRV and restore level

Crew refers to **ARPs**

Continue with next event at LE *discretion*

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

**EVENT #6:**

Steam leak develops in CNMT on "C" SG over a ten minute period

**IMF MSS01C (0 0) 1E6 600**

Steam leak develops on "C" SG

**IMMEDIATE PLANT RESPONSE:**

CNMT Temp, Pres and Humidity slowly increase (indicators VB A)

A1-1E CONTAINMENT AIR PRESSURE HIGH/LOW (Y5023D, UCP031)

A2-2B UNIDENTIFIED LEAKAGE SYSTEM TROUBLE

A1-1F CONTAINMENT AIR AVERAGE TEMP HIGH/LOW (Y5022D)

A1-2G INCORE INST ROOM/CNMT SUMP LEVEL HIGH/VALVE NOT RESET (L0002D)

Crew notes alarms, diagnose steam leak inside CNMT

CNMT condition continue to degrade

US directs manual reactor trip manual SI due to degrading plant/CNMT conditions

Crew enters **E-0**, performs immediate operator actions.

Crew performs IMAs of **E-0.**

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Annunciator A5-6D TURBINE TRIP DUE TO REACTOR TRIP - LIT<br>Power range indication - LESS THAN 5%<br>Neutron flux - DROPPING | | RO verifies reactor tripped. |
| | Throttle Valves - ALL CLOSED<br>OR<br>Governor Valves - ALL CLOSED<br>Main Generator Output Bkrs - OPEN<br>Exciter Circuit Bkr - OPEN | | BOP verifies turbine tripped. |
| | AC Emergency Busses - BOTH ENERGIZED | | BOP verifies power to AC Emergency Buses. |
| | Check SI - ACTUATED<br>CNMT Pressure - > 5PSIG<br>PZR Pressure - < 1860 PSIG<br>SG Steam Pressure - < 500 PSIG | | RO checks SI status |
| Crew continues E-0 | Manually actuate SI (both trains) | | RO manually actuates SI both trains |
| | Alert Plant Personnel | | RO/BOP sound Standby Alarm, announce reactor trip and safety injection |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Check [2HVS*FN204A(B)], Leak Collection Filtered Exhaust Fan – AT LEAST ONE RUNNING | | BOP checks Leak Collection Exhaust Fan status |
| **CRITICAL TASK**<br>Crew establishes flow from at least one high head ECCS pump before transition out of E-0. | Charging Pumps – **NONE** RUNNING<br>**[2CHS*P21B] TRIPPED ON SI**<br>**[2CHS*P21A] – REQUIRED MANUAL START**<br>Charging Pumps – ONE RUNNING<br>HHSI Flow – INDICATED<br>LHSI Pumps – TWO RUNNING | | RO verifies SI System status<br>RO reports trip of [2CHS*P21B]<br>RO reports manual start of [2CHS*P21A] required |
| | Motor-driven AFW Pumps – RUNNING<br>Turb driven AFW Pump Stm Supply Isol Valves – OPEN<br>AFW Throttle Vlvs – FULL OPEN<br>Total AFW Flow – GREATER THAN 340 GPM | | BOP verifies AFW System status |
| | Perform **Attachment A-0.11** "Verification Of Automatic Actions" in a timely manner | | US directs performance of **Attachment A-0.11** when time/manpower permit |
| Attachment A-0.11 included with scenario beginning on Pg 21 | LIST ATT A-0.11 DISCREPANCIES AS APPLICABLE | | |
| | RCPs OPERATING – MONITOR Tavg<br>RCPs STOPPED – MONITOR Tcold | | RO/BOP check RCS Tavg stable at or trending to 547°F |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Check CIB - **ACTUATED**<br>Recirc Spray HXs – SERVICE WATER FLOW TO ALL 4 HXs<br>Check Recirc Spray Pumps – ANY RUNNING<br>Check Recirc Spray Pumps – ALL RUNNING<br>Check Recirc Spray Pumps – NOT CAVITATING | | RO checks Recirc Spray Pump status |
| | **All RCPs – STOPPED** | | RO Stops all RCPs due to CIB |
| | PORVs – CLOSED<br>Spray Valves – CLOSED<br>Safety relief valves – (PSMS Detailed Data Page 1) – CLOSED<br>Check PRT conditions – CONSISTENT WITH EXPECTED VALUES<br>Power to at least one block valve – AVAILABLE<br>Block valves – AT LEAST ONE OPEN | | RO verifies PZR isolated |
| | **RCPs PREVIOUSLY STOPPED** | | RO checks if RCPs should be stopped |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER<br>OR<br>ANY SG COMPLETELY DEPRESSURIZED | | BOP checks if any SGs are faulted.<br><br>**CREW DETERMINES 1 OR MORE SGs ARE FAULTED, TRANSITIONS TO E-2 STEP 1** |
| **Crew transitions to E-2 step 1** | | | US directs STA to monitor status trees. |
| As U-1 operator, when requested, report proper CREVS actuation. | Check CREVS actuated:<br>Control room air intake and exhaust dampers – CLOSED<br><br>[2HVC*FN241A(B)] – AT LEAST ONE RUNNING<br><br>Request U1 operator to verify CREVS actuation<br><br>Commence Control Room ventilation actions IAW **ATT A-2.4** | | BOP verifies CREVS actuated, requests Unit 1 CREVS verification. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **CRITICAL TASK**<br>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. | **AUTO MSLI FAILURE – BOTH TRAINS** | | Crew verifies steam line isolation. |
| | **MSLI MANUALLY ACTUATED** | | Crew identifies failure of AUTO MSLI, MANUALLY actuates MSLI Both Trains |
| | Check All yellow SLI marks – LIT | | |
| | Check all SG pressures – ANY STABLE OR RISING | | BOP checks for any non-faulted SG. |
| | Check all SGs pressure – ANY SG PRESSURE DROPPING IN AN UNCONTROLLED MANOR<br>OR<br>ANY SG COMPLETELY DEPRESSURIZED | | BOP identifies "C" SG as faulted. |
| | **"C" SG pressure dropping uncontrollably.** | | |
| **CRITICAL TASK**<br>Crew isolates the faulted SG and directs operator to close isolation valve(s) operated from outside of the control room before transition out of E-2. | Check FWI – PREVIOUSLY VERIFIED | | Crew verifies faulted SG (C) isolated |
| | [2FWS*HYV-157C] closed | | BOP verifies "C" SG CNMT isolation vlv closed. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2FWS*FCV498] closed. | | BOP verifies "C" MFRV closed. |
| | [2FWS*FW499] closed. | | BOP verifies "C" BPFRV closed. |
| | [2FWE*HCV100A, B] closed. | | BOP closes [2FWE*HCV100A, B]. |
| | Check Residual Heat Release valve – CLOSED | | BOP closes [2SVS*HCV104]. |
| **IRF LOA-MSS011 (0 0) 0** | Check Residual Heat Release Valve from faulted SG – PREVIOUSLY ISOLATED: SG 21C [2SVS*29] | | Crew dispatch operator to close [2SVS*29] |
| | Close Turbine driven AFW pump steam supply isolation valves from faulted SG: [2MSS*SOV105C,F] | | BOP closes [2MSS*SOV105C,F] |
| **IF REQUESTED:** | Close atmospheric steam dump on faulted SG [2SVS*PCV101C] | | BOP closes "C" SG atmospheric steam dump [2SVS*PCV101C] |
| **IRF LOA-MSS018 (0 0) 0 To close [2SVS*25]** | | | |
| | Verify SG blowdown isolation valve from faulted SG CLOSED: [2BDG*AOV100C1] OR [2BDG*AOV101C1] | | BOP verifies SG blowdown isolated from "C" SG. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Close [2SSR*AOV117C] SG blowdown sample outside CNMT isolation valves | | BOP isolates SG blowdown sample from "C" SG |
| | Check [2FWE-TK210] PPDWST level - > 85 inches | | Crew checks PPDWST level > 85 inches<br>Or<br>Refer to **Attachment A-1.8** for makeup. |
| | Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER | | Crew checks if SG tubes are intact. |
| | Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES<br>[2ARC-RQ100] Air Ejector Discharge (1007)<br>[2SSR-RQ100] SGBD sample | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | RCS Subcooling based on core exit TCs > 41F [59F ADVERSE CNMT]<br>Secondary heat sink:<br>Total feed flow to intact SGs – GREATER THAN 340 GPM<br>OR<br>Narrow range level in at least one intact SG – GREATER THAN 12% [31% ADVERSE CNMT] | | RO/BOP check if SI flow should be reduced |
| | RCS pressure – STABLE OR RISING<br>PRZR level – GREATER THAN 17% [38% ADVERSE CNMT] | | Crew determines SI Termination criteria met, transitions to **ES-1.1** |
| **Crew transitions to ES-1.1 Step 1** | | | US directs STA to monitor status trees. |
| | SI, CIA & CIB - RESET | | RO resets SI, CIA & CIB |
| | All but one charging pump - STOPPED | | RO stops all but one Charging Pump |
| | RCS Pressure – STABLE OR RISING | | RO checks/reports RCS Pressure status |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | HHSI Cold Leg Isol VLVs – CLOSED:<br><br>[2SIS*MOV867A]<br>[2SIS*MOV867B]<br>[2SIS*MOV867C]<br>[2SIS*MOV867D] | | RO isolates HHSI injection path |
| Drill may be terminated after HHSI flow is isolated | | | |
| **CLASSIFY EVENT** | | | UE TAB 2.10 |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Attachment A-0.11 'Verification of Automatic Actions' performed as time & manpower permit | | | US directs operator to perform Attachment A-0.11 as time & manpower permit |
| | Diesel generators – BOTH RUNNING | | Check both EDGs running |
| | CNMT pressure – GREATER THAN 7 PSIG<br>**OR**<br>SG Steam Pressure – LESS THAN 500 PSIG<br>**OR**<br>Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS | | Check if MSLI is required<br>If **not required**, go to step 4 |
| **MANUAL MSLI REQUIRED** | Yellow SLI marks - LIT | | Verify steamline isolation |
| STEP 4 | Open [2CCS-AOV118] Domestic Water to Station Air Compressor | | Establish Domestic Water System Cooling to Station Air Compressors |
| | At least one Station Air Compressor – RUNNING | | Start 1 Station Air Compressor as required |
| | CCP pumps – AT LEAST 1 RUNNING | | Check CCP Pump status |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2NME-NR45] Nuclear Recorder selected to operable source and intermediate range displays | | Align neutron flux monitoring for shutdown |
| | CNMT pressure – HAS REMAIND LESS THAN 11 PSIG | | Check CIB status |
| | IF NOT | | Actuate CIB if required |
| | Manually initiate CIB – BOTH SWITCHES FOR BOTH TRAINS | | |
| | Manually align equipment as required<br>All RCPs – STOPPED<br>BV-1 operator verifies CREVS actuation<br>Service water established to RSS HX(s) | | Stop ALL RCPs |
| | Service Water Pumps – 2 RUNNING<br>Service Water Header Pressure – GREATER THAN 55 PSIG<br>SWS Seal Water Pressure – NOT LOW | | Verify Service Water System in service |
| | [2HCS*SOV100A1, B1] – CNMT Sample amber light – LIT | | Verify both CNMT hydrogen analyzers running |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | All Red SIS Marks – LIT<br>All Orange CIA Marks – LIT<br>All Green FWI Marks – LIT | | Verify ESF Equipment status – Start/align equipment as required |
| | Power available to both Emergency AC Busses | | Verify power to both AC Emergency busses<br><br>Restore power as required |
| | Attachment A-0.11 – COMPLETE | | Report any discrepancies to SM/US |

| | | | | | |
|---|---|---|---|---|---|
| Facility: | BVPS 2 | Scenario No.: | 2 | Op Test No.: | NRC |
| Examiners: | _____ | Candidates: | _____ | | SRO |
| | _____ | | _____ | | ATC |
| | _____ | | _____ | | BOP |

Initial Conditions: MOL, 75 % power Equ Xe, CB = 188, 1116 PPM IC-166

Turnover: Maintain current plant conditions

Critical Tasks:

1. E-1.C Crew trips all RCPs when RCS to highest SG D/P criteria is exceeded and SI flow verified prior to exiting procedure E-1.
2. FR-S.1.C Crew inserts negative reactivity into the core by inserting RCCAs before completing the immediate action steps of FR-S.1.
3.

| Event No. | Malf. No. | Event Type | Event Description |
|---|---|---|---|
| 1 | XMT-MSS022A | I(BOP/SRO) *SRO T.S.* | [2MSS*FT485] "B" SG Selected Steam Flow Channel drifts HIGH |
| 2 | XMT-LDS003A | I(RO/SRO) | VCT Level control channel failure LOW |
| 3 | XMT-RCS032A | *SRO T.S.* | [2RCS*PT455] PRZR Pressure Protection Channel fails HIGH |
| 4 | | R(RO)<br>N(BOP/SRO) | Power reduction due to TS 3.0.3 requirement<br>(No TS Action addressing two channels of OTΔT being inoperable) |
| 5 | RCP01A | C(RO/SRO) | RCP #1 seal leakoff excessive (requires Rx trip) |
| 6 | PPL01A<br>PPL01B | M(ALL) | ATWS – Failure of auto/manual Rx trip |
| 7 | LOA-AFW022<br>PPL07B | C(BOP/SRO) | [2FWE*P22], Turbine driven AFW pump trips during S/U, [2FWE-P23B] Motor Driven AFW Pump requires manual start |
| 8 | VLV-RCS032A | M(ALL) | PORV [2RCS*PCV455C] sticks open after auto open and its block valve [2RCS*MOV535] cannot be closed from CR (PRZR Vapor space leak) |

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

The crew will assume the shift at approximately 75% power BOL equilibrium Xenon. Power Range Channel N-42 is OOS and remove from service IAW AOP 2.2.1C, Power Range Channel Malfunction. Motor driven AFW pump 2FWE*P23A is also OOS. Crew instructions are to maintain the plant at 75% power. After the crew assumes the shift, the controlling channel of steam flow on the "B" steam generator [2MSS*FT485] will drift HIGH. The crew will respond to the alarms and implement the actions of instrument failure procedure OM 2.24.4.IF ATT #3 and take manual control of SGWLC on the "B" SG. The crew will swap controlling channels and return SGWLC to automatic. After the US implements the required Technical Specification actions, VCT level transmitter 2CHS*LT115 will FAIL LOW causing automatic make-up to VCT to begin. The crew will STOP the automatic make-up to VCT and respond to the alarms and implement the actions of instrument failure procedure OM 2.7.4.IF ATT #1. From this point on in the scenario, all VCT make-ups will need to be initiated manually. After stabilizing the plant, PRZR Pressure Protection channel 2RCS*PT455 will FAIL HIGH. The crew will respond to the annunciators and implement the actions of instrument failure procedure OM 2.6.4.IF ATT #2. While performing the actions of the procedure and Technical Specifications, the crew MUST recognize that there are NOW 2 channels of OTΔT OOS and Technical Specification 3.0.3 is applicable. Plant management instructs the crew to begin an immediate power reduction to comply with Technical Specification 3.0.3 actions. The crew begins a power reduction IAW 2OM-52.4.B, Load Follow. During the power reduction, #1 seal on the "B" RCP will degrade. The crew will respond to the alarms and implement the actions of AOP 2.6.8, RCP Malfunction. The seal degradation will worsen to the point where the AOP 2.6.8, RCP Malfunction will require the crew to initiate a manual reactor trip. The crew will enter E-0, Reactor Trip or Safety Injection only to find that manual and automatic reactor trips will not function. The crew will transition to FR-S.1, Response to Nuclear Power generation – ATWS. The actions of FR-S.1, Response to Nuclear Power generation – ATWS will be complicated by the steam driven AFW pump tripping during start-up and motor driven AFW pump 2FWE*P23B failing to automatically start. This will require the crew to manually start motor driven AFW pump 2FWE*P23B. The actions of FR-S.1, Response to Nuclear Power generation – ATWS will be further complicated by PRZR PORV failing to close, after automatically opening, and its associated block valve cannot be fully closed. (PRZR VAPOR SPACE LEAK). The reactor will be tripped locally by the operator dispatched during FR-S.1, Response to Nuclear Power generation – ATWS performance. The crew will transition back to E-0, Reactor Trip or Safety Injection and perform the actions to verify ECCS equipment operating and diagnose the vapor space leak. The crew will then transition into E-1, Loss of Reactor or Secondary Coolant and perform the actions to stabilize the plant. The scenario is terminated when the crew transitions into ES-1.2, Post LOCA Cooldown and Depressurization.

**EOP Flow Path:**
E-0, Reactor Trip or Safety Injection → FR-S.1, Response to Nuclear Power generation – ATWS → E-0, Reactor Trip or Safety Injection → E-1, Loss of Reactor or Secondary Coolant → ES-1.2, Post LOCA Cooldown and Depressurization

**INITIAL CONDITIONS:** 75 % Power, CBD = 188, EQU XE MOL, 1116 PPM Boron, IC-166

| ADDITIONAL LINEUP CHANGES | STICKERS | VOND MARKINGS |
|---|---|---|
| N-42 Control Pwr fuses – REMOVED<br>N-42 Rod Stop BP sw to BP<br>Channel Comparator Defeat sw to N-42<br>NR-45 NOT selected to N-42<br>[2FWE*P23A] - PTL | N-42 meters (2)<br>Chan 2 OTDT Meter<br>Ann OTDT Trip/Rod stop<br><br>DANGER – [2FWE*P23A] switch | |

| EQUIPMENT STATUS | DATE/TIME OOS | TECHNICAL SPECIFICATION(S) |
|---|---|---|
| N-42 | 2 Hrs. ago | |
| [2FWE*P23A] | 3 Hrs. ago | |

## SHIFT TURNOVER INFORMATION

1. Protected Train is Train "B"
2. N-42 removed from service per **AOP 2.2.1C**,
3. [2FWE*P23A] Motor ground, repair estimate is 8 - 10 Hrs.
4. Maintain current plant conditions.

## SCENARIO SUPPORT MATERIAL REQUIRED

Reactivity plan placard for MOL
Placard for [2FWE*P22] position stating [2FWE*P22] is aligned to "A" header
Place plaque on wall for Protected Train "B"

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Initialize IC Set 166, and establish initial plant conditions. | Reactor plant at 75% power, MOL, equilibrium conditions. RCS boron 1116 PPM, CBD = 188 steps. | | |
| Insert the following per the Simulator Setup section of the HTML File for this drill: | Inserts all pre-loads required to support the drill | | |
| **IRF LOA-HIV055 (0 0) 1** | [2FW*P23A] breaker racked out | | |
| **IMF PPL02A (30 120)** | Train A trip BKR open | | |
| **IMF PPL02B (30 130)** | Train B trip BKR open | | |
| **IRF LOA-CRF007 (30 140) 1** | Trip A rod drive MG set | | |
| **IRF LOA-CRF008 (30 150) 1** | Trip B rod drive MG set | | |
| **IMF PPL01A (0 0) 1** | Set ATWS condition TRN "A" | | |
| **IMF PPL01B (0 0) 1** | Set ATWS condition TRN "B" | | |
| **IMF VLV-RCS011 (0 0) 1** | [2RCS*MOV535] cannot be closed from control room | | |
| **TRGSET 1 'RRCH455C >= 0.1'** | Set trigger 1 on [2RCS*PCV455C] position | | |
| **IMF VLV-RCS032A (1 0) 50** | [2RCS*PCV455C] sticks open after auto open | | |
| **TRGSET 2 'OAFWT22 >= 1000'** | Set trigger 2 on [2FWE*P22] speed | | |
| **IRF LOA-AFW022 (2 0) 1** | [2FWE*P22] trips during startup | | |
| **IMF PPL07B (0 0) 5** | [2FWE*P23B] fails to auto start, manual successful | | |
| **IMF NIS03B (0 0) 0** | PRNI N-42 OOS | | |
| **IMF BST-PCS158 (0 0) 0** | CH II OTDT Reactor trip B/S | | |
| **IMF BST-PCS159 (0 0) 0** | CH II OTDT Rod Stop/Turbine Runback B/S | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Assign shift positions<br><br>SM:_____<br><br>US:_____<br><br>RO:_____<br><br>BOP:_____<br><br>STA:_____ | | | |
| 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 drill. | Simulator running. | | Crew assumes control of the Unit. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

**EVENT #1:**

[2MSS-FT485] drifts high

| | | |
|---|---|---|
| **IMF XMT-MSS022A (0 0) 5 30** | IMMEDIATE PLANT RESPONSE:<br>[2MSS-FI485] begins to drift high<br>[2FWS*FCV488] begins to open<br>"B" SG level begins to increase<br>A6-10F LOOP B FEEDWATERFLOW > STEAM FLOW (F0476D)<br>A6-10E (possible) SG21B LEVEL DEVIATION FROM SETPOINT (L0477D) | BOP notes/verifies alarms, informs US/Crew of apparent instrument failure of [2MSS*FT485] |
| | | US/Crew refer to ARPs & Procedure **2OM-24.4.IF ATT 3** |
| | [2FWS-FCV488] – MANUAL | BOP places MFRV for "B" SG to manual and restores level |
| | [2FWS-FR488] – Position FT 487 | BOP selects position FT 487 on [2FWS-FR488] |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **When Directed:** | | | |
| **IMF A4-7F-Y0218D (0 0) 0** | Process rack door open | | US directs personnel to place [2FWS-FR488] to Position FT 484 inside primary process rack RK-2PRI-PROC7 |
| **IOR XC1I077F (0 0) 0**<br><br>to simulate placing [2FWS-FR488] in Position FT 484 | [2FWS-FR488] – Position FT 484<br>A1-4E MAIN STEAM FLOW CHANNEL SELECTED TROUBLE<br>A6-10F CLEARS | | |
| **DMF A4-7F-Y0218D** | Process rack door closed | | |
| | | | US declares [2FWS*LT486] SG21B NR Level Transmitter Channel III inoperable |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | US refers to **TS 3.3.1, Table 3.3.1-1** Function 14 Condition E:<br>**E.1**: Place channel in TRIP W/I 6 hrs<br>**OR**<br>**E.2:** Be in MODE 3 W/I 12 hrs<br><br>US refers to **TS 3.3.2, Table 3.3.2-1** Functions 5.b and 6.b:<br>5.b & 6.b Condition D<br>**D.1**: Place channel in TRIP W/I 6 hrs<br>**OR**<br>**D.2**: Be in MODE 3 W/I 12 hrs<br>**AND**<br>**D.2.2:** Be in MODE 4 W/I 18 hrs |
| **When directed to trip bistables:** | | | US refers to **ATT 1** to trip bistables for the failed channel, contacts I&C |
| **IRF LOA-PCS003 (0 0) 1** | Protection rack C3 door open | | Crew monitors tripping of B/S |
| **IMF BST-PCS041 (0 0) 0** | 2LS/486A (BS-1) low-low trip | | |
| **IMF BST-PCS032 (0 0) 0** | 2LS/486C (BS-2) high-high FWI | | |
| **IRF LOA-PCS003 (0 0) 0** | Protection rack C3 door closed | | US directs BOP to place [2FWS-FCV488] to auto when SG level returned to normal and stable |
| **THEN** report actions to CR | | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Proceed with next event at LE discretion | | | |
| **EVENT #2:** | | | |
| [2CHS*LT115] fails LOW | | | |
| | **IMMEDIATE PLANT RESPONSE:** | | |
| **IMF XMT-LDS003A (0 0) 0** | A2-2G VOLUME CONTROL TANK TROUBLE (L0145D)<br>[2CHS*LT115] VCT Level indicates 0, VB A<br>Auto M/U initiates (blender station BB A) | | RO diagnoses **LOW** failure of [2CHS*LT115], reports to US/Crew<br><br>Crew refers to **ARPs** or **2OM-7.4.IF ATT #1** |
| | Actual VCT level is well W/I normal level range and rising as indicated by [2CHS*LT112] (L2704A) on plant PCS | | RO confirms failure by comparing VB A [2CHS*LI115] to PCS point (L2704A) |
| | Auto M/U in progress | | RO reports auto M/U in progress<br><br>US directs RO to place M/U control switch to OFF after rising VCT level is confirmed. |
| | Auto M/U stopped, VCT level rise stopped | | RO places M/U switch to OFF |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | Crew monitors Tavg for inadvertent boron change |
| | | | US directs I&C to investigate problem with [2CHS*LT115] |
| | [2CHS*LT112] indication SAT, blender controls remain in OFF | | Crew controls VCT level in manual control |
| Continue with next event at LE discretion | | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **EVENT #3:** | | | |
| [2RCS*PT455] fails high | | | |
| **IMF XMT-RCS032A (0 0) 2500** | [2RCS*PI455] indicates pegged high | | RO diagnose high failure of [2RCS*PT455], reports to US/Crew |
| | **IMMEDIATE PLANT RESPONSE:** | | |
| | A4-2D PRESSURIZER PRESSURE HIGH/LOW ACTUATES (P0480D)<br>[2RCS*PI455] (CH I) indicates pegged high (2500 psig) on BB B<br>[2RCS*TI412C] Loop 1 OTDT Setpoint indicates pegged high (150%) BB B | | US ensures plant is stable<br>US directs crew to **ARP A4-2D and IF procedure 2.6.4.IF Att 2** |
| | OPERABLE OT/OPDT channel selected on recorder [2RCS-TR412] | | RO selects OPERABLE channel on [2RCS-TR412] |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | US refers to TS 3.3.1 and Table 3.3.1-1 Function 6, 8.a and 8.b, TS 3.3.2 and Table 3.3.2-1 Function 1.d and 8.b, TS 3.3.4 and TS Bases Table B3.3.4-1 Function 2.a |
| | 2TS/412C-1, OTDT trip – **CANNOT BE TRIPPED**<br>2TS/412C-2, OTDT rod stop – **CANNOT BE TRIPPED** | | **TS 3.3.1, Table 3.3.1-1:** (RTS)<br>**Function 6**: **OTDT** Condition E.1 – Place in TRIPPED Condition (6 hrs) **OR**<br>E.2 – Be in MODE 3 (12 hrs) |
| | | | US refers to TS, determines that OTDT B/S cannot be tripped W/O causing a reactor trip |
| | | | US determines that **TS 3.0.3** applies |
| | | | US identifies **PZR Pressure** instrument related TS and **MAY** trip B/S associated with PZR Pres<br>**Function 8.a**: **PZR Press LOW** Condition K.1 – Place in TRIPPED Condition (6 hrs) **OR**<br>K.2 – Reduce THERMAL POWER to < P-7 (12 hrs) |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | **Function 8.b**: **PZR Press HIGH** Condition<br>E.1 – Place in TRIPPED Condition (6 hrs)<br>**OR**<br>E.2 – Be in MODE 3 (12 hrs) |
| | | | US refers to **ESFAS TS** associated with PZR Pres and **MAY** trip B/S associated with PZR Pres<br>**TS 3.3.2, Table 3.3.2-1:** (ESFAS)<br>**Function 1.d**: **PZR Press LOW** Condition<br>D.1 – Place channel in TRIP (6 hrs) **OR**<br>D.2.1 – Be in MODE 3 (12 hrs) **AND**<br>D.2.2 – Be in MODE 4 (18 hrs)<br>**Function 8.b**: **PZR Press P-11** Condition<br>K.1 – Verify interlock is in required state for existing Unit condition (1 hr) **OR**<br>K.2.1 – Be in MODE 3 (7 hrs) **AND**<br>K.2.2 – Be in MODE 4 (13 hrs) |
| As Plant Management, direct US to commence an immediate plant S/D to MODE 3 | | | US informs Plant Management that a plant S/D is required by TS |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

As I&C use the following to trip the B/S and then inform the CR that **repairs will take a minimum of 10 – 12 Hrs.**

**IF** requested to trip **PZR Pres** bistables **THEN:**

US **may** decide to trip only the B/S associated with SI, HIGH/LOW press Rx Trip, P-11 and PORV Block

| | |
|---|---|
| **IRF LOA-PCS001 (0 0) 1** | Protection rack 1 door open. |
| **IMF BST-PCS117 (0 0) 0** | 2PS/455A, high pressure trip. |
| **IMF BST-PCS118 (0 0) 0** | 2PS/455B, P-11. |
| **IMF BST-PCS125 (0 0) 0** | 2PS/455C, low pressure trip. |
| **IMF BST-PCS126 (0 0) 0** | 2PS/455D, low pressure SI. |
| **IMF BST-PCS127 (0 0) 0** | 2PS/455G, PORV block. |
| **IRF LOA-PCS001 (0 0) 0** | Protection rack 1 door closed. |

Report actions to CR

**NOTE:** IF the US insists on tripping the B/S associated with OTDT **THEN:**

| | |
|---|---|
| **IMF BST-PCS151 (0 0) 0** | 2TS/412C-1, OTDT trip. |
| **IMF BST-PCS152 (0 0) 0** | 2TS/412C-2, OTDT rod stop. |

Report actions to CR

Event #5 will be inserted upon trip, advance to page 15 for **E-0** actions

Reactor trip **SHOULD HAVE OCCURRED**

RO announce 1st out reactor trip **AND** that the reactor **DID NOT TRIP**

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | US directs entry into **E-0** |
| **EVENT #4:** | | | |
| Normal power reduction | | | Crew commences power reduction IAW **2OM-52.4.B** Load Follow |
| Reactor Engineering is currently unavailable. Plant Management directs immediate power reduction to MODE 3 SM recommends 12%/Hr. | | | Crew develops reactivity plan for 12% Hr. power reduction to MODE 3 |
| | | | BOP prepares EHC for load reduction, presses GO when ordered |
| | | | BOP maintains VPL 5% above turbine load |
| | | | RO maintains axial flux W/I target band, rods above RIL and Tavg +/- 2F of Tref during transient |
| | | | BOP maintains Generator Lagging power factor and Base Adjuster at Null |
| Continue with next event at LE discretion: | | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **EVENT #5:** | | | |
| [2RCS*P21A] #1 seal degrades | | | |
| | **IMMEDIATE PLANT RESPONSE:** | | |
| **IMF RCP01A (0 0) 8** | A2-4D REACTOR COOLANT PUMP SEAL TROUBLE (F0125D) for the "A" RCP | | RO checks alarms, reports indications of #1 seal failure on [2RCS*P21A] to US/Crew |
| | | | US refers to **ARPs, AOP 2.6.8 Step 2.g** |
| | [2CHS-FR154A] RED PEN indicates 6 gpm (off scale high for "A"RCP) | | RO reports that "A" RCP #1 seal leakoff is > 6 gpm |
| | | | US direct manual reactor trip,<br>Directs RO to trip [2RCS*P21A] after completion of IMAs of **E-0,**<br>Directs Crew to isolate [2RCS*P21A] seal leakoff W/I 3 – 5 min after tripping RCP |
| **Crew enters E-0, performs immediate operator actions.** | | | Crew performs IMAs of **E-0.** |
| | Annunciator A5-6D TURBINE TRIP DUE TO REACTOR TRIP – **NOT LIT**<br>Power range indication – **NOT LESS THAN 5%**<br>Neutron flux – **NOT DROPPING** | | RO verifies reactor tripped.<br>RO Attempts manual reactor trip from BB B and BB A, reports reactor has **NOT** tripped |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **US transitions to FR-S.1** | Reactor **IS NOT** tripped | | US/Crew determine **FR-S.1** entry conditions met, transition to **FR-S.1** Step 1 |
| When directed to locally trip the reactor:<br><br>**TRG! 30**<br><br>Time delays are built in. | | | Crew performs IMAs of **FR-S.1** |
| | Turbine is tripped | | BOP manually trips the turbine |
| **CRITICAL TASK**<br>Crew inserts negative reactivity into the core by inserting RCCAs before completing the immediate action steps of FR-S.1. | Control Rods are inserting | | RO inserts control rods, **AUTO** at first, **THEN MANUAL** when required |
| | **[2FWE*P23A] on clearance**<br>**[2FWE*P23B] REQUIRE MANUAL START**<br>**[2FWE*P22] TRIPPED during S/U**<br>*AFW Throttle Vlvs – FULL OPEN* | | Crew verifies AFW status<br><br>BOP reports AFW status, **manually starts** [2FWE*P23B], verifies flow to SGs |
| SI may not have actuated at this time | Charging Pumps – AT LEAST 1 RUNNING<br>SI – ACTUATED (possibly not at this time)<br>HHSI flow – INDICATED | | Crew initiates Emergency Boration |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Step 3.e | [2CHS*MOV350] – OPEN<br>In service boric acid Xfer pump – STARTED<br>Emergency Boration Flow - > 30 GPM<br>[2CHS*FCV122] adjusted for > 40 GPM | | Crew aligns boration path |
| | PZR Pressure < 2330 PSIG | | RO checks PZR pres < 2330 PSIG |
| | Plant personnel alerted of ATWS | | Crew alerts plant personnel, sounds STBY alarm and announces U2 reactor trip W/O SCRAM |
| | Turbine – TRIPPED<br>[2MSS-MOV100A,B] – CLOSED<br>Reheater Controller – RESET | | BOP verifies turbine tripped and reheat steam isolated |
| | **IF** SI – ACTUATED **THEN:**<br>First NINE steps of **E-0** performed when time and manpower permit | | Crew checks SI Status |
| | Power range channels - <5%<br>IRNI channels – NEGATIVE SUR | | Crew checks if reactor is subcritical |
| | Boration continues for SDM considerations | | Crew continues boration as necessary |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Scenario assumes the reactor has been locally tripped by this time | | | US directs return to **E-0** step 1 |
| Crew enters **E-0,** performs immediate operator actions. | | | Crew performs IMAs of E-0. |
| | Annunciator A5-6D TURBINE TRIP DUE TO REACTOR TRIP - LIT<br>Power range indication - LESS THAN 5%<br>Neutron flux - DROPPING | | RO verifies reactor tripped. |
| | Throttle Valves - ALL CLOSED<br>OR<br>Governor Valves - ALL CLOSED<br>Main Generator Output Bkrs - OPEN<br>Exciter Circuit Bkr - OPEN | | BOP verifies turbine tripped. |
| | AC Emergency Busses - BOTH ENERGIZED | | BOP verifies power to AC Emergency Buses. |
| | Check SI – ACTUATED<br>CNMT Pressure - > 5PSIG<br>PZR Pressure - < 1860 PSIG<br>SG Steam Pressure - < 500 PSIG | | RO checks SI status<br>**CREW DETERMINES SI REQUIRED** |
| **Crew continues E-0** | Manually actuate SI (both trains) | | RO manually actuates SI both trains |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Alert Plant Personnel | | RO/BOP sound Standby Alarm, announce reactor trip and safety injection |
| | Check [2HVS*FN204A(B)], Leak Collection Filtered Exhaust Fan – AT LEAST ONE RUNNING | | BOP checks Leak Collection Exhaust Fan status |
| | Charging Pumps – TWO RUNNING<br>HHSI Flow – INDICATED<br>LHSI Pumps – TWO RUNNING | | RO verifies SI System status |
| | Motor-driven AFW Pumps – **ONE** RUNNING<br>Turb driven AFW Pump **TRIPPED** DURING S/U<br>AFW Throttle Vlvs – FULL OPEN<br>Total AFW Flow – GREATER THAN 340 GPM | | BOP verifies AFW System status |
| | Perform **Attachment A-0.11** "Verification Of Automatic Actions" in a timely manner | | US directs performance of **Attachment A-0.11** when time/manpower permit |
| **Attachment A-0.11** included with scenario beginning on Pg 27 | **LIST ATT A-0.11 DISCREPANCIES AS APPLICABLE:**<br>[2FWE*P23B] required manual start<br>[2FWE*P22] tripped during S/u | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | RCPs OPERATING – MONITOR Tavg<br>RCPs STOPPED – MONITOR Tcold | | RO/BOP check RCS Tavg stable at or trending to 547°F |
| | Check CIB – **NOT ACTUATED** | | RO checks Recirc Spray Pump status |
| | PORVs – **NOT ALL CLOSED**<br>[2RCS*PCV455C] – **STUCK OPEN**<br>[2RCS*MOV535] – **CANNOT BE CLOSED** | | RO verifies PZR isolated<br><br>RO reports status of [2RCS*PCV455C] AND its block valve [2RCS*MOV535] |
| **Transition to E-1** | | | US directs transition to **E-1** due to PORV/Block Valve status |
| | Control Room radiation monitor [2RMC*RQ201, 202] (1069, 1072) – NOT IN HIGH ALARM | | Crew checks if CREVS should be actuated |
| | CIB – **HAS NOT OCCURRED** | | |
| **CRITICAL TASK**<br>Crew trips all RCPs when RCS to highest SG D/P criteria is exceeded and SI flow verified prior to exiting procedure E-1. | D/P between RCS pressure and highest SG pressure – LESS THAN 205 PSID [220 PSID ADVERSE CNMT]<br>AND<br>HHSI Flow – INDICATED<br>**RCPs – STOPPED** | | RO checks if RCPs should be stopped<br><br>RO stops RCPs |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | CIB - **NOT ACTUATED** | | RO checks Recirc Spray Pump status |
| | Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER<br>OR<br>ANY SG COMPLETELY DEPRESSURIZED | | BOP checks if any SGs are faulted. |
| | **SGs are NOT faulted** | | |
| | Narrow Range Levels – GREATER THAN 12% [31% ADVERSE CNMT] | | BOP checks intact SG levels |
| | | | *BOP controls feed flow to intact SGs to* maintain NR level between 12% [31% ADVERSE CNMT] and 50% |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Check all SG levels – NONE RISING IN AN UNCONTROLLED MANNER<br>Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES<br>[2ARC-RQ100] (1007) Air ejector discharge<br>[2SSR-RQ100] (1062) SGBD sample<br>[2MSS*RQ101A,B,C] Main Steamline discharge (1005, 3005, 5005)<br><br>**SG Tubes are intact** | | *Crew checks if SG tubes are intact* |
| | Power to the Block Vlvs – AVAILABLE<br>PORVs – [2RCS*PCV455C] – **STUCK OPEN**<br>Block Vlvs – [2RCS*MOV535] – **CANNOT BE CLOSED** | | RO checks PRZR PORVs and Block Valves |
| | RCS Subcooling based on core exit TCs **LESS THAN** 41F [59F ADVERSE CNMT] | | RO/BOP check if SI flow can be reduced |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | **Secondary heat sink:**<br>Total feed flow to intact SGs – GREATER THAN 340 GPM<br>**OR**<br>Narrow range level in at least one intact SG – GREATER THAN 12% [31-% ADVERSE CNMT]<br>RCS pressure – **REDUCING**<br>PRZR level – GREATER THAN 17% [38% ADVERSE CNMT] | | RO/BOP check if SI flow can be reduced<br>**(continued)** |
| | **SI FLOW CANNOT BE REDUCED** | | |
| | Any Quench spray or recirc spray pump **NONE RUNNING** | | RO/BOP check if CNMT Spray should be stopped |
| | SI & CIA - RESET | | RO resets SI and CIA |
| | RCS Pressure - > 225 PSIG [250 PSIG ADVERSE CNMT] | | RO checks if LHSI Pmps should be stopped |
| **NOTE:** RCS pressure **MAY** appear to be stable and RO will stop LHSI pumps | RCS Pressure – **REDUCING** | | **IF STABLE**, RO stops LHSI pumps and places them in auto |
| | Check pressures in all SGs – STABLE OR RISING<br>Check RCS Pressure – STABLE OR DROPPING | | RO/BOP check RCS and SG Pressures |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Verify AC emergency busses energized from offsite | | BOP checks if EDGs should be stopped |
| | Stop any unloaded EDG by performing **2OM-36.4.AF(AG)** | | Crew stops EDGs |
| | Recirc capability exists | | US directs operators to perform **Att A-0.6** and verify cold leg recirculation capability |
| | Check Aux building and Safeguards radiation – CONSISTENT WITH PRE-EVENT | | Crew tries to identify and isolate the leakage |
| | | | SM consults with TSC Staff to determine whether samples can be obtained |
| | Sample:<br>CNMT atmosphere for radioactivity and hydrogen<br>CNMT sump for pH and boron<br>RCS liquid | | US directs Chemistry and HP to obtain pertinent samples |
| | Crew performs **ATT A-1.1** | | US directs crew to perform additional actions as required to aid in plant recovery per **ATT A-1.1** |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | RCS Pressure - > 225 PSIG [250 PSIG ADVERSE CNMT] | | RO checks if cooldown and depressurization is required |
| | | | US directs crew transition to **ES-1.2** |
| Terminate drill when crew transitions to **ES-1.2** | | | |
| Classify Event | | | Site Area Emergency<br>Tab 2.3 |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **Attachment A-0.11** 'Verification of Automatic Actions' performed as time & manpower permit | | | US directs operator to perform **Attachment A-0.11** as time & manpower permit |
| | Diesel generators – BOTH RUNNING | | Check both EDGs running |
| | CNMT pressure – GREATER THAN 7 PSIG<br>**OR**<br>SG Steam Pressure – LESS THAN 500 PSIG<br>**OR**<br>Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS | | Check if MSLI is required<br>If **not required**, go to step 4 |
| | Yellow SLI marks - LIT | | Verify steamline isolation |
| STEP 4 | Open [2CCS-AOV118] Domestic Water to Station Air Compressor | | Establish Domestic Water System Cooling to Station Air Compressors |
| | At least one Station Air Compressor – RUNNING | | Start 1 Station Air Compressor as required |
| | CCP pumps – AT LEAST 1 RUNNING | | Check CCP Pump status |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2NME-NR45] Nuclear Recorder selected to operable source and intermediate range displays | | *Align neutron flux monitoring for shutdown* |
| | CNMT pressure – HAS REMAIND LESS THAN 11 PSIG | | Check CIB status |
| | IF NOT | | Actuate CIB if required |
| | Manually initiate CIB – BOTH SWITCHES FOR BOTH TRAINS | | |
| | Manually align equipment as required<br>All RCPs – STOPPED<br>BV-1 operator verifies CREVS actuation<br>Service water established to RSS HX(s) | | Stop ALL RCPs |
| | Service Water Pumps – 2 RUNNING<br>Service Water Header Pressure – GREATER THAN 55 PSIG<br>SWS Seal Water Pressure – NOT LOW | | Verify Service Water System in service |
| | [2HCS*SOV100A1, B1] – CNMT Sample amber light – LIT | | Verify both CNMT hydrogen analyzers running |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | All Red SIS Marks – LIT<br>All Orange CIA Marks – LIT<br>All Green FWI Marks – LIT | | Verify ESF Equipment status – Start/align equipment as required |
| | Power available to both Emergency AC Busses | | Verify power to both AC Emergency busses |
| | | | Restore power as required |
| | **Attachment A-0.11** – COMPLETE | | Report any discrepancies to SM/US |

Facility: BVPS 2 Scenario No.: 3 Op Test No.: NRC

Examiners: _____ Candidates: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: MOL, 75 % power Equ Xe, CB = 188, 1116 PPM IC-167

Turnover: Plant has been at 75% for three days at system request. Crew is to return the unit t full power at 12%/Hr IAW 2OM-52.4.B, Load Follow, and the reactivity plan provided by Reactor Engineering. [2FWE*P23A] Motor Driven AFW Pump is on clearance for motor replacement and is due to be returned tomorrow. [2SAS-C21E] Station Air Compressor is on clearance for bearing replacement and due to be returned 2 days from now.

Critical Tasks:
1. E-0.Q Crew manually trips the main turbine before a Severe (orange path) challenge develops to either the Sub-criticality or the Integrity CSF o before transition to ECA-2.1, whichever occurs first.
2. FR-H.1.A Crew establishes feedwater flow into at least one SG before RCS feed and bleed is required.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | NIS03D | I (RO/SRO)<br>*SRO T.S.* | PRNI N-44 fails HIGH causing automatic control rod insertion |
| 2 | CRF03-H14 | *SRO T.S.* | Misaligned rod. During control rod motion, Control R d H-14 will drop to some position below the group and then remain stuck at that position |
| 3 | | R (RO)<br>N (BOP/SRO) | Normal power reduction |
| 4 | PMP-CFW05 | C (BOP/SRO) | [2FWS-P21B], Main Feedwater Pump trips |
| 5 | PMP-CFW04 | M (ALL) | [2FWS-P21A], 2nd Main Feedwater Pump trips |
| 6 | EHC08A | C (BOP/SRO) | Main Turbine fails to auto trip, manual trip successful |
| 7 | LOA-AFW022<br>PMP-AFW002 | M (ALL) | [2FWE*P22] Turbine driven AFW Pump trips during startup [2FWE*P23B] Motor driven AFW Pump Trip resulting in Entry into FR-H.1 Loss of Secondary Hea Sink. |

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

The crew will assume the shift at approximately 75% power BOL equilibrium Xenon. Motor driven AFW pump 2FWE*P23A is OOS. Station air compressor 2SAS-C21B is also OOS. Crew is to raise power at 12%/hr IAW 2OM-52.4.B, Load Follow. Before the crew can begin raising power, Power range channel N-44 FAILS HIGH which causes automatic control rod insertion at 72 SPM. During the rapid rod insertion, rod H-14 drops to a position below the group and becomes stuck at this position. The crew responds to the alarms and implements the actions of AOP 2.2.1C, Power Range channel Malfunction and AOP 2.1.3, RCCA Control Bank Inappropriate Continuous Movement. The crew will manually stop the inward rod motion and stabilize the plant. After the plant is stable, the US will then implement AOP 2.1.8, Rod Inoperability and implement the required Technical Specification actions for both the failed N44 and stuck rod. After the Technical Specifications have been addressed, reactor engineering/plant management directs an immediate power reduction to 50% to gather data and assess the impact of the stuck control rod. The crew begins the power reduction. During the power reduction, Main feed pump 2FWS-21B trips. The crew responds to the alarms and implements the actions of AOP 2.24.1, Loss of Feedwater. When the crew attempts to start the startup feed pump 2FWS-P24 it will NOT start. The crew will be required to commence a rapid load reduction to 50% power as part of the loss of feedwater AOP. During the load reduction, the 2$^{nd}$ main feed pump trips. This will require the crew to manually trip the reactor and enter E-0, Reactor Trip or Safety Injection. The actions of E-0, Reactor Trip or Safety Injection will be complicated by a failure of the turbine to automatically trip. The crew will be required to manually trip the turbine. The actions of E-0, Reactor Trip or Safety Injection will be further complicated by a failure of the steam driven and only operable motor driven AFW pumps. The crew will transition into ES-0.1, Reactor Trip Response. While in ES-0.1, a RED PATH will be identified on Heat sink No AFW flow and NR levels less than 12%. This will require the crew to transition into FR-H.1, Loss of Heat Sink (RED PATH). The crew will remain in FR-H.1 and restore the heat sink by depressurizing the steam generators and establishing condensate flow to the steam generators. After establishing condensate flow, the crew will transition back to ES-0.1, Reactor Trip Response The scenario is terminated when condensate flow is established and a transition has been made back to ES-0.1.

**EOP Flow Path:**
E-0, Reactor Trip or Safety Injection → ES-0.1, Reactor Trip Response → FR-H.1, Loss of Heat Sink → ES-0.1, Reactor Trip Response

**INITIAL CONDITIONS:** 75 % Power, CBD = 188, EQU XE, MOL, 1116 PPM Boron IC-167 (bighorn21)

| ADDITIONAL LINEUP CHANGES | STICKERS | VOND MARKINGS |
|---|---|---|
| [2FWE*P23A] PTL<br>[2SAS-C21B] PTL | DANGER<br>DANGER | |
| **EQUIPMENT STATUS** | **DATE/TIME OOS** | **TECHNICAL SPECIFICATION(S)** |
| [2FWE*P23A]<br>[2SAS-C21B] | 12 hrs ago<br>1week ago | |

## SHIFT TURNOVER INFORMATION

1. Protected Train is Train "B"
2. [2SAS-C21B] Motor bearing replacement, due back in 2 days
3. [2FWE*P23A] Motor replacement, due back tomorrow
4. Return to 100% power at 12%/Hr IAW **2OM-52.4.B** Load Follow **AND** Reactivity Plan provided by Reactor Engineering
5. Plant has been at 75% power for 3 days at System request
6. Time in life is MOL (10,000 MWD/MTU)
7. All notifications have been made and permission has been received to return the Unit to full power

## SCENARIO SUPPORT MATERIAL REQUIRED

Reactivity plan placard for MOL **AND** Reactivity Plan from Reactor Engineering
**2OM-52.4.B** Load Follow
Placard for [2FWE*P22] position stating [2FWE*P22] is aligned to "A" header
Place plaque on wall for Protected Train "B"

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Initialize IC - 167, and establish initial plant conditions. | Reactor plant at 75 % power, MOL, equilibrium conditions. RCS boron 1116 PPM, CBD = 188 steps. | | |
| Insert the following per the Simulator Setup section of the HTML File for this drill | Inserts all pre-loads required to support the drill | | |
| **IRF LOA-HIV055 (0 0) 1** | [2FW*P23A] breaker racked out | | |
| **IMF PMP-CAS004 (0 0) 1** | [2SAS-C21B] OOS | | |
| **IMF EHC08A (0 0)** | Turbine fails to auto trip, manual successful | | |
| **TRGSET 1 'FNISPR(4) >= 120'** | Set trigger 1 on N-44 indication | | |
| **IMF CRF08-H14 (0 0) 0** | Control rod H14 remains stuck at 188 steps during rod motion | | |
| **TRGSET 2 'OAFWT22 > 50'** | Set trigger 2 on [2FWE*P22] start | | |
| **IRF LOA-AFW022 (2 0) 1** | [2FWE*P22] trips during startup/sequencing | | |
| **IMF VLV-CFW027 (0 0) 0** | [2FWS-P24] will not start, set up **FR-H.1** conditions | | |
| **TRGSET 3 'MCRFNS(3) <= 225'** | Set trigger 3 on reactor trip | | |
| **IMF PMP-AFW002 (3 90) 1** | [2FWE*23B] trips 90 seconds after reactor trip | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Assign shift positions<br><br>SM:_____<br><br>US:_____<br><br>RO:_____<br><br>BOP:_____<br><br>STA:_____ | | | |
| 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 drill. | Simulator running. | | Crew assumes control of the Unit. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

**EVENT #1 & 2**

N-44 fails high **AND**

Rod H-14 drops to a position below the group and then remains stuck at that position (Pre-load)

**IMF NIS03D (0 0) 200**
**IMF CRF08-H14 (5 0) 0**
**TRGSET 4 'FNISPR(4) >= 80'**
**TRG 4 'SET MCRFNS(44) = 168'**
**TRGSET 5 'XB2I040H == 1'**

N-44 fails high AND Rod H-14 drops to a position below the group and then remains stuck at that position

RO diagnose & reports high failure of PRNI N-44

**IMMEDIATE PLANT RESPONSE:**

Annunciators actuate:

A4-4F NIS POWER RANGE COMPARATOR DEVIATION (Y0130D)

A4-4H NIS POWER RANGE HIGH SETPOINT OVERPOWER ROD STOP BLOCK ROD WD (Y0131D)

A4-5G NIS POWERRANGE HIGH/LOW SP NEUTRON FLUX HIGH(N0004D)

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Control bank "D" begins to step IN at FAST SPEED<br>[2NMP-NI44B] pegs high (BB B)<br>N-44 indication at NI rack pegs high<br>RCS Temperature and Pressure begin to reduce<br>PZR Level begins to reduce | | |
| | | | US directs RO to place Control Rods in manual upon determining an instrument failure has caused rod motion |
| **AOP 2.1.3 STARTS HERE** | | | US directs crew actions for **AOP 2.1.3** |
| | **ADDITIONAL ANNUNCIATORS:**<br>A4-8G ROD POSITION DEVIATION (C5680D)<br>A4-1D PRESSURIZER CONTROL PRESSURE HIGH/LOW<br>A4-1E PRESSURIZER CONTROL PRESSURE DEVIATION HIGH/LOW (P0501D)<br>PRESSURE RELIEF BLOCK (P0496D)<br>PRESSURIZER BACKUP HEATER GROUP AUTO ON/OFF (P0503D)<br>TAVG DEVIATION FROM TREF (T0508D) | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | **NO LOAD REJECTION** | | Crew reports no load rejection in progress |
| | Rod Motion – **STOPPED** | | US directs RO to place Control Rods in MANUAL |
| | Tavg – **REDUCING**<br>Restore Tavg by load reduction | | US directs preparation for load reduction to match Tavg/Tref |
| | OPERABLE PRNIS – **W/I ± 2%** OF EACH OTHER | | Crew checks core power distribution NORMAL |
| | CHANNEL DEVIATION light – **LIT** (due to failed inst) | | |
| | A4-4F – NIS POWER RANGE COMPARATOR – **LIT** (due to failed inst) | | |
| | Delta Flux Indicators – **W/I TARGET BAND** | | |
| | Control Rod Positions – **GREATER THAN RIL** | | RO reports Rods above RIL |
| | Reactor Power **≥ 50%** | | RO reports power level |
| | QPTR in progress | | STA previously directed to perform QPTR |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | A4-3C TAVG DEVIATION FROM TREF<br>- may/may not be lit depending on progress of load reduction at this time | | Crew refers to ARPs as required |
| | Power operation continues<br>Minimize turbine load changes<br>Adjust boron to control Tavg | | US directs recovery efforts to restore Tavg/Tref |
| | | | Crew completes actions of **AOP 2.2.1.3** |
| **AOP 2.2.1C STARTS HERE** | | | US directs crew actions for **AOP 2.2.1C** |
| | **ONLY N-44** has failed | | Crew checks only **ONE PRNI** has failed |
| | | | US refers to TS when time permits |
| | | | W/I 1 hr verify **P-8** and **P-9** interlocks **are SAT** for current plant conditions **(TS 3.3.1 Function 17.c & 17.d: Be in MODE 2 W/I 7 hrs.)** |
| | | | Crew verifies P-8 and P-9 interlocks are SAT (power > 50%) |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | Crew verifies P-10 interlock is SAT (power > 10%) |
| | | | W/I 1 hr verify **P-10** interlocks are SAT for current plant conditions **(TS 3.3.1 Function 17.e: Be in MODE 3 W/I 7 hrs.)** |
| | | | BOP removes N-44 Control Power fuses |
| | A4-4G actuates when fuses pulled | | W/I 6 hrs trip nuclear B/S by removing the Control Power fuses from drawer 'A' for the failed channel **(TS 3.3.1 Function 2.a, 2.b and 3: Be in MODE 3 W/I 12 hrs.)** |
| | N-44 has failed high | | RO ensures Control Rod group Selector Switch is in MANUAL (previously performed) |
| | At NIS Rack 50 – 'Detector Current Comparator' – 'Rod Stop Bypass Switch' to **BYPASS for N-44**<br>Panel 308 status light D-14 'Overpower Rod Stop Bypass' – **LIT**<br>A4-4 clears | | BOP operates switches as directed |
| | Power > 50% | | RO reports power > 50% |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | US directs STA to perform QPTR |
| | ALL PRNI Upper and Lower channel inputs to QPTR – **OPERABLE** | | Crew determines all inputs to QPTR are OPERABLE |
| | At NIS Rack N37/N46 – 'Comparator and Rate' – 'Comparator Channel Defeat Switch' to **N-44**<br>A4-4F clears | | BOP operates switches as directed |
| | Vertical board 'A' recorders selected to monitor OPERABLE channels | | RO selects OPERABLE channels to N-45 recorder |
| | | | Crew completes **AOP 2.2.1C** for N-44 |
| | | | US directs crew actions for **AOP 2.1.8** |
| | **NO Control Rods Have Dropped** | | RO reports **No Dropped Rods** |
| | ROD H-14 - **Stuck at a position > 12 steps below its respective group** | | RO reports Rod H-14 is at a position > 12 steps below its respective group |
| | Control Rods – MANUAL<br>Control Rod motion – STOPPED | | US directs RO to place Control Rods in MANUAL (**PREVIOUS**) |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

Reactor **IS** critical

Tavg - > 541F

Tavg – **NOT W/I** ± 4F of Tref

Tavg – **Stable** (after rods placed in MANUAL)

US refers to **TS 3.1.4** (Rod Group Alignment Limits) when time permits:

**MODES 1&2:**

All SD and CR shall be operable **AND** Individual indicated rod positions shall be **W/I 12** steps of their group step counter demand position.

**Condition B:**

**B.1** Restore rod to W/I alignment limit (1Hr)

**OR**

**B.2.1.1** Verify SDM to be W/I the limits specified in the COLR (1Hr)

**OR**

**B.2.1.2** Initiate boration to restore SDM to W/I limits (1Hr) **AND**

**B2.2.2** Reduce THERMAL POWER to <= 75% RTP (2Hrs) **AND**

**B.2.3** Verify SDM is W/I the limits specified in the COLR (once/12 Hrs) **AND**

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | **B.2.4** Perform SR 3.2.1.1 and SR 3.2.1.2 (72 Hrs) **AND** |
| | | | **TS 3.1.4** (continued)<br>**B.2.5** Perform SR 3.2.2.1 (72 Hrs) **AND**<br>**B.2.6** Re-evaluate safety analysis and confirm results remain valid for duration of operation under these conditions (5 days) |
| | OPERABLE PRNIS – **W/I ± 2%** OF EACH OTHER | | Crew checks core power distribution NORMAL |
| | CHANNEL DEVIATION light – **LIT** (due to failed inst) | | |
| | A4-4F – NIS POWER RANGE COMPARATOR – **LIT** (due to failed inst) | | |
| | Delta Flux Indicators – **W/I TARGET BAND** | | |
| | Control Rod Positions – **GREATER THAN RIL** | | RO reports Rods above RIL |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Reactor Power $\geq$ **50%** | | RO reports power level |
| | QPTR in progress | | STA previously directed to perform QPTR |
| | A4-3C TAVG DEVIATION FROM TREF<br>- may/may not be lit depending on progress of load reduction at this time | | Crew refers to ARPs as required |
| | | | Crew completes actions of **AOP 2.1.8** |
| **EVENT #3:** | | | Crew develops a reactivity plan for power reduction of 12%/hr |
| Normal Power reduction | | | US contacts Reactor Engineering for a complete reactivity plan to complete the load reduction |
| After appropriate delay, provide the crew with a reactivity plan that will allow the continued power reduction | | | Crew refers to **2OM-52.4.B** Load Follow for the load reduction |
| | Power < 100% **AND** load change will be GREATER than 2% | | |
| | Turbine control – 1ST STG IN | | BOP transfers turbine control in 1st STG IN mode |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Setter – SET TO LOWER VALUE | | BOP sets the EHC SETTER to a lower value as directed by the US |
| | 1%/min selected | | BOP selects 1%/min load rate on EHC panel |
| | Turbine load – REDUCING | | BOP depresses the GO pushbutton on the EHC control panel when directed |
| | Blender controls set as desired per the reactivity plan | | RO sets the blender controls for the desired boration rate/amount as determined by the reactivity plan |
| | **MAINTAIN**:<br>Tavg/Tref W/I ± 2F<br>AFD W/I limits of CB-14 (TS 3.2.3 'AXIAL FLUX DIFFERENCE')<br>Control Rods ABOVE RIL as defined by **COLR Fig 4.1-1**<br>VPL at 5% above turbine load<br>Generator parameters W/I limit of 'Calculated Capability Curve' **2OM-52.5.A.5 (Figure 52-5)** between a power factor of 0.90 lagging and 1.0<br>[2GSS-MOV204] – ADJUSTED as necessary to maintain gland steam pressure | | Crew maintains plant/turbine & generator parameters as specified by **2OM-52.4.B** during the load reduction |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Continue with next set of events at LE discretion: | | | |
| **EVENT #4** | | | |
| Loss of 1 Main Feedwater Pump | | | |
| **IMF PMP-CFW005 (0 0) 1** | [2FWS-P21B] trips | | BOP reports [2FWS-P21B] has tripped |
| | **IMMEDIATE PLANT RESPONSE:**<br>A6-10A SG FEED PUMP 21 A/B AUTO-STOP (Y0438D)<br>SG levels begin to reduce<br>3 Main Feed Reg Valves begin to open | | |
| | SG Levels recover in automatic control | | BOP monitors SG levels, reports levels recovering |
| | | | Crew refers to **AOP 2.24.1 and ARPs** for loss of Main Feedwater Pump |
| | [2CNM-P21B,C] Condensate Pumps – **RUNNING**<br>[2HDH-P21A,B] Heater Drain Pumps – **RUNNING**<br>[2HDH-P22A,B] Separator Drains Pumps – **NOT RUNNING** | | BOP checks status of Condensate & Drains pumps |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | BOP starts pumps as necessary |
| **NOTE:** When crew discovers that [2FWS-P24] is unavailable, they may conservatively trip the reactor and go to E-0. If so, go to page of this scenario | Reactor Power > 52% | | BOP reports [2FWS-P21A] is Running |
| | **ONLY ONE MFP RUNNING** | | Crew attempts use of [2FWS-P24] , Startup Feed Pump |
| | [2CNM-DCV100] – **OPEN** | | BOP opens [2CNM-DCV100] Condensate Demin Diff Control Vlv |
| **IMF-VLVCFW027 (0 0) 0**<br>Prevent opening of [2FWR-FCV155] (PRE-LOAD) | [2FWR-FCV155] – **DOES NOT OPEN** | | BOP attempts start of [2FWS-P24] by placing pump start switch to START and holding until [2FWR-FCV155] opens |
| | [2FWS-P24] – **DOES NOT START** | | BOP reports [2FWS-P24] did not start |
| | Rx power < 80% - TRIP NOT REQUIRED | | RO reports reactor power < 80% |
| | | | Crew begins Emergency S/D to 50% power IAW **AOP 2.51.1** Emergency Shutdown |
| **NOTE:** The Emergency S/D is scripted for a reduction to an end point of approximately 50% power and 4KV busses **WILL NOT** be transferred to offsite power. | Standby Alarm sounded<br>Emergency S/D announced<br>EPP evaluated | | Crew alerts plant personnel of emergency S/D |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | 3 PORVs – AVAILABLE (3 block vlvs open, 3 PORVs in auto) | | RO reports PORVs available |
| **NOTE:** Proceed to the next event at any time during the Emergency S/D at the LE discretion | For 2%/min – USE 2OM-7.4.AR BLENDER OPERATION IN MODE 1<br>For 5%/min – USE 2OM-7.4.Q EMERGENCY BORATION | | RO begins boration at directed rate |
| | Turbine Control – 1st STG IN MODE<br>Load reduction rate thumbwheel set as directed<br>GO Pushbutton – PRESSED | | BOP starts power reduction at directed rate |
| | Governor valves function properly | | BOP monitors turbine operation during transient |
| | Control rods in AUTO or Manual as desired | | RO maintains Tavg/Tref within +/- 5F with auto/manual rods as directed |
| | PZR HTRS – ALL ON | | RO places all PZR heaters to ON |
| | VPL at 5% above GV position | | BOP maintains VPL at proper position during transient |
| | 4KV BUSSES – **NOT TRANSFERRED TO OFFSITE** | | Crew does not transfer 4KV busses to offsite |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **NOTE:** If crew tripped the reactor earlier, **DO NOT** trip [2FWS-P21B] until after transition to ES-0.1 | | | Crew notifies SYSTEM CONTROL of emergency power reduction |
| | Reactor Power approximately 50%<br>Turbine Control – HOLD | | Crew stops power reduction |
| **EVENT #5** | | | |
| Loss of the 2nd Main Feedwater Pump | | | |
| **IMF PMP-CFW004 (0 0) 1** | [2FWS-P21A] trips, no Main Feedwater Pumps operating | | BOP reports trip of only running Main Feedwater Pump |
| | | | US directs RO to manually trip the reactor |
| | Reactor Tripped | | RO manually trips the reactor |
| Crew enters **E-0,** performs immediate operator actions. | | | Crew performs IMAs of **E-0.** |
| | Annunciator A5-6D TURBINE TRIP DUE TO REACTOR TRIP - LIT<br>Power range indication - LESS THAN 5%<br>Neutron flux - DROPPING | | RO verifies reactor tripped. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **EVENT #6**<br><br>Main turbine fails to auto trip, manual successful **(PRE-LOAD)**<br><br>**IMF EHC08A (0 0)**<br><br>**CRITICAL TASK**<br><br>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. | **Auto Turbine trip failure**, manual successful<br><br>Throttle Valves - ALL CLOSED<br>OR<br>Governor Valves - ALL CLOSED<br>Main Generator Output Bkrs - OPEN<br>Exciter Circuit Bkr - OPEN | | BOP verifies turbine tripped **REPORTS AUTO TRIP FAILURE** and manually trips the Main Turbine |
| | AC Emergency Busses - AT LEAST ONE ENERGIZED<br><br>Check SI – ACTUATED<br>CNMT Pressure - > 5PSIG<br>PZR Pressure - < 1860 PSIG<br>SG Steam Pressure - < 500 PSIG | | BOP verifies power to AC Emergency Buses.<br><br>RO checks SI status<br><br>**CREW DETERMINES SI IS NOT REQUIRED, TRANSITIONS TO ES-0.1 STEP 1** |
| Crew transitions to **ES-0.1** Step 1 | | | US directs STA to monitor status trees. |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | SOUND Standby Alarm<br>U2 Rx Trip – ANNOUNCED | | Crew alerts plant personnel of reactor trip |
| | RCS Temp – STABLE AT OR TRENDING TO 547F:<br><br>Tavg – RCPs RUNNING<br>Tcold – RCPs NOT RUNNING | | Crew monitors RCS temperature for proper response |
| | RCS temperature maintained by Condenser Stm Dmps:<br><br>MSIVs – AT LEAST 1 OPEN<br>Condenser – AVAILABLE<br>Stm Dmps adjusted to slightly above Stm HDR Pres<br>Stm Dmps Controller – MANUAL<br>Output Demand – ZERO<br>Stm Dmps – STM PRESS MODE<br>Tavg Interlock – DEFEATED (if req)<br>Stm Dmps Controller – AUTO<br>Controller Setpoint – ADJUST AS NECESSARY | | Crew sets Condenser Steam Dumps to maintain RCS temperature in AUTO<br><br>OR<br><br>Crew uses SG Atmospheric Stm Dmp Vlvs<br><br>OR<br><br>RHR Vlv |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **IF NOT previously performed** trip [2FWS-P21B] at this time | | | |
| Loss of the 2nd Main Feedwater Pump | | | |
| **IMF PMP-CFW004 (0 0) 1** | [2FWS-P21A] trips, no Main Feedwater Pumps operating | | BOP reports trip of only running Main Feedwater Pump |
| **EVENT #7 & 8** | | | |
| Complete loss of all feedwater – **FR-H.1** conditions **(PRE-LOAD)** | | | |
| **IRF LOA-AFW022 (2 0) 1**<br>**IMF PMP-CFW008 (0 0) 2**<br>**IMF PMP-AFW002 (3 180) 1** | [2FWE*P22] trips during startup<br>[2FWS-P24] cannot be started<br>[2FWE*P23B] trips 180 seconds after startup | | |
| | **All feedwater pumps – STOPPED**<br>Annunciators A5-2C(3C)(4C) 'SG 21A(21B)(21C) LEVEL LOW-LOW REACTOR TRIP' – ANY LIT AS FIRST OUT<br>**NO AFW Pumps RUNNING**<br>**NO AFW Flow to SGs** | | Crew checks Feedwater Status<br>STA reports **FR-H.1** entry conditions are met |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Crew transitions to **FR-H.1** | | | US directs crew transition to **FR-H.1** step 1 |
| | RCS Pressure is > SG pressure<br>RCS Hot Leg Temperature > 350F | | Crew checks if Secondary Heat Sink is required |
| | WR level in at least 2 SGs is above 14% [32% ADVERSE CNMT]<br>PZR pressure is <2330 psig | | Crew checks if RCS Bleed and Feed should be initiated |
| | *PPDWST > 85 inches* | | *BOP checks PPDWST level > 85 inches* |
| | [2BDG*AOV100A1,B1,C1] SGBD ISOLATION VALVES – CLOSED<br>[2SSR*AOV117A,B,C] BLOWDOWN SAMPLE OUTSIDE CNMT ISOL VLVS – CLOSED<br>No Motor Driven AFW pumps available | | BOP try to establish AFW flow to at least one SG |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Turbine Driven AFW Pump Steam Supply Valves – OPEN<br>SG 21A [2MSS*SOV105A,D]<br>SG 21B [2MSS*SOV105B,E]<br>SG 21C [2MSS*SOV105C,F]<br>AFW throttle valves – OPEN<br>Computer point Y5172D Turb DR AFW PP Tripped FWE*P22 Inop – **IN ALARM STATE**<br>FW-P-2 Tripped/mechanical damage | | Crew continues to try to restore AFW |
| | Total Flow - **LESS THAN 340 GPM** | | US/Crew continues with **FR-H.1** |
| | RCPs – Stopped | | RO stop RCPs |
| **CRITICAL TASK**<br>Crew establishes feedwater flow into at least one SG before RCS feed and bleed is required. | Condensate system – AVAILABLE, IN SERVICE<br>[2FWS*HYV157A,B,C] – OPEN | | BOP try to establish MFW flow to at least 1 SG |
| | [2FWS-P24] Startup Feed Pump – UNAVAILABLE<br>[2FWS-P21A,B] – UNAVAILABLE | | BOP reports Both Main feed pumps and the Startup Feed Pump are unavailable |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | All SGNR Levels – LESS THAN 12%<br>[31% ADVERSE CNMT] | | BOP reports status of SGNR levels |
| | Letdown – **NOT IN SERVICE** | | Crew prepares for RCS depressurization to less than 2000 psig |
| | ONE PORV – OPEN | | RO opens ONE PORV to perform the depressurization |
| | RCS pressure - < 2000 psig | | RO closes PORV and stops the depressurization |
| | PORV – CLOSED | | |
| | [2CHS*MOV310] – OPEN<br>[2CHS*FCV122] – ADJUSTED TO MAINTAIN PZR LEVEL | | RO restores normal charging flow |
| | Low Steamline Press SI – BLOCKED<br>Low PZR Pressure SI – BLOCKED | | RO blocks SI Signals |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | MSIVs – 1 OPEN<br>CONDENSER – AVAILABLE<br>STEAM DMPS – MANUAL<br>DEMAND – ZERO<br>STEAM DUMPS – IN STM PRES MODE<br>TAVG - > 541F<br>A12-3F NOT LIT<br>Steam Dump Rate – GRADUALLY RAISED | | *Crew begins SG depressurization to less than 440 psig to establish condensate flow by dumping steam to the condenser at the max rate*<br><br>Crew uses SG Atmospheric Steam Dumps **IF** MSLI occurs |
| | Tavg approaches 541 F (A12-3F lit)<br>Tavg INTERLOCK – BLOCKED | | BOP blocks low Tavg interlock when required |
| | **FOLLOWING CONDITIONS ESTABLISHED:**<br><br>[2FWE*P23A,B] – PTL<br>[2FWS-P21A,B] – PTL<br>[2FWS-P24] – PTL<br>[2FWS*FCV478,488,498] – CLOSED<br>[2FWS-MOV154A,B,C] – CLOSED<br>[2FWS*FCV479,489,499] – CLOSED<br>[2FWS-MOV155A,B,C] – OPEN | | Crew establishes condensate flow to at least one SG per **Attachment A-1.10**<br><br>US dispatches operators to MCCs to assist in establishing conditions per **Att. A-1.10** |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **WHEN OPEN:** | | | |
| **IMF VLV-CFW043 (0 0) 0** | [2FWS-MOV150A] – OPEN | | BOP opens [2FWS-MOV150A] |
| **IMF VLV-CFW044 (0 0) 0** | [2FWS-MOV150B] – OPEN | | BOP opens [2FWS-MOV150B] |
| **IMF VLV-CFW045 (0 0) 0** | [2FWS-MOV152] – OPEN | | BOP opens [2FWS-MOV152] |
| When directed to locally close [2FWS-HCV200]: | | | |
| **IRF LOA-CFW037 (0 0) 2** | [2FWS-HCV200] - CLOSED | | US dispatches operator to locally close [2FWS-HCV200] |
| Then report valve is closed | | | |
| | [2CNM-DCV100] – OPEN | | BOP checks [2CNM-DCV100] open |
| | [2CNM-P21B,C] - RUNNING | | BOP checks condensate pumps operating |
| | **SI – HAS NOT OCCURRED** | | Crew checks SI Status |
| | [2FWS*HYV157A,B,C] – OPEN | | Crew checks FWI valves open |
| | [2FWS-FCV479,489,499] – Throttled open to establish feed flow to each SG | | BOP operates [2FWS-FCV479,489,499] as directed to establish feed flow to each SG |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Level rising on [2FWS-LR477] | | Crew checks SG level rising |
| | | | Crew continues with **FR-H.1** |
| | Feed Flow verified to at least one SG | | Crew verifies feed flow established |
| | **IF ON SCALE** – SGNR Level rising in SG/SGs selected for feeding | | Crew checks SGNR levels |
| | | | BOP maintains feed flow to SGs until SGNR level > 12% [31% ADVERSE CNMT] in at least one SG |
| | Core Exit TCs – **DROPPING**<br>SG Wide Range Level – **RISING IN AT LEAST ONE SG** | | |
| | Heat Sink Restored | | US/Crew returns to Procedure/step in effect, returns to **ES-0.1** |
| Scenario may be terminated when Condensate flow is established | | | |
| Classify Event at the end of the scenario | | | **SAE Tab 2.2** – CSF RED PATH on HEAT SINK |

| | | | | | |
|---|---|---|---|---|---|
| Facility: | BVPS 2 | Scenario No.: | 4 | Op Test No.: | NRC |
| Examiners: | _____ | Candidates: | _____ | | SRO |
| | _____ | | _____ | | ATC |
| | _____ | | _____ | | BOP |

Initial Conditions: BOL, 100% power Equ Xe, CB 229, 1459 PPM IC-168

Turnover: Maintain current plant conditions
2CHS*P21C HHSI Pump OOS. Will be returned in approximately 1 week

Critical Tasks:
1. E-0.A Crew manually trips the reactor from the control room before performing the mitigation strategy of FR-S.1.
2. E-0.D Crew manually actuates at least one train of SIS-actuated safeguards before transition to any ORP.
3. ECA-3.1.B Crew initiates cool down of the RCS to cold shutdown conditions at the highest rate achievable but less than 100°F per hour in all RCS cold legs.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | XMT-MSS042A | I(ALL)<br>*SRO T.S.* | 2MSS*PT446 Selected First Stage Pressure Transmitter fails LOW |
| 2 | PMP-CHS002 | C(RO/SRO)<br>*SRO T.S.* | 2CHS*P21B HHSI Pump trips |
| 3 | N/A | R(RO)<br>N(BOP/SRO) | Crew begins power reduction |
| 4 | XMT-RCS030A | I(RO/SRO) | 2RCS-PT444 PRZR Pressure Control Channel fails HIGH |
| 5 | VLV-RCS032 | C(RO/SRO) | [2RCS*PCV455C] PRZR PORV sticks open after lifting, block valve closure required |
| 6 | IMF PPL01A<br>IMFPPL01B<br>IOR XB11021T | I(RO/SRO) | Automatic reactor trip failure Manual RX trip from BB 'B' UNSUCCESSFUL, Manual RX trip from BB 'A' SUCCESSFUL |
| 7 | RCS04C<br>***VLV-MSS003***<br>***VLV-MSS004***<br>***VLV-MSS005*** | M(ALL) | 350 GPM SGTR on "C" SG ***with all MSIVs stuck open*** |
| 8 | PPL05A<br>PPL05B | ***C(RO/SRO)*** | Auto SI failure, both trains, manual actuation required |

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

The crew will assume the shift at 100% power BOL equilibrium xenon. HHSI pump 2CHS*P21C is OOS. The crew is instructed maintain current plant conditions. After the crew assumes the shift, Selected first stage pressure transmitter 2MSS*PT446 will FAIL LOW. Control rods will begin stepping inward. The crew will verify no load rejection and then place rod control to manual. The crew will then implement the actions of instrument failure procedure OM-24.4.IF Att.# 5 and stabilize the plant. The crew will swap controlling first stage pressure transmitters. After the US implements the required Technical Specification actions, HHSI pump 2CHS*P21B will trip. The crew will implement the actions of AOP 2.7.1, Loss of Charging/Letdown. Crew will isolate letdown and start the standby HHSI pump 2CHS*P21A. After the standby HHSI pump is started and letdown restoration is underway, and the US has implemented the appropriate Technical Specification actions, plant management will direct a power reduction to comply with the Technical Specification actions for only one operable HHSI pump. During the power reduction PRZR pressure control channel 2RCS-PT444 will FAIL HIGH. This will cause PRZR PORV 2RCS*PCV455C to open. PRZR PORV 2RCS*PCV455C will stick open forcing the crew to manually close the block valve. When the crew stabilizes the plant, a 350 GPM tube rupture will occur. The reactor will fail to trip automatically but can be tripped from the control room BB-A switch ONLY (BB-B switch will not work). The crew will enter E-0, Reactor Trip or Safety Injection. The actions of E-0 will be complicated by the failure of SI to automatically actuate, this will require the crew to manually actuate SI. The crew will verify ECCS equipment operating and diagnose a SGTR. The crew will transition into E-3, SGTR. The actions of E-3 will be complicated by the failure of all MSIVs to CLOSE. This will require the crew to transition into ECA-3.1, SGTR With Loss Of Reactor Coolant – Subcooled Recovery Desired. The scenario is terminated when a cooldown to mode 5 has commenced in ECA-3.1.

**EOP Flow Path:**
E-0, Reactor Trip or Safety Injection → E-3, SGTR → ECA-3.1, SGTR With Loss Of Reactor Coolant – Subcooled Recovery Desired.

**INITIAL CONDITIONS:** 100% Power, BOL, CB D = 229, 1459 PPM Boron IC-168

| ADDITIONAL LINEUP CHANGES | STICKERS | VOND MARKINGS |
|---|---|---|
| | | |
| **EQUIPMENT STATUS** | **DATE/TIME OOS** | **TECHNICAL SPECIFICATION(S)** |
| [2CHS*P21C] | Yesterday 1300 | |
| | | |

## SHIFT TURNOVER INFORMATION

1. Protected Train is Train "B"
2. [2CHS*P21C] is OOS for motor replacement and will not be returned until next week
3. Maintain current plant conditions
4.

## SCENARIO SUPPORT MATERIAL REQUIRED

Reactivity plan placard for BOL
Placard for [2FWE*P22] position stating [2FWE*P22] is aligned to "A" header
Place plaque on wall for Protected Train "B"

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Initialize IC Set 168, and establish initial plant conditions. | Reactor plant at 100% power, BOL, equilibrium conditions. RCS boron 1459 PPM, CBD = 229 steps. | | |
| Insert the following per the Simulator Setup section of the HTML File for this drill: | Inserts all pre-loads required to support the drill | | |
| **IMF PLP05A (0 0) 0** | Auto SI failure (both trains) | | |
| **IMF PLP05B (0 0) 0** | | | |
| **IMF VLV-MSS003 (0 0) 1** | 3 MSIVs fail open and cannot be closed | | |
| **IMF VLV-MSS004 (0 0) 1** | | | |
| **IMF VLV-MSS005 (0 0) 1** | | | |
| **IMF PPL01A (0 0) 0** | Failure of auto Rx trip TRN "A" | | |
| **IMF PPL01B (0 0) 0** | Failure of auto Rx trip TRN "B" | | |
| **IMF RCS04C (30 0) 350** | 'C' SGTR 350 gpm | | |
| **IMF VLV-RCS032 (30 0) 1** | [2RCS*PCV455C] sticks open | | |
| **IMF XMT-RCS030A (30 0) 2500** | [2RCS-PT444] fails high | | |
| **IOR XB1I021T (0 0) 0** | Prevent manual trip from BB B | | |
| **TRGSET 1 'RRCH535 <= 0.899'** | Trigger 1 on [2RCS*MOV535] position | | |
| **IMF VLV-RCS011 (1 0) 3** | [2RCS*MOV535] sticks partially open until a reactor trip occurs | | |
| **TRGSET 2 'MCRFNS(3) <=225'** | Trigger 2 on reactor trip | | |
| **TRG 2 'DMF VLV-RCS011'** | Trigger 2 allows closure of [2RCS*MOV535] | | |
| **TRGSET 3 'XB1I042C == 1'** | Trigger 3 on [2RCS*MOV535] switch position to close | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **IOR XB1O042R (3 0) 1** | Trigger 3 fails RED light on for [2RCS*MOV535] | | |
| **TRGSET 4 'RRCH535 <= 0.1'** | Trigger 4 on [2RCS*MOV535] position | | |
| **TRG 4 'DOR XB1O042R'** | Trigger 4 allows RED light to go out for [2RCS*MOV535] | | |
| Assign shift positions<br><br>SM:_____<br><br>US:_____<br><br>RO:_____<br><br>BOP:_____<br><br>STA:_____ | | | |
| 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 drill. | Simulator running. | | *Crew assumes control of the Unit.* |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **EVENT #1:**<br><br>[2MSS*PT446] fails low | | | |
| **IMF XMT-MSS042A (0 0) 0** | **IMMEDIATE PLANT RESPONSE:**<br>1A FIRST STAGE STM PRESS [2MSS*PI446] Ch III indicates low (VB C)<br>(P2840D) TURB 1ST STAGE PRESS<br>Tref (green pen) indicates 547F on recorder [2RCS-TR408] (VB B)<br>Control rods begin to step in at fast speed<br>Ann A4-3C TAVG DEVIATION FROM TREF actuates (T0507D)<br>Ann A6-12G AMSAC TROUBLE actuates (Y2522D)<br>Panel 18 Status light D-10 STM DUMP TRIP OPEN actuates | | Crew reports no load rejection, diagnose failure of [2MSS*PT446] |
| | Control rod motion stops | | US directs RO to place control; rods in manual |
| **AOP 2.1.3 STARTS HERE** | | | US directs crew actions for **AOP 2.1.3** |
| | NO LOAD REJECTION | | Crew reports no load rejection in progress |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Rod Motion – **STOPPED** | | US directs RO to place Control Rods in MANUAL |
| | Tavg – **REDUCING**<br>Restore Tavg by load reduction | | US directs preparation for load reduction to match Tavg/Tref |
| | OPERABLE PRNIS – W/I + 2% OF EACH OTHER | | Crew checks core power distribution NORMAL |
| | CHANNEL DEVIATION light – **NOT LIT** | | |
| | A4-4F – NIS POWER RANGE COMPARATOR – **NOT LIT** | | |
| | Delta Flux Indicators – W/I TARGET BAND | | |
| | Control Rod Positions – GREATER THAN RIL | | RO reports Rods above RIL |
| | Reactor Power > 50% | | RO reports power level |
| | QPTR in progress | | STA previously directed to perform QPTR |
| | A4-3C TAVG DEVIATION FROM TREF – **LIT** (due to failed inst.) | | Crew refers to ARPs as required |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Power operation continues<br>Minimize turbine load changes<br>Adjust boron to control Tavg | | US directs recovery efforts to restore Tavg/Tref |
| | | | Crew completes actions of **AOP 2.1.3** |
| | **180 SECONDS** after the transmitter failure Ann A12-1E AMSAC BYPASSED BY C-20 PERMISSIVE actuates | | Crew refers to appropriate ARPs |
| | | | Crew refers to IF procedure **24.4.IF ATT 5** |
| | [2MSS*PT446] has failed low | | BOP reports [2MSS*PT446] failed low |
| | Control Rods previously placed in Manual | | RO reports Control Rods in Manual, rod motion stopped |
| | [2MSS*PT447] selected<br>A4-3C Clears (possible) | | BOP selects redundant channel [2MSS*PT447] on BB C |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2MSS*PK464] IN Manual with zero % output signal<br>[2MSS*PK464] setpoint adjusted for 1005 psig<br>Train A/B Steam Dump Bypass Selector Switches in OFF/RESET<br>Steam Dump Mode Selector Switch in STM PRESS<br>[2MSS*PK464] in AUTO<br>[2RCS-TI408B] Tavg Steam Dump Demand, indicates 0%<br>Train A/B Steam Dump Bypass Selector Switches in ON<br>All Steam Dumps – CLOSED | | BOP places Steam Dump control in the **STEAM PRESSURE** mode |
| | | | Crew refers to **2OM-1.4.ACJ** for AMSAC restoration |
| | Control Rods **MAY** be returned to AUTO **if desired** | | RO places Control Rods to AUTO IF Directed |
| | | | US refers to **TS 3.3.1** and **Table 3.3.1-1 Function 17.f** |
| | | | **TS 3.3.1 W/I 1 Hr:** Verify interlock is in required state for existing plant conditions |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| When directed to locally rearm AMSAC: | | | US directs additional personnel to rearm AMSAC IAW **2OM-1.4.ACJ** |
| **IMF BST-PCS014 (0 0) 0** | Test switch [TPS/2MSS 446] in test (up) position | | |
| Then report actions to the Control Room | Following test lights are **ON:**<br>[TL/2MSS446]<br>[TL/2MSS447]<br>[TL/2MSS440A] (2/2 impulse pres $\geq$ 40%)<br>[TL/2MSS440B] (C-20 permissive) | | |
| | Ann A12-1E AMSAC BYPASSED BY C-20 PERMISSIVE **clears** | | |
| Proceed with the next event at LE discretion | | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **EVENT #2:** | | | |
| 2CHS*P21B Trips<br><br>**IMF PMP-CHS002 (0 0) 1**<br><br>**Role-play field operator and report motor ground.** | **IMMEDIATE PLANT RESPONSE:**<br>[2CHS*P21B] bright white LIT (BB A)<br>[2CHS*II21B] 21B CHG Pump Amps indicates 0 (VB A)<br>[2CHS*FI122A] charging flow indicates 0 (VB A)<br>[2CHS*FI130A, FI127A, FI124A],RCPs Seal injection indicates 0 (VB A)<br>Annunciators Actuate:<br>A2-3D CHARGING PUMP AUTO-START/AUTO-STOP (Y0116D)<br>A2-3E CHARGING FLOW PATH TROUBLE (F0101D)<br>A2-4D REACTOR COOLANT PUMP SEAL TROUBLE(F0112D, F0116D, F0118D)<br>[2CHS*TI140] Regen HX Letdown Temp begins to increase (VB A)<br>[2CHS*TI144] Letdown Temp begins to increase (VB A)<br>[2RCS*LI459A, LI461, LI460] PZR level CH I, III, II begin to decrease (BB B)<br><br>**DELAYED RESPONSE:**<br>Ann A2-3F LETDOWN FLOW PATH TROUBLE actuates (T0127D) | | Crew diagnose trip of [2CHS*P21B]<br><br>US dispatch personnel to investigate the loss of [2CHS*P21B] |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Charging Pumps – **NONE** RUNNING | | US implements **AOP 2.7.1** Loss of Charging/Letdown |
| | [2CHS*AOV200A,B,C] - CLOSED | | RO closes L/D orifice isolation valves |
| | [2CHS*LCV115C,E] - OPEN | | RO verifies CHP suction valves from VCT open |
| | VCT Level – NORMAL<br>VCT Pressure – NORMAL | | Crew verifies CHP **did not trip/stop** due to cavitation |
| | [2CHS*FCV122] - CLOSED | | RO closes charging pumps discharge flow control valve |
| | [2CHS-HCV186] - CLOSED | | RO closes RCP seal injection flow controller |
| | [2CHS*P21A] – RUNNING | | RO starts the standby charging pump |
| | [2CHS*P21B] – PTL | | RO places tripped charging pump in PTL |
| | [2CHS-HCV186] adjusted to obtain 6 to 9 gpm on [2CHS-FI130A, 127A, 124A] | | RO adjusts RCP seal injection flow to 6 to 9 gpm for each RCP |
| | [2CHS*FCV122] adjusted as required to restore PZR level **AND THEN** placed in **AUTO** | | RO adjusts charging pump discharge flow control valve to restore level as required and then places valve in auto |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| After appropriate delay report that [2CHS*P21A] is operating properly | [2CHS*P21A] operating properly | | US dispatch operator to ensure proper operation of [2CHS*P21A] |
| | | | US directs operators to restore Letdown flow IAW **2OM-7.4.AB** |
| | [2CHS*FCV122] - CLOSED | | RO places [2CHS*FCV122] in manual and closes the valve |
| | [2CHS*MOV289] - OPEN | | RO verifies [2CHS*MOV289] open |
| | [2CHS*MOV310] - OPEN | | RO verifies [2CHS*MOV310] open |
| | [2CHS*FCV122] throttled to obtain 30 – 50 gpm on [2CHS*FI122] (VB A) | | RO throttles charging pump discharge flow control valve open to provide 30 – 50 gpm flow as indicated on [2CHS*FI122] (VB A) |
| | [2CHS*AOV200A, B, C] - CLOSED | | RO verifies 3 L/D isolation valves are closed |
| | [2CHS*AOV204] - OPEN | | RO verifies the NRHX L/D inlet valve is open (BB A) |
| | [2CHS*PCV145] – IN MANUAL AND ADJUSTED TO 50% OPEN DEMAND SIGNAL (BB A) | | RO place NRHX Disch Pres control valve in MANUAL and adjusts for 50% output demand |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2CHS*MOV100A] – OPEN<br>[2CHS*MOV100B] – CLOSED | | RO verifies positions of [2CHS*MOV100A], [2CHS*MOV100B] |
| | [2CHS*LCV460A, B] - OPEN | | RO verifies Regen HX L/D Inlet valves open |
| | [2CHS*AOV200A, B] - OPEN | | RO opens L/D isol valves to establish L/D flow at previous value |
| | [2CHS*PCV145] adjusted to maintain 260 psig as indicated on [2CHS*PI145]<br>SETPOINT of [2CHS*PCV145] – SET FOR 260 PSIG | | RO establishes automatic control of letdown flow |
| | [2CHS*PCV145] – PLACED IN AUTO<br>[2CHS*FCV122] – PLACED IN AUTO | | US directs personnel to perform **2OST-6.4** |
| | PZR level trending to normal | | RO monitors PZR level for proper response |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | US refers to **TS 3.5.2, 3.5.3** and **LRM 3.1.3, 3.1.4**<br><br>**TS 3.5.2:** 2 ECCS TRAINS SHALL BE OPERABLE: Restore 2 Trains W/I 72 Hrs<br>**OR**<br>**MODE 3** W/I 6 Hrs<br>**OR**<br>**MODE 4** W/I 12 Hrs<br><br>**TS 3.5.3**: Applicable **MODE 4 ONLY**<br><br>**LRM 3.1.3:** Applicable **MODE 5 ONLY**<br><br>**LRM 3.1.4:** 2 Charging Pumps **SHALL** be OPERABLE **MODE 1 – 4**: Restore two pumps to OPERABLE status W/I 72 Hrs<br>**OR**<br>**MODE 3** W/I 6.0 Hrs **AND** borated to SDM of 1% DK/K at 200F **AND** restore the required charging pump to OPERABLE status W/I 174 Hrs |
| **When informed** as plant management, direct the US to begin power reduction at 12 % hr | | | US informs plant management of the loss of [2CHS*P21B] and the requirement to S/D due to the status of [2CHS*P21C] |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **EVENT #3:** | | | Crew develops a reactivity plan for power reduction of 12%/hr |
| Normal Power reduction | | | US contacts Reactor Engineering for a complete reactivity plan to complete the load reduction |
| After appropriate delay, provide the crew with a reactivity plan that will allow the continued power reduction | | | Crew refers to **2OM-52.4.B** Load Follow for the load reduction |
| | Turbine control – 1ST STG OUT | | BOP verifies turbine control in 1st STG OUT mode |
| | Setter – SET TO LOWER VALUE | | BOP sets the EHC SETTER to a lower value as directed by the US |
| | 1%/min selected | | BOP selects 1%/min load rate on EHC panel |
| | Turbine load – REDUCING | | BOP depresses the GO pushbutton on the EHC control panel when directed |
| | Blender controls set as desired per the reactivity plan | | RO sets the blender controls for the desired boration rate/amount as determined by the reactivity plan |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | **MAINTAIN**:<br>Tavg/Tref W/I ± 2F<br>AFD W/I limits of CB-14 (TS 3.2.3 'AXIAL FLUX DIFFERENCE')<br>Control Rods ABOVE RIL as defined by COLR Fig 4.1-1<br>VPL at 5% above turbine load<br>Generator parameters W/I limit of 'Calculated Capability Curve' 2OM-52.5.A.5 (Figure 52-5) between a power factor of 0.90 lagging and 1.0<br>[2GSS-MOV204] – ADJUSTED as necessary to maintain gland steam pressure | | Crew maintains plant/turbine & generator parameters as specified by **2OM-52.4.B** during the load reduction |
| | Power – LESS THAN 98% | | BOP stops load reduction by pushing HOLD PB on EHC control panel |
| | Turbine Control – Transferred to 1st STG IN mode | | BOP transfers turbine control to 1st STG IN mode by pushing the 1st STG IN PB on EHC control panel |
| | Turbine Load – REDUCING | | BOP pushes GO PB on EHC control panel **When Directed** to resume load reduction |

Continue with next set of events at LE discretion:

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|

**NOTE:** the following Events #4 through 7 will occur **simultaneously.** All commands are **PRE-LOADED** and will actuate when **Trigger 30** is fired

**EVENTS#4, 5,6 7**

(4)
[2RCS-PT444] Fails high
**IMF XMT-RCS030A (30 0) 2500**
(5)
[2RCS*PCV455C] Sticks open
**IMF VLV-RCS032 (30 0) 1**
(6)
Automatic reactor trip failure
**IMF PPL01A (0 0) 0**
**IMF PPL01B (0 0) 0**
Manual trip from BB B unsuccessful
**IOR XB1I021T (0 0) 0**
(7)
350 GPM SGTR on "C" SG
**IMF RCS04C (30 0) 350**

**IMMEDIATE PLANT RESPONSE:**

Annunciators actuate:

A4-1D PRESSURIZER CONTROL PRESSURE HIGH/LOW (P0501D)

A4-1E PRESSURIZER CONTROL PRESSURE DEVIATION HIGH/LOW(P0503D)

A4-2F PRESSURE RELIEF BLOCK (P0496D)

A4-1A PRESSURIZER POWER/SAFETY RELIEF TROUBLE (T0480D)

A4-1F – PRESSURIZER PORV OPEN PERMISSIVE (Y6672D) (immediate reset)

A2-4B REACTOR COOLANT SYSTEM SUBCOOLING OFF NORMAL (T0761D)

A4-5A RADIATION MONITORING SYSTEM TROUBLE (R0003D)

A4-5C RADIATION MONITORING LEVEL HIGH (R0004D)

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **WHEN DIRECTED:** | | | |
| **TRG! 30** | | | |
| | [2RCS*LI459A, LI461, LI460] PZR level CH I, III, II begin to decrease (BB B) | | |
| | [2RCS*PI455, PI456, PI457] PZR pres CH I, II, III begin to decrease (BB B) | | |
| | [2RCS-PI445] PZR control pres indicator begins to decrease (VB B) | | |
| | [2RCS-PR441] RCS Wide range pressure recorder red/green pens begin to decrease (VB A) | | |
| | RCS pressure rapidly reducing | | RO verifies alarms, diagnose [2RCS-PT444] has failed high |
| | [2RCS*PCV455A,B] – CLOSED | | RO closes Spray Valves, reduces MPC output to 0 |
| **EVENT #5** | [2RCS*PCV455C] – **STUCK OPEN** | | RO attempts to close [2RCS*PCV455C] reports it **does not close** |
| | [2RCS*MOV535] – TRAVELING CLOSED | | RO closes [2RCS*MOV535] |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | **1ST OUT ANNUNCIATOR:** A5-4H<br>PRESSURIZER PRESSURE LOW<br>REACTOR TRIP (P0488D) | | RO Reports 1st OUT Annunciator A5-4H |
| **EVENT #6** | Reactor – **NOT TRIPPED** | | RO reports failure of automatic trip |
| **CRITICAL TASK**<br>Crew manually trips the reactor from the control room before performing the mitigation strategy of FR-S.1. | | | |
| **EVENT #6** | Reactor – **NOT TRIPPED** | | Ro attempts manual trip from BB B, reports **UNSUCCESSFUL** |
| **EVENT #6** | Reactor – **TRIPPED** | | Ro attempts manual trip from BB A, reports **SUCCESSFUL** |
| | [2RCS*MOV535] – **CLOSED** | | RO reports [2RCS*MOV535] closed after reactor trip |
| **EVENT #7** | RCS Pressure **APPEARS** to recover until the effects of the SGTR are seen | | RO monitors RCS pressure and **MAY** report that it is recovering until the SGTR effects are seen |
| Crew enters **E-0,** performs immediate operator actions. | | | Crew performs IMAs of **E-0.** |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Annunciator A5-6D TURBINE TRIP DUE TO REACTOR TRIP - LIT<br>Power range indication - LESS THAN 5%<br>Neutron flux - DROPPING | | RO verifies reactor tripped. |
| | Throttle Valves - ALL CLOSED<br>OR<br>Governor Valves - ALL CLOSED<br>Main Generator Output Bkrs - OPEN<br>Exciter Circuit Bkr - OPEN | | BOP verifies turbine tripped. |
| | AC Emergency Busses - BOTH ENERGIZED | | BOP verifies power to AC Emergency Buses. |
| | Check SI ACTUATED<br>CNMT Pressure - > 5PSIG<br>PZR Pressure - < 1860 PSIG<br>SG Steam Pressure - < 500 PSIG | | RO checks SI status<br><br>**CREW DETERMINES SI REQUIRED** |
| Crew continues **E-0** | Manually actuate SI (both trains) | | RO manually actuates SI both trains |
| | Alert Plant Personnel | | RO/BOP sound Standby Alarm, announce reactor trip and safety injection |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Check [2HVS*FN204A(B)], Leak Collection Filtered Exhaust Fan – AT LEAST ONE RUNNING | | BOP checks Leak Collection Exhaust Fan status |
| **EVENT #8:**<br><br>**(PRE-LOADED)** | Charging Pumps – **ONE** RUNNING<br>HHSI Flow – INDICATED<br>LHSI Pumps – TWO RUNNING | | RO verifies SI System status, reports auto SI failure on **BOTH** Trains, **MANUALLY** actuates both trains of SI |
| Both trains of auto SI fail to actuate, manual actuation successful<br><br>**IMF PLP05A (0 0) 0**<br>**IMF PLP05B (0 0) 0** | **BOTH TRAINS OF AUTO SI FAILURE**<br><br>**ONLY ONE HHSI PUMP OPERATING** | | |
| **CRITICAL TASK**<br>Crew manually actuates at least one train of SIS-actuated safeguards before transition to any ORP. | | | |
| | Motor-driven AFW Pumps – RUNNING<br>Turb driven AFW Pump Stm Supply Isol Valves – OPEN<br>AFW Throttle Vlvs – FULL OPEN<br>Total AFW Flow – GREATER THAN 340 GPM | | BOP verifies AFW System status |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Perform **Attachment A-0.11** "Verification Of Automatic Actions" in a timely manner | | US directs performance of **Attachment A-0.11** when time/manpower permit |
| **Attachment A-0.11** is included and begins on page 31 of scenario | **LIST ATT A-0.11 DISCREPANCIES AS APPLICABLE:** | | |
| | **Manual SI required – BOTH TRAINS ONLY ONE HHSI PUMP RUNNING** | | |
| | **RCPs OPERATING – MONITOR Tavg**<br>RCPs STOPPED MONITOR Tcold | | RO/BOP check RCS Tavg stable at or trending to 547°F |
| | **Check CIB – HAS NOT ACTUATED** | | RO checks Recirc Spray Pump status |
| | PORVs – **2 CLOSED** –<br>[2RCS*PCV455C] Stuck **OPEN, ISOL by [2RCS*MOV535]**<br>Spray Valves – CLOSED<br>Safety relief valves – (PSMS Detailed Data Page 1) – CLOSED<br>Check PRT conditions – CONSISTENT WITH **EXPECTED** VALUES<br>Power to at least one block valve – AVAILABLE<br>Block valves – AT LEAST ONE OPEN | | RO verifies PZR isolated |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | D/P between RCS pressure and highest SG pressure – LESS THAN 205 PSID [220 PSID ADVERSE CNMT]<br>AND<br>HHSI Flow – INDICATED | | RO checks if RCPs should be stopped<br><br>**RO DOES NOT STOP RCPs** |
| | Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER<br>OR<br>ANY SG COMPLETELY DEPRESSURIZED | | BOP checks if any SGs are faulted.<br><br>**BOP REPORTS SGs NOT FAULTED** |
| | Check all SG levels – **"C" IS** RISING IN AN UNCONTROLLED MANNER<br>Check Secondary Radiation – CONSISTENT WITH PRE-EVENT VALUES<br>[2ARC-RQ100] Air Ejector Discharge (1007)<br>[2SSR-RQ100] SG Blowdown Sample (1062)<br>[2MSS*RQ101A,B,C] Main Steamline Discharge (1005, 3005, 5005) | | Crew checks if SG tubes are intact<br><br>**CREW REPORTS INDICATION OF SGTR ON "C" SG** |
| **Crew transitions to E-3 STEP 1** | | | US directs transition to **E-3**<br><br>US directs STA to monitor status trees |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | CREVS not actuated | | BOP checks if CREVS should be activated |
| | CR radiation not in high alarm | | |
| | CIB has not occurred | | Crew commences control room ventilation action per **Attachment A-2.5** |
| | D/P between RCS pressure and highest SG pressure – LESS THAN 205 PSID [220 PSID ADVERSE CNMT]<br>AND<br>HHSI Flow – INDICATED | | RO checks if RCPs should be stopped<br><br>**RO does not stop RCPs** |
| | "C" SG ruptured | | US identifies **"C" SG** as the ruptured SG |
| | Unexpected rise in NR level | | |
| | Rad survey results:<br>ANY SAMPLE<br>[2MSS*RQ102A,B,C] SG N-16 monitors (1075, 2075, 3075)<br>[2MSS*RQ101A,B,C] Main Stm Monitors (1005, 3005, 5005)<br>High Radiation from any SG BD rad monitor | | |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | | | US directs crew to isolate flow from the ruptured SG |
| **IF REQUESTED:** | Close atmospheric steam dump on ruptured SG [2SVS*PCV101C] | | BOP closes "C" SG atmospheric steam dump [2SVS*PCV101C] |
| **IRF LOA-MSS018 (0 0) 0** **To close [2SVS*25]** | | | Setpoint raised to 100% |
| | Check Residual Heat Release valve – CLOSED | | BOP closes [2SVS*HCV104]. |
| **IRF LOA-MSS011 (0 0) 0** **To close [2SVS*29]** | Check Residual Heat Release Valve from faulted SG CLOSED: SG 21A [2SVS*29] | | Crew dispatch operator to close [2SVS*29] |
| | **2 RUNNING** | | BOP checks motor driven AFW pumps |
| | [2MSS*SOV105C & F] CLOSED | | BOP closes [2MSS*SOV105C & F] |
| | SG-21C blowdown isol valve [2BDG*AOV100C1] CLOSED | | BOP closes SG 21C blowdown isol vlv |
| | SG-21C Main Stm Line drain [2SDS*AOV111C1] CLOSED | | BOP closes SG 21C main steamline drain vlv |
| | RHR Piping Drain [2SDS*AOV129A] CLOSED | | BOP closes RHR Piping drain vlv |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| **EVENT #7 (continued):** | 3 BVPASS VLVS - CLOSED | | BOP reports Bypass valves closed |
| **(PRE-LOADED)** | | | |
| **3 MSIVs Stuck open** | **NO MSIVs** can be closed | | BOP reports that all **3 MSIVs** are stuck open and cannot be closed |
| **IMF VLV-MSS003**<br>**IMF VLV-MSS004**<br>**IMF VLV-MSS005** | | | **RUPTURED SG CANNOT BE ISOLATED FROM 1 INSTACT SG, GO TO ECA-3.1** |
| Crew transitions to **ECA-3.1 Step 1** | | | |
| | SI, CIA & CIB - RESET | | RO resets SI, CIA & CIB |
| | Open [2CCS-AOV118] Domestic Water to Station Air Compressor | | Establish Domestic Water System Cooling to Station Air Compressors |
| | | | US directs additional personnel to perform **Att A-1.20** as manpower permits |
| | At least one Station Air Compressor – RUNNING | | Start 1 Station Air Compressor as required |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2IAC-MOV131] & [2IAC*MOV130] – OPEN | | Crew establishes Inst Air to CNMT |
| | CNMT Inst Air Press > 85 PSIG | | |
| | All AC Busses – ENERGIZED BY OFFSITE POWER | | BOP checks 4KV electrical status |
| | All PZR HTRS – PULL TO LOCK | | RO places PZR HTRS in PTL |
| | Quench/Recirc Spray Pumps – **NONE RUNNING** | | Crew checks if CNMT spray should be stopped |
| | "C" SG level > 12% [31% ADVERSE CNMT] | | BOP checks ruptured SG level |
| | [2FWE*HCV100A,B] - CLOSED | | Crew isolates feed flow to "C" SG |
| | [2FWS*HYV157C] CLOSED | | Check FWI previously verified |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | RCS Pressure - > 225 PSIG [250 PSIG ADVERSE CNMT] | | RO checks if LHSI Pmps should be stopped |
| | Pressure – STABLE OR RISING | | |
| | LHSI Pmps stopped and in auto | | RO stops LHSI Pmps and places them in auto |
| | Aux Bldg/Safeguards radiation – CONSISTENT WITH PRE-EVENT LEVELS | | Crew evaluates plant status |
| | Obtain Pertinent samples | | |
| | Pressures in all SGs – ANY DROPPING IN AN UNCONTROLLED MANNER<br>OR<br>ANY SG COMPLETELY DEPRESSURIZED | | BOP checks if any SGs are faulted.<br><br>Crew checks faulted SGs previously isolated unless needed or C/D |
| | **SGs ARE NOT FAULTED** | | |
| | Total AFW flow maintained >340 GPM until SG level > 12% [31% adverse CNMT] THEN CONTROL AFW flow to maintain level between 26% [33% adverse CNMT] and 50% | | BOP checks intact SG levels, controls AFW flow to intact SGs |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | Shutdown margin requirements are satisfied for cooldown | | US directs chemistry to sample as required,<br>Crew maintains SDM during C/D |
| **CRITICAL TASK**<br>Crew initiates cool down of the RCS to cold shutdown conditions at the highest rate achievable but less than 100°F per hour in all RCS cold legs. | C/D rate - < 100F/Hr<br>Trend initiated/initialed at ½ hr interval<br>RHR used if in service<br>SI blocked when PZR Pres < 2000 PSIG<br>Condenser Stm Dmps operated in MANUAL control to cooldown<br>Tavg interlock blocked < 541F | | Crew initiates cooldown to MODE 5 at < 100F/hr<br><br>BOP operates Condenser Stm Dmps as required to maintain C/D rate W/I limits |
| Terminate drill after proper C/D rate established or at LE discretion | RWST Level - > 600 inches<br>Ruptured (C) SG level - < 95% [79% ADVERSE CNMT] | | Crew checks if subcooled recovery desired<br><br>IF NOT TRANSITION TO ECA 3.2 STEP 1 |
| Classify event at the end of the scenario | | | **ALERT** based on TAB 2.3 entry into E-3 |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| Attachment A-0.11 'Verification of Automatic Actions' performed as time & manpower permit | | | US directs operator to perform Attachment A-0.11 as time & manpower permit |
| | Diesel generators – BOTH RUNNING | | Check both EDGs running |
| | CNMT pressure – GREATER THAN 7 PSIG<br>**OR**<br>SG Steam Pressure – LESS THAN 500 PSIG<br>**OR**<br>Steamline pressure high rate of change – 100 PSIG DROP IN 50 SECONDS | | Check if MSLI is required<br>If **not required**, go to step 4 |
| | Yellow SLI marks - LIT | | Verify steamline isolation |
| STEP 4 | Open [2CCS-AOV118] Domestic Water to Station Air Compressor | | Establish Domestic Water System Cooling to Station Air Compressors |
| | At least one Station Air Compressor – RUNNING | | Start 1 Station Air Compressor as required |
| | CCP pumps – AT LEAST 1 RUNNING | | Check CCP Pump status |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| | [2NME-NR45] Nuclear Recorder selected to operable source and intermediate range displays | | Align neutron flux monitoring for shutdown |
| | CNMT pressure – HAS REMAIND LESS THAN 11 PSIG | | Check CIB status |
| | IF NOT | | Actuate CIB if required |
| | Manually initiate CIB – BOTH SWITCHES FOR BOTH TRAINS | | |
| | Manually align equipment as required<br>All RCPs – STOPPED<br>BV-1 operator verifies CREVS actuation<br>Service water established to RSS HX(s) | | Stop ALL RCPs |
| | Service Water Pumps – 2 RUNNING<br>Service Water Header Pressure – GREATER THAN 55 PSIG<br>SWS Seal Water Pressure – NOT LOW | | Verify Service Water System in service |
| | [2HCS*SOV100A1, B1] – CNMT Sample amber light – LIT | | Verify both CNMT hydrogen analyzers running |

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|---|---|---|---|
| MANUAL SI REQUIRED<br>ONLY ONE HHSI PMP RUNNING | All Red SIS Marks - LIT<br>All Orange CIA Marks – LIT<br>All Green FWI Marks – LIT | | Verify ESF Equipment status – Start/align equipment as required |
| | Power available to both Emergency AC Busses | | Verify power to both AC Emergency busses |
| | | | Restore power as required |
| | Attachment A-0.11 – COMPLETE | | Report any discrepancies to SM/US |