

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: PERFORM A QPTR CALCULATION

JPM NO.: A1

REVISION: 1

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: PERFORM A QPTR CALCULATION

JPM No.: A1

Rev. No.: 1

Task No.: 37750, Perform a Quadrant Power Tilt Ratio calculation

STP Objective: Perform a Quadrant Power Tilt Ratio calculation in accordance with OPSP10-NI-0002.

Related K/A Reference: 2.1.20 (4.3) Ability to execute Procedure Steps

References: T.S. 3/4.2.4 Quadrant Power Tilt Ratio
OPOP09-AN-05M3(05M3-A-4) PR Lower Det Flux Dev Hi/Auto Def
OPSP10-NI-0002, Rev 6, Excore QPTR Determination

Task Normally Completed By: RO

Method of Testing: Performance

Location of Testing: N/A

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 20 minutes

Required Materials (Tools/Equipment):
Calculator

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 has been at approximately 100% steady state power (currently at 99.9%) for 5 days. Control Room Annunciator 05M03-A-4, PR LOWER DET FLUX DEV HI/AUTO DEF, alarms. Initial action of 0POP09-AN-05M3-A-4 to verify all Control Rods are properly aligned, is complete. All Excore Nuclear Instrumentation Channels are operable and the detector currents (in microamps) are:

N41U = 537	N41L = 561
N42U = 554	N42L = 561
N43U = 536	N43L = 589
N44U = 579	N44L = 571

- All meter readings were taken with the Current Meter Range Switch Scale in the “1” position.
- Reactor Power is 99.9% by U1169

INITIATING CUE:

The Shift Supervisor instructs you to manually calculate QPTR per 0PSP10-NI-0002, Excore QPTR Determination.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Applicant determines Upper Tilt Ratio = 1.002 (± 0.003), Lower Tilt Ratio = 1.027 (± 0.003), and QPTR = 1.027 (± 0.003) and identifies the Acceptance Criteria is NOT met.

JOB PERFORMANCE MEASURE INFORMATION SHEET (Cont.)

HANDOUTS:

- 0PSP10-NI-0002, Excore QPTR Determination

NOTES:

- Examiner has a “KEY” of Form 1 and Form 3 of 0PSP10-NI-0002 and Figure 5.1 of Unit 1, Plant Curve Book.
- An “Exam Only” copy of the Unit 1 Plant curve book will be available in the examination area for the applicant’s use.
- The calculated QPTR is equal to approximately 1.027 (± 0.003) and does not meet the procedure acceptance criteria and T.S. LCO actions 3.2.4.a and 3.2.4.b are entered.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain the procedure.

Standard:

Applicant obtains current revision of 0PSP10-NI-0002, Excore QPTR Determination.

Comment:

Cue:

Provide the Handout Copy of 0PSP10-NI-0002, Excore QPTR Determination

Notes:

The Handout Copy also includes partially completed Forms 1 and 3

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Review 0PSP10-NI-0002 for applicability and prerequisites.

Standard:

Applicant reviews procedure and verifies prerequisites are met and signs Form 1.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 3

Obtain latest Figure 5.1 in the Unit 1 Plant Curve Book.

Standard:

Obtains Figure 5.1 of the Unit 1 Plant Curve Book.

Comment:

Cue:

Provide the "Exam Use Only" copy of the Unit 1 Plant Curve Book, or the Handout Copy of Figure 5.1, Incore-Excore Cross Calibration Constants.

Notes:

The JPM copy of Figure 5.1 data may not be the current data in the Unit 1, Plant Curve Book, but contains the data applicable to this JPM.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

100% Power Detector Currents from Figure 5.1 and the current Indicated Detector Currents for the Upper and Lower Detectors are entered into Form 3.

Standard:

Enters the 100% and Indicated Power Currents onto Form 3.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 5

For each channel of Upper Detectors, calculate Normalized Current, then the sum of normalized currents, and average of normalized current.

Standard:

Calculates the Average Normalized Upper Current to be 1.003 (± 0.003)

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6(C)

Calculate Upper Tilt Ratio.

Standard:

Calculates the Upper Tilt Ratio to be 1.002 (± 0.003)

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 7

For each channel of Lower Detectors, calculate Normalized Current, then the sum of normalized currents, and average of normalized currents.

Standard:

Calculates the Average Normalized Lower Current to be 1.017 (± 0.003)

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8(C)

Calculate Lower Tilt Ratio.

Standard:

Calculates the Lower Tilt Ratio to be 1.027 (± 0.003)

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 9(C)

Determine QPTR.

Standard:

Determines the QPTR to be 1.027 (± 0.003)

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 10

Obtain independent verification of calculations.

Standard:

Applicant informs examiner that independent verification is needed.

Comment:

Cue:

Inform applicant that the independent verification is complete with no changes.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 11(C)

Verify the calculated QPTR meets acceptance criteria.

Standard:

Determines QPTR does NOT meet acceptance criteria and immediately notifies Shift Supervisor.

Comment:

Cue:

As Shift Supervisor, acknowledge applicant's determination of results.

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: A1, PERFORM A QPTR CALCULATION

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

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Excore QPTR Determination			
Quality	Non Safety-Related	Usage: Referenced	Effective Date: 08/16/01
R. L. Warren	J. E. Eichenlaub	J. C. Garza	NF&A
PREPARER	TECHNICAL	USER	COGNIZANT ORGANIZATION

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KEY

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Excore QPTR Determination			

1.0 Purpose and Scope

- 1.1 The purpose of this procedure is to determine the Quadrant Power Tilt Ratio (QPTR) and verify it satisfies the requirements of Technical Specification 3.2.4.
- 1.2 This procedure is written to verify QPTR by Plant Computer QPTR Method or by Manual QPTR Method.
- 1.3 This procedure meets the Surveillance Requirements of Technical Specifications 4.2.4.1.a and 4.2.4.1.b.

2.0 Responsibilities

- 2.1 The Test Coordinator is responsible for identifying the portions of this procedure that are to be performed to satisfy the test purpose.
- 2.2 The Test Coordinator SHALL ensure that all requirements of this procedure are completed and determine acceptability of the test results.
- 2.3 The procedure performer SHALL obtain data as specified in the procedure and prepare the data package.
- 2.4 The verifier SHALL verify all entries and calculations in the data package as specified in the procedure.
- 2.5 Shift Supervisor or designee SHALL complete the Second Review of Test Results on Form 1
- 2.6 Shift Supervisor SHALL complete the Plant Operations Review of Test Results on Form 1 if acceptance criteria are not met.

3.0 Notes & Precautions

- 3.1 When verifying QPTR to support Power Range NIS Axial Flux Difference (AFD) Calibrations, then the manual calculation process should be used to verify QPTR until all four Power Range channels are calibrated.
- 3.2 When using the manual calculation process to verify QPTR, then the correct current scale should be read for each detector current value.
- 3.3 When above 75% RTP with one Power Range NI channel inoperable, at least once per 12 hours, an incore QPTR shall be determined per 0PSP10-II-0004 (Determination of Quadrant Power Tilt Ratio Using Incore Instrumentation) concurrently with this procedure.

4.0 Prerequisites

4.1 Plant Computer QPTR Method

4.1.1 All four Power Range NI channels are operable. N/A

4.1.2 All 4 AFD channels have been calibrated with the latest Incore-Excore calibration data. For example, this prerequisite CAN NOT be satisfied if any AFD channels are calibrated with old Incore-Excore calibration data after any AFD channels have been calibrated with new Incore-Excore calibration data. N/A

4.1.3 The following Plant Computer points are operable. N/A

- ICYUH0111N QPTR NIS UPPER QUAD A (CH 43)
- ICYUH0112N QPTR NIS UPPER QUAD B (CH 42)
- ICYUH0113N QPTR NIS UPPER QUAD C (CH 44)
- ICYUH0114N QPTR NIS UPPER QUAD D (CH 41)
- ICYUH0121N QPTR NIS LOWER QUAD A (CH 43)
- ICYUH0122N QPTR NIS LOWER QUAD B (CH 42)
- ICYUH0123N QPTR NIS LOWER QUAD C (CH 44)
- ICYUH0124N QPTR NIS LOWER QUAD D (CH 41)

4.2 Manual QPTR Method

4.2.1 At least three Power Range NI channels are operable. Initials

4.3 Reactor power has not changed by greater than $\pm 0.5\%$ RTP in the last 5 minutes. Initials

4.4 The plant is in Mode 1. Initials

4.5 Notify the Shift Supervisor to review the limiting conditions for operation associated with Technical Specification 3.2.4, Quadrant Power Tilt Ratio. Initials

4.6 Have the Shift Supervisor sign Form 1 giving permission to start the test. Initials

5.0 Procedure

NOTE

- An approved computer code may be used to perform the calculations on Form 3.
- Computer generated forms may also be used for Form 2 or Form 3.

5.1 If using Plant Computer QPTR Method to verify QPTR, then perform the following steps. Otherwise NA the following steps.

5.1.1 Verify the prerequisites have been met and sign Form 1. N/A

5.1.2 Record the following information on Excure QPTR Form 2. N/A

5.1.2.1 Unit number, cycle number, date and time. N/A

5.1.2.2 The current Reactor Power indication being used and its value. N/A

5.1.3 Record the following QPTR values on Excure QPTR Plant Computer points on Form 2. N/A

Upper Radial Flux Tilts (URFT's)

- ICYUH0111N QUAD A (CH 43)
- ICYUH0112N QUAD B (CH 42)
- ICYUH0113N QUAD C (CH 44)
- ICYUH0114N QUAD D (CH 41)

Lower Radial Flux Tilts (LRFT's)

- ICYUH0121N QUAD A (CH 43)
- ICYUH0122N QUAD B (CH 42)
- ICYUH0123N QUAD C (CH 44)
- ICYUH0124N QUAD D (CH 41)

5.1.4 Record the QPTR on Form 2 as the largest numerical value of the URFT or the LRFT Plant Computer points recorded per Step 5.1.3. N/A

5.1.5 The Test Coordinator SHALL sign Form 2 when complete. N/A

5.1.6 Continue with Step 5.3. N/A

5.2 If using Manual QPTR Method to verify QPTR, then perform the following steps. Otherwise NA the following steps.

- 5.2.1 Verify the prerequisites have been met and sign Form 1. Initials
- 5.2.2 Record the following information on Excore QPTR Form 3. Initials
- 5.2.2.1 Unit number, cycle number, date and time. Initials
- 5.2.2.2 The current Reactor Power indication being used and its value. Initials

CAUTION

Always use the 100% power detector currents from the latest Figure 5.1 in the Plant Curve Book for ALL the NI channels, even if the new values have not yet been set in all of the NI channels.

- 5.2.2.3 Latest 100% power detector current, in microamps, for each operable upper and lower Power Range NI detector from Figure 5.1 in the Plant Curve Book. Initials

CAUTION

- The reading of the upper and lower detector currents for all of the operable Power Range NI detectors should be done as near the same time as possible to minimize any errors from NI channel oscillations.
- Steps 5.2.3 and 5.2.4 need to be performed concurrently.
- Step 5.2.3 refers to each detector current meter range switch scale setting (0.1, 0.5, 1 and 5 settings).
- Ensure that the correct current scale is being read for each detector current value.

5.2.3 Record each detector current meter range switch scale prior to reading the detector current. Initials

5.2.4 Read the indicated detector current for each operable upper and lower Power Range NI detector from CP-011 to the nearest microamp, e.g. 612 microamps, and record the values on Excore QPTR Form 3. Initials

NOTE

- When one Power Range NI channel is inoperable, the three operable channels shall be used to determine QPTR.
- Comments pertaining to the inoperable channel should be recorded in the REMARKS section of Excore QPTR Form 1.

5.2.5 Calculate the Upper Tilt Ratio (UTR) as follows:

CAUTION

The following calculations in steps 5.2.5.1 through 5.2.5.4 shall be carried out to at least three decimal places.

- | | | |
|---------|--|-----------------|
| 5.2.5.1 | Determine the upper normalized current (I_U) for each channel by dividing the indicated detector current by the 100% power detector current. Record the upper normalized current (I_U) on Excore QPTR Form 3. | <u>Initials</u> |
| 5.2.5.2 | Determine the sum of the upper normalized detector currents (Sum I_U) and record this value on Excore QPTR Form 3. | <u>Initials</u> |
| 5.2.5.3 | Determine the average upper normalized current (Average I_U) by dividing the sum of the upper normalized currents (Sum I_U) by the number of operable detectors. Record the average upper normalized current (Average I_U) on Excore QPTR Form 3. | <u>Initials</u> |
| 5.2.5.4 | Calculate the UTR by dividing the maximum upper normalized current (Maximum I_U) by the average upper normalized current (Average I_U). Record the UTR on Excore QPTR Form 3. | <u>Initials</u> |

KEY

5.2.6 Calculate the Lower Tilt Ratio (LTR) as follows:

CAUTION

The following calculations in steps 5.2.6.1 through 5.2.6.4 shall be carried out to at least three decimal places.

- 5.2.6.1 Determine the lower normalized current (I_L) for each channel by dividing the indicated detector current by the 100% power detector current. Record the lower normalized current (I_L) on Excure QPTR Form 3. Initials

- 5.2.6.2 Determine the sum of the lower normalized current (Sum I_L) and record this value on Excure QPTR Form 3. Initials

- 5.2.6.3 Determine the average lower normalized current (Average I_L) by dividing the sum of the lower normalized currents (Sum I_L) by the number of operable detectors. Record the average lower normalized current (Average I_L) on Excure QPTR Form 3. Initials

- 5.2.6.4 Calculate the LTR by dividing the maximum lower normalized current (Maximum I_L) by the average lower normalized current (Average I_L). Record the LTR on Excure QPTR Form 3. Initials

NOTE

QPTR is defined in Technical Specifications as the value of the UTR or the value of the LTR, whichever is greater.

- 5.2.7 Record the larger numerical value (UTR or LTR) as the QPTR on Form 3. Initials

- 5.2.8 The Test Coordinator SHALL sign Form 3 when calculations are complete. Initials

- 5.2.9 Obtain independent verification of all calculations, including verification that all of the recorded 100% detector currents on Form 3 are from the latest approved Figure 5.1 of the Plant Curve Book. Sign for independent verification on Form 3. IV

5.3 Verify the QPTR meets the Acceptance Criteria. Initials

NOTE

If the QPTR > 1.02 and Reactor Power is ≤ 50%, then reactor power may be increased above 50% in accordance with the action requirements of Technical Specification 3.2.4.

- | | | |
|------|---|-----------------|
| 5.4 | If the test results did not satisfy the Acceptance Criteria then immediately notify the Shift Supervisor. | <u>Initials</u> |
| 5.5 | If QPTR > 1.02 and Reactor Power > 50%, then notify the Reactor Engineering Supervisor to prepare to take action per Technical Specification 3.2.4 action b. | _____ |
| 5.6 | The Test Coordinator SHALL ensure all procedure performers and verifiers print their names, sign and initial Form 1. | _____* |
| 5.7 | Indicate the reason for performing this test on Form 1. | _____ |
| 5.8 | Indicate the test results and sign Form 1. | _____* |
| 5.9 | Mark sections of Form 1, Form 2 or Form 3 which were not completed with N/A or similar notation. | _____ |
| 5.10 | Forward the data package to the Shift Supervisor. | _____ |
| 5.11 | The Shift Supervisor SHALL indicate the results of the second review on Form 1. | _____ |
| 5.12 | If the Shift Supervisor determines test results did not satisfy the acceptance criteria, then he SHALL immediately complete the applicable portion of Form 1. | _____ |
| 5.13 | Forward the Data Package for review in accordance with 0PGP03-ZE-0004 (Plant Surveillance Program). | _____ |

6.0 Acceptance Criteria

- 6.1 The Quadrant Power Tilt Ratio shall not exceed 1.02.

7.0 References

- 7.1 STPEGS Technical Specification 3/4.2.4
- 7.2 0PGP03-ZE-0004, Plant Surveillance Program
- 7.3 0PSP10-II-0004, Determination of Quadrant Power Tilt Ratio Using Incore Instrumentation
- 7.4 CR 97-17272 Operator Weakness Reading Wrong Power Range Scale.

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Excore QPTR Determination			

8.0 Support Documents

8.1 Form 1 Data Package Cover Sheet

8.2 Form 2 Plant Computer Excore QPTR Data Sheet

8.3 Form 3 Excore QPTR Manually Calculated Data Sheet

KEY

KEY

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Excore QPTR Determination			
Form 1	Data Package Cover Sheet (SAMPLE)		Page 2 of 2

KEY

Performers and Verifiers:			
Name (Printed)	Signature	Initials	Sections Performed
Name	<i>Signature</i>	<i>Initials</i>	4,5

5.1.1 or 5.2.1 Prerequisites met: _____
Signature Date
Test Coordinator Date

Remarks:

KEY

KEY

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Excore QPTR Determination			
Form 2	Plant Computer Excore QPTR Data Sheet (SAMPLE)		Page 1 of 1

5.1.2.1 Unit _____ Cycle _____ Date _____ Time _____

5.1.2.2 Reactor Power _____ Indicator _____

5.1.3

Point ID	Description	Channel	Value
Upper Radial Flux Tilt (URFT)			
ICYUH0111N	QPTR NIS UPPER QUAD A	CH 43	
ICYUH0112N	QPTR NIS UPPER QUAD B	CH 42	
ICYUH0113N	QPTR NIS UPPER QUAD C	CH 44	
ICYUH0114N	QPTR NIS UPPER QUAD D	CH 41	
Lower Radial Flux Tilt (LRFT)			
ICYUH0121N	QPTR NIS LOWER QUAD A	CH 43	
ICYUH0122N	QPTR NIS LOWER QUAD B	CH 42	
ICYUH0123N	QPTR NIS LOWER QUAD C	CH 44	
ICYUH0124N	QPTR NIS LOWER QUAD D	CH 41	

5.1.4 QPTR = Largest numerical value of the URFT's or LRFT's

5.1.5 Performed by: _____ Date: _____

KEY

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Excure QPTR Determination			
Form 3	Excure QPTR Manually Calculated Data Sheet (SAMPLE)		Page 1 of 1

5.2.2.1 Unit 1 Cycle 10 Date Date Time Time
 5.2.2.2 Reactor Power 99.9 Indicator U1169

UPPER DETECTORS

	N41U	N42U	N43U	N44U		
5.2.3	Current Meter Range Switch Scale (0.1, 0.5, 1 or 5)	1	1	1	1	
5.2.4	Indicated Detector Current (µA)	537	554	536	579	
5.2.2.3	100% Power Detector Current (µA)	535	554	534.7	576.1	5.2.5.2 Sum I _U
5.2.5.1	Normalized (I _U) Currents	1.004	1.000	1.002	1.005	5.2.5.3 Average I _U
5.2.5.4 UPPER TILT RATIO (UTR) =		$\frac{\text{Maximum } I_U}{\text{Average } I_U} = \frac{1.002}{1.003}$				

LOWER DETECTORS

	N41L	N42L	N43L	N44L		
5.2.3	Current Meter Range Switch Scale (0.1, 0.5, 1 or 5)	1	1	1	1	
5.2.4	Indicated Detector Current (µA)	561	561	589	571	
5.2.2.3	100% Power Detector Current (µA)	557.4	555.1	584.6	547.1	5.2.6.2 Sum I _L
5.2.6.1	Normalized (I _L) Currents	1.006	1.011	1.008	1.044	5.2.6.3 Average I _L
5.2.6.4 LOWER TILT RATIO (LTR) =		$\frac{\text{Maximum } I_L}{\text{Average } I_L} = \frac{1.027}{1.017}$				

5.2.7 QPTR = Larger numerical value of the UTR or LTR = 1.027

5.2.8 Performed by: Signature Date: Date

5.2.9 Verified (IV) by: _____ Date: _____

This form, when completed, SHALL be retained for the life of the plant.

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 has been at approximately 100% steady state power (currently at 99.9%) for 5 days. Control Room Annunciator 05M03-A-4, PR LOWER DET FLUX DEV HI/AUTO DEF, alarms. Initial action of 0POP09-AN-05M3-A-4 to verify all Control Rods are properly aligned, is complete. All Excore Nuclear Instrumentation Channels are operable and the detector currents (in microamps) are:

N41U = 537	N41L = 561
N42U = 554	N42L = 561
N43U = 536	N43L = 589
N44U = 579	N44L = 571

- All meter readings were taken with the Current Meter Range Switch Scale in the “1” position.
- Reactor Power is 99.9% by U1169

INITIATING CUE:

The Shift Supervisor instructs you to manually calculate QPTR per 0PSP10-NI-0002, Excore QPTR Determination.

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: DETERMINE BORATION REQUIRED TO ACHIEVE DESIRED SHUTDOWN MARGIN

JPM NO.: A2

REVISION: 2

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: DETERMINE BORATION REQUIRED TO ACHIEVE DESIRED SHUTDOWN MARGIN

JPM No.: A2

Rev. No.: 2

Task No.: 76950, Perform a Shutdown Margin verification
70100, Perform a boration of the Reactor Coolant System

STP Objective: Determine Shutdown Margin Using Procedures
Perform Boration of RCS

Related

K/A Reference: 2.1.25 [2.8] Ability to Obtain and Interpret References

References: 0PSP10-ZG-0003, Shutdown Margin Verification Modes 3, 4, and 5
Figure 3.1, Unit 1 Plant Curve Book, Boration / Dilution
Figure 5.5, Unit 1 Plant Curve Book, Shutdown Margin Limit Curve

Task Normally Completed By: RO

Method of Testing: Actual Performance

Location of Testing: N/A

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 20 minutes

Required Materials (Tools/Equipment):

Calculator

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 was manually tripped from 100% power due to Main Turbine governor valve problems. The Unit will remain in Mode 3, NOP/NOT, while troubleshooting governor valves. Additional plant conditions are:

- Unit 1 Cycle 10
- Mode 3, $T_{avg} = 567^{\circ}\text{F}$ (all loops)
- 439 EFPD (16,100MWD/MTU)
- RCS Boron Concentration 153 ppm (20 minutes ago)
- BAT A & B at 7500 ppm
- All control rods have inserted fully into the core

INITIATING CUE:

- You are the extra Reactor Operator and the Unit Supervisor directs you to determine the Xenon Free shutdown margin for Mode 3, 567°F using the Short Form in accordance with 0PSP10-ZG-0003 and using the TABLE of Figure 5.5, Plant Curve Book.
- If necessary, determine how many gallons of boron addition are needed to attain the required shutdown margin using Figure 3.1, Plant Curve Book.

JOB PERFORMANCE MEASURE INFORMATION SHEET (Cont.)

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Completes Form 2 of 0PSP10-ZG-0003, Short Form SDM Limit Curve Method to obtain a target boron concentration. Calculates the boron addition needed to maintain proper shutdown margin is 2627-2732 gals. (Based on Interpolation of Figure 5.5 table at 16,100 MWD/MTU - yielding 409-419 ppm .)

OR

The applicant may choose to use a more conservative value of 423 ppm at 16,000 MWD/MTU and not do this interpolation. This would yield a calculated value for boron addition of 2,774 gals (423ppm).

HANDOUTS:

- 0PSP10-ZG-0003, Shutdown Margin Verification Modes 3, 4, and 5

NOTES:

- Interpolation of Figure 5.5 table yields 409-419 ppm @ 16,100 MWD/MTU.
- The applicant may choose to use the more conservative value of 423ppm @ 16,000 MWD/MTU and not do this interpolation.
- The calculated values for boron addition from Figure 3.1 formula are 2627-2732 gals (409-419 ppm) or 2,774 gals (423 ppm)
- A copy of a Unit 1 Plant Curve Book will be available in the examination area.
- A copy of the Nuclear Design Report (NDR) will be available in the examination area.
- The examiner is provided a KEY for the procedure and one for the calculation.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain the procedure.

Standard:

Obtains controlled or working copy of 0PSP10-ZG-0003, Shutdown Margin Verification - Modes 3, 4, and 5.

Comment:

Cue:

Provide the Handout Copy of 0PSP10-ZG-0003.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Verifies the prerequisites are complete.

Standard:

- ___ *Verifies copies of the NDR and Unit 1 Plant Curve Book are available.*
- ___ *Verifies the plant is in Modes 3, 4, 5 or 6*
- ___ *Notifies the Shift Supervisor to review Tech Specs 3.1.1.1 and 3.1.1.2*
- ___ *Obtains verbal permission from the shift Supervisor to determine shutdown margin*

Comment:

Cue:

- As Shift Supervisor, acknowledge the request to review Tech Specs 3.1.1 and 3.1.2
- As Shift Supervisor, give applicant verbal permission to determine shutdown margin.

Notes:

Applicant will enter cycle data on form 1, then transition to procedure step 5.5 to perform the Short Form SDM Limit Curve Method on Form 2.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3(C)

Determine C_B Effective.

Standard:

Calculates C_B Effective to be 153 ppm.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4(C)

Determine C_B SDM Limit.

Standard:

*Interpolates Figure 5.5 table for burnup of 16,100 MWD/MTU and 567°F and determines C_B SDM Limit 409-419 ppm **OR** the applicant may choose to use the more conservative value at 16,000 MWD/MTU and not do this interpolation which yields a C_B SDM Limit of 423 ppm.*

Comment:

The applicant may determine that the acceptance criteria of the test are not met, but since the Shutdown Margin was calculated for a xenon free condition (which does not exist now), a Tech Spec violation has NOT occurred.

Cue:

- If asked, inform applicant that a verification of data has been completed.
- When applicant informs SS that RCS boron is NOT adequate, direct the applicant to determine how many gallons of boron addition is needed to achieve the Xenon Free Shutdown Margin.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5(C)

Calculate volume of Boric Acid needed to maintain Xenon Free Shutdown Margin at 567°F.

Standard:

Calculates 2627-2732 gals (409-419 ppm) or 2,774 gals (423 ppm).

Comment:

It is expected that the applicant use the boration formula located on Figure 3.1 of the Plant Curve Book to perform this calculation.

Cue:

Notes:

The applicant may opt to calculate the boron addition for a few ppm higher than what the shutdown margin calculation calls for or add several gallons of acid to the final answer for conservatism as it is common practice to do this at STP.

- TERMINATE THE JPM -

JPM STOP TIME _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 was manually tripped from 100% power due to Main Turbine governor valve problems. The Unit will remain in Mode 3, NOP/NOT, while troubleshooting governor valves. Additional plant conditions are:

- Unit 1 Cycle 10
- Mode 3, $T_{avg} = 567^{\circ}\text{F}$ (all loops)
- 439 EFPD (16,100MWD/MTU)
- RCS Boron Concentration 153 ppm (20 minutes ago)
- BAT A & B at 7500 ppm
- All control rods have inserted fully into the core

INITIATING CUE:

- You are the extra Reactor Operator and the Unit Supervisor directs you to determine the Xenon Free shutdown margin for Mode 3, 567°F using the Short Form in accordance with 0PSP10-ZG-0003 and using the TABLE of Figure 5.5, Plant Curve Book.
- If necessary, determine how many gallons of boron addition are needed to attain the required shutdown margin using Figure 3.1, Plant Curve Book.

13admina2 - boration addition calculation formula (from Figure 3.1)

KEY

$$V_B = \left(\frac{624461}{8.4298} \right) \ln \left(\frac{7500-153}{7500-409} \right) = 2627 \text{ gals}$$

$$V_B = \left(\frac{624461}{8.4298} \right) \ln \left(\frac{7500-153}{7500-414} \right) = 2679 \text{ gals}$$

$$V_B = \left(\frac{624461}{8.4298} \right) \ln \left(\frac{7500-153}{7500-419} \right) = 2732 \text{ gals}$$

OR

KEY

$$V_B = \left(\frac{624461}{8.4298} \right) \ln \left(\frac{7500-153}{7500-423} \right) = 2774 \text{ gals}$$

KEY

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Shutdown Margin Verification - Modes 3, 4 and 5			
Quality	Safety-Related	Usage: REFERENCED	Effective Date: 06/27/01

J.C. Garza	R. L. Warren	J. E. Eichenlaub	NF&A
PREPARER	TECHNICAL	USER	COGNIZANT ORGANIZATION

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Shutdown Margin Verification - Modes 3, 4 and 5

1.0 Purpose and Scope

1.1 To verify that the SHUTDOWN MARGIN satisfies the requirements of Technical Specifications 4.1.1.1.a and 4.1.1.1.d when in Mode 3 or 4, and Technical Specifications 4.1.1.2.a and 4.1.1.2.b when in Mode 5.

1.2 This procedure is to be performed by Plant Operations or Reactor Engineering personnel.

2.0 Responsibilities

2.1 The Test Coordinator is responsible for identifying the portions of this procedure that are to be performed to satisfy the test purpose.

2.2 The Test Coordinator SHALL ensure that all requirements of this procedure are completed and determine acceptability of the test results.

2.3 The procedure performer SHALL obtain data as specified in the procedure and prepare the data package.

2.4 The verifier SHALL verify all entries and calculations in the data package as specified in the procedure.

2.5 Shift Supervisor or designee SHALL complete the Second Review of Test Results on Form 1.

2.6 Shift Supervisor SHALL complete the Plant Operations Review of Test Results on Form 1 if acceptance criteria are not met.

3.0 Precautions and Notes

3.1 Asterisk (*) on the checkoff denotes a step within the procedure that SHALL be signed off in the data package.

3.2 IF test results did NOT satisfy the acceptance criteria, THEN immediately notify the Shift Supervisor who SHALL complete the applicable portion of Form 1.

3.3 IF Xenon credit is used to verify SDM, THEN action SHALL be taken to prevent loss of SDM as Xenon concentration decreases due to decay.

3.4 The SDM limit typically increases as RCS temperature decreases; ensure adequate SDM exists to accommodate anticipated changes in plant conditions.

4.0 Prerequisites

Shutdown Margin Verification - Modes 3, 4 and 5

KEY

NOTE

- ! Data transferred from the Nuclear Design Report (NDR), Plant Curve Book, or alternate source SHALL be independently verified per Step 5.13.
- ! IF the NDR in step 4.1 is not available, THEN an alternate source may be used if it is approved and the source is recorded in the remarks section of Form 1.

- 4.1 An approved Nuclear Design Report (NDR) for the applicable unit and cycle is available. _____
- 4.2 The applicable unit and cycle Plant Curve Book Figure 5.5 Shutdown Margin Limit Curve is available. _____
- 4.3 The plant is in Modes 3, 4, 5 or 6. _____
- 4.4 Notify the Shift Supervisor to review the Limiting Conditions for Operation Action Statements associated with TS 3.1.1.1 and 3.1.1.2, and Surveillance Requirements 4.1.1.1.1 and 4.1.1.2. _____
- 4.5 Obtain verbal permission from the Shift Supervisor to determine SDM and sign Form 1. _____*

KEY

Shutdown Margin Verification - Modes 3, 4 and 5

5.0 Procedure

NOTE

! This procedure provides three methods of verifying SDM. Use the following guidelines to choose the best method to verify SDM based on plant conditions.

The "0.95 Keff" method is the most conservative. This method will verify actual RCS boron conditions greater than the Refueling, All Rods Out (ARO), $K \leq 0.95$ boron concentration. This method will provide the easiest way to verify SDM if multiple control and shutdown rods are inoperable (i.e. Rapid Refueling). This method SHALL only be used in Mode 5 or 6.

The "Short Form SDM Limit Curve" method will verify RCS boron concentration greater than the Shutdown Margin Limit Curve in the Plant Curve Book. This method will account for inoperable control and shutdown rods, however, this method may be too conservative with multiple rods inoperable. This method will NOT account for Xenon or Samarium which adds conservatism. This method may be used in Modes 3, 4, or 5.

The "Long Form SDM Limit Curve" method provides less conservatism than the other two methods. This method will adjust the Shutdown Margin Limit Curve in the Plant Curve Book for Xenon. Samarium is not accounted for which adds conservatism. This method will also account for inoperable control and shutdown rods. This method may be used in Modes 3, 4, or 5.

! Throughout this procedure, Form 2 SHALL be used if verifying SDM by the "Short Form SDM Limit Curve" method, Form 3 SHALL be used if verifying SDM by the "Long Form SDM Limit Curve" method, and Form 4 SHALL be used if verifying SDM by the "0.95 Keff" method.

5.1 Verify applicable Prerequisites have been met AND Precautions and Notes have been read AND sign Form 1.

_____ *

5.2 Enter the Unit and Cycle number on Form 1, Form 2, Form 3, Form 4, Form 5 and Form 6 as applicable.

5.3 Record the following information on Form 1:

5.3.1 Cycle burnup in MWD/MTU.

5.3.2 Minimum Loop RCS average temperature (Tavg) from QDPS, CP-005 or CP-018. Tavg may be obtained by averaging Thot and Tcold.

Shutdown Margin Verification - Modes 3, 4 and 5

NOTE

- ! Inoperable rods are those which are not fully inserted and are immovable as a result of excess friction or mechanical interference or known to be untrippable.
- ! Because of the Incomplete Rod Insertion issue at STP, safety evaluations may be applicable which allow stuck rods to be considered operable under certain RCS conditions. Refer to Plant Curve Book Figure 1.2 for a summary of any applicable safety evaluations for Incomplete Rod Insertion.

5.3.3 Inoperable rods.

5.3.3.1 Record the Number of inoperable rods with incomplete insertion at greater than 18 steps as indicated by DRPI. _____

5.3.3.2 Record the Number of inoperable rods with incomplete insertion at less than or equal to 18 steps as indicated by DRPI. _____

NOTE

- ! An RCS boron concentration greater than 12 hours old SHALL not be used to verify SDM at current conditions.

5.3.4 RCS boron concentration (C_B RCS), sample date and sample time. A boron sample up to 12 hours old may be used provided the RCS was not diluted since the sample time. Initiate RCS boron sampling if required. _____

5.4 IF SDM is to be verified using the "Short Form SDM Limit Curve" method THEN proceed to Step 5.5 IF SDM is to be verified using the "Long Form SDM Limit Curve" method THEN proceed to Step 5.6. IF SDM is to be verified using the "0.95 Keff" method THEN proceed to Step 5.7. _____

Shutdown Margin Verification - Modes 3, 4 and 5

5.5 "Short Form SDM Limit Curve" method.

- 5.5.1 Verify the plant is in Mode 3, 4 or 5 and initial Form 2. _____ *
- 5.5.2 IF the number of inoperable rods recorded per Step 5.3 is NOT zero (0), THEN determine the RCS boron concentration inoperable rod correction (C_B Rod) by completing Form 5. Record the value of C_B Rod on Form 2. _____
- 5.5.3 IF the number of inoperable rods recorded per Step 5.3 is zero (0), THEN record a value of zero (0) on Form 2 for the RCS boron concentration inoperable rod correction (C_B Rod). _____
- 5.5.4 Determine the effective boron concentration (C_B Effective) by the following expression. Record C_B Effective on Form 2. _____

$$C_B \text{ Effective} = C_B \text{ RCS} - C_B \text{ Rod}$$

NOTE

- ! Do NOT interpolate Figure 5.5 for RCS average temperature. IF the RCS average temperature is between two of the supplied curves, THEN use the curve which provides the greater required boron concentration.
- ! A more conservative (more positive value) SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) may be recorded on Form 2. Ensure the RCS average temperature and cycle burnup used to determine the conservative value of SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) are recorded on Form 2, if applicable.

- 5.5.5 Obtain the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) from Plant Curve Book Figure 5.5 at the RCS average temperature and cycle burnup recorded in Step 5.3. _____
- 5.5.5.1 Record the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) on Form 2. _____
- 5.5.5.2 Record the RCS average temperature and cycle burnup used to determine the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) on Form 2. _____
- 5.5.6 Continue with Step 5.8.

5.6 "Long Form SDM Limit Curve" method.

Shutdown Margin Verification - Modes 3, 4 and 5

- 5.6.1 Verify the plant is in Mode 3, 4 or 5 and initial Form 3. _____ *
- 5.6.2 IF the number of inoperable rods recorded per Step 5.3 is NOT zero (0), THEN determine the RCS boron concentration inoperable rod correction (C_B Rod) by completing Form 5. Record the value of C_B Rod on Form 3. _____
- 5.6.3 IF the number of inoperable rods recorded per Step 5.3 is zero (0), THEN record a value of zero (0) on Form 3 for the RCS boron concentration inoperable rod correction (C_B Rod). _____
- 5.6.4 Determine the RCS boron concentration Xenon correction (C_B Xenon) per Addendum 1 and record the value on Form 3. _____
- 5.6.5 Determine the effective boron concentration (C_B Effective) by the following expression. Record C_B Effective on Form 3. _____

$$C_B \text{ Effective} = C_B \text{ RCS} - C_B \text{ Rod} + C_B \text{ Xenon}$$

NOTE

- ! Do NOT interpolate Figure 5.5 for RCS average temperature. IF the RCS average temperature is between two of the supplied curves, THEN use the curve which provides the greater required boron concentration.
- ! A more conservative (more positive value) SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) may be recorded on Form 3. Ensure the RCS average temperature and cycle burnup used to determine the conservative value of SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) are recorded on Form 3, if applicable.

- 5.6.6 Obtain the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) from Plant Curve Book Figure 5.5 at the RCS average temperature and cycle burnup recorded in Step 5.3. _____
- 5.6.6.1 Record the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) on Form 3. _____

Shutdown Margin Verification - Modes 3, 4 and 5

- 5.6.6.2 Record the RCS average temperature and cycle burnup used to determine the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit) on Form 3. _____
- 5.6.7 Continue with Step 5.8. _____
- 5.7 "0.95 Keff" method.
- 5.7.1 Verify the plant is in Mode 5 or 6 and initial Form 4. _____ *
- 5.7.2 The effective boron concentration (C_B Effective) is equal to the RCS boron concentration (recorded on Form 1, Step 5.3.4). Record C_B Effective on Form 4. _____
- C_B Effective = C_B RCS
- 5.7.3 Obtain the Refueling C_B , ARO, $K \leq 0.95$ from the applicable unit and cycle Plant Curve Book Figure 5.5. Record the value on Form 4 as the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit). _____
- 5.8 Compare the Effective boron concentration (C_B Effective) with the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit). Record the results of the comparison on Form 2, Form 3 or Form 4. _____
- 5.9 Evaluate the test results against the acceptance criteria.
- 5.9.1 IF C_B Effective is greater than or equal to C_B SDM Limit, THEN adequate SHUTDOWN MARGIN is present. _____
- 5.9.2 IF C_B Effective is less than C_B SDM Limit, THEN adequate SHUTDOWN MARGIN is NOT present. _____
- 5.10 IF SDM was verified using the "Long Form SDM Limit Curve" method, complete Addendum 2 to determine the length of time that the SDM verification remains valid. Record the SDM Validity Time on Form 3. _____
- 5.11 The test coordinator SHALL sign completed Form 2, Form 3, Form 4, Form 5, or Form 6. _____ *
- 5.12 Forward the test package to a verifier. _____

Shutdown Margin Verification - Modes 3, 4 and 5

5.13 The verifier SHALL perform the following:

5.13.1 Independently verify all entries on completed Form 2, Form 3, Form 4, Form 5 and Form 6. _____

5.13.2 Verify any assumed conservative values on Form 2 or Form 3 are truly conservative. _____

5.13.3 Sign completed Form 2, Form 3, Form 4, Form 5 and Form 6 when the verification is complete. _____ *

5.13.4 Forward the test package to the Test Coordinator. _____

5.14 The Test Coordinator SHALL ensure the names of all data takers and procedure performers are entered on Form 1. _____

5.15 Indicate the reason for performing this test on Form 1. _____

5.16 Evaluate the test results against the acceptance criteria. _____

5.17 Indicate the test results, sign, AND enter the date and time on Form 1. _____ *

5.18 IF the test results did not satisfy the acceptance criteria, THEN perform the following:

5.18.1 Immediately notify the Shift Supervisor who SHALL complete the applicable portion of Form 1. _____

5.18.2 Notify the Reactor Engineering Supervisor. _____

5.18.3 Initiate a Condition Report. _____

5.19 IF xenon credit was used to verify SDM, THEN ensure the Shift Supervisor is notified of the SDM Validity Time and a Control Room log entry is made to document the SDM Validity Time.

5.20 Notify the Shift Supervisor that testing has been completed, then sign Form 1. _____ *

5.21 Ensure this surveillance is logged as complete in the Control Room Log Book. _____

5.22 Forward the Data Package to the Shift Supervisor or designee for a second review. _____

Shutdown Margin Verification - Modes 3, 4 and 5

5.23 The Shift Supervisor or designee SHALL indicate the acceptability of the test results AND sign Form 1. _____ *

5.24 IF the second review, or any subsequent review reveals that the test results have not satisfied the Acceptance Criteria, THEN notify the Shift Supervisor who SHALL complete applicable portion of Form 1. _____

5.25 Forward the test package for review in accordance with OPGP03-ZE-0004 (Plant Surveillance Program). _____

6.0 Acceptance Criteria

The Effective boron concentration (C_B Effective) is greater than or equal to the SHUTDOWN MARGIN Limit boron concentration (C_B SDM Limit).

7.0 References

7.1 Technical Specification 3.1.1.1 and 3.1.1.2.

7.2 OPEP02-ZG-0001 (Xenon Worth Calculation), Rev. 1

7.3 SER 92-015 (Loss of Shutdown Reactivity Margin)

7.4 5Z010Z51003 STP Setpoint Document - Section Q.1

8.0 Support Documents

8.1 Addendum 1 Xenon Boron Correction

8.2 Addendum 2 SDM Validity Time

8.3 Form 1 Data Package Cover Sheet

8.4 Form 2 Short Form SDM Limit Curve Method

8.5 Form 3 Long Form SDM Limit Curve Method

8.6 Form 4 0.95 Keff Method

8.7 Form 5 RCS Boron Concentration Inoperable Rod Correction

8.8 Form 6 RCS Boron Concentration Xenon Correction and SDM Validity Time

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Shutdown Margin Verification - Modes 3, 4 and 5			
Addendum 1	Xenon Boron Correction		Page 1 of 1

Determine the present Xenon Worth (XW) per 0PEP02-ZG-0001 (Xenon Worth Calculation) or from an approved computer code. Record the Xenon Worth (XW), date and time on Form 6 as a negative value.

- Appendix A contains two sets of Differential Boron Worth (DBW) Tables. The DBW as a Function of Vessel Average Moderator Temperature Table is based on a NO Xe condition, while the DBW as a Function of Power Level Table is based on a 100% Equilibrium Xenon condition. At HZP ($T_{avg} = 567$ °F and Power = 0 %), the most appropriate table will depend on the Xenon concentration.

Obtain the Differential Boron Worth (DBW) from the applicable unit and cycle Nuclear Design Report (NDR) for the RCS conditions recorded on Form 3. The DBW should be obtained by interpolating on boron concentration, RCS average temperature and burnup. DBW values should be located in NDR Appendix A. Record the DBW on Form 6 as a negative value.

- Calculate the RCS boron concentration poison correction (C_B Xenon) by dividing the Xenon Worth (XW) by the Differential Boron Worth (DBW). Record C_B Xenon on Form 6.

$$C_B \text{ Xenon} = XW / DBW$$

KEY

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Shutdown Margin Verification - Modes 3, 4 and 5			
Addendum 2	SDM Validity Time		Page 1 of 1

This Addendum SHALL be performed if Xenon credit was used to verify adequate SDM. This Addendum is necessary since poison decay may cause a loss of adequate SDM unless appropriate operator action is taken to account for the decay. **This Addendum assumes that RCS boron concentration does not decrease and the SDM Limit remains unchanged through the SDM Validity Time.**

- 1.0 Using the data recorded on Form 3, calculate the amount of Effective boron concentration in excess of the SHUTDOWN MARGIN limit boron concentration (C_B Excess). Record C_B Excess on Form 6.

$$C_B \text{ Excess} = C_B \text{ Effective} - C_B \text{ SDM Limit}$$

- 2.0 Calculate the Excess Boron Worth (EBW) by multiplying C_B Excess by the Differential Boron Worth (DBW). Obtain the DBW from Addendum 1, Step 2, Form 6. Record EBW on Form 6 as a negative value.

$$EBW = C_B \text{ Excess} \times DBW$$

- 3.0 Calculate the Minimum Xenon Worth (MXW) required to ensure adequate SDM by subtracting the Excess Boron Worth (EBW) from the Xenon Worth (XW). Obtain XW from Addendum 1, Step 1, Form 6. Record the MXW on Form 6.

$$MXW = XW - EBW$$

NOTE

SDM Validity Time is that time at which SDM is lost due to xenon concentration decrease from radioactive decay.

- 4.0 IF the Minimum Xenon Worth (MXW) is greater than or equal to zero (0), THEN adequate SDM exists assuming no credit for Xenon. IF the MXW is greater than or equal to zero (0), THEN the SDM Validity Time is indefinite. Record the SDM Validity Time on Form 6.
- 5.0 IF the MXW is less than zero (0), THEN use 0PEP02-ZG-0001 (Xenon Worth Calculation) or an approved computer code to determine the time (SDM Validity Time) when the Xenon worth will be less negative than the Minimum Xenon Worth (MXW). Record the SDM Validity Time on Form 6.

Unit <u> 1 </u> Cycle <u> 10 </u>			
Tech Spec Reference: 4.1.1.1.1.d or 4.1.1.2.b 4.1.1.1.1.a or 4.1.1.2.a	Test Interval: 24 Hour (Periodic) 12 Hour (Conditional)	Modes Required: Mode <u>3</u> , 4 or 5	Test Performance Mode: <u>3</u> , 4, 5, or 6
Reason for Test:			
<input type="checkbox"/> X For Surveillance Credit (T.S.4.1.1.1.a) <input type="checkbox"/> G Not for Surveillance Credit	<input type="checkbox"/> G Periodic Surveillance Test <input type="checkbox"/> G Other _____		
Test Results:			
<input type="checkbox"/> G Acceptable (All Acceptance Criteria met) <input type="checkbox"/> X Unacceptable (Any Acceptance Criteria <u>NOT</u> met)			
Test Completed By: _____ <i>Signature</i> _____ <i>Date</i> _____ <i>Time</i> <div style="display: flex; justify-content: space-around;"> Test Coordinator Date Time </div>			
Second Review of Test Results:			
<input type="checkbox"/> G Acceptable (All Acceptance Criteria met) <input type="checkbox"/> G Unacceptable (Any Acceptance Criteria <u>NOT</u> met)			
Test Reviewed By: _____ _____ _____ <div style="display: flex; justify-content: space-around;"> Shift or Unit Supervisor Date Time </div>			
Plant Operations Review of Test Results(if required):			
<p><u>IF</u> test results are unacceptable, IMMEDIATELY inform the Shift Supervisor who SHALL complete the following:</p>			
Potential Reportable Occurrence	G Yes	G No	
LCO Action Statement Entered	G Yes	G No	
Corrective Action Taken: _____			
Reviewed By: _____ _____ _____ <div style="display: flex; justify-content: space-around;"> Shift Supervisor Date Time </div>			
All pages of this form and Form 2, Form 3, or Form 4 SHALL be included in the data package. The data package SHALL also include Form 5 or Form 6 if completed.			

This Form, when complete, SHALL be retained for the life of the plant.

Performers and Verifiers			
Name (Printed)	Signature	Initials	Sections Performed
Name	Signature	Initials	4.0, 5.0-5.5, 5.8, 5.9, 5.11, 5.12, 5.14-5.18

4.5 Verbal permission from the Shift Supervisor obtained to commence testing: _____
Signature
Test Coordinator

5.1 Applicable prerequisites have been met and Precautions and Notes have been read: _____
Signature
Test Coordinator

5.3 Cycle Burnup: 16,100 MWD/MTU

Minimum Loop RCS Tavg: 567 °F

of Inoperable Rods 0 Rods with incomplete insertion at > 18 Steps on DRPI
0 Rods with incomplete insertion at ≤ 18 Steps on DRPI

C_B RCS 153 ppm (20 minutes ago)
Sample Date Sample Time

5.20 Shift Supervisor notified of test completion: _____
Signature
Test Coordinator

Remarks:

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Form 3	Long Form SDM Limit Curve Method (Sample)		Page 1 of 1

Unit _____ Cycle _____

5.6.1 Plant is in Mode 3, 4 or 5: _____
Initial

5.6.2 C_B Rod = (+) _____ ppm

5.6.3

5.6.4 C_B Xenon = (+) _____ ppm

5.6.5 C_B Effective = $\frac{\text{_____}}{C_B \text{ RCS}} - \frac{\text{_____}}{C_B \text{ Rod}} + \frac{\text{_____}}{C_B \text{ Xenon}}$

C_B Effective = _____ ppm

5.6.6.1 C_B SDM Limit = _____ ppm

5.6.6.2 RCS Average Temperature _____ °F

Cycle Burnup _____ MWD/MTU

5.8 Is C_B Effective \geq C_B SDM Limit? ___ Yes ___ No

5.10 SDM Validity Time (until): _____
Date _____ Time _____

Completed By: _____

Date: _____

Verified By: _____

Date: _____

This Form, when complete, SHALL be retained for the life of the plant.

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Shutdown Margin Verification - Modes 3, 4 and 5			
Form 4	0.95 Keff Method (Sample)		Page 1 of 1

Unit _____ Cycle _____

5.7.1 Plant is in Mode 5 or 6: _____
Initial

5.7.2 C_B Effective = _____ ppm

5.7.3 C_B SDM Limit = _____ ppm

5.8 Is C_B Effective \geq C_B SDM Limit? Yes No

KEY

Completed By: _____

Date: _____

Verified By: _____

Date: _____

This Form, when complete, SHALL be retained for the life of the plant.

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Shutdown Margin Verification - Modes 3, 4 and 5			
Form 5	RCS Boron Concentration Inoperable Rod Correction (Sample)		Page 1 of 1

Unit 1 Cycle 10

	Number of Inoperable Rods (1)	Equivalent Boron per Rod (ppm/rod) (2)	Equivalent Boron (ppm) (3)
Inoperable rods with incomplete insertion at > 18 Steps on DRPI			
Inoperable rods with incomplete insertion at ≤ 18 Steps on DRPI			
RCS Boron Concentration Inoperable Rod Correction (ppm)		C_B Rod (4)	

- (1) # of inoperable rods from Form 1
- (2) Values are from Reference 7.4
- (3) Equivalent Boron is equal the Number of Inoperable Rods times the Equivalent Boron per Rod.
(3) = (1) × (2)
- (4) RCS Boron Concentration Inoperable Rod Correction (C_B Rod) is the sum of the Equivalent Boron for Inoperable rods with incomplete insertion at > 18 Steps on DRPI and Equivalent Boron for Inoperable rods with incomplete insertion at ≤ 18 Steps on DRPI.
[Sum of column (3)]

Remarks: _____

Completed By: _____

Date: _____

Verified By: _____

Date: _____

This Form, when complete, SHALL be retained for the life of the plant.

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: REVIEW COMPLETED SURVEILLANCE

JPM NO.: A3

REVISION: 1

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: REVIEW COMPLETED SURVEILLANCE

JPM No.: A3

Rev. No.: 1

Task No.: 41600, Perform Essential Cooling Water Inservice Test

STP Objective: 41600, Perform an Essential Cooling Water Pump Inservice Test in accordance with OPSP03-EW-0017, 0018, or 0019

Related K/A Reference: 2.2.12 [3.0], Knowledge of Surveillance procedures

References: OPSP03-EW-0018, Essential Cooling Water System Train B Testing

Task Normally Completed By: RO

Method of Testing: Actual Performance

Location of Testing: N/A

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 20 minutes

Required Materials (Tools/Equipment):

Calculator

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is at 100% power during a "Train B" work week. Essential Cooling Water System Train B testing per OPSP03-EW-0018 is in progress. Essential Cooling Water Pump 1B was tested per Step 5.4 of OPSP03-EW-0018.

INITIATING CUE:

Perform a Peer Check of the data collected per Step 5.4, OPSP03-EW-0018, and determine if acceptance criteria are met taking into account any errors found.

THREE errors have been inserted into the surveillance, two (2) Critical and one (1) Non-Critical. As a MINIMUM, you are to IDENTIFY both Critical errors. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

- 1) Carryover errors count as only one error (i.e., a single error that carries over from calculation to calculation or multiple line items with the same incorrect information)

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Both critical errors have been identified AND it is determined that the acceptance criteria for the test are NOT met.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

- 0PSP03-EW-0018, Essential Cooling Water System Train B Testing

NOTES:

- The examiner is provided a KEY of 0PSP03-EW-0018. Critical errors are identified on pages 29 and 66; non-critical error is identified on page 21.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1(C)*

Review the surveillance.

Standard:

Identifies the following ERRORS:

- 1) *Incorrect Bay Level Correction Factor was taken from Addendum 1 in Step 5.4.7.*
- 2)* *Flows are incorrectly totaled on Data Sheet 1*
- 3)* *Step 5.4.15.3 is incorrectly marked as "ECW Pump 1B Delta P is within Acceptable Range".*

Comment:

- * Denotes Critical Error. Error #2 causes the incorrect flow range to be used in Table 2. Error #3 indicates that the pump is operable when it is in actuality inoperable and an LCO should be entered.
- Error #1 is not critical because it does not affect the outcome of the surveillance, only makes the pump closer to the limit (but still inoperable).
- Error #2 results in incorrect calculations for average flow on Table 1, TOTAL ECW SYSTEM FLOW (step 5.4.14), and use of the incorrect flow range (step 5.4.15.1). If the applicant considers this 2 or more errors, remind him/her of Initiating Cue Assumption #2 - this is considered only 1 error.

Cue:

- After applicant finds flow calculation error, tell him/her to continue on using the new number.

STEP CONTINUED ON NEXT PAGE

JOB PERFORMANCE MEASURE CHECK SHEET

Notes:

SAT/UNSAT Performance Step: 2

Report the error to the Unit/Shift Supervisor

Standard:

Informs the Unit/Shift Supervisor of the errors found and that the acceptance criteria of the procedure are NOT met.

Comment:

Cue:

The Shift Supervisor acknowledges the report.

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: A3, REVIEW COMPLETED SURVEILLANCE

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is at 100% power during a "Train B" work week. Essential Cooling Water System Train B testing per OPSP03-EW-0018 is in progress. Essential Cooling Water Pump 1B was tested per Step 5.4 of OPSP03-EW-0018.

INITIATING CUE:

Perform a Peer Check of the data collected per Step 5.4, OPSP03-EW-0018, and determine if acceptance criteria are met taking into account any errors found.

THREE errors have been inserted into the surveillance, two (2) Critical and one (1) Non-Critical. As a MINIMUM, you are to IDENTIFY both Critical errors. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

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Essential Cooling Water System Train B Testing			
Quality	Safety-Related	Usage: IN HAND	Effective Date: 6/21/2001
C. R. Gellner	K. D. Regis	Crew 2B	Operations
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.

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Procedure Performance Data Sheet

Essential Cooling Water System Train B Testing

Unit Number: 1	Work Activity Number: 191260	-ST: 86000720
Technical Specification Reference: 3.7.4 [ITS 3.7.8] 4.0.5 [ITS 5.5.8] 4.3.2.1.1.c.7 [ITS SR 3.3.2.7.1c]		
Test Interval: Quarterly	Test Performance Allowed in Plant Modes: 1, 2, 3, 4, 5, 6 and Core Offloaded to the Spent Fuel Pool	Train Reference: B
Reason for Test: <input checked="" type="checkbox"/> Periodic Surveillance Test <input checked="" type="checkbox"/> Maintenance Work Package # 178605 <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> For Surveillance Credit <input type="checkbox"/> Not for Surveillance Credit <input type="checkbox"/> Increased Frequency Testing 		
Radiation Work Permit No.: N/A	Fire Hazard Evaluation No.: N/A	Equipment Clearance No.: N/A
Administrative Approval to Perform Test: <div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> _____ Shift Supervisor </div> <div style="width: 20%;"> Today _____ Date </div> <div style="width: 20%;"> _____ Time </div> </div>		
Test Results Review: Pump Test Results: <input type="checkbox"/> Acceptable - All data within Acceptance Criteria <input type="checkbox"/> Acceptable - Data within Alert Range (explain in Remarks Section) <input type="checkbox"/> Unacceptable - Any data NOT within Acceptance Criteria (explain in Remarks Section) Valve Test Results: <input type="checkbox"/> Acceptable - All data within Acceptance Criteria <input type="checkbox"/> Unacceptable - Any data NOT within Acceptance Criteria (explain in Remarks Section) Reviewed by: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Test Coordinator Date Time </div>		
Plant Operations Review: All data within Acceptance Criteria? <input type="checkbox"/> Yes <input type="checkbox"/> No Any pump data within Alert Range? <input type="checkbox"/> Yes <input type="checkbox"/> No ECW Train B in Service? <input type="checkbox"/> Yes <input type="checkbox"/> No Potential Reportable Occurrence? <input type="checkbox"/> Yes <input type="checkbox"/> No LCO Action Statement Entered? <input type="checkbox"/> Yes <input type="checkbox"/> No Reviewed by: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Shift Supervisor Date Time </div>		

Essential Cooling Water System Train B Testing

1.0 Purpose and Scope

- 1.1 This procedure provides instructions to demonstrate components in the Essential Cooling Water System, required to perform a specific function in shutting down the Reactor to a Cold Shutdown Condition or mitigating the consequences of an accident, are Operable per Technical Specification 4.0.5 [ITS 5.5.8] and the Unit 1/Unit 2 Pump and Valve Inservice Test Plan.
- 1.2 Satisfactory performance of Section 5.4 will partially satisfy the quarterly testing requirements of a Slave Relay Test for ECW Pump 1B(2B) per Technical Specification 4.3.2.1.1.c.7 [ITS SR 3.3.2.7.1c].
- 1.3 This procedure provides instructions to verify the following pumps are operating properly by observing that pump performance is within the allowable range of Acceptance Criteria:
- Essential Cooling Water Pump 1B(2B)
 - Essential Cooling Water Screen Wash Booster Pump 1B(2B)
- 1.4 This procedure provides instructions for verifying the following Essential Cooling Water System valves are Operable by cycling open and closed and verifying valve stroke time is within Acceptance Criteria:
- 1(2)-EW-FV-6936, ECW Blowdown Valve
 - 1(2)-EW-FV-6924, ECW Screen Wash Booster Pump 1B(2B) Discharge Valve
 - 1(2)-EW-MOV-0137, ECW Pump 1B(2B) Discharge Valve
- 1.5 This procedure provides instructions for verifying the following valves move to the fail-safe position upon loss of actuator power:
- 1(2)-EW-FV-6936, ECW Blowdown Valve
 - 1(2)-EW-FV-6924, ECW Screen Wash Booster Pump 1B(2B) Discharge Valve
- 1.6 This procedure provides instructions for verifying the following check valves will pass full design accident flow:
- 1(2)-EW-0042, ECW Pump 1B(2B) Discharge Check Valve
 - 1(2)-EW-0404, Emergency Backflush Check Valve
 - 1(2)-EW-0254, ECW Screen Wash Booster Pump 1B(2B) Discharge Check Valve

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

- 1.7 This procedure provides instructions for manual operation of Self Cleaning Strainer Emergency Backflush Valve 1(2)-EW-0278 and ECW Pump 1B(2B) Discharge Strainer Backflush Throttle Valve 1(2)-EW-0189 through at least one cycle of operation.
- 1.8 This procedure verifies that ECW Pump 1B(2B) Room Fans and dampers operate during ECW Pump 1B(2B) operation.
- 1.9 This procedure verifies the ECW Self Cleaning Strainer starts on ECW Pump Start.
- 2.0 Responsibilities
- 2.1 Test Coordinator shall ensure that the procedure revision is correct and that all applicable Field Changes are incorporated.
- 2.2 Shift Supervisor shall grant permission for performance of this test.
- 2.3 This procedure shall be performed by Plant Operations.
- 2.4 WHEN " ____ " (blank) follows a step, THEN the performer shall enter initials to verify step completion.
- 2.5 Plant Performance personnel may perform the vibration monitoring portion of this procedure on the ECW Pump.
- 2.6 Plant Performance personnel may perform the vibration-monitoring portion of this procedure for the ECW Screen Wash Booster Pump (ECWSWBP).
- 2.7 I&C Maintenance shall perform venting of the ECW System flow instruments.

NOTE

After completion, procedure routing is per 0PGP03-ZE-0004, Plant Surveillance Program, and 0PGP03-ZA-0055, Plant Surveillance Scheduling.

- 2.8 The following shall review the test results:
- Test Coordinator
 - Shift Supervisor
 - Division Surveillance Coordinator
 - Section XI Coordinator

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

3.0 Precautions and Notes

3.1 IF one of the following occurs during performance of this test, THEN suspend the test AND restore Essential Cooling Water System to normal.

- Safety Injection Signal
- Loss of Offsite Power

3.2 IF either of the following conditions occur during testing of the ECW Pump, THEN suspend performance of the test until the condition is restored to the pre-test condition AND the Essential Cooling System is stabilized prior to continuing:

- Automatic start of the ECW Screen Wash Booster Pump
- Increasing temperatures from components supplied with ECW which may be an indication of inadequate ECW flow

3.3 IF during performance of this test, the ECW Self Cleaning Strainer differential pressure exceeds 5 psid as indicated by a Plant Computer alarm OR local indication on 1(2)-EW-PDI-6869, THEN the following shall be performed:

- Suspend testing
- Open 1(2)-EW-0189
- Start ECW Self Cleaning Strainer

3.3.1 WHEN strainer differential pressure is <5 psid, THEN perform the following:

- Stop the ECW Self Cleaning Strainer
- Close 1(2)-EW-0189
- Resume testing

3.4 This procedure should be reviewed in its entirety prior to performing the test.

KEY

Essential Cooling Water System Train B Testing

3.5 Specific Reference Values incorporated in this procedure were obtained for the respective equipment on the following dates:



<u>Component Description</u>	<u>Reference Value Date</u>
Essential Cooling Water Pump 1B	10-14-00
ECW Screen Wash Booster Pump 1B	05-31-94
Essential Cooling Water Pump 2B	05-09-97
ECW Screen Wash Booster Pump 2B	08-03-94

- 3.6 Essential Cooling Water System flows from QDPS are indicated on QDPS Detail Data Menu Page 9.
- 3.7 Communications between the Control Room, ECW Intake Structure, and CCW Heat Exchanger Room shall be maintained during testing in which valves or control switches are **NOT** in normal alignment.
- 3.8 Valves subject to testing shall be closed/opened by normal operation and without preliminary or subsequent exercising or adjustments. Tightening of a valve by manual means after operation of a valve operator, cycling a valve to improve leakage or stroke time performance, and mechanical agitation (tapping) of valves are examples of activities **NOT** allowed. (Ref. 7.4.4)
- 3.9 In order to ensure an air operated valve has sufficient time to reach normal air pressure prior to stroke timing the valve, approximately 2 minutes should have elapsed since the valve was last stroked.
- 3.10 IF the Essential Chillers are in Cold Weather alignment OR a Chiller is Inoperable with the Chiller Train maintained Operable, THEN it will be necessary to use 0POP02-CH-0005, Essential Chiller Operation, to ensure 1(2)-EW-3016, 1(2)-EW-3019, or 1(2)-EW-1003 are properly restored to their AS FOUND position in Section 5.6.
- 3.11 IF testing is performed with an Inoperable Essential Chiller with the Chiller Train maintained Operable, THEN this test **SHALL** be reperformed when the Inoperable chiller is restored.



This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

- 3.12 The Valve Database, as referred to in this procedure, is the **currently approved** database used by Plant Operations to determine required valve positions. As of the Effective Date of this procedure, the ECO Database is the currently approved database. Future plans are a database within the Station MED system.
- 3.13 IF a discrepancy is found between AS FOUND position and REQUIRED POSITION as directed by a Step in this procedure, THEN the Shift Supervisor SHALL be notified to determine system/component operability or reportability status.
- 3.14 This procedure verifies the fail-safe position of valves 1(2)-EW-FV-6924 and 1(2)-EW-FV-6936.
- 3.14.1 Special timing of valves is **NOT** required since full stroke valve exercising in this procedure will de-energize the valves that have fail-safe positions.
- 3.14.2 The Solenoid valves tested in this procedure are spring loaded to vent air from air operated valve when the solenoid is de-energized.
- 3.15 IF the Essential Cooling Water System is shutdown, THEN testing of valves in Section 5.11 may be performed prior to starting the ECW Pump.
- 3.16 Acceptance Criteria steps are annotated with the letters **AC** in the left margin preceding the step.
- 3.17 IF this procedure can **NOT** be performed as written, THEN the procedure performer shall stop and immediately notify the Shift Supervisor.
- 3.18 IF any ECW Pump or ECW Screen Wash Booster Pump parameter falls in the Alert Range, THEN calibration of the affected instruments may be performed and the pump may be retested.
- 3.19 IF a valve with measured stroke times **DOES NOT** meet Acceptance Criteria **AND DOES NOT** exceed limiting values per Reference 7.8.3, THEN the valve **SHALL** be immediately retested OR declared inoperable per 0PGP03-ZE-0021, Inservice Testing Program for Valves. An Engineering evaluation **SHALL** be performed for each retested valve.
- 3.20 IF this procedure is terminated for any reason, THEN immediately notify the Shift Supervisor.
- 3.21 IF any Acceptance Criteria are **NOT** met, THEN immediately notify the Shift Supervisor **AND** document failure per 0PGP03-ZE-0004, Plant Surveillance Program.

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

4.0 Prerequisites

- 4.1 Ensure procedure revision is correct and all applicable Field Changes are incorporated. AC
- 4.2 This procedure may be performed in any Mode. Record the current plant Mode:

Mode I AC
- 4.3 Review Operability Assessment System (OAS) to ensure no equipment is out of service that could conflict with test completion or cause unexpected multiple trains to be inoperable while performing this test. AC
- 4.4 IF testing is to be performed with an Inoperable Essential Chiller with the Chiller Train maintained Operable, THEN ensure an OAS entry is entered to reperform testing once the chiller is restored. N/A
- 4.5 Essential Cooling Water System Train B is in operation or available for operation per 0POP02-EW-0001, Essential Cooling Water Operation. AC
- 4.6 Verify I&C Maintenance personnel are available for performance of instrument venting. AC
- 4.7 Verify qualified personnel are available for performance of ECW Pump vibration measurement. AC
- 4.8 For ECW pump testing, obtain the following test instrumentation:
 - Test Gage with a range of 0 to 100 psig with an accuracy of $\pm 0.1\%$ of full scale to measure ECW Pump 1B(2B) discharge pressure. (Ref. 7.4.2) AC
 - A vibration instrument with an accuracy $\pm 5\%$ of full scale to measure vibration velocity in in/sec. AC
- 4.9 For ECW Screen Wash Booster Pump testing, obtain the following test instrumentation:
 - A vibration instrument with an accuracy $\pm 5\%$ of full scale to measure vibration velocity in in/sec. AC
- 4.10 For any valve timing, obtain a calibrated stopwatch accurate to $\pm 1\%$. AC

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY

4.11 Ensure ECW System pumps to be operated are inspected and acceptable for operation per the criteria established in 0POP01-ZQ-0022, Plant Operations Shift Routines.

- Essential Cooling Water Pump 1B(2B) AC
- ECW Screen Wash Booster Pump 1B(2B) AC

4.12 IF this procedure is being performed to demonstrate post-maintenance operability OR increased frequency testing of an Essential Cooling Water System component, THEN N/A the applicable subsection(s) for the component(s) **NOT** being tested, OTHERWISE N/A this step. N/A

4.13 Evaluate current plant conditions and note in the Remarks Section of the PPDS any changes in Work Risk Assessment due to special plant conditions. AC

Work Risk Assessment by Plant Mode

Reactor Trip Potential:

Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	No Mode
NONE						

Turbine Trip Potential:

Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	No Mode
NONE						

ESF Actuation Potential:

Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	No Mode
LOW						

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY

4.14 Record the following or "N/A", as applicable, on the PPDS:

- Unit Number
- Work Activity Number
- Surveillance Test (ST) Number(s)
- Reason for Test
- M&TE Data for vibration instrument
- M&TE Data for 0-100 psig test gage
- M&TE Data for stopwatch

AC

4.15 Notify the Shift Supervisor to review Technical Specifications LCO 3.7.4 [ITS 3.7.8] and LCOs for systems affected by ECW for action requirements prior to performing this surveillance.

AC

4.16 Obtain Shift Supervisor signature on PPDS for administrative approval to perform test.

AC

KEY

Essential Cooling Water System Train B Testing

5.0 Procedure

KEY
5.1 Preparations

- 5.1.1 Ensure Prerequisites Section has been completed and Precautions and Notes Section has been read. AC
- 5.1.2 Conduct a prejob briefing, including any changes in Work Risk Assessment as noted in the Remarks Section of the PPDS. AC
- 5.1.3 Ensure Control Room Logbook entry documents the commencement of this surveillance test. AC
- 5.1.4 Ensure personnel performing sections of this test have locked valve keys. Keys are required for testing the following:
 - Sections 5.3, 5.4, and 5.5 for testing 1(2)-EW-0404, -0278, -0042 and ECW Pump testing requires key for "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". AC
 - Section 5.5 for testing 1(2)-EW-0042 requires key for "1(2)-EW-0064 CCW HEAT EXCHANGER 1B(2B) ECW RETURN THROTTLE VALVE" AC
- 5.1.5 IF ECW Pump inservice testing is to be performed, THEN install Test Gage for ECW Pump 1B(2B) discharge pressure as follows, OTHERWISE mark this step as N/A: {ECWIS, Room 105(102)} (Ref. 7.4.1, 7.4.2)
 - 5.1.5.1 Install 0-100 psig Test Gage at test connection for "1(2)-EW-PI-6885 ECW PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR". AC
 - 5.1.5.2 Verify Test Gage is installed at the same elevation as "1(2)-EW-PI-6885 ECW PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR". AC

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY

5.2 Essential Cooling Water Pump 1B(2B) Startup

5.2.1 IF ECW Pump 1B(2B) is shutdown, THEN perform the following, OTHERWISE GO TO Step 5.2.2:

NOTE

IF ECW Pump room temperature is high, THEN the ECW Pump room fan will restart after being shutdown with handswitch in "AUTO" AND Step 5.2.1.1 will be marked N/A.

5.2.1.1 IF ECW Pump 1B(2B) room fan(s) running, THEN stop running fan(s) AND ensure handswitches in "AUTO": {CP022}

- "RM 105 FAN 11B HZ-VFN003 (RM 102 FAN 21B HZ-VFN003)" N/A

- "RM 105 FAN 12B HZ-VFN004 (RM 102 FAN 22B HZ-VFN004)" N/A

NOTE

ECW Screen Wash Booster Pump and Traveling Screens may start on high differential pressure when the ECW Pump is started.

5.2.1.2 Start ECW Pump 1B(2B) per 0POP02-EW-0001, Essential Cooling Water Operation. N/A

5.2.1.3 IF ECW Screen Wash Booster Pump and Traveling Screen 1B(2B) start, THEN perform the following, OTHERWISE mark the following N/A: {CP002}

- a. Approximately 4 minutes after ECW Pump start, ensure the "TRAV SCR N 1B(2B)" stops. N/A

- b. Stop "SCR N WASH PUMP 1B(2B)". N/A

5.2.2 Verify "ECW SELF CLEANING STRAINER 1B(2B)" is running. {ECWIS, MCC E1B3(E2B3)/C1} AC

KEY

Essential Cooling Water System Train B Testing

NOTE

IF ECWIS fans fail to operate OR ventilation dampers fail to open, THEN the Shift Supervisor shall be notified and an entry made in the Remarks Section of the PPDS.

5.2.3 Verify ECWIS ventilation operation as follows: {CP022}

5.2.3.1 ECWIS fans started on ECW Pump start OR are operating with ECW Pump running:

- "RM 105 FAN 11B HZ-VFN003 (RM 102 FAN 21B HZ-VFN003)" AC
- "RM 105 FAN 12B HZ-VFN004 (RM 102 FAN 22B HZ-VFN004)" AC

5.2.3.2 ECWIS intake and exhaust dampers are OPEN:

- "INTAKE FV-9895" AC
- "EXHAUST FV-9895A" AC

KEY

Essential Cooling Water System Train B Testing

KEY

NOTE

Steps 5.2.4 and 5.2.5 may be performed concurrently. IF ECW Screen Wash Booster Pump is to be tested, THEN Steps 5.2.4, 5.2.5, 5.7.6, and 5.7.7 may be performed concurrently.

5.2.4 Request I&C Maintenance vent the following instruments:

- Test gage installed at "1(2)-EW-PI-6885 ECW PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR".
{ECWIS Room 105(102)} IC
- "1(2)-EW-FI-6948 ECW PUMP 1B(2B) LUBE WATER FLOW INDICATOR" {ECWIS Room 105(102)} IC
- "1(2)-EW-FT-6863 CCW HEAT EXCHANGER 1B(2B) ECW RETURN FLOW TRANSMITTER"
{26' MAB, Room 106} IC
- "1(2)-EW-FT-6866 CCW PUMP SUPPLEMENTAL COOLER 11B(21B) ECW RETURN FLOW TRANSMITTER" {10' MAB Room 067E} IC
- "1(2)-EW-FT-6905 ESSENTIAL CHILLER 12B(22B) ECW RETURN FLOW TRANSMITTER" {10' MAB Room 067E} IC
- "1(2)-EW-FT-6864 ESSENTIAL CHILLER 11B(21B) ECW RETURN FLOW TRANSMITTER" {10' MAB Room 067E} IC
- "1(2)-EW-FT-6865 DIESEL GENERATOR #12(#22) ECW RETURN FLOW TRANSMITTER" {29' DGB, Room 002} IC

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY

5.2.5 IF ECW from Essential Chillers is in Cold Weather alignment, THEN request I&C Maintenance vent the bypass flow indicator(s) for the OPERABLE chiller(s) AND mark the inoperable chiller bypass flow indicator as N/A, OTHERWISE N/A this step.

- “1(2)-EW-FI-6864C ESSENTIAL CHILLER 11B(21B)”
“ECW OUTLET BYPASS FLOW INDICATOR”
{ 10’ MAB, Room 067E} N/A
- “1(2)-EW-FI-6905C ESSENTIAL CHILLER 12B(22B)”
“ECW OUTLET BYPASS FLOW INDICATOR”
{ 10’ MAB, Room 067E} N/A

5.2.6 Station operators and establish communications between the following locations:

- Control Room
- ECW Pump 1B(2B) Room 105(102) at the ECWIS
- CCW Heat Exchanger Room 26' MAB, Room 106
(if needed) AC

KEY

Essential Cooling Water System Train B Testing

5.3 Testing Emergency Backflush Valves 1(2)-EW-0278 and 1(2)-EW-0404 (Ref. 7.4.5)

- 5.3.1 Verify flow through the discharge strainer emergency backflush line is less than or equal to ½ of pipe diameter. (On ECW Pond side of ECWIS) AC
- 5.3.2 Record AS FOUND position of "1(2)-EW-0278 ECW PUMP 1B(2B) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE" in Step 5.6.3. {ECWIS, Room 105(102)} AC
- AC 5.3.3 Open "1(2)-EW-0278 ECW PUMP 1B(2B) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE". {ECWIS Room 105(102)} AC
- 5.3.4 Record REQUIRED POSITION, including the throttled position and lock status, of "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE" from Valve Database here AND in Step 5.6.3. {ECWIS, Room 105(102)}

REQUIRED POSITION LIP 4 ¼ TURNS OPEN AC
- 5.3.5 WHEN Step 5.3.7 is performed, THEN RECORD the AS FOUND position of "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". {ECWIS, Room 105(102)}

AS FOUND LIP 4 ¼ TURNS OPEN AC
- 5.3.6 IF the REQUIRED POSITION recorded in Step 5.3.4 AND the AS FOUND position recorded in Step 5.3.5 are different, THEN NOTIFY the Shift Supervisor, OTHERWISE N/A this Step. N/A
- AC 5.3.7 Unlock and close "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". AC
- AC 5.3.8 Verify flow through the discharge strainer emergency backflush line increases to full pipe diameter. (On ECW Pond side of ECWIS) AC
- AC 5.3.9 Close "1(2)-EW-0278 ECW PUMP 1B(2B) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE". {ECWIS, Room 105(102)} AC
- 5.3.10 Verify flow through the discharge strainer emergency backflush line returned to less than or equal to ½ of pipe diameter. (On ECW Pond side of ECWIS) AC

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

5.4 Testing Essential Cooling Water Pump 1B(2B)

NOTE

Placing ECW Self Cleaning Strainer handswitch in "STOP" will cause ESF Status Monitoring Lampbox 2M22 BYP/INOP "ECW STRN 1B(2B)" to alarm.

5.4.1 Remove ECW Self Cleaning Strainer 1B(2B) from service by placing "ECW SELF CLEANING STRAINER 1B(2B)" handswitch in "STOP". {ECWIS, MCC E1B3(E2B3)/C1} AC

5.4.2 IF ECW Self Cleaning Strainer 1B(2B) Normal Backflush is in service, THEN perform the following, OTHERWISE mark the following as N/A:

5.4.2.1 Record REQUIRED POSITION, including the throttled position and lock status, of "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE" from Valve Database here AND in Step 5.6.3. {ECWIS, Room 105(102)}

REQUIRED POSITION _____ N/A

5.4.2.2 WHEN Step 5.4.2.4 is performed, THEN RECORD the AS FOUND position, including the throttled position and lock status, of "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". {ECWIS, Room 105(102)}

AS FOUND _____ N/A

5.4.2.3 IF the REQUIRED POSITION recorded in Step 5.4.2.1 AND the AS FOUND position recorded in Step 5.4.2.2 are different, THEN NOTIFY the Shift Supervisor, OTHERWISE N/A this Step. N/A

AC

5.4.2.4 Close "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". {ECWIS, Room 105(102)}

N/A

Essential Cooling Water System Train B Testing

KEY

5.4.3 IF the 300 Ton Chiller is Inoperable in Modes 1-4, THEN perform the following, OTHERWISE N/A this step: (MAB 10', Room 067E)

5.4.3.1 Record AS FOUND position of "1(2)-EW-1003 ESSENTIAL CHILLER 11B(21B) ECW RETURN VALVE" in Step 5.6.4. N/A

5.4.3.2 Ensure "1(2)-EW-1003 ESSENTIAL CHILLER 11B(21B) ECW RETURN VALVE" throttled to achieve between 235 and 693 gpm. N/A

5.4.4 RECORD the start time of the 5 minute system stabilization period.
0145 AC

5.4.5 WHEN at least 5 minutes have passed, THEN record the end time of the 5 minute system stabilization period.
0152 AC

NOTE

- Actual indicated ECW Pump Bay Level should be recorded and **NOT** corrected for elevation.
- Normal ECW Pump Bay Level is 15.5 to 16.0 feet.

5.4.6 Record ECW Pump Bay Level "BAY LVL LI-6921": {CP002}
ECW Pump Bay Level 15.9 feet (LI-6921) AC

5.4.7 Using ECW Pump Bay Level recorded in Step 5.4.6 and Addendum 1, Essential Cooling Water Pump Bay Level Correction Factor, record the Bay Level Correction Factor for ECW Pump 1B(2B):
Bay Level Correction Factor 4.4 psig AC

5.4.8 Record ECW Pump 1B(2B) discharge pressure from 0-100 psig Test Gage at test connection for "1(2)-EW-PI-6885 ECW PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR".
ECW Pump Discharge Pressure 50.4 psig AC

Non-Critical Error:
Correct value is **4.3**

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

NOTE

The Bay Level Correction Factor value is ADDED to the ECW pump discharge pressure to compensate for the difference in the discharge pressure reading (as measured at centerline of the ECW pump horizontal discharge piping) and actual discharge pressure at the outlet of the ECW pump impeller (minus the suction pressure that is derived from bay level). (Reference: Addendum 1, Essential Cooling Water Pump Bay Level Correction Factor)

5.4.9 Calculate ECW Pump 1B(2B) Delta P using the following formula:

$$\frac{50.4}{\text{Disch Press (Step 5.4.8)}} \text{ psig} + \frac{4.4}{\text{Bay Level Corr Factor (Step 5.4.7)}} \text{ psig} = \frac{54.8}{\text{Delta P}} \text{ psig} \quad \underline{AC}$$

Errors carried forward

5.4.10 Record ECW flow from the following components in Table 1 (ECW System Flow):

- ECW Pump Lube Water flow from 1(2)-EW-FI-6948, {ECWIS} AC
- Flow to CCW Pump Supplementary Cooler "TRN B FT 6866" (QDPS) AC
- ECW Flow to "ESF DG 12(22) FT 6865" (QDPS) AC

5.4.11 Record ECW flow from Essential Chillers in Table 1 (ECW System Flow) AND mark step **NOT** performed as N/A:

5.4.11.1 IF ECW from Essential Chillers is in normal alignment AND both chillers are OPERABLE, THEN record the following in Table 1:

- "TRN B CHLR 11B(21B) FT 6864" (QDPS) AC
- "TRN B CHLR 12B(22B) FT 6905" (QDPS) AC

KEY

Essential Cooling Water System Train B Testing

KEY

NOTE

IF both Essential Chillers are OPERABLE, THEN Steps 5.4.11.2, 5.4.11.3, 5.4.11.4, and 5.6.4 will be marked as N/A.

5.4.11.2 IF ECW from Essential Chillers is in Cold Weather alignment, THEN perform the following:
(MAB 10', Room 067E)

a. Record AS FOUND position of ECW return bypass valve from INOPERABLE Essential Chiller in Step 5.6.4 AND mark OPERABLE chiller valve as N/A:

- "1(2)-EW-3016 ESSENTIAL CHILLER 11B(21B) ECW RETURN BYPASS ISOLATION VALVE" N/A
- "1(2)-EW-3019 ESSENTIAL CHILLER 12B(22B) ECW RETURN BYPASS ISOLATION VALVE" N/A

b. Close ECW return bypass valve from INOPERABLE Essential Chiller AND mark OPERABLE chiller valve as N/A:

- "1(2)-EW-3016 ESSENTIAL CHILLER 11B(21B) ECW RETURN BYPASS ISOLATION VALVE" N/A
- "1(2)-EW-3019 ESSENTIAL CHILLER 12B(22B) ECW RETURN BYPASS ISOLATION VALVE" N/A

KEY

Essential Cooling Water System Train B Testing

KEY

c. Record ECW flow from OPERABLE Essential Chiller(s) in Table 1: ECW System Flow AND mark INOPERABLE chiller flow as N/A:

- "1(2)-EW-FI-6864C ESSENTIAL CHILLER 11B(21B) ECW RETURN BYPASS FLOW INDICATOR" N/A

- "1(2)-EW-FI-6905C ESSENTIAL CHILLER 12B(22B) ECW RETURN BYPASS FLOW INDICATOR" N/A

5.4.11.3 IF the 150 Ton Chiller is INOPERABLE in Modes 1-4 OR either chiller INOPERABLE in Modes 5-6, THEN perform the following: (MAB 10', Room 067E)

a. Record AS FOUND position of ECW return bypass valve from INOPERABLE Essential Chiller in Step 5.6.4 AND mark OPERABLE chiller valve as N/A:

- "1(2)-EW-3016 ESSENTIAL CHILLER 11B(21B) ECW RETURN BYPASS ISOLATION VALVE" N/A

- "1(2)-EW-3019 ESSENTIAL CHILLER 12B(22B) ECW RETURN BYPASS ISOLATION VALVE" N/A

b. Close ECW return bypass valve from INOPERABLE Essential Chiller AND mark OPERABLE chiller valve as N/A:

- "1(2)-EW-3016 ESSENTIAL CHILLER 11B(21B) ECW RETURN BYPASS ISOLATION VALVE" N/A

- "1(2)-EW-3019 ESSENTIAL CHILLER 12B(22B) ECW RETURN BYPASS ISOLATION VALVE" N/A

KEY

Essential Cooling Water System Train B Testing

KEY

- c. Record ECW flow from OPERABLE Essential Chiller(s) in Table 1: ECW System Flow AND mark INOPERABLE chiller flow as N/A:
 - "TRN B CHLR 11B(21B) FT 6864" (QDPS) N/A
 - "TRN B CHLR 12B(22B) FT 6905" (QDPS) N/A

- 5.4.11.4 IF the 300 Ton Chiller is Inoperable in Modes 1-4, THEN record ECW flow from the 150 Ton Essential Chiller in Table 1: ECW System Flow AND mark INOPERABLE chiller flow as N/A:
 - "TRN B CHLR 11B(21B) FT 6864" (QDPS) N/A

- 5.4.12 Determine ECW flow from CCW Heat Exchanger 1B(2B) as follows:
 - 5.4.12.1 Record ECW flow from CCW Heat Exchanger 1B(2B) QDPS "TRN B FT6863" on Data Sheet 1 (Essential Cooling Water Flow from CCW Heat Exchanger) at approximately 30 second intervals until 21 flows have been recorded. (Detail Data Menu Page 9) AC
 - 5.4.12.2 After 21 flows have been recorded, then add the individual flows and record total on Data Sheet 1. AC
 - 5.4.12.3 Calculate and record the average ECW Flow from CCW Heat Exchanger in AVERAGE block of Data Sheet 1. AC
 - 5.4.12.4 Sign and Date Performance of Data Sheet 1. AC

KEY

Essential Cooling Water System Train B Testing

KEY

- 5.4.13 Record the AVERAGE ECW Flow from CCW Heat Exchanger from Data Sheet 1 in Table 1, ECW System Flow. AC
- 5.4.14 Calculate and record Total ECW System Flow in Table 1, ECW System Flow. AC

Table 1: ECW System Flow

Component	ECW Flow	Units
ECW Pump 1B(2B) Lube Water	11.7	gpm
ECW Flow to Essen Chlr 11B(21B)	639	gpm
ECW Flow to Essen Chlr 12B(22B)	1236	gpm
ECW Flow to CCW Pump Cooler	45	gpm
ECW Flow to ESF DG 12(22)	1694	gpm
ECW Flow to CCW HX (AVERAGE from Data Sheet 1)	13802.1	gpm
TOTAL ECW SYSTEM FLOW =	17427.8	gpm

Error Carried Forward
Correct value: 13302.1 gpm

Error Carried Forward
Correct value: 16927.8 gpm

- 5.4.15 IF performing this test in **Unit 1**, THEN perform the following, OTHERWISE N/A Steps 5.4.15.1 through 5.4.15.7:
 - 5.4.15.1 Determine ECW Total Flow Range of Table 2: ECW Pump 1B Reference Values, for the Total ECW System Flow recorded in Table 1: ECW System Flow.

ECW Total Flow Range 17400-17449 gpm AC
 - 5.4.15.2 Record ECW Pump 1B Delta P from Step 5.4.9 in Table 2: ECW Pump 1B Reference Values, at the corresponding ECW Total Flow Range determined in Step 5.4.15.1. AC

Error Carried Forward
Correct range: 16900 - 16949

KEY

Essential Cooling Water System Train B Testing

Table 2: ECW Pump 1B Reference Values

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
15,700-15,749	63.0		dP< 58.6	58.6 ≤dP< 59.8	59.8 ≤dP≤ 69.3	dP> 69.3
15,750-15,799	62.8		dP< 58.4	58.4 ≤dP< 59.7	59.7 ≤dP≤ 69.1	dP> 69.1
15,800-15,849	62.6		dP< 58.3	58.3 ≤dP< 59.5	59.5 ≤dP≤ 68.9	dP> 68.9
15,850-15,899	62.5		dP< 58.1	58.1 ≤dP< 59.3	59.3 ≤dP≤ 68.7	dP> 68.7
15,900-15,949	62.3		dP< 57.9	57.9 ≤dP< 59.2	59.2 ≤dP≤ 68.5	dP> 68.5
15,950-15,999	62.1		dP< 57.8	57.8 ≤dP< 59.0	59.0 ≤dP≤ 68.4	dP> 68.4
16,000-16,049	62.0		dP< 57.6	57.6 ≤dP< 58.9	58.9 ≤dP≤ 68.2	dP> 68.2
16,050-16,099	61.8		dP< 57.5	57.5 ≤dP< 58.7	58.7 ≤dP≤ 68.0	dP> 68.0
16,100-16,149	61.6		dP< 57.3	57.3 ≤dP< 58.6	58.6 ≤dP≤ 67.8	dP> 67.8
16,150-16,199	61.5		dP< 57.2	57.2 ≤dP< 58.4	58.4 ≤dP≤ 67.6	dP> 67.6
16,200-16,249	61.3		dP< 57.0	57.0 ≤dP< 58.2	58.2 ≤dP≤ 67.4	dP> 67.4
16,250-16,299	61.1		dP< 56.9	56.9 ≤dP< 58.1	58.1 ≤dP≤ 67.3	dP> 67.3
16,300-16,349	61.0		dP< 56.7	56.7 ≤dP< 57.9	57.9 ≤dP≤ 67.1	dP> 67.1
16,350-16,399	60.8		dP< 56.6	56.6 ≤dP< 57.8	57.8 ≤dP≤ 66.9	dP> 66.9
16,400-16,449	60.6		dP< 56.4	56.4 ≤dP< 57.6	57.6 ≤dP≤ 66.7	dP> 66.7
16,450-16,499	60.5		dP< 56.2	56.2 ≤dP< 57.5	57.5 ≤dP≤ 66.5	dP> 66.5
16,500-16,549	60.3		dP< 56.1	56.1 ≤dP< 57.3	57.3 ≤dP≤ 66.3	dP> 66.3
16,550-16,599	60.2		dP< 55.9	55.9 ≤dP< 57.1	57.1 ≤dP≤ 66.2	dP> 66.2
16,600-16,649	60.0		dP< 55.8	55.8 ≤dP< 57.0	57.0 ≤dP≤ 66.0	dP> 66.0
16,650-16,699	59.8		dP< 55.7	55.7 ≤dP< 56.9	56.9 ≤dP≤ 65.9	dP> 65.9
16,700-16,749	59.7		dP< 55.6	55.6 ≤dP< 56.8	56.8 ≤dP≤ 65.8	dP> 65.8
16,750-16,799	59.5		dP< 55.5	55.5 ≤dP< 56.7	56.7 ≤dP≤ 65.6	dP> 65.6
16,800-16,849	59.3		dP< 55.4	55.4 ≤dP< 56.6	56.6 ≤dP≤ 65.5	dP> 65.5
16,850-16,899	59.2		dP< 55.3	55.3 ≤dP< 56.5	56.5 ≤dP≤ 65.4	dP> 65.4
16,900-16,949	59.0	54.7	dP< 54.9	54.9 ≤dP< 56.0	56.0 ≤dP≤ 64.9	dP> 64.9
16,950-16,999	58.8		dP< 54.7	54.7 ≤dP< 55.9	55.9 ≤dP≤ 64.7	dP> 64.7
17,000-17,049	58.7		dP< 54.6	54.6 ≤dP< 55.7	55.7 ≤dP≤ 64.5	dP> 64.5
17,050-17,099	58.5		dP< 54.4	54.4 ≤dP< 55.6	55.6 ≤dP≤ 64.4	dP> 64.4
17,100-17,149	58.4		dP< 54.3	54.3 ≤dP< 55.4	55.4 ≤dP≤ 64.2	dP> 64.2
17,150-17,199	58.2		dP< 54.1	54.1 ≤dP< 55.3	55.3 ≤dP≤ 64.0	dP> 64.0

Correct range for Delta P:
Test Delta P is within the
Required Action Low

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

Table 2: ECW Pump 1B Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
17,200-17,249	58.0		dP< 54.0	54.0 ≤dP< 55.1	55.1 ≤dP≤ 63.9	dP> 63.9
17,250-17,299	57.9		dP< 53.8	53.8 ≤dP< 55.0	55.0 ≤dP≤ 63.7	dP> 63.7
17,300-17,349	57.7		dP< 53.7	53.7 ≤dP< 54.8	54.8 ≤dP≤ 63.5	dP> 63.5
17,350-17,399	57.6		dP< 53.5	53.5 ≤dP< 54.7	54.7 ≤dP≤ 63.3	dP> 63.3
17,400-17,449	57.4	54.8	dP< 53.4	53.4 ≤dP< 54.6	54.6 ≤dP≤ 63.2	dP> 63.2
17,450-17,499	57.3		dP< 53.3	53.3 ≤dP< 54.4	54.4 ≤dP≤ 63.0	dP> 63.0
17,500-17,549	57.1		dP< 53.1	53.1 ≤dP< 54.3	54.3 ≤dP≤ 62.8	dP> 62.8
17,550-17,599	57.0		dP< 53.0	53.0 ≤dP< 54.2	54.1 ≤dP≤ 62.6	dP> 62.6
17,600-17,649	56.8		dP< 52.9	52.9 ≤dP< 54.1	54.0 ≤dP≤ 62.5	dP> 62.5
17,650-17,699	56.6		dP< 52.8	52.8 ≤dP< 54.0	53.8 ≤dP≤ 62.3	dP> 62.3
17,700-17,749	56.5		dP< 52.5	52.5 ≤dP< 53.7	53.7 ≤dP≤ 62.1	dP> 62.1
17,750-17,799	56.3		dP< 52.4	52.4 ≤dP< 53.5	53.5 ≤dP≤ 62.0	dP> 62.0
17,800-17,849	56.2		dP< 52.2	52.2 ≤dP< 53.4	53.4 ≤dP≤ 61.8	dP> 61.8
17,850-17,899	56.0		dP< 52.1	52.1 ≤dP< 53.2	53.2 ≤dP≤ 61.6	dP> 61.6
17,900-17,949	55.9		dP< 51.9	51.9 ≤dP< 53.1	53.1 ≤dP≤ 61.4	dP> 61.4
17,950-17,999	55.7		dP< 51.8	51.8 ≤dP< 52.9	52.9 ≤dP≤ 61.3	dP> 61.3
18,000-18,049	55.5		dP< 51.7	51.7 ≤dP< 52.8	52.8 ≤dP≤ 61.1	dP> 61.1
18,050-18,099	55.4		dP< 51.5	51.5 ≤dP< 52.6	52.6 ≤dP≤ 60.9	dP> 60.9
18,100-18,149	55.2		dP< 51.4	51.4 ≤dP< 52.5	52.5 ≤dP≤ 60.8	dP> 60.8
18,150-18,199	55.1		dP< 51.2	51.2 ≤dP< 52.3	52.3 ≤dP≤ 60.6	dP> 60.6
18,200-18,249	54.9		dP< 51.1	51.1 ≤dP< 52.2	52.2 ≤dP≤ 60.4	dP> 60.4
18,250-18,299	54.8		dP< 50.9	50.9 ≤dP< 52.0	52.0 ≤dP≤ 60.2	dP> 60.2
18,300-18,349	54.6		dP< 50.8	50.8 ≤dP< 51.9	51.9 ≤dP≤ 60.1	dP> 60.1
18,350-18,399	54.4		dP< 50.6	50.6 ≤dP< 51.7	51.7 ≤dP≤ 59.9	dP> 59.9
18,400-18,449	54.3		dP< 50.5	50.5 ≤dP< 51.6	51.6 ≤dP≤ 59.7	dP> 59.7
18,450-18,499	54.1		dP< 50.3	50.3 ≤dP< 51.4	51.4 ≤dP≤ 59.5	dP> 59.5
18,500-18,549	54.0		dP< 50.2	50.2 ≤dP< 51.3	51.3 ≤dP≤ 59.4	dP> 59.4
18,550-18,599	53.8		dP< 50.1	50.1 ≤dP< 51.1	51.1 ≤dP≤ 59.2	dP> 59.2
18,600-18,649	53.7		dP< 49.9	49.9 ≤dP< 51.0	51.0 ≤dP≤ 59.0	dP> 59.0
18,650-18,699	53.5		dP< 49.8	49.8 ≤dP< 50.8	50.8 ≤dP≤ 58.9	dP> 58.9

Error Carried Forward
Places test incorrectly in
Acceptable Range



Essential Cooling Water System Train B Testing

Table 2: ECW Pump 1B Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
18,700-18,749	53.4		dP< 49.6	49.6 ≤dP< 50.7	50.7 ≤dP≤ 58.7	dP> 58.7
18,750-18,799	53.2		dP< 49.5	49.5 ≤dP< 50.5	50.5 ≤dP≤ 58.5	dP> 58.5
18,800-18,849	53.0		dP< 49.3	49.3 ≤dP< 50.4	50.4 ≤dP≤ 58.3	dP> 58.3
18,850-18,899	52.9		dP< 49.2	49.2 ≤dP< 50.2	50.2 ≤dP≤ 58.2	dP> 58.2
18,900-18,949	52.7		dP< 49.0	49.0 ≤dP< 50.1	50.1 ≤dP≤ 58.0	dP> 58.0
18,950-18,999	52.6		dP< 48.9	48.9 ≤dP< 49.9	49.9 ≤dP≤ 57.8	dP> 57.8
19,000-19,049	52.4		dP< 48.7	48.7 ≤dP< 49.8	49.8 ≤dP≤ 57.7	dP> 57.7
19,050-19,099	52.3		dP< 48.6	48.6 ≤dP< 49.6	49.6 ≤dP≤ 57.5	dP> 57.5
19,100-19,149	52.1		dP< 48.5	48.5 ≤dP< 49.5	49.5 ≤dP≤ 57.3	dP> 57.3
19,150-19,199	51.9		dP< 48.3	48.3 ≤dP< 49.3	49.3 ≤dP≤ 57.1	dP> 57.1
19,200-19,249	51.8		dP< 48.2	48.2 ≤dP< 49.2	49.2 ≤dP≤ 57.0	dP> 57.0
19,250-19,299	51.6		dP< 48.0	48.0 ≤dP< 49.0	49.0 ≤dP≤ 56.8	dP> 56.8
19,300-19,349	51.4		dP< 47.8	47.8 ≤dP< 48.8	48.8 ≤dP≤ 56.5	dP> 56.5
19,350-19,399	51.2		dP< 47.6	47.6 ≤dP< 48.6	48.6 ≤dP≤ 56.3	dP> 56.3
19,400-19,449	50.9		dP< 47.4	47.4 ≤dP< 48.4	48.4 ≤dP≤ 56.0	dP> 56.0
19,450-19,499	50.7		dP< 47.2	47.2 ≤dP< 48.2	48.2 ≤dP≤ 55.8	dP> 55.8
19,500-19,549	50.5		dP< 47.0	47.0 ≤dP< 48.0	48.0 ≤dP≤ 55.5	dP> 55.5
19,550-19,599	50.3		dP< 46.8	46.8 ≤dP< 47.8	47.8 ≤dP≤ 55.3	dP> 55.3
19,600-19,649	50.0		dP< 46.5	46.5 ≤dP< 47.5	47.5 ≤dP≤ 55.1	dP> 55.1
19,650-19,699	49.8		dP< 46.3	46.3 ≤dP< 47.3	47.3 ≤dP≤ 54.8	dP> 54.8
19,700-19,749	49.6		dP< 46.1	46.1 ≤dP< 47.1	47.1 ≤dP≤ 54.6	dP> 54.6
19,750-19,799	49.4		dP< 45.9	45.9 ≤dP< 46.9	46.9 ≤dP≤ 54.3	dP> 54.3
19,800-19,849	49.2		dP< 45.7	45.7 ≤dP< 46.7	46.7 ≤dP≤ 54.1	dP> 54.1
19,850-19,899	48.9		dP< 45.5	45.5 ≤dP< 46.5	46.5 ≤dP≤ 53.8	dP> 53.8
19,900-19,949	48.7		dP< 45.3	45.3 ≤dP< 46.3	46.3 ≤dP≤ 53.6	dP> 53.6
19,950-19,999	48.5		dP< 45.1	45.1 ≤dP< 46.1	46.1 ≤dP≤ 53.3	dP> 53.3
20,000-20,049	48.3		dP< 44.9	44.9 ≤dP< 45.9	45.9 ≤dP≤ 53.1	dP> 53.1
20,050-20,099	48.1		dP< 44.7	44.7 ≤dP< 45.7	45.7 ≤dP≤ 52.9	dP> 52.9
20,100-20,149	47.8		dP< 44.5	44.5 ≤dP< 45.4	45.4 ≤dP≤ 52.6	dP> 52.6
20,150-20,199	47.6		dP< 44.3	44.3 ≤dP< 45.2	45.2 ≤dP≤ 52.4	dP> 52.4



This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

Table 2: ECW Pump 1B Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
20,200-20,249	47.4		dP< 44.1	44.1 ≤dP< 45.0	45.0 ≤dP≤ 52.1	dP> 52.1
20,250-20,299	47.2		dP< 43.9	43.9 ≤dP< 44.8	44.8 ≤dP≤ 51.9	dP> 51.9
20,300-20,349	46.9		dP< 43.7	43.7 ≤dP< 44.6	44.6 ≤dP≤ 51.6	dP> 51.6
20,350-20,399	46.7		dP< 43.5	43.5 ≤dP< 44.4	44.4 ≤dP≤ 51.4	dP> 51.4
20,400-20,449	46.5		dP< 43.2	43.2 ≤dP< 44.2	44.2 ≤dP≤ 51.2	dP> 51.2
20,450-20,500	46.3		dP< 43.0	43.0 ≤dP< 44.0	44.0 ≤dP≤ 50.9	dP> 50.9

AC

5.4.15.3

Complete the following and mark steps that **DO NOT** apply N/A:

Critical Error:
(Acceptance Criteria NOT met)

Should be N/A

Should be initialed

- a. ECW Pump 1B Delta P is within Acceptable Range. AC
 - b. ECW Pump 1B Delta P is within Required Action High. N/A
 - c. ECW Pump 1B Delta P is within Alert Range Low. N/A
 - d. ECW Pump 1B Delta P is within Required Action Low. N/A
- 5.4.15.4 IF Total ECW System Delta P is within a Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE mark this step N/A. N/A

5.4.15.5

Measure the unfiltered vibration velocity (V) at indicated test points (Addendum 2, Vibration Test Point Locations and Instructions) and record vibration in Table 3: Unit 1 ECW Pump 1B Vibration Data. AC

KEY

Essential Cooling Water System Train B Testing

Table 3: Unit 1 ECW Pump 1B Vibration Data

Vibration Data Points	Ref Value	Test Data	Accept Range	Alert Range High	Req'd Action High	Units
1H1	0.126	0.120	$V \leq 0.315$	$0.315 < V \leq 0.700$	>0.700	in/sec
1H2	0.088	0.088	$V \leq 0.220$	$0.220 < V \leq 0.528$	>0.528	in/sec
1A	0.046	0.049	$V \leq 0.115$	$0.115 < V \leq 0.276$	>0.276	in/sec
2H1*		0.027				in/sec
2H2*		0.017				in/sec
3H1*		0.155				in/sec
3H2*		0.059				in/sec

* - Data point is reference only for system health monitoring, **NOT** a code requirement and NO acceptance criteria applicable.

AC

5.4.15.6 Complete the following and mark steps that **DO NOT** apply N/A:

- a. ECW Pump vibration is within Acceptable Range. AC
- b. ECW Pump vibration is within the Alert Range. N/A
- c. ECW Pump vibration is within the Required Action Range. N/A

5.4.15.7 IF ECW Pump 1B vibration is within Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE mark this step N/A. N/A

5.4.16 IF performing this test in **Unit 2**, THEN perform the following, OTHERWISE N/A Steps 5.4.16.1 through 5.4.16.7:

5.4.16.1 Determine ECW Total Flow Range of Table 4: ECW Pump 2B Reference Values, for the Total ECW System Flow recorded in Table 1: ECW System Flow.

ECW Total Flow Range _____ gpm N/A

5.4.16.2 Record ECW Pump 2B Delta P from Step 5.4.9 in Table 4: ECW Pump 2B Reference Values, at the corresponding ECW Total Flow Range determined in Step 5.4.16.1. N/A

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

Table 4: ECW Pump 2B Reference Values

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
15,700-15,749	61.9		dP< 57.6	57.6 ≤dP< 58.8	58.8 ≤dP≤ 68.1	dP> 68.1
15,750-15,799	61.8		dP< 57.5	57.5 ≤dP< 58.7	58.7 ≤dP≤ 68.0	dP> 68.0
15,800-15,849	61.6		dP< 57.3	57.3 ≤dP< 58.5	58.5 ≤dP≤ 67.8	dP> 67.8
15,850-15,899	61.5		dP< 57.2	57.2 ≤dP< 58.4	58.4 ≤dP≤ 67.7	dP> 67.7
15,900-15,949	61.4		dP< 57.1	57.1 ≤dP< 58.3	58.3 ≤dP≤ 67.5	dP> 67.5
15,950-15,999	61.3		dP< 57.0	57.0 ≤dP< 58.2	58.2 ≤dP≤ 67.4	dP> 67.4
16,000-16,049	61.2		dP< 56.9	56.9 ≤dP< 58.1	58.1 ≤dP≤ 67.3	dP> 67.3
16,050-16,099	61.1		dP< 56.8	56.8 ≤dP< 58.0	58.0 ≤dP≤ 67.2	dP> 67.2
16,100-16,149	61.0		dP< 56.7	56.7 ≤dP< 58.0	58.0 ≤dP≤ 67.1	dP> 67.1
16,150-16,199	60.8		dP< 56.5	56.5 ≤dP< 57.8	57.8 ≤dP≤ 66.9	dP> 66.9
16,200-16,249	60.7		dP< 56.5	56.5 ≤dP< 57.7	57.7 ≤dP≤ 66.8	dP> 66.8
16,250-16,299	60.6		dP< 56.4	56.4 ≤dP< 57.6	57.6 ≤dP≤ 66.7	dP> 66.7
16,300-16,349	60.5		dP< 56.3	56.3 ≤dP< 57.5	57.5 ≤dP≤ 66.6	dP> 66.6
16,350-16,399	60.4		dP< 56.2	56.2 ≤dP< 57.4	57.4 ≤dP≤ 66.4	dP> 66.4
16,400-16,449	60.3		dP< 56.1	56.1 ≤dP< 57.3	57.3 ≤dP≤ 66.3	dP> 66.3
16,450-16,499	60.1		dP< 55.9	55.9 ≤dP< 57.1	57.1 ≤dP≤ 66.1	dP> 66.1
16,500-16,549	60.0		dP< 55.8	55.8 ≤dP< 57.0	57.0 ≤dP≤ 66.0	dP> 66.0
16,550-16,599	59.9		dP< 55.7	55.7 ≤dP< 56.9	56.9 ≤dP≤ 65.9	dP> 65.9
16,600-16,649	59.8		dP< 55.6	55.6 ≤dP< 56.8	56.8 ≤dP≤ 65.8	dP> 65.8
16,650-16,699	59.7		dP< 55.5	55.5 ≤dP< 56.7	56.7 ≤dP≤ 65.7	dP> 65.7
16,700-16,749	59.6		dP< 55.4	55.4 ≤dP< 56.6	56.6 ≤dP≤ 65.6	dP> 65.6
16,750-16,799	59.4		dP< 55.2	55.2 ≤dP< 56.4	56.4 ≤dP≤ 65.3	dP> 65.3
16,800-16,849	59.3		dP< 55.1	55.1 ≤dP< 56.3	56.3 ≤dP≤ 65.2	dP> 65.2
16,850-16,899	59.2		dP< 55.1	55.1 ≤dP< 56.2	56.2 ≤dP≤ 65.1	dP> 65.1
16,900-16,949	59.1		dP< 55.0	55.0 ≤dP< 56.1	56.1 ≤dP≤ 65.0	dP> 65.0
16,950-16,999	59.0		dP< 54.9	54.9 ≤dP< 56.1	56.1 ≤dP≤ 64.9	dP> 64.9
17,000-17,049	58.8		dP< 54.7	54.7 ≤dP< 55.9	55.9 ≤dP≤ 64.7	dP> 64.7
17,050-17,099	58.7		dP< 54.6	54.6 ≤dP< 55.8	55.8 ≤dP≤ 64.6	dP> 64.6
17,100-17,149	58.5		dP< 54.4	54.4 ≤dP< 55.6	55.6 ≤dP≤ 64.4	dP> 64.4
17,150-17,199	58.4		dP< 54.3	54.3 ≤dP< 55.5	55.5 ≤dP≤ 64.2	dP> 64.2

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

Table 4: ECW Pump 2B Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
17,200-17,249	58.2		dP< 54.1	54.1 ≤dP< 55.3	55.3 ≤dP≤ 64.0	dP> 64.0
17,250-17,299	58.0		dP< 53.9	53.9 ≤dP< 55.1	55.1 ≤dP≤ 63.8	dP> 63.8
17,300-17,349	57.9		dP< 53.8	53.8 ≤dP< 55.0	55.0 ≤dP≤ 63.7	dP> 63.7
17,350-17,399	57.7		dP< 53.7	53.7 ≤dP< 54.8	54.8 ≤dP≤ 63.5	dP> 63.5
17,400-17,449	57.6		dP< 53.6	53.6 ≤dP< 54.7	54.7 ≤dP≤ 63.4	dP> 63.4
17,450-17,499	57.4		dP< 53.4	53.4 ≤dP< 54.5	54.5 ≤dP≤ 63.1	dP> 63.1
17,500-17,549	57.3		dP< 53.3	53.3 ≤dP< 54.4	54.4 ≤dP≤ 63.0	dP> 63.0
17,550-17,599	57.1		dP< 53.1	53.1 ≤dP< 54.2	54.2 ≤dP≤ 62.8	dP> 62.8
17,600-17,649	56.9		dP< 52.9	52.9 ≤dP< 54.1	54.1 ≤dP≤ 62.6	dP> 62.6
17,650-17,699	56.8		dP< 52.8	52.8 ≤dP< 54.0	54.0 ≤dP≤ 62.5	dP> 62.5
17,700-17,749	56.6		dP< 52.6	52.6 ≤dP< 53.8	53.8 ≤dP≤ 62.3	dP> 62.3
17,750-17,799	56.5		dP< 52.5	52.5 ≤dP< 53.7	53.7 ≤dP≤ 62.2	dP> 62.2
17,800-17,849	56.3		dP< 52.4	52.4 ≤dP< 53.5	53.5 ≤dP≤ 61.9	dP> 61.9
17,850-17,899	56.2		dP< 52.3	52.3 ≤dP< 53.4	53.4 ≤dP≤ 61.8	dP> 61.8
17,900-17,949	56.0		dP< 52.1	52.1 ≤dP< 53.2	53.2 ≤dP≤ 61.6	dP> 61.6
17,950-17,999	55.8		dP< 51.9	51.9 ≤dP< 53.0	53.0 ≤dP≤ 61.4	dP> 61.4
18,000-18,049	55.7		dP< 51.8	51.8 ≤dP< 52.9	52.9 ≤dP≤ 61.3	dP> 61.3
18,050-18,099	55.5		dP< 51.6	51.6 ≤dP< 52.7	52.7 ≤dP≤ 61.1	dP> 61.1
18,100-18,149	55.4		dP< 51.5	51.5 ≤dP< 52.6	52.6 ≤dP≤ 60.9	dP> 60.9
18,150-18,199	55.2		dP< 51.3	51.3 ≤dP< 52.4	52.4 ≤dP≤ 60.7	dP> 60.7
18,200-18,249	55.1		dP< 51.2	51.2 ≤dP< 52.3	52.3 ≤dP≤ 60.6	dP> 60.6
18,250-18,299	54.9		dP< 51.1	51.1 ≤dP< 52.2	52.2 ≤dP≤ 60.4	dP> 60.4
18,300-18,349	54.8		dP< 51.0	51.0 ≤dP< 52.1	52.1 ≤dP≤ 60.3	dP> 60.3
18,350-18,399	54.6		dP< 50.8	50.8 ≤dP< 51.9	51.9 ≤dP≤ 60.1	dP> 60.1
18,400-18,449	54.5		dP< 50.7	50.7 ≤dP< 51.8	51.8 ≤dP≤ 60.0	dP> 60.0
18,450-18,499	54.4		dP< 50.6	50.6 ≤dP< 51.7	51.7 ≤dP≤ 59.8	dP> 59.8
18,500-18,549	54.2		dP< 50.4	50.4 ≤dP< 51.5	51.5 ≤dP≤ 59.6	dP> 59.6
18,550-18,599	54.1		dP< 50.3	50.3 ≤dP< 51.4	51.4 ≤dP≤ 59.5	dP> 59.5
18,600-18,649	53.9		dP< 50.1	50.1 ≤dP< 51.2	51.2 ≤dP≤ 59.3	dP> 59.3
18,650-18,699	53.8		dP< 50.0	50.0 ≤dP< 51.1	51.1 ≤dP≤ 59.2	dP> 59.2

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

Table 4: ECW Pump 2B Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
18,700-18,749	53.6		dP< 49.8	49.8 ≤dP< 50.9	50.9 ≤dP≤ 59.0	dP> 59.0
18,750-18,799	53.5		dP< 49.8	49.8 ≤dP< 50.8	50.8 ≤dP≤ 58.9	dP> 58.9
18,800-18,849	53.3		dP< 49.6	49.6 ≤dP< 50.6	50.6 ≤dP≤ 58.6	dP> 58.6
18,850-18,899	53.2		dP< 49.5	49.5 ≤dP< 50.5	50.5 ≤dP≤ 58.5	dP> 58.5
18,900-18,949	53.0		dP< 49.3	49.3 ≤dP< 50.4	50.4 ≤dP≤ 58.3	dP> 58.3
18,950-18,999	52.9		dP< 49.2	49.2 ≤dP< 50.3	50.3 ≤dP≤ 58.2	dP> 58.2
19,000-19,049	52.7		dP< 49.0	49.0 ≤dP< 50.1	50.1 ≤dP≤ 58.0	dP> 58.0
19,050-19,099	52.6		dP< 48.9	48.9 ≤dP< 50.0	50.0 ≤dP≤ 57.9	dP> 57.9
19,100-19,149	52.5		dP< 48.8	48.8 ≤dP< 49.9	49.9 ≤dP≤ 57.8	dP> 57.8
19,150-19,199	52.3		dP< 48.6	48.6 ≤dP< 49.7	49.7 ≤dP≤ 57.5	dP> 57.5
19,200-19,249	52.1		dP< 48.5	48.5 ≤dP< 49.5	49.5 ≤dP≤ 57.3	dP> 57.3
19,250-19,299	51.9		dP< 48.3	48.3 ≤dP< 49.3	49.3 ≤dP≤ 57.1	dP> 57.1
19,300-19,349	51.8		dP< 48.2	48.2 ≤dP< 49.2	49.2 ≤dP≤ 57.0	dP> 57.0
19,350-19,399	51.6		dP< 48.0	48.0 ≤dP< 49.0	49.0 ≤dP≤ 56.8	dP> 56.8
19,400-19,449	51.4		dP< 47.8	47.8 ≤dP< 48.8	48.8 ≤dP≤ 56.5	dP> 56.5
19,450-19,499	51.2		dP< 47.6	47.6 ≤dP< 48.6	48.6 ≤dP≤ 56.3	dP> 56.3
19,500-19,549	51.0		dP< 47.4	47.4 ≤dP< 48.5	48.5 ≤dP≤ 56.1	dP> 56.1
19,550-19,599	50.8		dP< 47.2	47.2 ≤dP< 48.3	48.3 ≤dP≤ 55.9	dP> 55.9
19,600-19,649	50.7		dP< 47.2	47.2 ≤dP< 48.2	48.2 ≤dP≤ 55.8	dP> 55.8
19,650-19,699	50.5		dP< 47.0	47.0 ≤dP< 48.0	48.0 ≤dP≤ 55.6	dP> 55.6
19,700-19,749	50.3		dP< 46.8	46.8 ≤dP< 47.8	47.8 ≤dP≤ 55.3	dP> 55.3
19,750-19,799	50.1		dP< 46.6	46.6 ≤dP< 47.6	47.6 ≤dP≤ 55.1	dP> 55.1
19,800-19,849	49.9		dP< 46.4	46.4 ≤dP< 47.4	47.4 ≤dP≤ 54.9	dP> 54.9
19,850-19,899	49.7		dP< 46.2	46.2 ≤dP< 47.2	47.2 ≤dP≤ 54.7	dP> 54.7
19,900-19,949	49.6		dP< 46.1	46.1 ≤dP< 47.1	47.1 ≤dP≤ 54.6	dP> 54.6
19,950-19,999	49.4		dP< 45.9	45.9 ≤dP< 46.9	46.9 ≤dP≤ 54.3	dP> 54.3
20,000-20,049	49.2		dP< 45.8	45.8 ≤dP< 46.7	46.7 ≤dP≤ 54.1	dP> 54.1
20,050-20,099	49.0		dP< 45.6	45.6 ≤dP< 46.6	46.6 ≤dP≤ 53.9	dP> 53.9
20,100-20,149	48.8		dP< 45.4	45.4 ≤dP< 46.4	46.4 ≤dP≤ 53.7	dP> 53.7
20,150-20,199	48.6		dP< 45.2	45.2 ≤dP< 46.2	46.2 ≤dP≤ 53.5	dP> 53.5

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

Table 4: ECW Pump 2B Reference Values

(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
20,200-20,249	48.4		dP < 45.0	45.0 ≤ dP < 46.0	46.0 ≤ dP ≤ 53.2	dP > 53.2
20,250-20,299	48.3		dP < 44.9	44.9 ≤ dP < 45.9	45.9 ≤ dP ≤ 53.1	dP > 53.1
20,300-20,349	48.1		dP < 44.7	44.7 ≤ dP < 45.7	45.7 ≤ dP ≤ 52.9	dP > 52.9
20,350-20,399	47.9		dP < 44.5	44.5 ≤ dP < 45.5	45.5 ≤ dP ≤ 52.7	dP > 52.7
20,400-20,449	47.7		dP < 44.4	44.4 ≤ dP < 45.3	45.3 ≤ dP ≤ 52.5	dP > 52.5
20,450-20,500	47.5		dP < 44.2	44.2 ≤ dP < 45.1	45.1 ≤ dP ≤ 52.3	dP > 52.3

AC

5.4.16.3

Complete the following and mark steps that **DO NOT** apply N/A:

- a. ECW Pump 2B Delta P is within Acceptable Range. N/A
- b. ECW Pump 2B Delta P is within Required Action High. N/A
- c. ECW Pump 2B Delta P is within Alert Range Low. N/A
- d. ECW Pump 2B Delta P is within Required Action Low. N/A

5.4.16.4

IF Total ECW System Delta P is within a Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE mark this step N/A.

N/A

KEY

Essential Cooling Water System Train B Testing

KEY

5.4.16.5

Measure the unfiltered vibration velocity (V) at indicated test points (Addendum 2, Vibration Test Point Locations and Instructions) and record vibration in Table 5: Unit 2 ECW Pump 2B Vibration Data.

N/A

Table 5: Unit 2 ECW Pump 2B Vibration Data

Vibration Data Points	Ref Value	Test Data	Accept Range	Alert Range High	Req'd Action High	Units
1H1	0.053	N/A	$V \leq 0.132$	$0.132 < V \leq 0.318$	> 0.318	in/sec
1H2	0.039	N/A	$V \leq 0.097$	$0.097 < V \leq 0.234$	> 0.234	in/sec
1A	0.026	N/A	$V \leq 0.065$	$0.065 < V \leq 0.156$	> 0.156	in/sec
2H1*		N/A				in/sec
2H2*		N/A				in/sec
3H1*		N/A				in/sec
3H2*		N/A				in/sec

* - Data point is reference only for system health monitoring, **NOT** a code requirement and NO acceptance criteria applicable.

AC

5.4.16.6

Complete the following and mark steps that **DO NOT** apply N/A:

a. ECW Pump vibration is within Acceptable Range.

N/A

b. ECW Pump vibration is within the Alert Range.

N/A

c. ECW Pump vibration is within the Required Action Range.

N/A

5.4.16.7

IF ECW Pump 2B vibration is within Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE mark this step N/A.

N/A

KEY

Essential Cooling Water System Train B Testing

5.5 Testing ECW Pump 1B(2B) Discharge Check Valve 1(2)-EW-0042

KEY

5.5.1 IF ECW Total System Flow recorded in Step 5.4.14 is equal to or greater than 18290 gpm, THEN perform the following, OTHERWISE mark the following as N/A:

AC

5.5.1.1 Record the Total ECW System Flow from Step 5.4.14:

Total ECW System Flow _____ gpm N/A
 Acceptance Criteria \geq 18290 gpm

5.5.1.2 Mark Steps 5.5.2 through 5.5.7 as N/A. N/A

NOTE

Parts of Step 5.5.2 may have been performed in previous sections. Steps performed prior to this may be marked as N/A.

5.5.2 Perform the following for testing of 1(2)-EW-0042:

5.5.2.1 Ensure ECW Pump 1B(2B) is in operation per OPOP02-EW-0001, Essential Cooling Water Operation. AC

5.5.2.2 IF ECW Self Cleaning Strainer 1B(2B) Normal Backflush is in service, THEN perform the following, OTHERWISE mark the following as N/A:

- a. Record REQUIRED POSITION, including the throttled position and lock status, of "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE" from Valve Database here AND in Step 5.6.3. {ECWIS, Room 105(102)}

REQUIRED POSITION _____ N/A

KEY

Essential Cooling Water System Train B Testing

KEY

- b. WHEN Step 5.5.2.2.d is performed, THEN RECORD the AS FOUND position, including the throttled position and lock status, of "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE".
{ECWIS, Room 105(102)}

AS FOUND _____ N/A

- c. IF the REQUIRED POSITION recorded in Step 5.5.2.2.a AND the AS FOUND position recorded in Step 5.5.2.2.b are different, THEN notify the Shift Supervisor, OTHERWISE N/A this step.

N/A

AC

- d. Close "1(2)-EW-0189 ECW PUMP 1B(2B) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE".
{ECWIS, Room 105(102)}

N/A

NOTE

Placing ECW Self Cleaning Strainer handswitch in "STOP" will cause ESF Status Monitoring Lampbox 2M22 BYP/INOP "ECW STRN 1B(2B)" to alarm.

- 5.5.2.3 Ensure ECW Self Cleaning Strainer 1B(2B) is **NOT** in service by placing "ECW SELF CLEANING STRAINER 1B(2B)" handswitch in "STOP".
{ECWIS, MCC E1B3(E2B3)/C1}

AC

CAUTION

IF one of the following occurs, THEN opening of 1(2)-EW-0064 shall be stopped:

- Increasing temperatures from components cooled by ECW
- Exceeding ECW Pump capacity of 20610 gpm

- 5.5.3 Slowly open "1(2)-EW-0064 CCW HEAT EXCHANGER 1B(2B) ECW RETURN THROTTLE VALVE" to obtain Total ECW System Flow greater than 18290 gpm. (QDPS ECW TRN FLOW "TRN B")

AC

- 5.5.4 Record ECW flow from the following components in Table 6 (ECW System Flow for 1(2)-EW-0042):

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY

- ECW Pump 1B(2B) Lube Water flow from 1(2)-EW-FI-6948, {ECWIS} AC
 - Flow to CCW Pump Supplementary Cooler "TRN B FT 6866" (QDPS) AC
 - ECW Flow to "ESF DG 12(22) FT 6865" (QDPS) AC
- 5.5.5 Record ECW flow from Essential Chillers in Table 6 (ECW System Flow for 1(2)-EW-0042) and mark step **NOT** performed as N/A:
- 5.5.5.1 IF ECW from Essential Chillers is in normal alignment, THEN record the following for OPERABLE Essential Chiller(s) in Table 6 AND mark data for any INOPERABLE chiller as N/A:
- "TRN B CHLR 11B(21B) FT 6864" (QDPS) AC
 - "TRN B CHLR 11B(22B) FT 6905" (QDPS) AC
- 5.5.5.2 IF ECW from Essential Chillers is in Cold Weather alignment, THEN record Essential Chiller flows from OPERABLE Essential Chiller(s) in Table 6 AND mark data for any INOPERABLE chiller as N/A:
- "1(2)-EW-FI-6864C ESSENTIAL CHILLER 11B(21B) ECW RETURN BYPASS FLOW INDICATOR" N/A
 - "1(2)-EW-FI-6905C ESSENTIAL CHILLER 12B(22B) ECW RETURN BYPASS FLOW INDICATOR" N/A

KEY

Essential Cooling Water System Train B Testing

KEY

- 5.5.6 Determine ECW flow from CCW Heat Exchanger 1B(2B) as follows:
 - 5.5.6.1 Record ECW flow from CCW Heat Exchanger 1B(2B) using QDPS "TRN B FT6863" on Data Sheet 1 (Essential Cooling Water Flow from CCW Heat Exchanger) at approximately 30 second intervals until 21 flows have been recorded. (Detail Data Menu Page 9) AC
 - 5.5.6.2 After 21 flows have been recorded, then add the individual flows and record total on Data Sheet 1. AC
 - 5.5.6.3 Calculate and record the average ECW Flow from CCW Heat Exchanger in AVERAGE block of Data Sheet 1. AC
 - 5.5.6.4 Sign and Date Performance of Data Sheet 1. AC
- 5.5.7 Record AVERAGE ECW Flow from CCW Heat Exchanger from Data Sheet 1 in Table 6 (ECW System Flow for 1(2)-EW-0042) and calculate Total ECW System Flow through 1(2)-EW-0042: AC

Table 6: ECW System Flow for 1(2)-EW-0042

Component	ECW Flow	Units
ECW Pump 1B(2B) Lube Water	10.7	gpm
ECW Flow to Essen Chlr 11B(21B)	620	gpm
ECW Flow to Essen Chlr 12B(22B)	1154	gpm
ECW Flow to CCW Pump Cooler	46	gpm
ECW Flow to ESF DG 12(22)	1746	gpm
ECW Flow to CCW HX (AVERAGE from Data Sheet 1)	15650.5	gpm
TOTAL ECW SYSTEM FLOW =	1922702	gpm

- AC
- 5.5.8 Verify Total ECW System Flow through 1(2)-EW-0042 is equal to or greater than 18290 gpm from one of the following and mark criteria **NOT** used as N/A:
 - ECW Pump Flow (Step 5.5.1.1) N/A
 - TOTAL ECW SYSTEM FLOW from Table 6 (Step 5.5.7) AC

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

5.6 Restoration of Essential Cooling Water System Flow

KEY

5.6.1 IF adjustments to "1(2)-EW-0064 CCW HEAT EXCHANGER 1B(2B) ECW RETURN THROTTLE VALVE" have been performed in Step 5.5.3, THEN restore ECW flow from CCW Heat Exchanger 1B(2B) to normal operating range of 14040 gpm to 17400 gpm.

AC
Perform
YZ
Ind. Verif

5.6.2 IF adjustments to "1(2)-EW-0064 CCW HEAT EXCHANGER 1B(2B) ECW RETURN THROTTLE VALVE" have been performed in Step 5.5.3, THEN ensure "1(2)-EW-0064 CCW HEAT EXCHANGER 1B(2B) ECW RETURN THROTTLE VALVE" is locked in the throttled position.

AC
Perform
YZ
Ind. Verif

AC

5.6.3 **DV** Restore the following valves to the AS FOUND or REQUIRED POSITION position, or as directed by the Shift Supervisor, and record AS LEFT position:

- 1(2)-EW-0189 REQUIRED POSITION LIP 4 1/4 TURNS OPEN
- 1(2)-EW-0189 AS LEFT LIP 4 1/4 TURNS OPEN
- 1(2)-EW-0278 AS FOUND CLOSED
- 1(2)-EW-0278 AS LEFT CLOSED

AC
Perform
YZ
Dual Verif

AC
Perform
YZ
Ind. Verif

KEY

Essential Cooling Water System Train B Testing

NOTE

IF the Essential Chillers are in Cold Weather alignment OR a Chiller is Inoperable with the Chiller Train maintained Operable, THEN it will be necessary to use 0POP02-CH-0005, Essential Chiller Operation, to ensure 1(2)-EW-3016, 1(2)-EW-3019, or 1(2)-EW-1003 are properly restored to their AS FOUND position.

5.6.4 IF ECW from Essential Chillers is in Cold Weather alignment OR a Chiller is Inoperable with the Chiller Train maintained Operable, THEN restore the following valves to the AS FOUND position or as directed by the Shift Supervisor AND record AS LEFT position, OTHERWISE mark this step as N/A:

- 1(2)-EW-3016 AS FOUND _____
- 1(2)-EW-3016 AS LEFT _____ N/A
Perform
N/A
Ind. Verif
- 1(2)-EW-3019 AS FOUND _____
- 1(2)-EW-3019 AS LEFT _____ N/A
Perform
N/A
Ind. Verif
- 1(2)-EW-1003 AS FOUND _____
- 1(2)-EW-1003 AS LEFT _____ N/A
Perform
N/A
Ind. Verif

5.6.5 Return ECW Self Cleaning Strainer 1B(2B) to service by placing "ECW SELF CLEANING STRAINER 1B(2B)" handswitch in "AUTO". {ECWIS, MCC E1B3(E2B3)/C1 }

AC
Perform
YZ
Ind. Verif

Essential Cooling Water System Train B Testing

NOTE

- IF Essential Chillers are in Cold Weather alignment OR a Chiller is Inoperable with the Chiller Train maintained Operable, THEN ECW flow to Essential Chillers is in accordance with 0POP02-CH-0005, Essential Chiller Operation.
- IF Standby Diesel Generator 12(22) flow is NOT within the required range, THEN SED Performance Technicians should be notified to perform individual heat exchanger flow measurements prior to any valve adjustments. (Reference 7.4.6)
- IF Emergency Diesel Generator ECW flow is adjusted, THEN System Engineering should be notified that the individual cooler flows on the diesel engine may have been affected.

5.6.6 Ensure ECW System flows are restored to normal flow range and record flow in Table 7 (As Left ECW System Flow):

AC

Table 7: As Left ECW System Flow

Component	Indicator	ECW Flow	Normal Flow Range
ECW Pump 1B(2B) Lube Water	1(2)-EW-FI-6948	10.5 gpm	> 3.0 gpm
ECW Flow to CCW HX	QDPS TRN A FT 6863	15450 gpm	14040 to 17400 gpm
ECW Flow to Essen Chlr 11B(21B)	(QDPS) FT 6864	610 gpm	600 to 693 gpm (Note 1)
	(Cold Weather Alignment) 1(2)-EW-FI-6864C {10' MAB Chiller Room}		110 to 130 gpm (OPERABLE) Throttled per 0POP02-CH-0005 (INOPERABLE)
ECW Flow to Essen Chlr 12B(22B)	(QDPS) FT 6905	1140 gpm	1100 to 1272 gpm (Note 1)
	(Cold Weather Alignment) 1(2)-EW-FI-6905C {10' MAB Chiller Room}		230 to 250 gpm (OPERABLE) Throttled per 0POP02-CH-0005 (INOPERABLE)
ECW Flow to CCW Pump Supplementary Cooler	QDPS TRN A FT 6866	43 gpm	40 to 50 gpm
ECW Flow to ESF DG	QDPS DG 12(22) FT 6865	1723 gpm	1486 to 1743 gpm

Note 1: IF a Chiller is Inoperable, THEN record flow as adjusted per 0POP02-CH-0005, Essential Chiller Operation, AND enter a note in the Remarks Section.

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY

5.6.7 Remove the 0-100 psig Test Gage installed at ECW Pump discharge test connection for "1(2)-EW-PI-6885 ECW PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR" and install cap.

AC
Perform
YZ
Ind. Verif

5.6.8 Ensure "1(2)-EW-PI-6885 ECW PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR" is in service.

AC
Perform
YZ
Ind. Verif

KEY

Essential Cooling Water System Train B Testing

5.7 Testing ECW Screen Wash Booster Pump 1B(2B)

- 5.7.1 Ensure ECW Pump 1B(2B) is in operation per 0POP02-EW-0001, Essential Cooling Water Operation. AC
- 5.7.2 Ensure the following are shutdown: {CP002}
- "TRAV SCRN 1B(2B)" AC
 - "SCRN WASH PUMP 1B(2B)" AC

NOTE

Steps 5.7.3 through 5.9.4 are performed at the ECW Intake Structure, unless otherwise noted.

- 5.7.3 Verify "1(2)-EW-0172 ECW SCREEN WASH BOOSTER PUMP 1B(2B) SUCTION VALVE" is open. AC
- 5.7.4 Open the following instrument isolation valves:
- "1(2)-EW-0373B ECW SCREEN WASH BOOSTER PUMP 1B(2B) FE-6958 HIGH SIDE TEST VALVE" AC
 - "1(2)-EW-0374B ECW SCREEN WASH BOOSTER PUMP 1B(2B) FE-6958 LOW SIDE TEST VALVE" AC
 - "1(2)-EW-0375B ECW SCREEN WASH BOOSTER PUMP 1B(2B) SUCTION TEST VALVE" AC

NOTE

Normal lubricating oil level is at the approximate midpoint of the sight glass. IF level is low, THEN lubricant shall be added prior to continuing with this test.

- 5.7.5 Check ECW Screen Wash Booster Pump 1B(2B) lubricant level at approximately ½ of sight glass. AC
- 5.7.6 Notify I&C Maintenance to place the following instruments in service at the instrument manifold:
- "N1(2)EW-PDI-6941" AC
 - "N1(2)EW-FI-6958" AC

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY

- 5.7.7 Ensure the following instruments are properly vented:
- "N1(2)EW-PDI-6941" AC
 - "N1(2)EW-FI-6958" AC
 - "1(2)-EW-PI-6941 ECW SCREEN WASH PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR" AC
- 5.7.8 Start ECW Screen Wash Booster Pump by momentarily placing "SCRN WASH PUMP 1B(2B)" to "START". {CP002} AC
- 5.7.9 Record AS FOUND position, including the throttled position and lock status, of "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE". {Room 108(111)}
- AS FOUND LIP 3 ½ TURNS OPEN AC
- 5.7.10 Record the REQUIRED POSITION, including the throttled position and lock status, of "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE" from Valve Database here AND in Step 5.9.1. {Room 108(111)}
- REQUIRED POSITION LIP 3 ½ TURNS OPEN AC
- 5.7.11 IF the AS FOUND position recorded in Step 5.7.9 and the REQUIRED POSITION recorded in Step 5.7.10 are different, THEN notify the Shift Supervisor, OTHERWISE N/A this Step. N/A

KEY

Essential Cooling Water System Train B Testing

KEY

5.7.12 Establish ECW Screen Wash Booster Pump flow as follows:

5.7.12.1 Unlock and throttle "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE" until ΔP indicated on "N1(2)EW-FI-6958" is equal to 188 inches H₂O and record time:

Start time 0305 Time AC

5.7.12.2 IF ΔP is **NOT** equal to 188 inches H₂O, THEN adjust "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE" until pump flow is stable for 5 minutes with a differential pressure equal to 188 inches H₂O, OTHERWISE mark this step N/A.

AC

5.7.12.3 After 5 minutes, verify indicated ΔP on "N1(2)EW-FI-6958" is equal to 188 inches H₂O and record time:

End time 0311 Time AC

5.7.13 Record differential pressure from "N1(2)EW-FI-6958":

ΔP from "N1(2)EW-FI-6958" 188 inches H₂O AC

5.7.14 Record the following for ECW Screen Wash Booster Pump 1B(2B):

5.7.14.1 Discharge pressure from "1(2)-EW-PI-6941 ECW SCREEN WASH PUMP 1B(2B) DISCHARGE PRESSURE INDICATOR"

ECWSWBP Disch Press 78 psig (PI-6941) AC

5.7.14.2 Pump differential pressure (DP) from "N1(2)EW-PDI-6941":

ECWSWBP Diff Press 47 psid (PDI-6941) AC

KEY

Essential Cooling Water System Train B Testing

Table 8: ECW Screen Wash Booster Pump 1B(2B) Reference Values

	Ref Value	Req'd Action Low	Acceptable Range	Req'd Action High	Units
Unit 1	46.5	<41.9	41.9 ≤ DP ≤ 51.1	> 51.1	psid
Unit 2	47.5	<42.8	42.8 ≤ DP ≤ 52.2	> 52.2	psid

AC

5.7.14.3 Using ECW Screen Wash Booster Pump differential pressure recorded in Step 5.7.14.2, evaluate the pump differential pressure for acceptable operation on Table 8 (ECW Screen Wash Booster Pump 1B(2B) Reference Values).

AC

5.7.14.4 IF ECW Screen Wash Booster Pump 1B(2B) differential pressure is within Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE mark this step N/A.

N/A

5.7.15 IF performing this test in **Unit 1**, THEN measure unfiltered vibration velocity (V) at indicated test points (Addendum 3, Vibration Test Point Locations and Instructions) AND record vibration in Table 9 (Unit 1 ECW Screen Wash Booster Pump 1B Vibration Data), OTHERWISE mark this step and the Test Data blocks in Table 9 N/A.

AC

Table 9: Unit 1 ECW Screen Wash Booster Pump 1B Vibration Data

Vibration Data Points	Ref Value	Test Data	Accept Range	Alert Range High	Req'd Action High	Units
3H	0.058	0.072	V ≤ 0.145	0.145 < V ≤ 0.348	> 0.348	in/sec
3V	0.072	0.084	V ≤ 0.180	0.180 < V ≤ 0.432	> 0.432	in/sec
3A	0.032	0.044	V ≤ 0.080	0.080 < V ≤ 0.192	> 0.192	in/sec

KEY

Essential Cooling Water System Train B Testing

KEY

5.7.16 IF performing this test in **Unit 2**, THEN measure unfiltered vibration velocity (V) at indicated test points (Addendum 3, Vibration Test Point Locations and Instructions) AND record vibration in Table 10 (Unit 2 ECW Screen Wash Booster Pump 2B Vibration Data), OTHERWISE mark this step and the Test Data blocks in Table 10 N/A.

N/A

Table 10: Unit 2 ECW Screen Wash Booster Pump 2B Vibration Data

Vibration Data Points	Ref Value	Test Data	Accept Range	Alert Range High	Req'd Action High	Units
3H	0.056	N/A	$V \leq 0.140$	$0.140 < V \leq 0.336$	> 0.336	in/sec
3V	0.045	N/A	$V \leq 0.112$	$0.112 < V \leq 0.270$	> 0.270	in/sec
3A	0.024	N/A	$V \leq 0.060$	$0.060 < V \leq 0.144$	> 0.144	in/sec

AC

5.7.17 Using Table 9 or 10, as applicable, perform the following:

5.7.17.1 Evaluate ECWSWB Pump vibration test data.

AC

5.7.17.2 Complete the following and mark steps that **DO NOT** apply N/A:

a. ECWSWB Pump vibration is within Acceptable Range.

AC

b. ECWSWB Pump vibration is within the Alert Range.

N/A

c. ECWSWB Pump vibration is within the Required Action Range.

N/A

5.7.18 IF any ECW Screen Wash Booster Pump 1B(2B) vibration is within Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE mark this step N/A.

N/A

KEY

Essential Cooling Water System Train B Testing

5.8 Testing ECW Screen Wash Booster Pump Discharge Check Valve
1(2)-EW-0254

- 5.8.1 Ensure ECW Screen Wash Booster Pump 1B(2B) is in operation per 0POP02-EW-0001, Essential Cooling Water Operation. AC
- 5.8.2 IF the REQUIRED POSITION of "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE" is **NOT** recorded in Step 5.9.1, THEN PERFORM the following, OTHERWISE mark the following steps as N/A:
- 5.8.2.1 Record the AS FOUND position, including the throttled position and lock status, of "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE". {ECWIS, Room 108(111)}
AS FOUND _____ N/A
- 5.8.2.2 Record the REQUIRED POSITION, including the throttled position and lock status, of "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE" from Valve Database here AND in Step 5.9.1. {Room 108(111)}
REQUIRED POSITION _____ N/A
- 5.8.2.3 IF the AS FOUND position recorded in Step 5.8.2.1 AND the REQUIRED POSITION recorded in Step 5.8.2.2 are different, THEN notify the Shift Supervisor, OTHERWISE N/A this Step. N/A
- 5.8.3 Open "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE". {ECWIS, Room 108(111)} AC
- 5.8.4 Record ΔP from "N1(2)EW-FI-6958":
ECWSWBP Diff Press 188 in H₂O (FI-6958) AC
- AC 5.8.5 Determine ECW Screen Wash Booster Pump 1B(2B) flow rate using ΔP recorded in Step 5.8.4 from Addendum 4 (ECW Screen Wash Booster Pump 1B(2B) Flow) and record:
ECWSWBP Flow 158.4 gpm AC
Acceptance Criteria > 158 gpm

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

5.9 Restoration of ECW Screen Wash System

5.9.1

DV

Restore "1(2)-EW-0003 ECW TRAVELING SCREEN 1B(2B) SPRAY WASH VALVE" to the REQUIRED POSITION or as directed by the Shift Supervisor and record AS LEFT position:

- 1(2)-EW-0003 REQUIRED POSITION *LIP 3 ½ TURNS OPEN*
- 1(2)-EW-0003 AS LEFT *LIP 3 ½ TURNS OPEN* AC
Perform
YZ
Dual Verif

5.9.2 Stop "SCRN WASH PUMP 1B(2B)". {CP002} AC

5.9.3 Equalize and isolate the following at the respective instrument manifold:

- "N1(2)EW-PDI-6941" IC
Perform
MN
Ind. Verif
- "N1(2)EW-FI-6958" IC
Perform
MN
Ind. Verif

KEY

Essential Cooling Water System Train B Testing

KEY

5.9.4 Close the following valves:

- "1(2)-EW-0373B ECW SCREEN WASH BOOSTER PUMP
1B(2B) FE-6958 HIGH SIDE TEST VALVE"

AC
Perform
YZ
Ind. Verif

- "1(2)-EW-0374B ECW SCREEN WASH BOOSTER PUMP
1B(2B) FE-6958 LOW SIDE TEST VALVE"

AC
Perform
YZ
Ind. Verif

- "1(2)-EW-0375B ECW SCREEN WASH BOOSTER PUMP
1B(2B) SUCTION TEST VALVE"

AC
Perform
YZ
Ind. Verif

KEY

Essential Cooling Water System Train B Testing

5.10 Testing ECW Blowdown Isolation Valve 1(2)-EW-FV-6936

- 5.10.1 ECW Pump 1B(2B) is in operation per 0POP02-EW-0001, Essential Cooling Water Operation. AC
- 5.10.2 Record the AS FOUND position of handswitch "ECW TRAIN B BLWDN ISOL FV-6936" in Step 5.10.5. AC

NOTE

Steps 5.10.3 and 5.10.4 may be performed in any order.

- 5.10.3 Perform "ECW TRAIN B BLWDN ISOL FV-6936" close exercise and stroke timing as follows:
 - 5.10.3.1 Ensure approximately 2 minutes have elapsed since "ECW TRAIN B BLWDN ISOL FV-6936" was opened to allow time for the valve control/operator to reach normal air pressure prior to stroke-timing. AC
 - 5.10.3.2 Simultaneously start stopwatch and close FV-6936 by placing handswitch "ECW TRAIN B BLWDN ISOL FV-6936" to "CLOSE". AC
 - 5.10.3.3 WHEN "ECW TRAIN B BLWDN ISOL FV-6936" is fully closed (Red lamp OFF, Green lamp ON), THEN stop stopwatch and record valve closing time:
 - Time 8.72 seconds AC
- Acceptance Criteria: **Unit 1:** $3.35 \leq t \leq 10.05$ seconds
 Unit 2: $1.91 \leq t \leq 5.73$ seconds

AC

KEY

Essential Cooling Water System Train B Testing

KEY

5.10.4 Perform "ECW TRAIN B BLWDN ISOL FV-6936" open exercise as follows:

5.10.4.1 Place handswitch "ECW TRAIN B BLWDN ISOL FV-6936" to "AUTO". AC

AC

5.10.4.2 Verify "ECW TRAIN B BLWDN ISOL FV-6936" is full open (Red light ON, Green light OFF). AC

5.10.5 Restore handswitch "ECW TRAIN B BLWDN ISOL FV-6936" to the AS FOUND position or as directed by the Shift Supervisor and record AS LEFT position:

- 1(2)-EW-FV-6936 AS FOUND CLOSED

- 1(2)-EW-FV-6936 AS LEFT CLOSED

AC
Perform
YZ
Ind. Verif

KEY

Essential Cooling Water System Train B Testing

5.11 Testing Essential Cooling Water Valves

NOTE

Steps 5.11.1 and 5.11.2 may be performed in any order.

5.11.1 Testing of ECW Pump 1B(2B) Discharge Valve 1(2)-EW-MOV-0137

5.11.1.1 ECW Pump 1B(2B) is shutdown per 0POP02-EW-0001, Essential Cooling Water Operation. AC

5.11.1.2 Ensure "DISCH ISOL MOV-0137" is CLOSED. {CP002} AC

5.11.1.3 Perform ECW Pump Discharge Valve open exercise and stroke timing as follows:

a. Simultaneously start stopwatch and open ECW Pump Discharge Valve by momentarily placing handswitch "DISCH ISOL MOV-0137" to "OPEN". AC

AC

b. WHEN "DISCH ISOL MOV-0137" is fully open (Red lamp ON, green lamp OFF), THEN stop stopwatch and record valve opening time:

Time 8.89 seconds AC

Acceptance Criteria: **Unit 1:** $6.38 \leq t \leq 10.64$ seconds
Unit 2: $6.18 \leq t \leq 10.29$ seconds

5.11.1.4 Perform "DISCH ISOL MOV-0137" close exercise by performing the following:

a. Close ECW Pump Discharge Valve by momentarily placing handswitch "DISCH ISOL MOV-0137" to "CLOSE". AC

AC

b. Verify "DISCH ISOL MOV-0137" is full closed (Red light OFF, Green light ON). AC

Essential Cooling Water System Train B Testing

KEY

5.11.2 Testing of ECW Screen Wash Booster Pump Discharge Valve 1(2)-EW-FV-6924

5.11.2.1 ECW Screen Wash Booster Pump 1B(2B) is shutdown per 0POP02-EW-0001, Essential Cooling Water Operation. AC

5.11.2.2 Verify "TRAV SCRN 1B(2B) WASH FV-6924" is CLOSED. {CP002} AC

5.11.2.3 Record the AS FOUND position of handswitch "TRAV SCRN 1B(2B) WASH FV-6924" in Step 5.11.2.6. {CP002} AC

5.11.2.4 Perform ECW Screen Wash Booster Pump Discharge Valve open exercise and stroke timing as follows:
 a. Simultaneously start stopwatch and open ECW Screen Wash Booster Pump Discharge Valve by placing handswitch "TRAV SCRN 1B(2B) WASH FV-6924" to "OPEN". AC

AC

b. WHEN "TRAV SCRN 1B(2B) WASH FV-6924" is fully open (Red lamp ON, green lamp OFF), THEN stop stopwatch and record valve opening time:

Time 3.66 seconds AC

Acceptance Criteria: **Unit 1:** $1.45 \leq t \leq 4.35$ seconds
Unit 2: $1.31 \leq t \leq 3.93$ seconds

5.11.2.5 Perform "TRAV SCRN 1B(2B) WASH FV-6924" close exercise test as follows:

a. Close ECW Screen Wash Booster Pump Discharge Valve by placing handswitch "TRAV SCRN 1B(2B) WASH FV-6924" to "CLOSE". AC

AC

b. Verify "TRAV SCRN 1B(2B) WASH FV-6924" is closed (Red light OFF, Green light ON). AC

KEY

Essential Cooling Water System Train B Testing

6.0 Acceptance Criteria

- 6.1 Essential Cooling Water Emergency Backflush Manual Valve 1(2)-EW-0278 shall manually operate full open and full closed. (Steps 5.3.3 and 5.3.9)
- 6.2 Essential Cooling Water Emergency Backflush Check Valve 1(2)-EW-0404 full opened by indication of flow from emergency backflush piping. (Step 5.3.8)
- 6.3 Essential Cooling Water Discharge Strainer Backflush Throttle Valve 1(2)-EW-0189 shall manually operate full closed and open to its required safety position (throttled). (Steps 5.3.7, 5.4.2.4, 5.5.2.2d, 5.6.3)
- 6.4 ECW Pump 1B(2B) flow shall be within the Acceptable Range or the Alert Range. (Step 5.4.15.3 or 5.4.16.3)
- 6.5 ECW Pump 1B(2B) Vibration Test Data shall be within the Acceptable Range or the Alert Range. (Step 5.4.15.6 or 5.4.16.6)
- 6.6 ECW Pump 1B(2B) Discharge Check Valve 1(2)-EW-0042 exercised to the full open position by verification of flow greater than the Acceptance Criteria. (Step 5.5.1.1 or 5.5.8)
- 6.7 ECW Screen Wash Booster Pump 1B(2B) Differential Pressure (DP) shall be within the Acceptable Range. (Step 5.7.14.3)
- 6.8 ECW Screen Wash Booster Pump 1B(2B) Vibration Test Data shall be within the Acceptable Range or the Alert Range. (Step 5.7.17)
- 6.9 Flow through 1(2)-EW-0254 ECW Screen Wash Booster Pump Discharge Check Valve shall be greater than 158 gpm. (Step 5.8.5)
- 6.10 1(2)-EW-FV-6936 ECW Blowdown Valve shall close (fail-safe position) with a stroke time within the allowed time listed in Step 5.10.3.3, and operate through one complete cycle open and closed. (Steps 5.10.3.3 and 5.10.4.2)
- 6.11 1(2)-EW-MOV-0137 ECW Pump Discharge Valve shall open with a stroke time within the allowed time listed in Step 5.11.1.3b, and operate through one complete cycle open and closed. (Steps 5.11.1.3b and 5.11.1.4b)
- 6.12 1(2)-EW-FV-6924 ECW Screen Wash Booster Pump Discharge Valve shall open (fail-safe position) with a stroke time within the allowed time listed in Step 5.11.2.4b, and operate through one complete cycle open and closed. (Steps 5.11.2.4b and 5.11.2.5b)

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing**7.0** References**7.1** **Technical Specifications**

- 7.1.1 Technical Specification 3.7.4 [ITS 3.7.8]
- 7.1.2 Technical Specification 4.0.5 [ITS 5.5.8]
- 7.1.3 Technical Specification 4.3.2.1.1.c.7 [ITS SR 3.3.2.7.1c]

7.2 **Regulatory Guides and Standards**

- 7.2.1 ASME OMa-1988, Addenda to ASME OM-1987, Operation and Maintenance of Nuclear Power Plants, Part 6, Inservice Testing of Pumps in Light-Water Reactor Power Plants.
- 7.2.2 ASME OMa-1988, Addenda to ASME OM-1987, Operation and Maintenance of Nuclear Power Plants, Part 10, Inservice Testing of Valves in Light-Water Reactor Power Plants.

7.3 **UFSAR**

- 7.3.1 Section 3.9.6, Inservice Testing of Pumps and Valves
- 7.3.2 Section 9.2.1.2, Essential Cooling Water System

7.4 **Commitments**

- 7.4.1 SPR 870394, ECW Pump Test Failure Due To Instrumentation Problems
- 7.4.2 SPR 940802, Installed Plant Pump Gages Exceed ASME Section XI Range Requirements
- 7.4.3 SPR 941413, M&TE Issue Sheets not Completed for each use of Instrument
- 7.4.4 Generic Letter 91-15, Operating Feedback Report, Solenoid-Operated Valve Problems at U.S. Reactors
- 7.4.5 ST-HL-AE-7393, Reply to Notice of Violation 9236-05 Regarding Failure to Include Valves in the Inservice Testing (IST) Program
- 7.4.6 MATS Item 9201148-936 (NRC IR 92-201), July 1992 ECW Inspection
- 7.4.7 CR 97-12395, Containment Spray Pump Slave Relay Testing

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing**7.5 Technical Standards and Manuals**

- 7.5.1 14269-4122(8122)-01001-HX, Instruction Manual for ECW Screen Wash Pump, Reactor Makeup Water Pump, and EAB Chilled Water Pump
- 7.5.2 4Z479Z44810 Sh 23, Instrument Data Sheet, Head-Type Primary Flow Elements
- 7.5.3 5R289MB1006, Essential Cooling Water System Design Basis Document
- 7.5.4 Unit 1/Unit 2 Pump and Valve Inservice Test Plan

7.6 Drawings

- 7.6.1 Piping and Instrument Drawings
- 7.6.1.1 5R289F05038 #1 and #2 Sheet 2, Essential Cooling Water System Train 1B(2B)
- 7.6.1.2 5R289F05039 #1 and #2, Essential Cooling Water System
- 7.6.2 Elementary Wiring Diagrams
- 7.6.2.1 9-E-EW01-01 #1 and #2, Essential Cooling Water Pumps 1A, 1B & 1C (2A, 2B & 2C)
- 7.6.2.2 9-E-EW02-02 #1 and #2, Essential Cooling Water Screen Wash Booster Pump 1A, 1B & 1C
- 7.6.2.3 9-E-EW05-02 #1, Essential Cooling Water Traveling Screens 1A, 1B & 1C
- 7.6.2.4 9-E-EW05-02 #2, Essential Cooling Water Traveling Screens Train "A", "B" & "C"

KEY

Essential Cooling Water System Train B Testing

7.7 STPEGS Procedures and Policies

- 7.7.1 OPOP02-EW-0001, Essential Cooling Water Operation
- 7.7.2 OPOP02-CH-0005, Essential Chiller Operation
- 7.7.3 0PSP03-EW-0011, Essential Cooling Water Pump 1B(2B) Reference Values Measurement
- 7.7.4 0PSP03-EW-0014, ECW Screen Wash Booster Pump 1B(2B) Reference Values Measurement
- 7.7.5 OPOP01-ZQ-0022, Plant Operations Shift Routines
- 7.7.6 OPGP03-ZE-0004, Plant Surveillance Program
- 7.7.7 OPGP03-ZE-0005, Plant Surveillance Procedure Preparation
- 7.7.8 OPGP03-ZA-0055, Plant Surveillance Scheduling
- 7.7.9 OPGP03-ZC-0004, Measuring and Test Equipment Control Program
- 7.7.10 OPGP03-ZM-0016, Installed Plant Instrumentation Calibration Verification Program
- 7.7.11 OPGP03-ZE-0021, Inservice Testing Program for Valves
- 7.7.12 OPGP03-ZE-0022, Inservice Testing Program for Pumps

7.8 Calculations

- 7.8.1 MC-6118, Calculation for Screen Wash Pump Minimum Flow
- 7.8.2 Calculation No. 88-EW-002, ECW Pump Discharge and Suction Pressures
- 7.8.3 CR 98-12276-35, O&M Code Calculation of Stroke Time Acceptance Criteria

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

8.0 Support Documents

- 8.1 Addendum 1, Essential Cooling Water Pump Bay Level Correction Factor
- 8.2 Addendum 2, ECW Pump Vibration Test Point Locations and Instructions
- 8.3 Addendum 3, ECW Screen Wash Booster Pump Vibration Test Point Locations and Instructions
- 8.4 Addendum 4, ECW Screen Wash Booster Pump 1B(2B) Flow
- 8.5 Data Sheet 1, Essential Cooling Water Flow from CCW Heat Exchanger

KEY

This procedure, when complete, shall be retained for the life of the plant.

KEY

Bay Level LI-6921 feet	Bay Level Correction Factor
15.0	4.7
15.1	4.7
15.2	4.6
15.3	4.6
15.4	4.6
15.5	4.5
15.6	4.5
15.7	4.4
15.8	4.4
15.9	4.3
16.0	4.3
16.1	4.3
16.2	4.2
16.3	4.2
16.4	4.1
16.5	4.1

NOTE: Values in the above table were calculated using the following:

ECW Bay Level Correction Factor

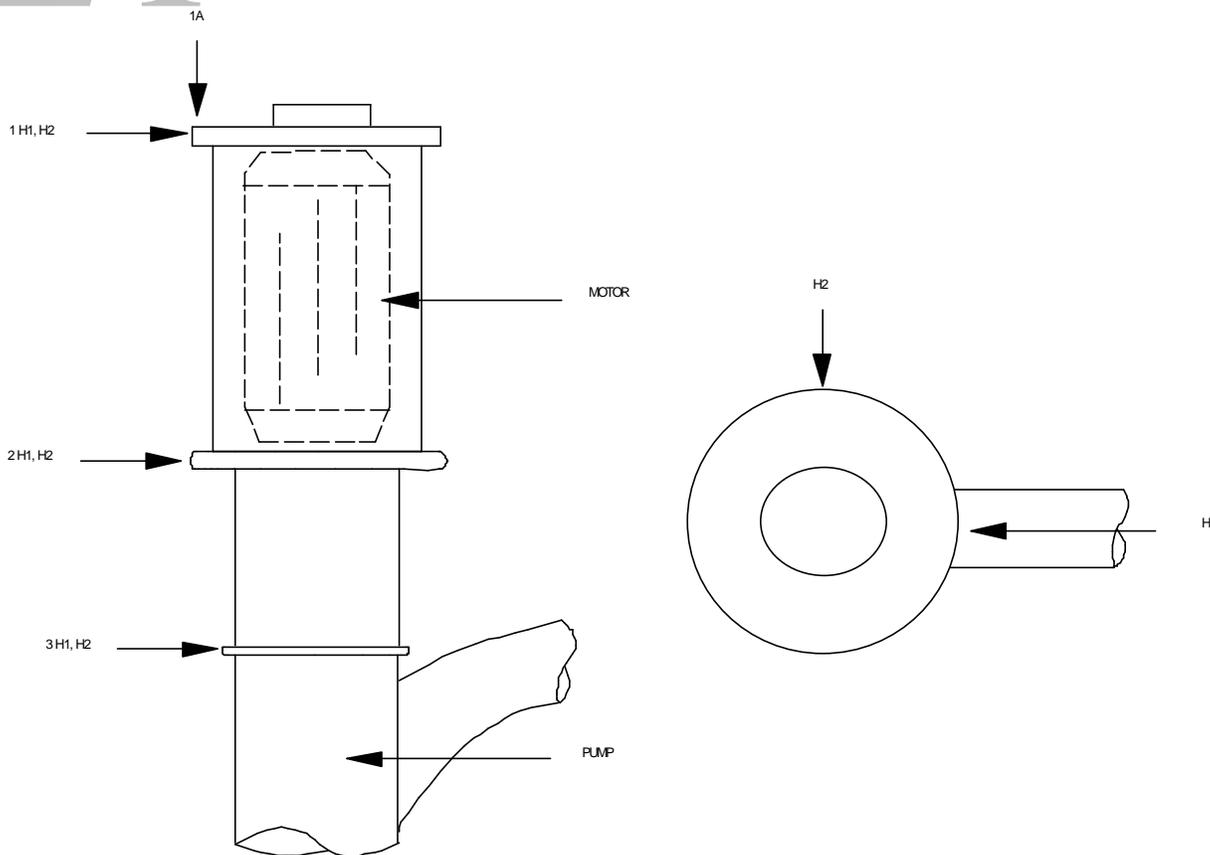
$$\text{Bay Level Correction Factor} = 0.43\text{psi/ft} \times (26\text{ft} - \text{ECW Bay Level})$$

KEY

This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

KEY



D116B

D116B.WPG

- H1- Denotes a horizontal vibration point. Probe shall be held perpendicular to the machine axis and parallel to both the floor and the pump discharge piping.
- H2- Denotes a horizontal vibration point. Probe shall be held parallel to the floor and perpendicular to both the machine axis and the pump discharge piping.
- A- Denotes an axial vibration point. Probe shall be held perpendicular to the floor and parallel to the machine axis.

KEY

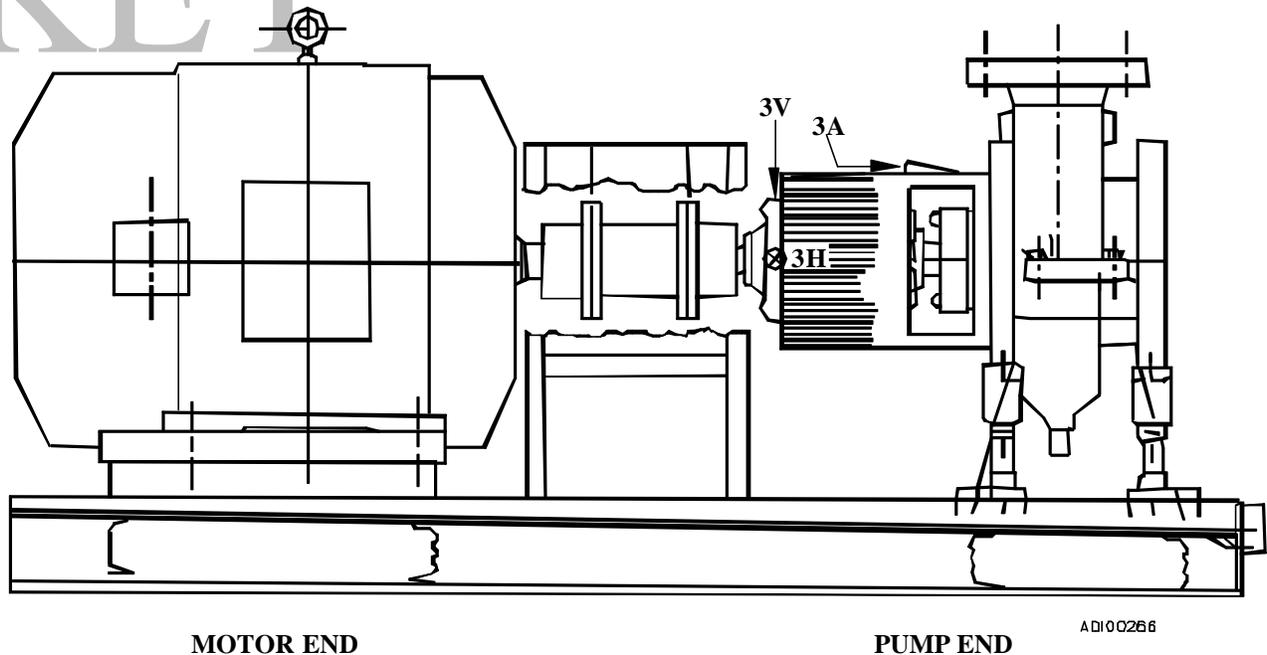
This procedure, when complete, shall be retained for the life of the plant.

Essential Cooling Water System Train B Testing

Addendum 3

ECW Screen Wash Booster Pump Vibration Test Point
Locations and Instructions

Page 1 of 1



MOTOR END

PUMP END

ADI00266

NOTE: Figure is **NOT** a specific drawing for the ECW Screen Wash Booster Pump. The Figure is for illustration of the location of vibration measuring points.

- H- Denotes a horizontal vibration point. Probe shall be held perpendicular to the machine axis and parallel to the floor.
- V- Denotes a vertical vibration point. Probe shall be held perpendicular to the floor and the machine axis.
- A- Denotes an axial vibration point. Probe shall be held parallel to the floor and the machine axis.

KEY

This procedure, when complete, shall be retained for the life of the plant.

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Essential Cooling Water System Train B Testing			
Addendum 4	ECW Screen Wash Booster Pump 1B(2B) Flow		Page 1 of 1

in H ₂ O	gpm	in H ₂ O	gpm	in H ₂ O	gpm	in H ₂ O	gpm	in H ₂ O	gpm
170	150.6	190	159.2	210	167.4	230	175.2	250	182.6
171	151.0	191	159.6	211	167.8	231	175.5	251	183.0
172	151.5	192	160.0	212	168.2	232	175.9	252	183.4
173	151.9	193	160.5	213	168.6	233	176.3	253	183.7
174	152.4	194	160.9	214	169.0	234	176.7	254	184.1
175	152.8	195	161.3	215	169.4	235	177.1	255	184.4
176	153.2	196	161.7	216	169.7	236	177.4	256	184.8
177	153.7	197	162.1	217	170.1	237	177.8	257	185.2
178	154.1	198	162.5	218	170.5	238	178.2	258	185.5
179	154.5	199	162.9	219	170.9	239	178.6	259	185.9
180	155.0	200	163.3	220	171.3	240	178.9	260	186.2
181	155.4	201	163.7	221	171.7	241	179.3	261	186.6
182	155.8	202	164.2	222	172.1	242	179.7	262	187.0
183	156.2	203	164.6	223	172.5	243	180.0	263	187.3
184	156.7	204	165.0	224	172.9	244	180.4	264	187.7
185	157.1	205	165.4	225	173.3	245	180.8	265	188.0
186	157.5	206	165.8	226	173.6	246	181.2	266	188.4
187	157.9	207	166.2	227	174.0	247	181.5	267	188.7
187.1	158.0	= MINIMUM ACCEPTABLE FLOW RATE THROUGH 1(2)-EW-0254							
188	158.4	208	166.6	228	174.4	248	181.9	268	189.1
189	158.8	209	167.0	229	174.8	249	182.3	269	189.4

NOTE: Values in the above Table were calculated using the following:

Calculation of ECW Screen Wash Booster Pump 1A(2A) Flow Rate from Differential Pressure

$$Flowrate = 11.55 \left(\frac{gpm}{inch H_2O^{1/2}} \right) \times \sqrt{DP \text{ inch } H_2O}$$

This procedure, when complete, shall be retained for the life of the plant.

	Step 5.4.12	Step 5.5.6
1	13453	15669
2	13397	15797
3	13213	15597
4	13233	15774
5	13265	15723
6	13197	15665
7	13157	15696
8	13385	15681
9	13309	15787
10	13441	15566
11	13249	15703
12	13120	15703
13	13237	15743
14	13461	15488
15	13405	15665
16	13169	15625
17	13249	15573
18	13333	15754
19	13305	15450
20	13361	15549
21	13405	15453
TOTAL =	289844	328661
AVERAGE	13802.1	15650.5

CRITICAL ERROR
 Correct value:
 279344

NOTE: IF Column is **NOT** used, **THEN** it may be

Step 5.4.12 Performed by _____

Step 5.5.6 Performed by _____

Error Carried Forward
 Correct value:
 13302.1 gpm

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

**TITLE: DETERMINE RADIOLOGICAL REQUIREMENTS TO ENTER A
HIGH RAD AREA**

JPM NO.: A4

REVISION: 2

LOCATION: UNIT 1 OR 2

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: DETERMINE RADIOLOGICAL REQUIREMENTS TO ENTER A HIGH RAD AREA

JPM No.: A4

Rev. No: 2

STP Task: T49250, Place in or remove a mixed bed or cation bed demineralizer.

STP Objective: NLO49250, When directed by designated Control Room personnel, remove/place in service a CVCS mixed bed demineralizer in accordance with OPOP02-CV-0004.

Related K/ A

Reference: G 2.3.10 [2.9/3.3] Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

References: Technical Specification 6.12.2
OPOP02-CV-0005, Rev. 15, CVCS Pre-Start System Alignment
OPGP03-ZR-0051, Rev. 14, Radiological Access and Work Controls
Conduct of Operations Manual, Rev. 15, Chapter 2 - step 3.5.12

Task Normally Completed By: PO

Method of Testing: Simulated

Location of Testing: Unit 1 or 2 RCA

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 15 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU HAVE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The unit is initially increasing power from a refueling outage. Mixed Bed Demineralizer 1(2) "B" was recently placed in service and subsequently removed when an increase in RCS leakage was observed. 1(2) CV-0430, the demineralizer "B" inlet vent valve is suspected of causing the leakage because it was recently replaced during the outage.

INITIATING CUE:

The Unit Supervisor directs you to find the location of the valve and to determine the radiological requirements necessary to access the valve itself.

- It is not necessary to go to the valve's location.
- You are to discuss all requirements with the evaluator.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Determines valve is in Room 244T, and discusses the radiological requirements for entering a GRAVE DANGER, Very High Radiation Area (VHRA)/Locked High Radiation Area (LHRA).

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

The Evaluator is provided with a the Radiological Area map handout for the MAB 60' elevation. The same map is displayed on the wall at the entrance to the mens RCA access point. The applicant may access the wall map to determine that Room 244T is in a Locked High Rad Area. You may also provide the handout as soon as the applicant locates the correct map, if desired.

NOTES:

- 3) This JPM should be given as the first JPM prior to entering the RCA. It should be performed in conjunction with, and just prior to, JPM P1, "Perform Channel check of RT-8038" and JPM P3, "Secure Alternate Boration".
- 4) The JPM may be performed in its entirety outside of the RCA. The applicant most likely will enter the RCA to locate the valve access area; however, it is not required.
- 5) **The NRC Evaluator will use RWP- and use " " as the WAN.**
- 6) The applicant is expected to access all references on his/her own.
- 7) There is **no** answer KEY associated with this JPM.
- 8) Applicant may discuss entry requirements with Health Physics personnel, however; entry requirements should be confirmed using plant references.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Access references to determine valve location.

Standard:

Accesses ORACLE or the Chemical and Volume Control Procedure (OPOP02-CV-0005), to determine location of valve.

Comment:

Applicant may know location from memory or may determine location using a computer either inside or outside of the RCA or OPOP02-CV-0005, Lineup 2, Page 35 of 38.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C)

Determine valve location.

Standard:

Determines 1(2) CV-0430 is in the MAB Room 244T Valve Pit.

Comment:

- 1) Room 244T is accessed from Room 329, Demineralizer access area on the MAB 60' elevation.
- 2) Room 244T is a valve pit, with a shielding plug as its access point.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3(C)

Determine Room Radiological Conditions for Room 244T .

Standard:

Determines that Room 244T is in a GRAVE DANGER, Very High Radiation Area (VHRA)/ Locked High Radiation Area (LHRA) .

Comment:

- 1) Radiation area survey maps are displayed on the wall at entrance to mens RCA entry point.
- 2) Radiation area survey maps can also be obtained at the HP desk.

Cue:

If applicant says he/she would contact Health Physics personnel, provide applicant with the handout of the area survey maps.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4 (C)*

Determine radiological entry requirements for a GRAVE DANGER, Very High Radiation Area (VHRA)/Locked High Radiation Area (LHRA).

Standard:

Discusses the following radiological requirements for entering a LHRA (in general terms) .

- 1)* *Personnel entering a LHRA SHALL be assigned an active RWP which permits such entry. (Specific RWP)*
- 2) *Personnel entering a LHRA SHALL be assigned an individual monitoring device. (TLD)*
- 3)* *Personnel entering a LHRA SHALL be provided with or accompanied by one or more of the following:*
 - *A radiation monitoring device that continuously indicates the dose rate in the area (dose rate meter), **OR***
 - *A radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received (alarming dosimeter), **OR***
 - *An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, and positive control over the activities within the area. (Health Physics Technician)*

Discusses additional requirements for entry into a GRAVE DANGER, VHRA.

- 1) *The access keys for a VHRA shall be unique and controlled.*
- 2) *A pre-job ALARA evaluation approved by the ALARA Review Committee is required.*
- 3) *The Radiation Protection Manager and the Plant Manager must approve entry.*

Comment:

- 1) * - denotes critical portion of step.
- The acceptable general term or phrase may be as short as the underlined portions above.
- The above information may be accessed in either Technical Specification 6.12.2 (for LHRA) or OPGP03-ZR-0051, "Radiological Access and Work Controls" (for LHRA and VHRA) or may ask Health Physics.

Cue:

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: A4, DETERMINE RADIOLOGICAL REQUIREMENTS TO
ENTER A HIGH RAD AREA

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results:

Sat / Unsat

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The unit is initially increasing power from a refueling outage. Mixed Bed Demineralizer 1(2) "B" was recently placed in service and subsequently removed when an increase in RCS leakage was observed. 1(2) CV-0430, the demineralizer "B" inlet vent valve is suspected of causing the leakage because it was recently replaced during the outage.

INITIATING CUE:

The Unit Supervisor directs you to find the location of the valve and to determine the radiological requirements necessary to access the valve itself.

- It is not necessary to go to the valve's location.
- You are to discuss all requirements with the evaluator.

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: MAKE THE NECESSARY COMMUNICATIONS FOR A GIVEN ACCIDENT

JPM NO.: A5

REVISION: 1

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: MAKE THE NECESSARY COMMUNICATIONS FOR A GIVEN ACCIDENT

JPM No.: A5

Rev. No.: 1

Task No.: T501000, Respond to plant transients and to actual or potential core damaging events

STP Objective: EPT003.01, EO05c, d: State the primary responsibility of the following on-shift personnel for response to emergencies at STPEGS: Reactor Plant Operator and Administrative Reactor Operator.

EPT003.01, EO06: Explain the purpose of emergency use communication circuits.

Related K/A Reference: G 2.4.39 [3.3/3.1], Knowledge of the RO's responsibilities in emergency plan implementation.

References: 0ERP01-ZV-IN02, Rev. 11, Notifications to Offsite Agencies

Task Normally Completed By: RO

Method of Testing: Simulated

Location of Testing: N/A

Time Critical Task: YES* (portions pertaining to notification of State/County and NRC)

Alternate Path JPM: YES

Validation Time: 20 mins.

Required Materials (Tools/Equipment): None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

An ALERT has just been declared in Unit 1. The Offsite Notification Message Form (Data Sheet-1) and the NRC Event Notification Worksheet (Data Sheet -4) have been filled out and approved by the Shift Supervisor. No offsite agencies have been notified of the event at this time.

INITIATING CUE:

You are directed to perform **ALL OFFSITE** notifications associated with the ALERT using the data sheets provided in accordance with 0ERP01-ZV-IN02. **Portions of this JPM are time critical.**

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

The Applicant notifies State/County officials within 15 minutes, then notifies the NRC within 60 minutes of the event declaration using applicable forms.

JOB PERFORMANCE MEASURE INFORMATION SHEET (Cont.)

HANDOUTS:

- Working copy of 0ERP01-ZV-IN02, Notifications to Offsite Agencies.
- Marked Up Copy of Data Sheet 1, Offsite Agency Notification Message Form and Data Sheet 4, NRC Event Notification Worksheet .

NOTES:

- 1) The State/County must be notified within 15 minutes and the NRC within 60 minutes of the EVENT declaration. The time critical portions of this JPM begin when the first event sheet (Data Sheet -1) is handed to the applicant.
- 2) The Event time and date have intentionally been left blank on the filled out copies of Data Sheet -1 and Data Sheet -4. This is due to the fact that the Event time is directly tied to the 15 and 60 minute notification clocks, which do not start until the Data Sheets are handed to the applicant.
- 3) The intent of this JPM is for the applicant to make the correct and timely notifications in accordance with 0ERP01-ZV-IN02, Notifications to Offsite Agencies. The intent is NOT to have the applicant read the same forms over and over again. For time considerations acknowledge the notification promptly and do not allow applicant to read the entire content of each message after the initial notification to the respective agency.
- 4) There is **no** KEY associated with this JPM.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain the procedure.

Standard:

Obtains copy of 0ERP01-ZV-IN02

Comment:

- 1) In accordance with 0ERP01-ZV-IN01, the State/County must be notified within 15 minutes of the initial Classification.
- 2) **Start the 15 minute and 1 hour clocks when the data sheet is provided and cue below is given.**

Cue:

- 1) Provide the applicant with the Handout Copy of 0ERP01-ZV-IN02, and marked up copies of Offsite Notification Message Form (Data Sheet -1), and NRC Event Notification Worksheet (Data Sheet -4).
- 2) When the data sheets are handed to the applicant, inform him/her that the time requirement for notification has commenced.

Notes:

SAT/UNSAT Performance Step: 2(C)

JOB PERFORMANCE MEASURE CHECK SHEET

Notify state and county officials within 15 minutes.

Standard:

Reviews Data Sheet -1 and notifies the Matagorda County Sheriff and DPS-Pierce within 15 minutes by console ringdown lines or by calling the applicable telephone numbers and reads the Notification Sheet.

Comment:

- 1) Data Sheet -3 , Offsite Agencies Log, provides telephone numbers of all 'in state' notifications, and should be used by the applicant.
- 2) The applicant should transition to section 5.2 for NRC notification.

Cue:

- When the call is made, inform the applicant that BOTH parties have answered the phone.
- If asked, inform the applicant that BOTH parties are ready to receive the message (they have their notification forms ready).
- (When contacted by applicant) listen to the message, acknowledge it, and direct the applicant to keep the agency updated as required.
- When applicant mentions faxing Data Sheet -1 to the agencies, as Unit Supervisor inform him/her that the Secondary RO will take care of all faxes.

Notes:

When the ringdown line is used, BOTH the Sheriff's office and DPS-Pierce will answer the phone.

- **Completion of this step within 15 minutes of JPM Start Time satisfies the Time Critical requirement for notification of State/County officials.**
-

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 3

Review Data Sheet -4 for NRC notification.

Standard:

Reviews Data Sheet -4 for completeness and accuracy.

Comment:

Since this event does not involve a radiological event, page 2 of Data Sheet-4 is not filled out.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 4(C)

Notify NRC Operations Center.

Standard:

Attempts use of ENS phone to notify NRC Operations Center within 1 hour of event declaration. ENS phone does not work and applicant uses appropriate outside phone line to contact NRC.

Comment:

- 1) If conducting this JPM in the Control Room, DO NOT allow applicant to pick up the ENS phone.
- 2) The NRC Resident Inspector may be notified before the NRC Operations Center by the applicant.

Cue:

- NRC ENS phone line number is not working.
- When applicant uses appropriate outside phone line, NRC representative acknowledges the Event Notification. The NRC requests another update in ten minutes to establish a continuous communication line.
- When the applicant mentions activating ERDS, as Unit Supervisor, inform him/her that the STA will activate ERDS.

Notes:

- **Completion of this step within 60 minutes of JPM Start Time satisfies the Time Critical requirement for notification of NRC.**
-

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 5

Inform NRC Resident Inspector.

Standard:

Informs NRC Resident Inspector of events in progress.

Comment:

- 1) Informing the NRC Resident Inspector is not an off-site notification, but is commonly done at this time.
- 2) The NRC Resident Inspector may be notified before the NRC Operations Center by the applicant.
- 3) The applicant should transition back to procedure step 5.1.2.4 for remaining notifications.

Cue:

The NRC Resident inspector acknowledges the events in progress, if notified.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 6

Make remaining notifications.

Standard:

Notifies, or mentions having to notify the following of events in progress:

- *Bureau of Radiation Control (BRC)*
- *Unaffected Control Room (not off-site)*
- *Reliant System Operations*

Comment:

During this particular event, there will not be an unaffected Control Room. (both Units will lose power and have a reactor trip.)

Cue:

All notified agencies/groups acknowledge.

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: A5, MAKE THE NECESSARY COMMUNICATIONS FOR A GIVEN ACCIDENT

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature: _____

Date: _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

An ALERT has just been declared in Unit 1. The Offsite Notification Message Form (Data Sheet-1) and the NRC Event Notification Worksheet (Data Sheet -4) have been filled out and approved by the Shift Supervisor. No offsite agencies have been notified of the event at this time.

INITIATING CUE:

You are directed to perform **ALL OFFSITE** notifications associated with the ALERT using the data sheets provided in accordance with 0ERP01-ZV-IN02. **Portions of this JPM are time critical.**

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

**TITLE: REVIEW RCS INVENTORY AND DETERMINE TECH SPEC
APPLICABILITY**

JPM NO.: A6

REVISION: 2

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: REVIEW RCS INVENTORY AND DETERMINE TECH SPEC APPLICABILITY

JPM No.: A6

Rev. No.: 2

Task No.: 10300, Interpret Technical Specifications.

STP Objective: 10300, Given that a condition exists requiring entry into a Technical Specification action statement, interpret Technical Specifications accurately, such that plant activities occur safely and smoothly, and that contacting superiors for advice is unnecessary.

Related K/A Reference: 2.1.7 [4.4] Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument response.

References: 0PSP03-RC-0006, Rev. 7, Reactor Coolant Inventory
South Texas Project Technical Specifications

Task Normally Completed By: SRO

Method of Testing: Actual Performance

Location of Testing: N/A

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 25 minutes

Required Materials (Tools/Equipment):

Calculator
Technical Specifications

READ TO PERFORMER:

JOB PERFORMANCE MEASURE INFORMATION SHEET

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is at 100% steady state power with indications of increased RCS leakage. OPSP03-RC-0006, Reactor Coolant Inventory, has just been completed using a manual calculation and indicates a Technical Specification Allowable Value has been exceeded.

INITIATING CUE:

You are the Unit Supervisor and are to complete the Plant Operations Review of the completed surveillance, including Technical Specification applicability.

- Primary to Secondary leakage is 13 gpd.
- There is no other known leakage.

THREE errors have been inserted into the surveillance, one (1) Critical and two (2) Non-Critical. As a MINIMUM, you are to IDENTIFY the Critical error. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

- 3) There are **NO** intended errors in the “Instrument”, “Start” or “Stop” columns of Data Sheet 1.
- 4) Carryover errors count as only one error (i.e., a single error that carries over from calculation to calculation or multiple line items with the same incorrect information)

JOB PERFORMANCE MEASURE INFORMATION SHEET CON'T

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

The critical error has been identified AND it is determined that Technical Specification LCO entry is NOT required.

HANDOUTS:

Handout Copy of the completed surveillance.

NOTES:

- 1) A completed Answer KEY is provided for the Evaluator. The Key contains the same errors as the handout. The location of the errors will be highlighted and described on the evaluator copy. **Do Not Hand to the Applicant**

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1 (C)*

Review the completed surveillance.

Standard:

Identifies the following ERRORS:

- 1)* *VCT level change calculation is reversed (“STOP-START” was used instead of “START-STOP”)*
- 2) *“Data Transcription or Calculations Verified By” signature block is N/A’d instead of being signed.*
- 3) *Data entry points at the bottom of page 2 of Data Sheet 1 are blank instead of being filled in.*

Comment:

- 1) * Denotes Critical Error. Error #1 potentially causes an LCO entry and possible plant shutdown.
- 2) Error #2 is a requirement of procedure step 3.2 (if a manual calculation is performed) and is not considered critical because it is an administrative requirement. Error #3 is not considered critical because it does not affect the outcome of the surveillance, only makes the surveillance easier to reconstruct once vaulted.
- 3) Error #1 results in incorrect calculations for GROSS Leakage rate (steps 5.8.1 and 5.8.2) and UNIDENTIFIED LEAKAGE Rate (step 5.11). If the applicant considers this 2 or more errors, remind him/her of Initiating Cue assumption #2 - this is considered only 1 error.

STEP CONTINUED ON NEXT PAGE

JOB PERFORMANCE MEASURE CHECK SHEET

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C)

Determine Technical Specification applicability.

Standard:

Determines that the Acceptance Criteria of the surveillance are NOT met (GROSS Leakage Rate is >1 gpm), however Technical Specification limits have NOT been exceeded and LCO entry is NOT required.

Comment:

This surveillance is unique in that the Acceptance Criteria may not be met, yet an entry into a Technical Specification LCO may not be required.

Cue:

Notes:

Technical Specification limits are as follows:

- No Pressure Boundary leakage
- 1 gpm Unidentified Leakage
- 150 gpd primary-to-secondary leakage through any one steam generator
- 10 gpm Identified Leakage

- TERMINATE THE JPM -

JPM STOP TIME _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is at 100% steady state power with indications of increased RCS leakage. OPSP03-RC-0006, Reactor Coolant Inventory, has just been completed using a manual calculation and indicates a Technical Specification Allowable Value has been exceeded.

INITIATING CUE:

You are the Unit Supervisor and are to complete the Plant Operations Review of the completed surveillance, including Technical Specification applicability.

- Primary to Secondary leakage is 13 gpd.
- There is no other known leakage.

THREE errors have been inserted into the surveillance, one (1) Critical and two (2) Non-Critical. As a MINIMUM, you are to IDENTIFY the Critical error. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

- 1) There are **NO** intended errors in the “Instrument”, “Start” or “Stop” columns of Data Sheet 1.
- 2) Carryover errors count as only one error (i.e., a single error that carries over from calculation to calculation or multiple line items with the same incorrect information)

O:\PROC\OFFICE97\PSP03\ORC0006.07x Effective Date: 02/19/98 Print Time / Date: 2:56 PM 10/17/01	<h1>OPSP03-RC-0006</h1>	<h2>Rev. 7</h2>	Page 1 of 16
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Reactor Coolant Inventory

Quality	Safety-Related	Usage: REFERENCED	Effective Date: 02/19/98
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K. P. Mulligan	J. C. Heil	Crew 2D	Operations
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.

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Reactor Coolant Inventory**1.0 Purpose and Scope**

- 1.1 Provide instructions for performing a Reactor Coolant System Water Inventory Balance to determine RCS leakage and satisfy the surveillance requirements of Technical Specification Section 4.4.6.2.1.c [ITS SR 3.4.14.1].
- 1.2 The calculations in this procedure assume the plant is in Modes 1, 2, 3, or 4 and plant conditions are stable. Performance of an inventory balance at conditions other than previously stated may yield unreliable results.
- 1.3 Provide a means for updating the Plant Computer Sump Level Monitoring System identified leakage value.

2.0 Responsibilities

- 2.1 This procedure is performed by Plant Operations.
- 2.2 The following personnel shall review this test:
 - Test Coordinator
 - Shift Supervisor
 - Division Surveillance Coordinator
- 2.3 After completion of test, routing is per OPGP03-ZE-0004 (Plant Surveillance Program), and OPGP03-ZA-0055 (Plant Surveillance Scheduling).

3.0 Precautions and Notes

- 3.1 IF the computer program is used for data calculation, THEN the following applies:
 - 3.1.1 The computer generated form may be substituted for Data Sheet 1, Leakage Rate, Page 2 of 2.
 - 3.1.2 A second qualified individual **SHALL** sign on the PPDS cover sheet where indicated, to verify the correct transcription of data.
- 3.2 IF a manual calculation is performed, THEN a second qualified individual **SHALL** sign on the PPDS cover sheet where indicated, to verify the calculation is correct.
- 3.3 In Modes 1 or 2, Reactor Power **SHALL** be maintained in a 1% band.

Reactor Coolant Inventory

Initials

- 3.4 In Modes 1, 2, or 3, a minimum of one RCP in operation is required.
- 3.5 IF performing to obtain an Identified OR Unidentified Leakage Rate, THEN VERIFY RCDT level is being maintained between 20 and 70%.
- 3.6 Diversion of letdown to Recycle Holdup Tanks will invalidate the test.
- 3.7 IF determining an Identified OR Unidentified Leak Rate, THEN the following will invalidate this test:
 - 3.7.1 Draining of the RCDT or PRT
 - 3.7.2 Venting, draining, or sampling any portion of the RCS, CVCS, or interconnected piping
 - 3.7.3 RCS sampling may be allowed to recirculate to the VCT, however, RCS Coolant **SHALL NOT** be removed from the RCS during this test.
 - 3.7.4 Opening RC-FV-3650 (PRT SPRAY ISOL) or the opening of RC-FV-3651 (RMW to PRT/RCP standpipe) with known leakage across RC-FV-3650 (Reference 7.4.2).
- 3.8 Failure to meet the acceptance criteria of the test may require entry into LCO Action Statement 3.4.6.2 [ITS 3.4.14 Condition A].
- 3.9 Any changes to this procedure requires a review of the computer program for adherence to Software Quality Assurance Standards.
- 3.10 Operation of the HHSI or LHSI pumps may invalidate the test due to potential relief valve leakage into the PRT (Reference 7.4.2).

4.0 Prerequisites

- 4.1 Pressurizer/Reactor Coolant System pressure is approximately 400 psig OR 2235 psig. JD
- 4.2 Record the following on PPDS:
 - Unit Number JD
 - Reason for Test JD

Reactor Coolant Inventory

Initials

5.0 Procedure

5.1 VERIFY the prerequisites are complete. JD

5.2 RECORD START data and instrumentation on Data Sheet 1, Leakage Rate. JD

NOTE

This test should be performed over a two hour period unless steady conditions cannot be maintained. A test period of one hour is sufficient to satisfy the surveillance test. The test period may be specified at the discretion of the Shift Supervisor.

5.3 WHEN the determined test period has elapsed, THEN perform the following:

5.3.1 VERIFY Stop time Reactor Power is within 1% of Start time Reactor Power. JD

5.3.2 VERIFY Stop time PRZR pressure is within 10 psig of Start time PRZR pressure. JD

5.3.3 IF Reactor Power and Pressure data are within limits above, THEN record STOP data on Data Sheet 1, Leakage Rate. JD

5.3.4 IF Reactor Power and Pressure data were NOT within limits above, THEN do NOT record stop data. N/A

5.3.5 WHEN Reactor Power and Pressure stabilize within limits, THEN return to Step 5.2 and obtain new data. N/A

5.4 DETERMINE PRT level in gallons from percent using the Plant Curve Book, Figure 10.8, Pzr Relief Tank. JD

5.5 DETERMINE RCDT level in gallons from percent using the Plant Curve Book, Figure 10.9, RC Drain Tank. JD

5.6 Pressurizer level correction factor calculation:

$$68.3 + 0.023 (2235 - \frac{2246}{\text{Stop Press}} \text{ psig}) = \frac{68.047}{\text{gal/\%}} \text{ JD}$$

Reactor Coolant Inventory

Initials

5.7 Temperature correction factor calculation:

5.7.1 IF pressure is approximately 400 psig AND Stop Temperature is between 240 and 4000F, THEN PERFORM the following:

$$32 + 0.147 \left(\frac{\text{N/A}}{\text{Stop Temp}} \text{ } ^\circ\text{F} - 240 \right) = \text{N/A gal/}^\circ\text{F}$$

N/A

JD

Error carried forward from Data Sheet 1 – Value should be **-41.7**

pressure is approximately 223. between 500 and 600°F, THEN u

Calculation error carried forward – Value should be **184.54**

5.8 GROSS Leakage Rate calculation:

5.8.1 Sum changes in VCT, PRZR, TEMP and Makeup.

$$\frac{41.7 \text{ gal}}{\text{VCT}} + \frac{144.94 \text{ gal}}{\text{PRZR}} + \frac{18.34 \text{ gal}}{\text{TEMP}} + \frac{63 \text{ gal}}{\text{Makeup}} = \frac{267.98 \text{ gal}}{\text{Total}}$$

5.8.2 Divide the sum by the elapsed time:

$$\frac{267.98 \text{ gal}}{\text{Total}} \div \frac{137 \text{ min}}{\text{Time}} = \frac{1.96 \text{ gpm}}{\text{GROSS Leakage Rate}}$$

Calculation error carried forward – Value should be **1.35**

Reactor Coolant Inventory

Initials

NOTE

Steps 5.9, 5.10, and 5.11 should be performed unless instrumentation problems exist or as directed by the Shift Supervisor.

5.9 Identified Leakage Rate calculation:

5.9.1 Sum data from the PRT and RCDT:

$$\frac{0}{\text{PRT}} \text{ gal} + \frac{99.7}{\text{RCDT}} \text{ gal} = \frac{99.7}{\text{Total}} \text{ gal}$$

5.9.2 Divide the sum by the elapsed time:

$$\frac{99.7}{\text{Total}} \text{ gal} \div \frac{137}{\text{Time}} \text{ min} = \frac{0.73}{\text{Contained Leak Rate}} \text{ gpm}$$

5.9.3 OBTAIN latest calculated Primary - to - Secondary Leakage from Chemical Analysis per 0PCP09-ZR-0005. JD

5.9.4 Divide results by 1440 to determine leak rate in gallons per minute.

$$\frac{13}{\text{Primary - to - Secondary Leakage Rate}} \text{ gpd} \div (1440 \text{ min/day}) = \frac{0.01}{\text{gpm}}$$

JD

5.9.5 ENTER other Identified Leakage that is not directed to the PRT or RCDT or is not Primary - to - Secondary Leakage. N/A

SOURCES

LEAKAGE

N/A
Other Identified Leakage

N/A gpm
Other Leakage Rate

Reactor Coolant Inventory

Initials

NOTE

IDENTIFIED LEAKAGE Rate Acceptance Criteria is less than or equal to 10 gpm.

AC 5.10 DETERMINE IDENTIFIED LEAKAGE Rate by summing Contained, Primary - to - Secondary and Other Leakage Rates.

$$\frac{0.73}{(5.9.2)} \text{ gpm} + \frac{0.01}{(5.9.4)} \text{ gpm} + \frac{0}{(5.9.5)} \text{ gpm} = \frac{0.74}{\text{IDENTIFIED LEAKAGE RATE}} \text{ gpm}$$

NOTE

UNIDENTIFIED LEAKAGE Rate Acceptance Criteria is less than or equal to 1 gpm.

AC 5.11 DETERMINE UNIDENTIFIED LEAKAGE Rate by subtracting IDENTIFIED LEAKAGE Rate from GROSS Leakage Rate.

$$\frac{1.96}{(5.8.2)} \text{ gpm} - \frac{0.74}{(5.10)} \text{ gpm} = \frac{1.22}{\text{UNIDENTIFIED LEAKAGE Rate}} \text{ gpm}$$

Error carried forward from Step 5.8.2 – Value should be **1.35**

Calculation error carried forward – Value should be **0.61**

Reactor Coolant Inventory

Initials

NOTE

Mark Section 5.12 "N/A" IF Sump Level Monitoring is NOT available on the Proteus Plant Computer.

5.12 IF this test is being performed due to a high leakage indicated on the Proteus Sump Level Monitoring System (SLM) AND the RCS leak rate is normal, THEN perform the following:

5.12.1 Obtain Reactor Coolant Pressure Boundary (RCPB) sump monitor accessible constants display as follows:

5.12.1.1 SELECT "MISC FUNCT" N/A

5.12.1.2 ENTER "16" on display and PRESS "EXECUTE" N/A

5.12.2 ENTER the value of ZERO (0.0) in the normal and secondary sump IDENTIFIED INFLOW and PRESS "EXECUTE" N/A

5.12.3 WHEN one hour has elapsed, THEN obtain the RCPB LEAK DETECTION STATUS display as follows:

5.12.3.1 SELECT "SYSTEM MENU" N/A

5.12.3.2 ENTER "RC" on display and PRESS "EXECUTE" N/A

5.12.3.3 SELECT "DISPLAY LIST" N/A

5.12.3.4 ENTER "66"("65" Unit 2) on display and PRESS "EXECUTE" N/A

5.12.4 Obtain the normal and secondary CALCULATED INFLOW from the RCPB LEAK DETECTION STATUS display by:

5.12.4.1 Using the "NEXT FIELD" Button to place the cursor on each inflow value and PRESS "PICK" N/A

5.12.4.2 Document the normal and secondary CALCULATED INFLOW values

• Normal Sump Calculated Inflow N/A gpm N/A

• Secondary Sump Calculated Inflow N/A gpm N/A

5.12.5 Obtain the RCPB sump monitor accessible constants display as follows:

Reactor Coolant Inventory

- 5.12.5.1 SELECT "MISC FUNCT" N/A
- 5.12.5.2 ENTER "16" on display and PRESS "EXECUTE" N/A
- 5.12.6 ENTER the CALCULATED INFLOW values from Step 5.12.4.2 for the normal and secondary IDENTIFIED INFLOW and press "EXECUTE" N/A
- 5.12.7 IF the Proteus RCPB Sump Monitoring System IDENTIFIED INFLOWS were changed per this procedure, THEN ENTER the new values.
 - Normal Identified Inflow N/A gpm N/A
 - Secondary Identified Inflow N/A gpm N/A
- 5.12.8 ENTER the IDENTIFIED INFLOW values in the Proteus Accessible Constants Log located in the Plant Computer Room. N/A

NOTE

Mark Section 5.13 "N/A" IF Sump Level Monitoring is NOT available on the ICS Plant Computer.

- 5.13 IF this test is being performed due to a high leakage indicated on the ICS Plant Computer Sump Level monitoring program AND the RCS leak rate is normal, THEN perform the following on the computer:
 - 5.13.1 Access the "Point Information" display.
 - 5.13.2 Remove the desired point from Scan and enter the value of ZERO (0.0) for the following constants:
 - K7801 "Cntmnt Nrm Sump Ident Inflow" N/A
 - K7802 "Cntmnt SCD Sump Ident Inflow" N/A

Reactor Coolant Inventory

- 5.13.3 WHEN one hour has elapsed, THEN obtain the calculated inflow values from RC-012 RCPB LEAK DETECTION STATUS display and record the values below:
- NORMAL SUMP CALCULATED INFLOW N/A gpm
 - SECONDARY SUMP CALCULATED INFLOW N/A gpm
- 5.13.4 Enter the value for NORMAL SUMP CALCULATED INFLOW from Step 5.13.3 into K7801 “Cntmnt Nrm Sump Ident Inflow” and return the point to Scan. N/A
- 5.13.5 Enter the value from SECONDARY SUMP CALCULATED INFLOW from Step 5.13.3 into K7802 “Cntmnt SCD Sump Ident Inflow” and return the point to Scan. N/A
- 5.13.6 Enter the new identified inflow values for K7801 and K7802 into the Plant Computer Accessible Constants Log. N/A
- 5.14 ENSURE all performers and verifiers sign/initial on Data Sheet 1. JD
- 5.15 DETERMINE test results by using Acceptance Criteria, Section 6.0 AND sign Test Performed by. JD
- 5.16 NOTIFY Shift Supervisor of test results and completion. JD

Reactor Coolant Inventory**6.0** Acceptance Criteria**NOTE**

WHEN actual UNIDENTIFIED LEAKAGE is less than 0.2 gpm, THEN calculated values between -0.2 and +0.2 gpm may be expected due to instrument drift and are acceptable for surveillance credit.

6.1 Leakage rates as follows:

- GROSS Leakage Rate less than 1.0 gpm. (Step 5.8.2)

OR

- IDENTIFIED LEAKAGE does not exceed 10.0 gpm. (Step 5.10)

AND

- UNIDENTIFIED LEAKAGE does not exceed 1.0 gpm. (Step 5.11)

7.0 References**7.1** **Technical Specifications**

7.1.1 3.4.6.2 [ITS 3.4.14]

7.1.2 4.4.6.2.1.c [ITS SR 3.4.14.1]

7.2 **Regulatory Guides and Standards**

None

7.3 **UFSAR**

None

7.4 **Commitments**

7.4.1 ST-AE-HL-91335, Inspection Report 87-37, Item 3f

7.4.2 CR# 95-239 (IEN 94-46)

7.5 **Technical Standards and Manuals**

None

Reactor Coolant Inventory**7.6 Drawings**

None

7.7 STPEGS Procedures and Policies

7.7.1 OPCP09-ZR-0005, Determination of Primary to Secondary Leak Rate

7.7.2 Plant Curve Book

8.0 Support Documents

8.1 Addendum 1, Temperature Change Conversion Factors For T_{avg}/T_{cold} 500 - 600°F

8.2 Data Sheet 1, Leakage Rate

KEY

Reactor Coolant Inventory

Addendum 1

Temperature Change Conversion Factors For T_{avg}/T_{cold} 500
- 600°F

Page 1 of 1

TEMP	CONVERSION FACTOR						
500	46.3	526	52.4	552	60.8	578	72.5
501	46.5	527	52.7	553	60.9	579	73.0
502	46.7	528	52.9	554	61.6	580	73.7
503	46.8	529	53.4	555	61.8	581	74.3
504	47.0	530	53.4	556	62.3	582	74.8
505	47.4	531	53.9	557	62.6	583	75.4
506	47.6	532	54.1	558	63.1	584	76.1
507	47.7	533	54.4	559	63.4	585	76.4
508	47.9	534	54.8	560	63.9	586	77.3
509	48.3	535	54.9	561	64.2	587	78.0
510	48.4	536	55.5	562	64.7	588	78.6
511	48.6	537	55.6	563	65.3	589	79.2
512	48.9	538	55.9	564	65.6	590	79.8
513	49.1	539	56.3	565	66.1	591	80.6
514	49.5	540	56.4	566	66.6	592	81.3
515	49.6	541	57.0	567	66.8	593	81.9
516	49.8	542	57.3	568	67.5	594	82.9
517	50.2	543	57.4	569	67.8	595	83.5
518	50.3	544	58.0	570	68.3	596	84.2
519	50.5	545	58.1	571	69.0	597	85.0
520	50.8	546	58.6	572	69.3	598	85.8
521	51.2	547	59.0	573	69.8	599	86.8
522	51.3	548	59.3	574	70.4	600	87.5
523	51.7	549	59.4	575	70.9		
524	51.9	550	60.2	576	71.4		
525	52.2	551	60.3	577	72.1		

This procedure, when complete, SHALL be retained for five years.

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Reactor Coolant Inventory			
Data Sheet 1	Leakage Rate (Sample)		Page 1 of 2

Procedure Performance Data Sheet

Unit Number: <p style="text-align: center; font-size: 1.2em;">ONE</p>	Test Interval: <p style="text-align: center;">72 hour</p>	Technical Specifications Reference: <p style="text-align: center;">4.4.6.2.1.c [ITS SR 3.4.14.1]</p>	Plant MODE: <p style="text-align: center;">1,2,3, or 4</p>
Reason for Test: <input type="checkbox"/> Periodic Surveillance Test <input checked="" type="checkbox"/> For Surveillance Credit			
Test Results: Technical Specifications Allowable Value Exceeded: <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES (explain in Remarks) <input type="checkbox"/> Acceptable (All AS LEFT data within tolerance) <input checked="" type="checkbox"/> Unacceptable (Any AS LEFT data NOT within tolerance) (explain in Remarks)			
Test Performed by: _____ <div style="text-align: center;">John Doe Reactor Operator</div>		Date: _____ <div style="text-align: center;">5/21/01 Date</div>	Time: _____ <div style="text-align: center;">0730 Time</div>
Data Transcription or Calculations Verified By: _____ <div style="text-align: center;">N/A Reactor Operator</div>		Date: _____	Time: _____
Plant Ops Review: Potential Reportable Occurrence: <input type="checkbox"/> Yes <input type="checkbox"/> No LCO Action Statement Entered? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Reviewed By: _____ <div style="text-align: center;">Shift Supervisor</div>		Date: _____	Time: _____
Operations Surveillance Coordinator Review: Reviewed By: _____ <div style="text-align: center;">Operations Surveillance Coordinator</div>			

NON-Critical Error: The calculations should have been verified and a signature, time and date entered

Performers and Verifiers:

Name (Print)	Signature	Initials
John Doe	John Doe	JD

Remarks: Gross leakage is greater than 1.0 gpm. Unidentified leakage has exceeded the Tech Spec limit of 1.0 gpm.

Reactor Cool

Data Sheet 1

Leakage

Critical Error: (STOP – START)CF was used to calculate VCT level change in gallons instead of (START – STOP)CF.

Correct calculation is (48.55-49.78)33.9 = -41.7

Computer generated data should be used whenever possible. However, in all cases the same instrument must be used for STOP data that was used for START data.

	Instrument	Step 5.2 Start	Step 5.3 Stop	Correction Factor (CF)	Calculation	Result
Time	N/A	0500	0717	N/A	STOP - START	137 min.
Reactor Power	NE0041	100.91 %	100.06 %	N/A	STOP - START	0.85 ≤ 1.0% (SAT)UNSAT
PRZR/RCS Pressure	QDPS PT0456	2248 psig	2246 psig	N/A	STOP - START	2 ≤ 10 psig (SAT)UNSAT
VCT Level	L0112 or	48.55 %	49.78 %	33.9	(START - STOP)CF	41.7 gal
PRZR Level	LE0465	55.34 %	53.21 %	68.047 (1)	(START - STOP)CF	144.94 gal
RCS Tavg/Tcold	TA0412A	589.7 °F	589.93 °F	79.76 (2 of 3)	(STOP - START)CF	18.34 gal
Makeup Totalizer	FQI-0111B	43602 gal	43665 gal	N/A	STOP - START	63 gal
PRT Level	L0485 or	71.1 % 11544.4 gal	71.1 % 11544.4 gal	N/A	STOP - START	0 gal
RCDT Level	LI-4901	40 % 148.7 gal	66 % 248.4 gal	N/A	STOP - START	99.7 gal

GROSS (4) gpm - IDENTIFIED (5) gpm = UNIDENTIFIED gpm

IDENTIFIED includes (Primary - to - Secondary) (6) gpm and (Other) (7) gpm

- (1) Step 5.6 (2) Step 5.7.1 (3) Step 5.7.2 (4) Step 5.8.2
- (5) Step 5.10 (6) Step 5.9.4 (7) Step 5.9.5

NON-Critical Error: Data in these blanks is expected to be filled in

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: REVIEW CONTROL ROOM LOGS

JPM NO.: A7

REVISION: 1

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: REVIEW CONTROL ROOM LOGS

JPM No.: A7

Rev. No.: 1

Task No.: 30200, Review Operations Logs

STP Objective: 30200, Review Operations Logs IAW 0POP01-ZQ-0022, Plant Operations Shift Routines, to verify that all forms have been completed and any Corrective Action initiated.

**Related
K/A Reference:** 2.1.3 [3.4], Knowledge of Shift Turnover Practices

References: 0POP01-ZQ-0022, Plant Operations Shift Routines
0POP02-CV-0003, Mixing of Boric Acid
Technical Specifications
SPR-940598, Low Boron Concentration, BAT 1A

**Task Normally
Completed By:** SRO

**Method
of Testing:** Simulated

**Location
of Testing:** N/A

**Time
Critical Task:** NO

**Alternate
Path JPM:** NO

**Validation
Time:** 15 minutes

Required Materials (Tools/Equipment):
None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The plant is in MODE 1, 100% steady state conditions.

INITIATING CUE:

You are directed to review the enclosed log package for accuracy and locate technical and/or procedural errors which have been inserted.

THREE errors have been inserted into the log package, one Critical and two Non-Critical. As a MINIMUM, you are to IDENTIFY the Critical error. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

- 1) Carryover errors count as only one error (i.e., a single error that carries over from calculation to calculation or multiple line items with the same incorrect information)

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Correctly locates the critical error which has been inserted into the Control Room Log Package.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Copy of faulted Control Room Log Package.

NOTES:

- 1) The Control Room log package will consist of a cover page plus 5 of the 34 logsheets. Three errors have been inserted into the Log Package, two of which are noncritical and one of which is critical. The critical error relates to a missed Technical Specification violation, and the non critical errors relate to STP administrative or procedural limit violations. As a minimum, the examinee must locate the Critical error for successful completion of the task.
- 2) The Evaluator is provided with an ANSWER KEY which is appropriately marked ("KEY"). The location of inserted errors is also mentioned in the body of this JPM. The evaluator shall not hand out any page(s) marked as "KEY" to the examinee.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Review faulted log package.

Standard:

The applicant reviews faulted log package for errors and/or omissions.

Comment:

While there is no time limit associated with this JPM, the examinee is expected to make reasonable progress during the review process.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2(C)*

Discuss errors and/or omissions located within the logsheets.

Standard:

**As a minimum, the examinee correctly locates the critical error inserted in the log package:*

- 1) Log page 10 of 35 - *The logtaker has incorrectly taken credit for the level in BAT Tank 1A, which is being batched (filled) to a normal level. Because it is in a batching lineup (the tank would only be available as a gravity feed source), and it's boric acid concentration is unknown, the tank is technically inoperable. Therefore the total BAT Volume recorded on the logs should be the amount present in BAT tank 1B ONLY (this figure should be 28K and not 43K gal.) Because the amount of boric acid present in BAT 1B is greater than the minimum required in the TRM (27K), this is not a violation of the TRM.*
- 2) Log page 12 of 35- *The margin between LOOP DELTA-T TI-0421 and OPDT SET POINT TI-0422B is less than the STP administrative limit required 5%, and is not red circled or noted on the cover page. There are no TS or TRM limits associated with the Loop Delta-T indicators.*
- 3) Log page 13 of 35- *There is greater than a 12 step difference between DRPI and the STEP DEMAND POSITION INDICATION for CONTROL ROD BANK "D". This is a violation of TS 3.1.3.2, requiring DRPI and Step Demand to indicate within 12 steps of each other. This should be red circled and noted on the cover page. *(Critical Error)**

STEP CONTINUED ON NEXT PAGE

JOB PERFORMANCE MEASURE CHECK SHEET

Comment:

- 1) A summary of Technical Specification 3.1.3.2 is as follows:
 - a) With a maximum of 1 DRPI per bank inoperable, either (1) Determine position of the non-indicating rod(s) indirectly by the movable incore detectors every 8 hours... or (2) Reduce thermal power to < 50% of rated thermal power within 8 hours.
 - b) With a maximum of one demand position indicator per bank inoperable either (1) Verify all DRPI for the affected bank are operable and that the most withdrawn rod and the least withdrawn rod of the bank are within 12 steps of each other at least once per 8 hours, or (2) Reduce thermal power to < 50% of rated thermal power within 8 hours.
- 2) For All Control Room Log readings, Step 4.3.9 of OPOP01-ZQ-0022, Shift Routines applies:

"IF any log reading is outside its specified limits, THEN:

 - a) Circle the reading in RED.
 - b) IF the reading is related to Technical Specification equipment OR satisfies a Technical Specifications Surveillance, THEN immediately notify the Unit/Shift Supervisor.
 - c) Record corrective action(s) taken or in progress in the remarks section of the applicable log.

Cue:

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: A7, REVIEW CONTROL ROOM LOGS

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The plant is in MODE 1, 100% steady state conditions.

INITIATING CUE:

You are directed to review the enclosed log package for accuracy and locate technical and/or procedural errors which have been inserted.

THREE errors have been inserted into the log package, one Critical and two Non-Critical. As a MINIMUM, you are to IDENTIFY the Critical error. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

- 1) Carryover errors count as only one error (i.e., a single error that carries over from calculation to calculation or multiple line items with the same incorrect information)

CR

UNIT: 1 DATE: 9/21/01

0000-0200 SHIFT			1200-1400 SHIFT		
Start Time: 0010	Mode: 1	Finish Time: 0140	Start Time:	Mode:	Finish Time:
1) Currently batching acid to Boric acid tank 1A.					
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p><i>Additionally, this remark should include comments to the effect of "Due to the batching lineup the tank is isolated and is unavailable as a reactivity source ."</i></p> </div>					
<div style="border: 1px solid black; padding: 10px; margin: 10px;"> <p><i>Shaded areas on pages 10, 12, and 13 of 35 represent the errors inserted and are indicative of parameters which have exceeded their associated limits.</i></p> <p><i>A note/remark should appear on the cover page which includes the out of specification reading/parameter, the associated limit exceeded, and corrective actions taken or in progress. In addition, the parameter would normally be circled in red with a number corresponding to the note on the cover page.</i></p> </div>					
START <u>N/A</u> hrs.	STOP <u>N/A</u> hrs.	(Ref. 6.8.18)	START	hrs. STOP	hrs. (Ref. 6.8.18)
Note change to temporary log status in Remarks Section.			Note change to temporary log status in Remarks Section.		
OPERATOR: <u>Eli Whitney</u>			OPERATOR: _____		
SUPERVISOR: _____			SUPERVISOR: _____		
PLANT OPS SURVEILLANCE COORDINATOR: _____					

UNIT: **1** DATE: **9/21/01**

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECH SPEC	MODE	NOTE
PRT LEVEL	CP-004	LI-0670	73		(UNIT 1) 65-75% (UNIT 2) 70-79%	N/A	ALL	
PRT PRESS		PI-0669	4		< 6 PSIG			
RCDT LEVEL		LI-4901	52		8-92%			
RCDT PRESS		PI-4900	3		< 6 PSIG			
RCDT TEMP		TI-4902	85		< 187°F			
RCB SEC SUMP LEVEL	CP-004	LI-7811	64		N/A %	3.3.3.6	1,2,3	(1) ONLY APPLICABLE IF BAT(S) IS DESIGNATED BORON SOURCE. (2) SUM OF OPERABLE BAT TANKS.
RCB NORM. SUMP LEVEL		LI-7812	30			3.4.6.2	1,2,3,4	
NORM SUMP DISCHARGE		FQI-7823	428323		N/A GAL			
BAT A LVL	N/A	LI-0103	15,000 (1)		N/A GAL	TRM 3.1.2.6	1,2,3,4	
BAT A TEMP.		TI-0104	112 (1)		≥ 65°F (1)			
BAT B TEMP.		TI-0107	95		≥ 65°F (1)			
BAT B LVL		LI-0105	28,000		N/A GAL			
BAT VOLUME		CALC (2)	43,000		≥ 27,000 GAL (1)			

Non-Critical Error:

UNIT: 1 DATE: 9/21/01

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECH SPEC	MODE	NOTE
PRZR VAPOR	CP-004	TI-0607	650		N/A	3.4.9.2	ALL	(1) TI-0607 MINUS TI-0126. (2) ONLY IF AUX SPRAY IN USE.
REGEN HX TEMP		TI-0126	545		N/A			
AUX SPRAY DELTA-T		CALC. (1)	N/A		≤ 621°F (2)			
PORV 655A BLOCK VLV		MOV-0001A	N/A		OPEN (1)	3.4.9.3 (2)	4 ONLY	(1) IF PORVs USED FOR COLD OVERPRESSURE PROTECTION. (2) <u>IF</u> ALT VENT PATH ESTABLISHED, <u>THEN</u> LOG VENT VERIF SAT PER T.S.4.4.9.3.2.
PORV 656A BLOCK VLV		MOV-0001B	N/A					
CHARGING PUMP PRESSURE	CP-004	PI-0204	2550		CHNL CHECK ≤ 200 PSIG BETWEEN PI-0204 AND PI-0288B/287B/286B	3.3.2 Table 3.3-3, Item 3d-2, Action 16	1,2,3,4	(1) TRANSCRIBE READING OF ONE RUNNING PUMP FROM LOGSHEET 13, MEAB MODES 1, 2, 3, AND 4 TECH SPECS LOGSHEET.
	(1)	PI-0288B PI-0287B PI-0286B	2660					

KEY

KEY

UNIT: 1 DATE: 9/21/01

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECH SPEC	MODE	NOTE
RCS TAVG	CP-005	TI-0412A	590		≥ 571 °F (1) CHNL CHECK 5°F (2)	3.3.2, Table 3.3-3, Item 5f, Action 20 3.1.1.4	1,2,3	(1) IF < 571 °F WITH TAVG-TREF DEV ALARM NOT RESET IN MODE 1 OR IN MODE 2 WITH KEFF ≥ 1, THEN COMPLETE LOGSHEET 7. (2) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS.
		TI-0422A	589					
		TI-0432A	588					
		TI-0442A	589					
RCS TAVE DNB PARAMETER	CP-005	CALC (1)	589		≤ 595 °F	3.2.5	1	(1) AVERAGE OF ALL OPERABLE RCS TAVE CHANNELS (3 MINIMUM).
LOOP DELTA-T	CP-005 OR PLANT COMPUTER (1)	TI-0411	99		≥ 5% BELOW SETPOINT	N/A	1,2 (3)	(1) IF PLANT COMPUTER USED, THEN COMPARE TO PLANT COMPUTER SETPOINT. LOG ACTUAL VALUE. IF LESS THAN 5% BELOW OTDT OR OPDT SETPOINTS, THEN RESTORE MARGIN TO GREATER THAN 5%. N/A IN MODES 3 AND 4.
		TI-0421	100					
		TI-0431	98					
		TI-0441	99					
OPDT SETPOINT		TI-0412B	107		CHNL CHECK 6% (4)	Items 8,9 Action 6	(3)	(4) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS DUE TO INSTRUMENT ERROR. LIMIT MAY BE EXCEEDED DUE TO DIFFERENT LOOP OPERATING TEMPERATURES.
		TI-0422B	104					
		TI-0432B	108					
		TI-0442B	108					
OTDT SETPOINT		TI-0412C	117		CHNL CHECK 10% (4)			
		TI-0422C	117					
		TI-0432C	115					
		TI-0442C	118					
VESSEL FLANGE L/O TEMP		TI-0600	89		N/A °F	3.4.6.2	1,2,3,4	

Non-Critical Error - Should be identified as having exceeded the administrative limit

UNIT: 1 DATE: 9/21/01

PARAMETER	INSTRUMENT	00-02	12-14	LIMIT	TECH SPEC	MODE	NOTE
FOP	N/A (1)	249		N/A	3.1.3.1 3.1.3.2 3.1.3.6	1,2 (4)	(1) FULL OUT POSITION (FOP) FROM PLANT CURVE BOOK TABLE 1.1. (2) RECORD BANK INSERTION LIMIT FOR PRESENT PWR LEVEL FROM CORE OPERATING LIMITS REPORT. (3) FULLY WITHDRAWN AS SPECIFIED IN CORE OPERATING LIMITS REPORT. (4) MODE 2 WITH KEFF ≥ 1. N/A IN MODES 3 AND 4.
CONTROL ROD BANK A POSITION INDICATION	GP. 1 DEMAND POS.	249		± 12 STEPS BETWEEN DRPI & DEMAND ALL RODS IN BANK ABOVE INSERT LIMIT			
	GP. 2 DEMAND POS.	249					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2)	(3)	(3)				
CONTROL ROD BANK B POSITION INDICATION	GP. 1 DEMAND POS.	249					
	GP. 2 DEMAND POS.	249					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	246					
	ROD INS LIMIT (2)	249					
CONTROL ROD BANK C POSITION INDICATION	GP. 1 DEMAND POS.	249					
	GP. 2 DEMAND POS.	249					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2)	249					
CONTROL ROD BANK D POSITION INDICATION	GP. 1 DEMAND POS.	228					
	GP. 2 DEMAND POS.	228					
	DRPI HIGHEST ROD	246					
	DRPI LOWEST ROD	246					

Critical Error - Difference between demand position and DRPI is > 12 steps (and hasn't

ROD INS LIMIT (2)	174				
-------------------	-----	--	--	--	--

KEY

KEY

KEY

KEY

UNIT: **1** DATE: **9/21/01**

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECH SPEC	MODE	NOTE
SHUTDOWN ROD POS IND.	ALL BANKS	HIGHEST DEMAND POSITION	249		±12 STEPS BETWEEN DRPI POS. & DEMAND POS. VERIFY EACH ROD FULLY WITHDRAWN WHEN CRITICAL USING DRPI. (1)	3.1.3.1 3.1.3.2 3.1.3.5	1,2	(1) FULLY WITHDRAWN AS SPECIFIED IN CORE OPERATING LIMITS REPORT.
		LOWEST DEMAND POSITION	249					
		HIGHEST DRPI	252					
		LOWEST DRPI	252					
EXTENDED RANGE NEUTRON FLUX (S/D MONITOR)	CP-005	NY-0046	N/A		CHNL CHECK CPS (1)	3.3.1, Table 4.3-1, Item 7, Action 12,17	3,4 ONLY	(1) <u>IF</u> HIGHEST READING ≥ 1000 CPS, <u>THEN</u> THE MAX DEV IS BY A FACTOR OF 10. IF NOT, MAX DEV. IS BY A FACTOR OF 15. (2) VERIFY NO ERROR MESSAGES WHEN PUSHBUTTON IS DEPRESSED. (Ref. 6.8.5)
		NY-0045	N/A					
		NY-0046 TEST P.B.	N/A		(2)			
		NY-0045 TEST P.B.	N/A					
QPTR ANNUNC WINDOW		5M3-A3	SAT		ALARM CLEAR (1)	4.2.4.1.a	1 > 50% PWR	(1) <u>IF</u> ALARM NOT CLEAR, <u>THEN</u> PERFORM 0PSP10-NI-0002 EVERY 12 HRS.
		5M3-B3	SAT					

KEY

KEY

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: REVIEW COMPLETED SURVEILLANCE

JPM NO.: A8

REVISION: 1

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: REVIEW COMPLETED SURVEILLANCE

JPM No.: A8

Rev. No.: 1

Task No.: 12000, Authorize the start of and review surveillance tests.

STP Objective: 12000, Authorize the start of surveillance tests, and review completion in accordance with PGP03-ZE-0004.

**Related
K/A Reference:** 2.2.12 [3.4], Knowledge of surveillance procedures.

References: OPGP03-ZE-0004, Rev. 20, Plant Surveillance Program
OPSP03-SI-0004, Rev. 5, High Head Safety Injection Pump 1A (2A)
Inservice Test

**Task Normally
Completed By:** SRO

**Method
of Testing:** Actual Performance

**Location
of Testing:** N/A

**Time
Critical Task:** NO

**Alternate
Path JPM:** NO

**Validation
Time:** 25 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is in Mode 3 preparing for reactor startup. 0PSP03-SI-0004, High Head Safety Injection Pump 1A(2A) Inservice Test is in progress. The pump ? P is determined to be just in the Required Action High range. The test was indefinitely suspended and a condition report initiated to calibrate the pump suction and discharge pressure gauges used in the surveillance.

INITIATING CUE:

As the on-shift SRO, you are directed to review the indefinitely suspended surveillance in accordance with 0PGP03-ZE-0004, Plant Surveillance Program.

THREE errors have been inserted into the surveillance, two (2) Critical and one (1) Non-Critical. As a MINIMUM, you are to IDENTIFY both Critical errors. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

- 1) The suction and discharge pressure gauges and recirc flowmeter were indicating stable readings during the test.
- 2) It is planned to re-run the test from the beginning following calibration of the gauges.
- 3) Carryover errors count as only one error (i.e., a single error that carries over from calculation to calculation or multiple line items with the same incorrect information)

JOB PERFORMANCE MEASURE INFORMATION SHEET CON'T

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

The 1A HHSI Pump has been declared inoperable and the pump lineup restored to normal.

HANDOUTS:

- Handout Copy of the completed surveillance, 0PSP03-SI-0004.
- Handout Copy of 0PGP03-ZE-0004, Plant Surveillance Program (if requested).

NOTES:

- 1) A completed Answer KEY is provided for the Evaluator. The Key contains the same errors as the handout. The location of the errors will be highlighted and described on the evaluator copy. **Do Not Hand to the Applicant**

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1 (C)*

Review the completed procedure in accordance with OPGP03-ZE-0004.

Standard:

Identifies the following ERRORS:

- 1)* *Test results should be marked as “Unacceptable” and the pump declared inoperable.*
- 2)* *The as left status of the system should be identified in the remarks section and actions taken to secure the pump (completing the remainder of the test would also satisfy this).*
- 3) *The remainder of the procedure past Step 5.3.4 should be N/A'd (or the remainder of the test could be completed), such that there are no “blanks” in the completed data package.*

Comment:

- 1) * Denotes Critical Error.
- 2) Error #1 results in a piece of equipment that should be inoperable to continue to be considered operable. Addendum 2 , step 1.b to OPGP03-ZE-0004 states that in this instance where there is no obvious indication of instrument failure, the test should be considered unacceptable and not suspended.
- 3) Error #2 is a requirement of step 4.4.5.2.d of OPGP03-ZE-0004. As indicated by the surveillance, the HHSI pump was left running on recirc which needs to be included in the remarks section of the procedure especially since there is a caution which limits pump runtime on recirc to 2 hours (to prevent pump damage due to overheating). And due to the time limit, action should be taken to secure the pump.

STEP CONTINUED ON NEXT PAGE

- 4) Error #3 is a Non-Critical error which violates the requirement of Addendum 1, step 2.B of

JOB PERFORMANCE MEASURE CHECK SHEET

OPGP03-ZE-0004. The overall results of the test are not affected by this error.

Cue:

- 1) If asked, the surveillance will be run again from the beginning with a new surveillance package.
- 2) If asked, there were NO other indications consistent with an instrument malfunction of the pump suction pressure, discharge pressure, and recirc flowmeter.
- 3) If asked, no procedure steps were completed beyond step 5.3.4 (the pump is still running)
- 4) If asked, the pump has been running on recirc for 1.5 hours.

Notes:

If requested, supply the Handout Copy of OPGP03-ZE-0004, Plant Surveillance Program.

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: A8, REVIEW COMPLETED SURVEILLANCE

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is in Mode 3 preparing for reactor startup. 0PSP03-SI-0004, High Head Safety Injection Pump 1A(2A) Inservice Test is in progress. The pump ? P is determined to be just in the Required Action High range. The test was indefinitely suspended and a condition report initiated to calibrate the pump suction and discharge pressure gauges used in the surveillance.

INITIATING CUE:

As the on-shift SRO, you are directed to review the indefinitely suspended surveillance in accordance with 0PGP03-ZE-0004, Plant Surveillance Program.

THREE errors have been inserted into the surveillance, two (2) Critical and one (1) Non-Critical. As a MINIMUM, you are to IDENTIFY both Critical errors. Editorial errors such as spelling, grammar, or punctuation are unintentional and DO NOT count.

You are to take the following into account during your review:

- 1) The suction and discharge pressure gauges and recirc flowmeter were indicating stable readings during the test.
- 2) It is planned to re-run the test from the beginning following calibration of the gauges.
- 3) Carryover errors count as only one error (i.e., a single error that carries over from calculation to calculation or multiple line items with the same incorrect information)

\\DATANW01\DATA1\PROCEDURES\APPROVED\PSP\03\0SI0004.04x Effective Date: 01/26/00 Print Time / Date: 2:57 PM 10/17/01		<h2>0PSP03-SI-0004</h2>	<h3>Rev. 5</h3>	Page 1 of 24
<h3>High Head Safety Injection Pump 1A(2A) Inservice Test</h3>				
Quality	Safety-Related	Usage: IN HAND	Effective Date: 06/19/01	
R. Hamilton	R.L. McAnnally	Crew IC	Operations	
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.	

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Procedure Performance Data Sheet

Unit Number: ONE	Work Activity Number: 14763	-ST: 860001374
Technical Specification Reference: 4.0.5, 4.3.2.1.1.c.7, 4.5.2.f.1 [ITS 5.5.8, SR 3.3.2.7-1c, SR 3.5.2.4]		
Test Interval: Quarterly	Test Performance Allowed in Plant Modes: 1, 2, 3, 4, 5, 6, or Core Off-Loaded to Spent Fuel Pool	Train Reference: A
Reason for Test: <input checked="" type="checkbox"/> Periodic Surveillance Test <input type="checkbox"/> Maintenance per Work Package # _____ <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> For Surveillance Credit <input type="checkbox"/> Not for Surveillance Credit 		
Radiation Work Permit No.: N/A	Fire Hazard Evaluation No.: N/A	Equipment Clearance No.: N/A
Administrative Approval to Perform Test: <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <u>John Wayne</u> Shift Supervisor </div> <div style="text-align: center;"> <u>5/17/01</u> Date </div> <div style="text-align: center;"> <u>0400</u> Time </div> </div>		
Test Results Review: Pump Test Results: <input type="checkbox"/> Acceptable - All data within Acceptance Criteria <input type="checkbox"/> Acceptable - Data within Alert Range (explain in Remarks) <input checked="" type="checkbox"/> Unacceptable - Any data NOT within Acceptance Criteria (explain in Remarks)		
Valve Test Results: <input type="checkbox"/> Acceptable - All data within Acceptance Criteria <input type="checkbox"/> Unacceptable - Any data NOT within Acceptance Criteria (explain in Remarks)		
Reviewed By: <u>John Doe</u> <u>5/17/01</u> <u>0630</u> Test indefinitely suspended at Step 5.3.4 <div style="display: flex; justify-content: space-between;"> Test Coordinator Date Time </div>		

Critical Error – The test results are unacceptable

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Procedure Performance Data Sheet

Plant Operations Review:

- All data within Acceptance Criteria? Yes No
- Any data within Alert Range? Yes No
- Train in Service? Yes No
- Potential Reportable Occurrence? Yes No
- LCO Action Statement Entered? Yes No

Reviewed By: _____
 Shift Supervisor Date Time

Division Surveillance Coordinator Review:

Reviewed By: _____
 Division Surveillance Coordinator Date Time

Section XI Coordinator:

Pump Test Results:

- Acceptable - All data within Acceptance Criteria
- Acceptable - Data within Alert Range (explain in Remarks)
- Unacceptable - Any data **NOT** within Acceptance Criteria (explain in Remarks)

Valve Test Results:

- Acceptable - All data within Acceptance Criteria
- Unacceptable - Any data **NOT** within Acceptance Criteria (explain in Remarks)

Corrective Action Taken: _____

Reviewed By: _____
 Section XI Coordinator Date Time

M&TE Used:

Description	STPEGS No.	Cal. Due Date
Vibration Instrument	800-017463	10/20/01

This procedure, when complete, shall be retained for the life of the plant.

Procedure Performance Data Sheet

M&TE Used:

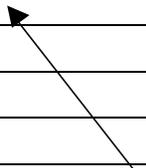
Description	STPEGS No.	Cal. Due Date

Performers and Verifiers:

Name (Print)	Signature	Initials	Sections Performed
John Doe	John Doe	JD	4.0 (all), 5.1-5.3.4

Remarks: Test indefinitely suspended at Step 5.3.4, Shift Supervisor notified.

CR# 01-8732 written to calibrate pump suction and discharge pressure gauges.



Critical Error – The as left status of the system is not recorded in the remarks

High Head Safety Injection Pump 1A(2A) Inservice Test**1.0 Purpose and Scope**

1.1 This procedure will satisfy the following Technical Specifications:

- 4.0.5 [ITS 5.5.8] For inservice testing of HHSI Pump 1A(2A) per Ref 7.3.1 and Ref 7.3.2 for partial stroke test of valves SI-0002A and SI-0005A.
- 4.3.2.1.1.c.7 [ITS SR 3.3.2.7-1c] Satisfactory performance of this Surveillance Procedure will partially satisfy the quarterly Slave Relay Test requirements for HHSI Pump 1A(2A) breaker continuity.
- 4.5.2.f.1 [ITS SR 3.5.2.4] Verifying HHSI Pump 1A(2A) developed head at the test flow point is greater than or equal to the required developed head.

1.2 This procedure provides instructions to verify High Head Safety Injection Pump (HHSI) 1A(2A) is Operable by pump performance during operation on recirculation flow.

1.3 This procedure provides instructions for partial stroke test of SI-0002A, Safety Injection Train 1A(2A) Suction Header Check Valve.

1.4 This procedure provides instructions for partial stroke test of SI-0005A, HHSI Pump 1A(2A) Discharge Check Valve, when Reactor Coolant System pressure is greater than HHSI Pump shutoff head at 1750 psig.

1.5 This procedure provides instructions to verify LHSI/HHSI/CSS pump cubicle cooler fan will automatically start when HHSI Pump 1A(2A) is placed in service.

1.6 This procedure provides instructions to verify containment sump isolation valve cubicle cooler fan will automatically start when HHSI Pump 1A(2A) is placed in service.

2.0 Responsibilities

2.1 Test Coordinator shall ensure that the procedure revision is correct and that all applicable Field Changes are incorporated.

2.2 Shift Supervisor shall grant permission for performance of this test.

2.3 This procedure shall be performed by Plant Operations.

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

- 2.4 WHEN " _____ " (blank) follows a step, THEN performer shall enter initials to verify step completion.
- 2.5 The Plant Performance Section may perform the vibration monitoring portion of this procedure.
- 2.6 After completion, procedure routing is per OPGP03-ZE-0004 (Plant Surveillance Program) and OPGP03-ZA-0055 (Plant Surveillance Scheduling).
- 2.7 The following shall review the test results:
- Test Coordinator
 - Shift Supervisor
 - Department Surveillance Coordinator
 - Section XI Coordinator

3.0 Precautions and Notes

- 3.1 IF Safety Injection Signal occurs, THEN ensure the following valves in proper position:
- "PUMP 1A(2A) DISCH ISOL MOV-0004A" is open
 - "HHSI Tc UP STREAM FV-3952" is closed
- 3.2 This procedure should be reviewed in its entirety prior to performing the test.
- 3.3 Acceptance Criteria steps are annotated with the letters **AC** in the left margin preceding the step.
- 3.4 IF this procedure cannot be performed as written, THEN the procedure performer shall stop and immediately notify Shift Supervisor.
- 3.5 IF this procedure is terminated for any reason, THEN immediately notify Shift Supervisor.
- 3.6 IF any Acceptance Criteria are **NOT** met, THEN immediately notify Shift Supervisor and document failure per OPGP03-ZE-0004 (Plant Surveillance Program).

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

- 3.7 Specific Reference Values incorporated in this procedure were obtained for the respective equipment on the following dates:

<u>Component Description</u>	<u>Reference Value Date</u>
High Head Safety Injection Pump 1A differential pressure, recirculation flow, and vibration	01/23/2000
High Head Safety Injection Pump 2A differential pressure, recirculation flow, and vibration	01/23/2000

- 3.8 The instructions for obtaining new Reference Values for HHSI Pump 1A(2A) are contained in 0PSP03-SI-0010 (High Head Safety Injection Pump 1A(2A) Reference Values Measurement).
- 3.9 HHSI Pump operation on recirculation should be limited to less than 2 hours to prevent pump overheating.
- 3.10 IF Reactor Coolant System (RCS) pressure is less than 1750 psig AND "PUMP 1A(2A) DISCH ISOL MOV-0004A" is closed, THEN Train A HHSI Pump 1A(2A) may be inoperable per Technical Specification 3.5.2 [ITS 3.5.2]. (SPR 940428)
- 3.11 IF RCS pressure is less than 1750 psig, THEN partial stroke test of SI-0005A, HHSI Pump 1A(2A) Discharge Check Valve, shall **NOT** be required.
- 3.12 IF any HHSI Pump parameter falls in the Alert Range, THEN recalibration of the affected instruments and retest of the pump may be performed.

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

4.0 Prerequisites

- 4.1 Ensure procedure revision is correct and all applicable Field Changes are incorporated. JD

- 4.2 This procedure may be performed in any plant Mode. Record current plant Mode:

Mode 3

JD

- 4.3 Review Operability Assessment System (OAS) to ensure no equipment is out of service that could conflict with test completion or cause unexpected multiple trains to be inoperable while performing this test. JD

- 4.4 Verify plant condition for current operating Mode and mark the steps that do not apply N/A:
 - 4.4.1 IF the plant is in Modes 1, 2, or 3, THEN HHSI Trains B and C are Operable per Technical Specification 3.5.2 [ITS 3.5.2]. JD
 - 4.4.2 IF the plant is in Mode 4, THEN HHSI Pumps B and C are Operable per Technical Specification 3.5.3.1 [ITS 3.4.12 and 3.5.3]. N/A
 - 4.4.3 IF the plant is in Mode 5 or Mode 6 when the reactor vessel head is on, THEN all HHSI Pumps are inoperable per Technical Specification 3.5.3.2 [ITS 3.4.13]. N/A

- 4.5 Verify Safety Injection System Train A is aligned per OPOP02-SI-0002 (Safety Injection System Initial Lineup). JD

- 4.6 Ensure HHSI Pump 1A(2A) inspected and acceptable per criteria established in OPOP01-ZQ-0022 (Plant Operations Shift Routines). JD

- 4.7 Verify Train A Low Head Safety Injection Pump is shutdown. (CP001) JD

- 4.8 Verify Train A Containment Spray Pump is shutdown. (CP002) JD

- 4.9 Verify the following cubicle cooler fans are aligned per OPOP02-SI-0002 (Safety Injection System Initial Lineup):
 - LHSI/HHSI/CSS pump room JD
 - Containment sump isolation valve room JD

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

4.10 Verify Refueling Water Storage Tank (RWST) contained volume is greater than or equal to 33,000 gallons. ("LVL LI-0931" or "LVL LI-0932", CP001) (Technical Requirements Manual 3.1.2.5)

JD

4.11 Obtain the following test instrumentation:

- Obtain a vibration instrument with an accuracy $\pm 5\%$ of full scale to measure vibration amplitude in in/sec.

JD

4.12 Establish communications between the Control Room and the HHSI Pump in Train A Pump Room 006. (FHB -29')

JD

NOTE

Performance of Steps 4.13 and 4.14 apply only to partial stroke test of SI-0005A, HHSI Pump 1A(2A) Discharge Check Valve, in Section 5.4 of this test. Performance of Section 5.4 is done only with RCS pressure greater than 1750 psig. IF RCS pressure is less than 1750 psig, THEN Steps 4.13, 4.14 AND Section 5.4 shall be marked N/A.

4.13 Verify RCS pressure is equal to or greater than 1750 psig. ("PRESS PI-0455 PI-0456 PI-0457 PI-0458", CP004)

JD

4.14 Verify no other Safety Injection or Containment Spray Pump inservice testing is in progress.

JD

4.15 Record the following, or "N/A", as applicable, on the Procedure Performance Data Sheet (PPDS):

- Unit Number
- Work Activity Number
- Surveillance Test (ST) Number(s)
- Reason for Test
- RWP Number
- M&TE Data for vibration instrument

JD

4.16 Notify the Shift Supervisor to review Technical Specifications LCOs 3.5.2, 3.5.3.1, and 3.5.3.2 [ITS 3.4.12, 3.4.13, 3.5.2 and 3.5.3] for action requirements prior to performing this surveillance.

JD

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

4.17 IF this procedure is being performed to demonstrate post-maintenance operability, THEN N/A the applicable subsection(s) for the component(s) **NOT** being tested, OTHERWISE N/A this step.

N/A

4.18 Obtain Shift Supervisor signature on PPDS for administrative approval to perform test.

JD

5.0 Procedure

5.1 **Preparation**

5.1.1 Ensure Prerequisites Section has been completed and Precautions and Notes Section has been read.

JD

5.1.2 Conduct a prejob briefing.

JD

5.1.3 Ensure Control Room Logbook entry documents the commencement of this surveillance test.

JD

KEY

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

5.2 HHSI Pump 1A(2A) Inservice Test

CAUTION

IF RCS pressure is less than 1750 psig AND "PUMP 1A(2A) DISCH ISOL MOV-0004A" is closed, THEN Train A HHSI Pump 1A(2A) may be inoperable per Technical Specification 3.5.2 [ITS 3.5.2]. (SPR 940428)

5.2.1 IF RCS pressure is less than 1750 psig, THEN ensure "PUMP 1A(2A) DISCH ISOL MOV-0004A" is closed, OTHERWISE N/A this step. ("PRESS PI-0455 PI-0456 PI-0457 PI-0458", CP001)

N/A
Perform
N/A
Ind. Verif

NOTE

IF SI Pump or isolation valve room temperature is high, THEN the LHSI/HHSI/CSS pump cubicle or containment sump isolation valve cubicle cooler fan will restart after being shutdown with handswitch in AUTO.

5.2.2 IF any of the following fans are running, THEN stop the fan AND place in AUTO: (CP022)

- LHSI/HHSI/CSS pump cubicle fan "TRN A/RM 006 SUPP CLR 11A(21A) HF-VAH004"
- Containment sump isolation valve cubicle fan "TRN A/RM 007 SUPP CLR 11A(21A) HF-VAH012"

JD
JD

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

CAUTION

Operation of High Head Safety Injection Pump on recirculation should be limited to less than 2 hours to prevent pump overheating.

NOTE

LHSI/HHSI/CSS pump cubicle cooler fan and containment sump isolation valve cubicle cooler fan will automatically start when the HHSI Pump is started.

- | | | | | |
|----|---------|---|--|-------------------|
| AC | 5.2.3 | Start "HHSI PUMP 1A(2A)" with handswitch at CP001 and record time: | <u>0417</u> Time | <u>JD</u> |
| | 5.2.4 | Verify the following fans are running: (CP022) | | |
| AC | 5.2.4.1 | LHSI/HHSI/CSS pump cubicle fan "TRN A/RM 006 SUPP CLR 11A(21A) HF-VAH004" | | <u>JD</u> |
| AC | 5.2.4.2 | Containment sump isolation valve cubicle fan "TRN A/RM 007 SUPP CLR 11A(21A) HF-VAH012" | | <u>JD</u> |
| | 5.2.5 | <u>WHEN</u> at least 5 minutes has elapsed since HHSI pump start, <u>THEN</u> record time and HHSI Pump 1A(2A) discharge pressure from "1(2)-SI-PI-0957 HI HEAD SAFETY INJECTION PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR": (FHB -29', Train A Pump Room 006, SPR 931954) | <u>0426</u> Time

<u>1765</u> psig (PI-0957) |

<u>JD</u> |
| | 5.3 | Record HHSI Pump 1A(2A) dynamic suction pressure from HHSI Pump 1A(2A) Suction Pressure gage PI-0911.: (FHB -29', Train A Pump Room 006) |

<u>32.5</u> psig |

<u>JD</u> |

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

NOTE

IF High Head Safety Injection Pump 1A(2A) differential pressure is less than 1480 psid,
THEN the Shift Supervisor shall be notified immediately.

- 5.3.1 Calculate HHSI Pump 1A(2A) differential pressure (DP) using the following formula:

DP = Discharge Pressure - Dynamic Suction Pressure

$$DP = \frac{1765}{\text{Step 5.2.5}} - \frac{32.5}{\text{Step 5.3}}$$

$$DP = \frac{1732.5}{\text{psid}}$$

- 5.3.2 Record HHSI Pump 1A(2A) recirculation flow rate from "1-SI-FI-0907 HI HEAD SAFETY INJECTION PUMP 1A MINIFLOW FLOW INDICATOR (N2SI-FI-0907)":
 (FHB, -13', Train A Valve Room 007)

$$\frac{107}{\text{gpm (FI-0907)}}$$

JD

JD

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

AC 5.3.3 Using Table 1 (HHSI Pump 1A(2A) Reference Values), perform the following:

5.3.3.1 Evaluate pump DP obtained in Step 5.3.1. JD

5.3.3.2 Complete the following and mark steps that **DO NOT** apply N/A:

a. Pump DP is within Acceptable Range. N/A

b. Pump DP is within the Required Action Range. JD

c. Pump Flow is within the Acceptable Range. JD

d. Pump Flow is within the Required Action Range. N/A

Table 1. HHSI Pump 1A(2A) Reference Values

	Ref Value $\Delta P_r/\Delta Q_r$	Test Value	Req'd Action Low $\Delta P_t < 0.90\Delta P_r$ $\Delta Q_t < 0.90\Delta Q_r$ $\Delta P_t < 1480^*$	Accept Range $0.90P_r \leq \Delta P_t \leq 1.10P_r$ $0.90Q_r \leq \Delta Q_t \leq 1.10Q_r$ $1480^* \leq \Delta P_t$	Req'd Action High $\Delta P_t > 1.10\Delta P_r$ $\Delta Q_t > 1.10\Delta Q_r$	Units
Pump DP Unit 1	1573	1732.5	DP < 1480	$1480 \leq DP \leq 1730.3$	DP > 1730.3	psid
Pump Recirc Unit 1	105	107	Flow < 94.5	$94.5 \leq \text{Flow} \leq 115.5$	Flow > 115.5	gpm
Pump DP Unit 2	1541.5	N/A	DP < 1480	$1480 \leq DP \leq 1695$	DP > 1695	psid
Pump Recirc Unit 2	105	N/A	Flow < 94.5	$94.5 \leq \text{Flow} \leq 115.5$	Flow > 115.5	gpm

* Technical Specification 4.5.2.f.1

5.3.4 IF HHSI Pump 1A(2A) DP or Flow is within Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE N/A this step. JD

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

5.3.5 IF performing this test in Unit 1, THEN determine unfiltered vibration Velocity (V_t) at indicated test points (Addendum 1, Vibration Test Locations and Instructions) AND record vibration Velocity (V_t) in Table 2 (Unit 1 Vibration Data), OTHERWISE N/A this step and leave Test Data block in Table 2.

Non-Critical Error – The remainder of the test was left “blank”

Table 2. Unit 1 Vibration Data

Vibration Data Point	Ref Value V_r	Test Data V_t	Acceptable Range $V_t \leq 2.5V_r$	Alert Range High $2.5V_r < V_t \leq 6V_r$ <u>OR</u> $0.325 < V_t \leq 0.7$	Req'd Action High $V_t > 6V_r$ <u>OR</u> $V_t > 0.7$	Units
1H1*						in/sec
1H2*						in/sec
2H1*						in/sec
2H2*						in/sec
3H1	0.155		$V \leq 0.325$	$0.325 < V \leq 0.700$	$V > 0.700$	in/sec
3H2	0.126		$V \leq 0.315$	$0.315 < V \leq 0.700$	$V > 0.700$	in/sec
1A*						in/sec

* Data point reference only for system health monitoring, NOT a Code requirement and NO Acceptance Criteria Applicable.

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials _____

5.3.6 IF performing this test in Unit 2, THEN determine unfiltered vibration Velocity (V_t) at indicated test points (Addendum 1, Vibration Test Point Locations and Instructions) AND record vibration Velocity (V_t) in Table 3 (Unit 2 Vibration Data), OTHERWISE N/A this step and the Test Data block in Table 3.

Table 3. Unit 2 Vibration Data

Vibration Data Point	Ref Value V_r	Test Data V_t	Acceptable Range $V_t \leq 2.5V_r$	Alert Range High $2.5V_r < V_t \leq 6V_r$ <u>OR</u> $0.325 < V_t \leq 0.7$	Req'd Action High $V_t > 6V_r$ <u>OR</u> $V_t > 0.7$	Units
1H1*						in/sec
1H2*						in/sec
2H1*						in/sec
2H2*						in/sec
3H1	0.068		$V \leq 0.170$	$0.170 < V \leq 0.408$	$V > 0.408$	in/sec
3H2	0.064		$V \leq 0.160$	$0.160 < V \leq 0.384$	$V > 0.384$	in/sec
1A*						in/sec

* Data point reference only for system health monitoring, NOT a Code requirement and NO Acceptance Criteria Applicable.

AC 5.3.7 Using the applicable Table (2 or 3), perform the following:

5.3.7.1 Evaluate pump vibration test data. _____

5.3.7.2 Complete the following and mark steps that **DO NOT** apply N/A:

- a. Pump vibration is within Acceptable Range. _____
- b. Pump vibration is within the Alert Range. _____
- c. Pump vibration is within the Required Action Range. _____

5.3.8 IF HHSI Pump 1A(2A) vibration is within Required Action Range, THEN immediately notify Shift Supervisor, OTHERWISE N/A this step. _____

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

NOTE

Performance of Section 5.4 is required when RCS pressure is greater than 1750 psig, and shall be marked N/A when RCS pressure is less than 1750 psig.

5.4 **SI-0005A Partial Stroke Test**

5.4.1 Ensure Section 5.2 is complete. _____

5.4.2 Establish communications between the Control Room and MAB 10' Non Radioactive Pipe Chase Room 064. _____

5.4.3 Open SI System Test Line valves: (CP001)

- "TEST LN ICIV FV-3970" _____

- "TEST LN OCIV FV-3971" _____

5.4.4 Verify "1(2)-SI-FI-0920A SIS CHECK VALVE TEST FLOW INDICATOR" indicates no flow. (MAB 10', Room 064) _____

5.4.5 Open "HHSI Tc UP STREAM FV-3952". (CP001) _____

AC

5.4.6 Verify flow increases through "1(2)-SI-FI-0920A SIS CHECK VALVE TEST FLOW INDICATOR". (MAB 10', Room 064) _____

5.4.7 Close "HHSI Tc UP STREAM FV-3952". (CP001) _____

Perform

Ind. Verif

5.4.8 Verify "1(2)-SI-FI-0920A SIS CHECK VALVE TEST FLOW INDICATOR" indicates no flow. (MAB 10', Room 064) _____

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

5.4.9 Close SI System Test Line valves: (CP001)

- "TEST LN ICIV FV-3970"

_____ Perform

_____ Ind. Verif

- "TEST LN OCIV FV-3971"

_____ Perform

_____ Ind. Verif

5.5 Restoration and Documentation

5.5.1 Stop "HHSI PUMP 1A(2A)" with handswitch at CP001.

NOTE

Steps 5.5.2 through 5.5.4 align HHSI Pump, LHSI/HHSI/CSS pump and containment sump isolation valve cubicle cooler fans to normal. IF any component(s) is **NOT** returned to normal, THEN reason(s) should be stated in the Remarks Section AND affected step(s) marked N/A.

5.5.2 IF required by plant conditions, THEN place "HHSI PUMP 1A(2A)" in AUTO. (CP001)

_____ Perform

_____ Ind. Verif

5.5.3 Ensure "PUMP 1A(2A) DISCH ISOL MOV-0004A" is open. (CP001)

_____ Perform

_____ Ind. Verif

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test

Initials

- | | | |
|--------|--|---------------------|
| 5.5.4 | Stop the following fans and place in AUTO: (CP022) | _____ |
| | <ul style="list-style-type: none"> • LHSI/HHSI/CSS pump cubicle fan "TRN A/RM 006 SUPP CLR 11A(21A) HF-VAH004" | _____
Perform |
| | <ul style="list-style-type: none"> • Containment sump isolation valve cubicle fan "TRN A/RM 007 SUPP CLR 11A(21A) HF-VAH012" | _____
Ind. Verif |
| | <ul style="list-style-type: none"> • Containment sump isolation valve cubicle fan "TRN A/RM 007 SUPP CLR 11A(21A) HF-VAH012" | _____
Perform |
| | <ul style="list-style-type: none"> • Containment sump isolation valve cubicle fan "TRN A/RM 007 SUPP CLR 11A(21A) HF-VAH012" | _____
Ind. Verif |
| 5.5.5 | Notify the Shift Supervisor that testing is complete. | _____ |
| 5.5.6 | Complete Test Results Section of the PPDS. | _____ |
| 5.5.7 | Ensure required information has been recorded on the M&TE Usage form (WOFWOME) in STP IMPACT for each piece of M&TE used. (SPR 941413) | _____ |
| 5.5.8 | Ensure M&TE Used Section of PPDS is complete. | _____ |
| 5.5.9 | Ensure Performers and Verifiers Section of the PPDS is complete. | _____ |
| 5.5.10 | <u>IF</u> any problems occurred, <u>THEN</u> initiate Condition Report(s) and log Condition Report number(s) in the Remarks section of PPDS, <u>OTHERWISE</u> N/A this step. | _____ |
| 5.5.11 | Forward procedure to Shift Supervisor for review. | _____ |

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test**6.0 Acceptance Criteria**

- 6.1 HHSI Pump 1A(2A) breaker continuity is verified by HHSI Pump 1A(2A) start. (Step 5.2.3)
- 6.2 LHSI/HHSI/CSS pump cubicle cooler fan automatically starts when HHSI Pump 1A(2A) is placed in service or running during pump operation. (Step 5.2.4.1)
- 6.3 Containment sump isolation valve cubicle cooler fan automatically starts when HHSI Pump 1A(2A) is placed in service or running during pump operation. (Step 5.2.4.2)
- 6.4 HHSI Pump 1A(2A) differential pressure (DP) shall be within the Acceptable Range. (Step 5.3.3)
- 6.5 HHSI Pump 1A(2A) Flow shall be within the Acceptable Range. (Step 5.3.3)
- 6.6 HHSI Pump 1A(2A) Vibration Test Data shall be within the Acceptable Range or the Alert Range. (Step 5.3.7)
- 6.7 Partial stroke test of SI-0005A, HHSI Pump 1A(2A) Discharge Check Valve, if performed, shall be acceptable if a flow increase is indicated on "1(2)-SI-FI-0920A SIS CHECK VALVE TEST FLOW INDICATOR" when test line valves are opened. (Step 5.4.6)
- 6.8 Partial stroke test of SI-0002A, Safety Injection Train 1A(2A) Suction Header Check Valve, shall be acceptable if HHSI Pump 1A(2A) meets or exceeds the requirements of Acceptance Criteria Step 6.4.

7.0 References**7.1 Technical Specifications**

- 7.1.1 Technical Specification 3.5.2 [ITS 3.5.2]
- 7.1.2 Technical Specification 3.5.3.1 [ITS 3.4.12 and 3.5.3]
- 7.1.3 Technical Specification 3.5.3.2 [ITS 3.4.13]
- 7.1.4 Technical Specification 4.0.5 [ITS 5.5.8]
- 7.1.5 Technical Specification 4.3.2.1.1.c.7 [ITS SR 3.3.2.7-1c]

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test**7.2 Technical Requirements Manual**

7.2.1 Technical Requirements Manual 3.7.13

7.2.2 Technical Requirements Manual 3.1.2.5

7.3 Regulatory Guides and Standards

7.3.1 ASME OMa-1988, Addenda to ASME OM-1987, Operation and Maintenance of Nuclear Power Plants, Part 6, Inservice Testing of Pumps in Light-Water Reactor Power Plants.

7.3.2 ASME OMa-1988, Addenda to ASME OM-1987, Operation and Maintenance of Nuclear Power Plants, Part 10, Inservice Testing of Valves in Light-Water Reactor Power Plants.

7.4 UFSAR

7.4.1 Section 3.9.6 (Inservice Testing of Pumps and Valves)

7.4.2 Section 6.3 (Emergency Core Cooling System)

7.4.3 Section 9.4.2 (Fuel Handling Building Heating, Ventilation, and Air Conditioning)

7.5 Commitments

7.5.1 SPR 920849 (Changing Temp Switch Setting to Actuate Cubicle Cooler)

7.5.2 SPR 931954 (Stabilization Period Required in AF Inservice Tests)

7.5.3 SPR 940428 (Declaration of LHSI Trains Inoperable During Surveillance Testing)

7.5.4 SPR 940802 (Installed Plant Pump Gages Exceed ASME Section XI Range Requirements)

7.5.5 SPR 941413 (M&TE Issue Sheets not Completed for each use of Instrument)

7.5.6 CR 97-12395 (Containment Spray Pump Slave Relay Testing)

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test**7.6 Technical Standards and Manuals**

- 7.6.1 VTD-P025-0004 (High Head Safety Injection Pump Operating & Maintenance Manual)
- 7.6.2 5N129MB1045 (Safety Injection System Design Basis Document)
- 7.6.3 Unit 1/Unit 2 Pump and Valve Inservice Test Plan.

7.7 Drawings

- 7.7.1 Piping and Instrumentation Diagrams
 - 7.7.1.1 5N129F05013 #1 and #2 (Safety Injection System)
 - 7.7.1.2 5N129F05016 #1 and #2 (Safety Injection System)
- 7.7.2 Elementary Wiring Diagrams
 - 7.7.2.1 9-E-SI05-01 #1 and #2 (High Head Safety Injection Pumps PA101A, PA101B, PA101C {PA201A, PA201B, PA201C})
 - 7.7.2.2 9-E-SI13-01 #1 and #2 (HHSI Pumps 1A, 1B, 1C Discharge MOV's 0004A, 0004B, 0004C)
 - 7.7.2.3 9-E-HF03-01 #1 and #2 (FHB HVAC LHSI Pump Supply Clr Unit Fans (AH004, AH005, AH006))
 - 7.7.2.4 9-E-HF12-01 #1 and #2 (FHB HVAC CS IV Cubicle Supplementary Coolers AH012, 013 & 014)

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test**7.8 STPEGS Procedures and Policies**

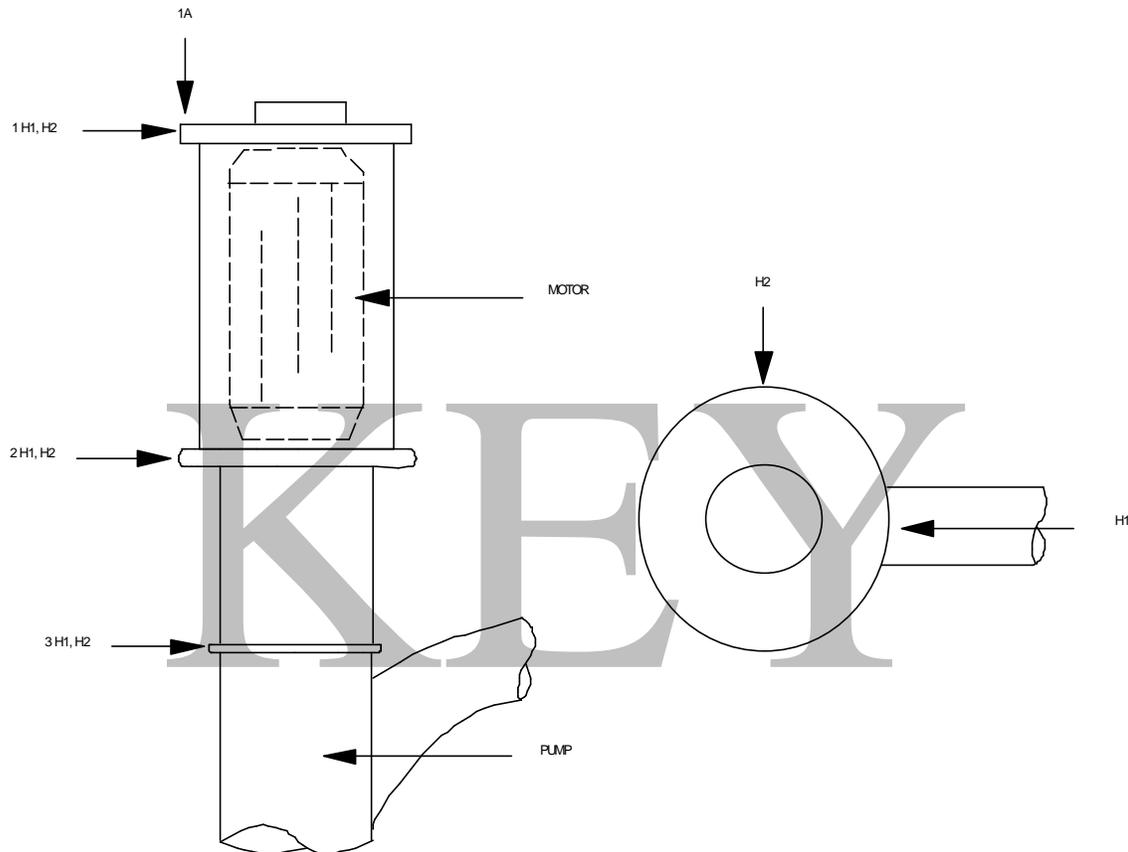
- 7.8.1 OPOP01-ZQ-0022 (Plant Operations Shift Routines)
- 7.8.2 OPOP02-SI-0002 (Safety Injection System Initial Lineup)
- 7.8.3 0PSP03-SI-0010 (High Head Safety Injection Pump 1A(2A) Reference Values Measurement)
- 7.8.4 OPGP03-ZC-0004 (Measuring and Test Equipment Control Program)
- 7.8.5 OPGP03-ZM-0016 (Installed Plant Instrumentation Calibration Verification Program)
- 7.8.6 OPGP03-ZE-0021 (Inservice Testing Program for Valves)
- 7.8.7 OPGP03-ZE-0022 (Inservice Testing Program for Pumps)
- 7.8.8 OPGP01-ZE-0005 (Plant Surveillance Procedure Preparation)
- 7.8.9 OPGP03-ZE-0004 (Plant Surveillance Program)
- 7.8.10 OPGP03-ZA-0055 (Plant Surveillance Scheduling)

8.0 Support Documents

- 8.1 Addendum 1, Vibration Test Point Locations and Instructions

This procedure, when complete, shall be retained for the life of the plant.

High Head Safety Injection Pump 1A(2A) Inservice Test



D116B

D116B.WPG

H1 - Denotes a horizontal vibration point. Probe shall be held perpendicular to the machine axis and parallel to both the floor and the pump discharge piping.

H2- Denotes a horizontal vibration point. Probe shall be held parallel to the floor and perpendicular to both the machine axis and the pump discharge piping.

NOTE: 3H vibration readings are taken on the pump seal assembly inside of pump frame.

A - Denotes an axial vibration point. Probe shall be held perpendicular to the floor and parallel to the machine axis.

This procedure, when complete, shall be retained for the life of the plant.

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: DECLARE EMERGENCY ACTION LEVELS

JPM NO.: A9

REVISION: 1

LOCATION: N/A

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: DECLARE EMERGENCY ACTION LEVELS

JPM No.: A9

Rev. No.: 1

Task No.: 74026 (SRO), Classify emergency conditions.

STP Objective: Given an emergency condition and a copy of the emergency classification tables from 0ERP01-ZV-IN01, Emergency Classification, classify the emergency condition.

**Related
K/A Reference:** 2.4.41 [4.0], Knowledge of the emergency action level thresholds and classifications.

References: 0ERP01-ZV-IN01, Rev. 5, Emergency Classification
0ERP01-ZV-SH01, Rev. 15, Shift Supervisor

**Task Normally
Completed By:** SRO

**Method
of Testing:** Actual Performance

**Location
of Testing:** N/A

**Time
Critical Task:** YES (15 minutes based on E-Plan Evaluation criteria)

**Alternate
Path JPM:** NO

**Validation
Time:** 20 minutes

Required Materials (Tools/Equipment):

NONE

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

You are the Unit 1 Shift Supervisor and the following series of events has just occurred:

1. Complete loss of **Main** Feedwater while the unit was at 100% power.
2. Unit trip occurred (Main Turbine and Reactor)
3. Main Steam Line Monitor RT-8048 is indicating $1.5E-1$ $\mu\text{ci/cc}$ and increasing.
4. All of the Annunciator Panels in the Control Room failed 15 minutes ago.
5. No steam release to the environment is present at this time.

INITIATING CUE:

Classify the event at its **MINIMUM** Emergency Action Level and **initiate** the STPEGS Emergency Plan. **Portions of this JPM are time critical.**

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

An ALERT is declared and the first step of Emergency Plan is implemented.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

NONE

NOTES:

- No handouts are provided for the performer.(The procedure is very large)
- A Key is provided for the evaluator with the applicable page of 0ERP01-ZV-IN01, EMERGENCY CLASSIFICATION, and ERP01-ZV-SH01, SHIFT SUPERVISOR.
- A copy of 0ERP01-ZR-IN01 will be available in the examination area.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain a copy of 0ERP01-ZV-IN01, Emergency Classification.

Standard:

Obtains a copy of 0ERP01-ZV-IN01, Emergency Classification.

Comment:

A procedural handout will not be provided. The appropriate procedure manuals will be available in the examination area.

Cue:

Notes:

The 15 minute time limit for declaring the Emergency Action Level starts when the applicant understands the initial conditions and initiating cue.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C)

Classify the event in accordance with Addendum 1 and 2 in 0ERP01-ZV-IN01.

Standard:

Classifies the event as an ALERT.

Comment:

- The ALERT classification is based on a loss of most (>50%) of Control Room Safety System annunciators for greater than 15 minutes with a significant plant transient in progress (COMMUNICATIONS/ALARMS/ASSESSMENT Section, SA4 EAL-1).
- Compare with Answer KEY

Cue:

If requested: QDPS and ICS are available.

Notes:

This step must be completed within 15 minutes of the time when the applicant understands the initial conditions and initiating cue.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3

Implement 0ERP01-ZV-SH01, Shift Supervisor.

Standard:

Implements 0ERP01-ZV-SH01, Shift Supervisor.

Comment:

A procedural handout will not be provided. The appropriate procedure manuals will be available in the examination area.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4 (C)

Initiate Data Sheet 2, Alert Checklist, starting at Step A.1.

Standard:

Implements Data Sheet 2 of 0ERP01-ZV-SH01 and begins by announcing to Control Room personnel the declaration of an Alert.

Comment:

Cue:

Notes:



- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: A9, DECLARE EMERGENCY ACTION LEVELS

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

You are the Unit 1 Shift Supervisor and the following series of events has just occurred:

1. Complete loss of **Main** Feedwater while the unit was at 100% power.
2. Unit trip occurred (Main Turbine and Reactor)
3. Main Steam Line Monitor RT-8048 is indicating $1.5E-1$ $\mu\text{ci/cc}$ and increasing.
4. All of the Annunciator Panels in the Control Room failed 15 minutes ago.
5. No steam release to the environment is present at this time.

INITIATING CUE:

Classify the event at its **MINIMUM** Emergency Action Level and **initiate** the STPEGS Emergency Plan. **Portions of this JPM are time critical.**

Emergency Classification

**RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX**

COMMUNICATIONS/ALARMS/ASSESSMENT

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
<p>SS6</p> <p>Inability to Monitor a Significant Transient in Progress</p> <p>Modes: 1-4</p>	<p><u>EAL-1</u></p> <p>The following conditions exist:</p> <p>a. Loss of Control Room Indicators and Annunciators associated with Safety Systems.</p> <p style="text-align: center;">AND</p> <p>b. Compensatory Non-Alarming Indications are Unavailable (i.e. QDPS, ICS, ERFDADS, Control Board, Local Alarms).</p> <p style="text-align: center;">AND</p> <p>c. Significant transient in progress.</p>	<p>SAE</p>
<p>SA4</p> <p>Unplanned Loss of Most Control Room Safety System Annunciation or Indication with Either (1) a Significant Transient In Progress, or (2) Compensatory Indicators are Unavailable</p> <p>Modes: 1-4</p>	<p><u>EAL-1</u></p> <p>The following conditions exist:</p> <p>a. Loss of most (>50%) of Control Room Safety System annunciators or indicators for greater than 15 minutes.</p> <p style="text-align: center;">AND</p> <p>b. The Shift Supervisor determines that the loss of the annunciators or indicators requires increased surveillance of compensatory indicators (e.g. Control Board Indicators, Local Indicators, QDPS, ICS, ERFDADS) to safely operate the unit.</p> <p style="text-align: center;">AND</p> <p>c. Annunciator or Indicator Loss does not result from planned action.</p> <p style="text-align: center;">AND</p> <p>d. Either of the following conditions exist:</p> <p>1. A significant plant transient is in progress.</p> <p style="text-align: center;">OR</p> <p>2. Compensatory indications are unavailable or cannot be adequately monitored with on-shift personnel.</p>	<p>ALERT</p>

(Name)	(Date)	(Unit)
Action	KEY	Time

A. INITIAL ACTIONS

1. Announce to Control Room personnel the declaration of an **Alert** and the continuation (or assumption) of Emergency Director responsibilities by the Shift Supervisor.

2. Ensure the following announcement (or a similar announcement) is made over the public address system using the **Unit Override** button:

(READ SLOWLY) "ATTENTION ALL PERSONNEL; ATTENTION ALL PERSONNEL. AN ALERT HAS BEEN DECLARED IN UNIT(S) _____. ALL DESIGNATED MEMBERS OF THE EMERGENCY RESPONSE ORGANIZATION REPORT TO YOUR FACILITY. ALL OTHER PERSONNEL ARE TO CONTINUE WITH THEIR NORMAL DUTIES UNLESS FURTHER INSTRUCTIONS ARE GIVEN." (Optional: Give brief description of the event.)

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: DETERMINE AND ESTABLISH CONTAINMENT SPRAY PUMP REQUIREMENTS

JPM NO.: C1

REVISION: 3

LOCATION: Unit 1 or 2 Control Room or Simulator

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: DETERMINE AND ESTABLISH CONTAINMENT SPRAY PUMP REQUIREMENTS

JPM No: C1

Rev. No: 3

STP Task: 82495 Respond to a Loss of Emergency Coolant Recirculation

STP Objective: 82495 Respond to a Loss of Emergency Coolant Recirculation Condition in accordance with POP05-EO-EC11

Related

K/A Reference: 013A1.06 [3.6/3.9], Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ESFAS controls including: RWST level.

026A4.01 [4.5/4.3], Ability to manually operate and/or monitor in the control room: CSS controls.

References: 0POP05-EO-EC11, Rev. 8, Loss of Emergency Coolant Recirculation

Task Normally Completed By:

RO or SRO

Method of Testing:

Simulated

Location of Testing:

Control Room / Simulator

Time

Critical Task: NO

Alternate

Path JPM: NO

Validation

Time: 20 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A Large Break LOCA has occurred on the primary system. Load Center E1(2)C2 lost power 10 minutes after the LOCA occurred. Control room operators have completed all steps of 0POP05-EO-EO00 and were partially through 0POP05-EO-EO10 when the RWST LO-LO Level alarm came in. The crew transitioned to and were proceeding through 0POP05-EO-ES13, TRANSFER TO COLD LEG RECIRCULATION, until they were unable to open any of the Containment Sump to SI Suction Header Valves (SI-MOV-0016A, B, & C). RCFC 11(21)B is tagged out for motor replacement and RCFC 12(22)B has tripped.

The Unit Supervisor has now transitioned to 0POP05-EO-EC11, LOSS OF EMERGENCY COOLANT RECIRCULATION, and has commenced cooldown per Step 5.

INITIATING CUE:

The Unit Supervisor directs you to continue with Step 6 and take appropriate actions per 0POP05-EO-EC11, LOSS OF EMERGENCY COOLANT RECIRCULATION.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Containment Spray Pumps are operated in accordance with 0POP05-EO-EC11 requirements.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Working copy of 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation

NOTES:

This JPM will be performed statically in either the Unit 1 or Unit 2 Control Room or on a static simulator.

SIMULATOR SETUP:

1. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
- 2) Check and Clean the following procedures:
 - 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation
3. Reset to IC #1 and verify:
 - Step Counter positions
 - ICS restored
 - Control Switch FLAGS reset
4. Leave the simulator in run. No other actions are necessary for this JPM since it is being performed statically on the simulator.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain the procedure.

Standard:

Obtains a copy of 0POP05-EO-EC11.

Comment:

Provide the operator with a copy of 0POP05-EO-EC11.

If performed in the Simulator, applicant may use the controlled copy of the procedure in the simulator.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Verify RCFCs Running. (procedure step 6a)

Standard:

Identifies three (3) RCFCs are running:

___ RCFC 11(21)A___ RCFC 12(22)A___ RCFC 11(21)C

Comment:

- 1) The table below is laid out in the same order as the Control board indicating lights
- 2) RCFC: 11(21)B tagged out for motor replacement.
12(22)B tripped
12(22)C no power (E1(2)C2 deenergized)

Cue:

RCFC Run Status	11(21)A	12(22)A	11(21)B <i>(tagged out)</i>	12(22)B <i>(tripped)</i>	11(21)C	12(22)C <i>(no power)</i>
Green	Off	Off	Off	On	Off	On
Red	On	On	Off	Off	On	Off

- **IF** applicant asks for RCFC air temperature, report inlet temperature is 95°F on the three operating RCFCs.
- **AFTER** the applicant has verified the status of the above equipment, hand out Attachment 1 for the applicant’s future reference.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3

Verify RCFC cooling water transferred to CCW. (procedure step 6b)

Standard:

Verifies RCFC cooling water transferred to CCW (for operable RCFCs):

<i>RCB Chilled Water valves - CLOSED:</i>	<i>CCW valves - OPEN:</i>
___ <i>MOV-0059</i>	___ <i>MOV-0057</i>
___ <i>MOV-0070</i>	___ <i>MOV-0069</i>
	___ <i>MOV-0068</i>
___ <i>MOV-0137</i>	___ <i>MOV-0136</i>
___ <i>MOV-0149</i>	___ <i>MOV-0148</i>
	___ <i>MOV-0147</i>
	___ <i>MOV-0208</i>

Comment:

No light indication to Train C valves due to loss of LC E1(2)C2.

MOV-0199
MOV-0209
MOV-0197
MOV-0210

Cues:

(continued next page)

STEP CONTINUED NEXT PAGE

JOB PERFORMANCE MEASURE CHECK SHEET

STEP 3 (continued)

CUES:

RCFC 11A/12A (21A/22A)	CHWS SPLY OCIV MOV-0059	CHWS RETURN OCIV MOV-0070	CCW SPLY OCIV MOV-0057	CCW RETURN OCIV MOV-0069	RCFC 11A/12A RET ICIV MOV-0068
Green	On	On	Off	Off	Off
Red	Off	Off	On	On	On
RCFC 11B/12B (21B/22B)	CHWS SPLY OCIV MOV-0137	CHWS RETURN OCIV MOV- 0149	CCW SPLY OCIV MOV- 0136	CCW RETURN OCIV MOV- 0148	RCFC 11B/12B RET ICIV MOV-0147
Green	On	On	Off	Off	Off
Red	Off	Off	On	On	On
RCFC 11C/12C (21C/22C)	CHWS SPLY OCIV MOV-0199	CHWS RETURN OCIV MOV- 0209	CCW SPLY OCIV MOV- 0197	CCW RETURN OCIV MOV- 0210	RCFC 11C/12C RET ICIV MOV-0208
Green	Off	Off	Off	Off	Off
Red	Off	Off	Off	Off	On

- **AFTER** the above equipment status is verified by the applicant, hand out Attachment 2
- **IF** applicant checks CCW Flow to RCFCs, provide the following cues.

RCFC Flow Indicator	<u>11A(21A)</u> FI-4536	<u>12A(22A)</u> FI-4538	<u>11B(21B)</u> FI-4553	<u>12B(22B)</u> FI-4555	<u>11C(21C)</u> FI-4570	<u>12C(22C)</u> FI-4572
CCW Flow (gpm)	2,000	2,000	2,000	2,000	2,000	2,000

- **AFTER** the above equipment status is verified by the applicant, hand out Attachment 3

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4(C)

Check RWST Level greater than 32,500 gallons (6%). (procedure step 7)

Standard:

Checks RWST level using any MCB Meter/Recorder or ICS/QDPS.

Comment:

Cue:

- RWST level channels (LI-931, LI-932) or level recorder (LR-931) = **73,000 gallons.**
- ICS or QDPS indication = **73,000 gallons**

Notes:

ICS is the Integrated Computer System (plant computer) with CRT displays.
QDPS is the computer system with plasma displays.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5(C)

Verify containment spray pump suction - ALIGNED TO RWST. (procedure step 8a)

Standard:

Determines Containment Spray Pump suction is aligned to the RWST.

Comment:

Cue:

Train A	CNTMT SUMP TO SI SUCT HDR ISOL, SI-MOV-0016A	RWST TO SI SUCT HDR ISOL, SI-MOV-0001A
Green	On	Off
Red	Off	On

Train B	CNTMT SUMP TO SI SUCT HDR ISOL, SI-MOV-0016B	RWST TO SI SUCT HDR ISOL, SI-MOV-0001B
Green	On	Off
Red	Off	On

Train C	CNTMT SUMP TO SI SUCT HDR ISOL, SI-MOV-0016C <i>(No power)</i>	RWST TO SI SUCT HDR ISOL, SI-MOV-0001C <i>(No power)</i>
Green	Off	Off
Red	Off	Off

If asked, pump flows are as follows:

- Low Head Safety Injection - 2500 gpm
- High Head Safety Injection - 900 gpm
- Containment Spray - 2200 gpm

Notes:

SAT/UNSAT Performance Step: 6 (C)

JOB PERFORMANCE MEASURE CHECK SHEET

Determine the Containment Spray Pump Operating Requirements. (procedure step 8b)

Standard:

*Determines **TWO (2)** Containment Spray Pumps should be running.*

Comment:

The operator should use RWST Level, CNTMT Pressure and RCFC status to determine that two (2) Containment Spray Pumps should be running.

Cue:

- RWST level channels (LI-931, LI-932), or recorder (LR-931) = **61,000 gallons**.
- ICS/QDPS = **61,000 gallons**.
- Containment pressure (PR-935/934, PR-9759, or ICS/QDPS) = **9.0 psig**.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 7

Verify Containment Spray Pumps running - EQUAL TO NUMBER REQUIRED.
(procedure step 8c)

Standard:

Identifies THREE (3) Containment Spray Pumps are running and only TWO (2) required.

Comment:

Cue:

Run Status	CSS PUMP 1(2)A	CSS PUMP 1(2)B	CSS PUMP 1(2)C
Green	Off	Off	Off
Red	On	On	On

Discharge Valve	CSS PUMP 1(2)A	CSS PUMP 1(2)B	CSS PUMP 1(2)C
Number	MOV-0001A	MOV-0001B	MOV-0001C
Status	Red - ON Green - OFF	Red - ON Green - OFF	Red - OFF Green - OFF

Discharge Flow	CSS PUMP 1(2)A	CSS PUMP 1(2)B	CSS PUMP 1(2)C
Indicator	FI-0813A	FI-0823A	FI-0833
Flow (gpm)	2,200	2,300	2,250

! Unit Supervisor directs that a Containment Spray Pump “C” be secured after need to secure 1 pump is identified.

Notes:



JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8(C)

Manually Operate Containment Spray Pumps. (procedure step RNO 8c)

Standard:

Secures a Containment Spray Pump:

Comment:

The Containment Spray actuation signal has NOT been reset. If the operator places CSS pump control switch to stop and returns to auto, the pump will remain running. The operator must take control switch to PTL or reset containment spray actuation signal to stop the pump.
(Logic Diagram: 9-Z-42130 #2)

Cue:

! **IF** selected CS Pump handswitch is turned to **OFF and applicant asks:**
The selected pump lights are: Red - On; Green - Off

AND If applicant informs Unit Supervisor or requests direction

THEN direct applicant to place the selected CS Pump handswitch in Pull-To-Lock (PTL)

! **IF** CS Pump handswitch turned to **PTL:**
The pump lights are: Green - On; Red - Off

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: C1, DETERMINE AND ESTABLISH CONTAINMENT SPRAY
PUMP REQUIREMENTS

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results:

Sat / Unsat

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A Large Break LOCA has occurred on the primary system. Load Center E1(2)C2 lost power 10 minutes after the LOCA occurred. Control room operators have completed all steps of 0POP05-EO-EO00 and were partially through 0POP05-EO-EO10 when the RWST LO-LO Level alarm came in. The crew transitioned to and were proceeding through 0POP05-EO-ES13, TRANSFER TO COLD LEG RECIRCULATION, until they were unable to open any of the Containment Sump to SI Suction Header Valves (SI-MOV-0016A, B, & C). RCFC 11(21)B is tagged out for motor replacement and RCFC 12(22)B has tripped.

The Unit Supervisor has now transitioned to 0POP05-EO-EC11, LOSS OF EMERGENCY COOLANT RECIRCULATION, and has commenced cooldown per Step 5.

INITIATING CUE:

The Unit Supervisor directs you to continue with Step 6 and take appropriate actions per 0POP05-EO-EC11, LOSS OF EMERGENCY COOLANT RECIRCULATION.

**JPM - STUDENT HANDOUT
ATTACHMENT 1**

RCFC Run Status	11(21)A	12(22)A	11(21)B <i>(tagged out)</i>	12(22)B <i>(tripped)</i>	11(21)C	12(22)C <i>(no power)</i>
Green	Off	Off	Off	On	Off	On
Red	On	On	Off	Off	On	Off

**JPM - STUDENT HANDOUT
ATTACHMENT 2**

RCFC 11A/12A (21A/22A)	CHWS SPLY OCIV MOV-0059	CHWS RETURN OCIV MOV-0070	CCW SPLY OCIV MOV-0057	CCW RETURN OCIV MOV-0069	RCFC 11A/12A RET ICIV MOV-0068
Green	On	On	Off	Off	Off
Red	Off	Off	On	On	On
RCFC 11B/12B (21B/22B)	CHWS SPLY OCIV MOV-0137	CHWS RETURN OCIV MOV- 0149	CCW SPLY OCIV MOV- 0136	CCW RETURN OCIV MOV- 0148	RCFC 11B/12B RET ICIV MOV-0147
Green	On	On	Off	Off	Off
Red	Off	Off	On	On	On
RCFC 11C/12C (21C/22C)	CHWS SPLY OCIV MOV-0199	CHWS RETURN OCIV MOV- 0209	CCW SPLY OCIV MOV- 0197	CCW RETURN OCIV MOV- 0210	RCFC 11C/12C RET ICIV MOV-0208
Green	Off	Off	Off	Off	Off
Red	Off	Off	Off	Off	On

**JPM - STUDENT HANDOUT
ATTACHMENT 3**

RCFC Flow Indicator	<u>11A(21A)</u> FI-4536	<u>12A(22A)</u> FI-4538	<u>11B(21B)</u> FI-4553	<u>12B(22B)</u> FI-4555	<u>11C(21C)</u> FI-4570	<u>12C(22C)</u> FI-4572
CCW Flow (gpm)	2,000	2,000	2,000	2,000	2,000	2,000

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: **PERFORM LOCAL CHANNEL CHECK OF RT-8038, LIQUID
WASTE EFFLUENT MONITOR**

JPM NO.: **P1**

REVISION: **3**

LOCATION: **UNIT 1 or 2**

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: PERFORM LOCAL CHANNEL CHECK OF RT-8038, LIQUID WASTE EFFLUENT MONITOR

JPM No.: P1

Rev. No: 3

STP Task: 30100, Operate the Liquid Waste Processing Subsystem.

STP Objective: NLO 30100, Given the specified procedure(s), logs/forms, tools, and equipment, Operate the Liquid Waste Processing Subsystem (LWPS) IAW the specified procedures, with no assistance allowed in operating the system.

Related

K/A Reference: 072 A4.01 [3.0/3.3] Ability to manually operate and/or monitor alarm and interlock setpoint checks and adjustments.

References: OPOP02-WL-0100, Rev. 5, Liquid Waste Release

Task Normally Completed By: PO

Method of Testing: Simulated

Location of Testing: Plant

Time Critical Task: NO

Alternate Path JPM: YES

Validation Time: 15 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the applicant):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

You are the MAB Operator. Preliminary steps 5.1 through 5.15 of OPOP02-WL-0100 have been completed in preparation for release of Waste Monitor Tank 1C(2C). Chemistry has returned the Release Package, proper dilution flowrate has been verified, and Waste Monitor Tank 1C(2C) has been on recirc for 60 minutes. RT-8038, Liquid Waste Effluent Radiation Monitor, is OPERABLE.

INITIATING CUE:

The Unit Supervisor directs you to locally perform a channel check on RT-8038, Liquid Waste Effluent Radiation Monitor in accordance with OPOP02-WL-0100, step 5.16.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

A satisfactory channel check of RT-8038, using the Standby LWPS RT-8038 Flow Strainer, has been performed locally in accordance with OPOP02-WL-0100.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Working copy 0POP02-WL-0100, Liquid Waste Release

NOTES:

- 1) This is an **Alternate Path** JPM due to the fact that the first attempt to perform a channel check on RT-8038 fails (on low flow) because the in service flow strainer is plugged. The operator must place the standby strainer in service and re-attempt the channel check.
- 2) The Handout copy of the procedure has been signed off up to step 5.16.
- 3) This JPM should be performed in conjunction with P3, and after, JPM A-4, "Determine Radiological Requirements to Enter a High Rad Area". This to help ensure a smooth flow of the exam schedule.
- 4) **The NRC Evaluator will use RWP- and use " " as the WAN.**

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain the procedure and review the Prerequisites and the Notes and Precautions.

Standard:

- 1) *Obtains a copy of OPOP02-WL-0100, Liquid Waste Release*
- 2) *Reviews the Prerequisites and the Notes and Precautions.*

Comment:

Provide the Handout copy of the applicable section of the procedure.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Notify the control room that a channel check of RT-8038 will be performed and that an alarm may actuate and be locked in until the setpoints are reset.
(procedure steps 5.16.1 and 5.16.2)

Standard:

Notifies the Control Room that a channel check of RT-8038 will be performed.

Comment:

The applicant should proceed to the MAB 10' elevation, Room 72 - Floor Drain Tank Pump 1B (2B) Room

Cue:

The Control Room acknowledges the report.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3 (C)

Open RT-8038 Inlet and Outlet Sample Isolation Valves. (procedure steps 5.16.3 and 5.16.4)

Standard:

- 1) *Opens 1(2)-SRA-3267, WMT PUMPS 1A, B & C DISCHARGE RT-8038 SAMPLE INLET VALVE*
- 2) *Opens 1(2)-SRA-3268, WMT PUMPS 1A, B & C DISCHARGE RT-8038 SAMPLE OUTLET VALVE*

Comment:

- 1) All RT-8038 local components are located on the 10' elevation of the MAB in Room 072, Floor Drain Tank Pump 1B (2B) Room
- 2) Inlet and Outlet valves are located at top-center of the RT-8038 Skid.

Cue:

SRA-3267 and SRA-3268: Initially - CLOSED
Finally - OPEN

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4 (C)

Place local Sample Pump handswitch to AUTO. (procedure steps 5.16.5)

Standard:

Places the Sample PUMP handswitch to AUTO on Panel NI(2)RAPCC8038.

Comment:

- 1) The panel is on the left side of the RT-8038 skid when facing it.
- 2) The RT-8038 skid is in the same room and area in both Units, however, the skid faces South in Unit 1 and North in Unit 2.

Cue:

PUMP HANDSWITCH: Initially - OFF
Finally - AUTO

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5(C)

Depress the PUMP ON/OFF pushbutton on the local panel. (procedure step 5.16.6)

Standard:

Depresses the PUMP ON/OFF pushbutton inside the control panel 1(2)-RA-RT-8038.

Comment:

Pushbutton located inside the control panel.

Cue:

- PUMP ON/OFF pushbutton: Initially - OFF
Finally - BACKLIT
- If applicant asks about the pump RED light: Initially - OFF
Finally - ON

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6

Observe channel check is satisfactory as indicated by illumination of green light on front of monitor. (procedure step 5.16.7)

Standard:

Attempts to verify Green OPERATE Light illuminated on front of control panel 1(2)-RA-RT-8038".

Comment:

Large Green Light located outside right control panel.

Cue:

- Green OPERATE Light: Initially - OFF
Finally - OFF
- If applicant desires to replace light bulb, tell applicant the Green OPERATE light is OFF.
- If applicant asks about the pump RED light: RED LIGHT - ON
(The pump will start and then automatically turn off with no flow for 60 seconds)

Notes:

ALTERNATE PATH - Applicant will expect the Green OPERATE Light to be LIT, however, the light will not illuminate at this time (due to a plugged in-service flow strainer). Contingency actions must be taken to place the standby flow strainer in service and restart the sample pump.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8 (C)

Place the standby LWPS Monitor RT-8038 Flow Strainer in service. (procedure step 5.16.9.2)

Standard:

Selects the standby LWPS MONITOR RT-8038 FLOW STRAINER using yellow T-handle.

Comment:

The selector must first be unlocked using the silver T-handle on top of the strainer; then the yellow T-handle rotated to the position of the opposite strainer. The silver T-handle is then turned to lock the yellow T-handle in place.

Cue:

Yellow T-handle selector is positioned to the desired strainer.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 9 (C)

Depress the PUMP ON/OFF pushbutton on the local panel. (procedure step 5.16.9.3)

Standard:

Depresses the PUMP ON/OFF pushbutton inside the control panel 1(2)-RA-RT-8038.

Comment:

Pushbutton located inside the control panel.

Cue:

- PUMP ON/OFF pushbutton: Initially - OFF
Finally - BACKLIT
- If applicant asks about the pump RED light: Initially - OFF
Finally - ON

Notes:

VERIFICATION OF COMPLETION

Job Performance Measure: P1, PERFORM LOCAL CHANNEL CHECK OF RT-8038, LIQUID WASTE EFFLUENT MONITOR

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

You are the MAB Operator. Preliminary steps 5.1 through 5.15 of OPOP02-WL-0100 have been completed in preparation for release of Waste Monitor Tank 1C(2C). Chemistry has returned the Release Package, proper dilution flowrate has been verified, and Waste Monitor Tank 1C(2C) has been on recirc for 60 minutes. RT-8038, Liquid Waste Effluent Radiation Monitor, is OPERABLE.

INITIATING CUE:

The Unit Supervisor directs you to locally perform a channel check on RT-8038, Liquid Waste Effluent Radiation Monitor in accordance with OPOP02-WL-0100, step 5.16.

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: LOCALLY TRIP THE REACTOR

JPM NO.: P2

REVISION: 2

LOCATION: Unit 1 or 2

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: LOCALLY TRIP THE REACTOR

JPM No.: P2

Rev. No.: 2

STP Task: 2600, Manually trip the reactor.

STP Objective: 2600, When required, manually trip the reactor.

Related

K/A Reference: EPE 029 EA1.11 [3.9/4.1] Ability to operate and monitor the following as they apply to a ATWS: Manual opening of the CRDS breakers.

References: 0POP05-EO-FRS1, Rev. 9, RESPONSE TO NUCLEAR POWER GENERATION - ATWS

Task Normally Completed By: PO/RO

Method of Testing: Simulated

Location of Testing: Plant

Time Critical Task: NO

Alternate Path JPM: YES

Validation Time: 15 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

An ATWS occurred; the Reactor Trip Breakers can not be opened using either of the reactor trip switches. The Primary Operator is inserting control rods per Step 1, OPOP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.

INITIATING CUE:

The Unit Supervisor directs you to perform the remainder of the Immediate Action steps of OPOP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

The operator has SIMULATED opening the Reactor Trip and Bypass Breakers.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

None

NOTES:

- 1) This JPM **STARTS** in the Control Room where the applicant attempts to trip the reactor.
- 2) This is an **Alternate Path** JPM due to the fact that the first attempt to trip the reactor by opening the motor generator set feeder breakers does not work as expected. The applicant must then take measures to trip the reactor by locally opening the reactor trip breakers.
- 3) The actions contained in this JPM are Immediate Actions of OPOP05-EO-FRS1, Response to Nuclear Power Generation - ATWS, and are to be completed without the aid of an in-hand procedure.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

SAT/UNSAT Performance Step: 1(C)

Open 480V LC 1K1 and 1L1 feeder breakers.

Standard:

The applicant simulates opening 480V LC 1K1 and 1L1 feeder breakers.

Comment:

Cue:

- LC 1K1 feeder breaker failed to open (red light ON, green light OFF)
- LC 1L1 feeder breaker opens as expected (green light ON, red light OFF)
- If asked by applicant if Reactor is tripped after attempting to open breakers, inform applicant the Reactor is NOT tripped.
- If questioned by the applicant, or if the applicant attempts to contact a Plant Operator, as the Unit Supervisor, direct the applicant to continue the immediate actions of OPOP05-EO-FRS1 by performing the necessary actions outside of the Control Room.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C)

Go to the Rod Control Equipment Room (60 ft EAB RM 323).

Standard:

The applicant proceeds to the Rod Control Equipment Room on the 60 ft. elevation of the EAB.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3 (C)

Open the reactor trip breakers.

Standard:

The applicant SIMULATES pushing the trip button for the reactor trip breakers.

_____ *Reactor Trip Breaker R*

_____ *Reactor Trip Breaker S*

Comment:

DO NOT OPEN REACTOR TRIP BREAKER DOORS. Simply inform the applicant that if he were to open the door, that the RED SHUT flag would be dropped, and the GREEN OPEN flag displayed.

Cue:

- The **RED** flag that says "**SHUT**" drops. The **GREEN** flag that says "**OPEN**" is displayed.
- The control room reports that they have open indication.

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: P2, LOCALLY TRIP THE REACTOR

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

An ATWS occurred; the Reactor Trip Breakers can not be opened using either of the reactor trip switches. The Primary Operator is inserting control rods per Step 1, 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.

INITIATING CUE:

The Unit Supervisor directs you to perform the remainder of the Immediate Action steps of 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: SECURE ALTERNATE BORATION

JPM NO.: P3

REVISION: 2

LOCATION: UNIT 1 OR 2

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: SECURE ALTERNATE BORATION

JPM No.: P3

Rev. No: 2

STP Task: NLO 81000, Perform MAB/EAB watchstation actions for Control Room Evacuation.

STP Objective: 81000, With the Control Room evacuated, respond as MAB/EAB watch to the Control Room Evacuation, by performing the watchstation actions IAW POP04-ZO-0001.

Related K/A Reference: APE 068 AA1.08 [4.2/4.2] Ability to operate and/or monitor the following as they apply to the Control Room Evacuation: Local boric acid flow.

References: OPOP04-ZO-0001, Rev. 15, Control Room Evacuation

Task Normally Completed By: PO/RO/SRO

Method of Testing: Simulated

Location of Testing: Plant

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 15 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The Control Room has been evacuated and the operating crew is performing the actions of OPOP04-ZO-0001, Control Room Evacuation, with all watchstations manned in the EAB.

The RCS is being borated using gravity drain to the charging pump.

INITIATING CUE:

The Shift Supervisor directs you as the extra RO to secure Boration Using Gravity Feed in accordance with Addendum 10, Step 8.0 of OPOP04-ZO-0001, Control Room Evacuation.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Charging pump suction has been re-aligned to the RWST and boric acid gravity drain to the charging pump is isolated.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Working copy of OPOP04-ZO-0001, Addendum 10

NOTES:

This JPM should be performed in conjunction with P1, and after, JPM A-4, "Determine Radiological Requirements to Enter a High Rad Area". This to help ensure a smooth flow of the exam schedule.

- 1) **The NRC Evaluator will use RWP- and use " " as the WAN.**

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain a copy of the procedure.

Standard:

Obtains a copy of Addendum 10 to OPOP04-ZO-0001.

Comment:

Provide the Handout Copy of OPOP04-ZO-0001, Addendum 10.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C) (S₁)

Direct ESF Switchgear Operators to open and de-energize the following valves:

- CV-MOV-112C, RWST TO CHG PUMP SUCTION ISOL
- CV-MOV-0113B, RWST TO CHG PUMP SUCTION ISOL

(Addendum 10, step 8.0.a)

Standard:

Directs the ESF Switchgear Operators to perform step 8.0.a of Addendum 10 which opens and de-energizes CV-MOV-0112C and CV-MOV-0113B by:

- *Contacting the operator at the Aux Shutdown Panel to relay the message to the ESF Switchgear Operators using a radio,*

OR

- *Going to the 35 ft and 60 ft ESF Switchgear Rooms to give the direction to the Switchgear Operators.*

Comment:

This step must be performed first to prevent a loss of suction to the running charging pump.

The following JPM Steps 3, 4, and 5 can be performed in any sequence.

Cue:

Respond as Auxiliary Shutdown Panel Operator or ESF Switchgear Operator(s):

CV-MOV-0112C and CV-MOV-0113B have been opened AND de-energized.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3 (*C) (S₂)

Close and lock 1(2)-CV-0226, "MANUAL BORATION". (Addendum 10, step 8.0.b)

Standard:

Closes AND locks 1(2)-CV-0226, "MANUAL BORATION".

Comment:

* Either this step or JPM step #5 must be completed to satisfy the critical step requirement.

Cue:

- Valve is initially unlocked and open
- Final condition is closed AND locked

Notes:

Valve is located on the 19 ft elevation of the MAB, Room 079.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4 (S₂)

Close the following valves: (Addendum 10, step 8.0.b)

- 1(2)-CV-0335A, "BA BATCHING TANK 1A(2A) TO BA TRANSFER PUMP"
- 1(2)-CV-0335B, "BA BATCHING TANK 1B(2B) TO BA TRANSFER PUMP"

Standard:

Closes the following valves:

___ 1(2)-CV-0335A, "BA BATCHING TANK 1A(2A) TO BA TRANSFER PUMP"

___ 1(2)-CV-0335B, "BA BATCHING TANK 1B(2B) TO BA TRANSFER PUMP"

Comment:

Cue:

- Initial condition for each valve - OPEN
- Final condition for each valve - CLOSED

Notes:

Valves are located on the 10 ft MAB, in rooms 018A and 018 respectively.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5 (*C) (S₂)

Close 1(2)-CV-0333, "BA TANK 1A(2A) TO CHARGING PUMPS SUCTION ISOL" (Addendum 10, step 8.0.b)

Standard:

Closes 1(2)-CV-0333, "BA TANK 1A(2A) TO CHARGING PUMPS SUCTION ISOL"

Comment:

* Either this step or JPM step #3 must be completed to satisfy the critical step requirement.

Cue:

- Valve is initially open
- Final condition of the valve is closed

Notes:

Valve is located on 19 ft MAB, Room 076

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: P3, SECURE ALTERNATE BORATION

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The Control Room has been evacuated and the operating crew is performing the actions of OPOP04-ZO-0001, Control Room Evacuation, with all watchstations manned in the EAB.

The RCS is being borated using gravity drain to the charging pump.

INITIATING CUE:

The Shift Supervisor directs you as the extra RO to secure Boration Using Gravity Feed in accordance with Addendum 10, Step 8.0 of OPOP04-ZO-0001, Control Room Evacuation.

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: RESTORE OFFSITE POWER TO ESF BUS

JPM NO.: S1

REVISION: 1

LOCATION: Simulator

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: RESTORE OFFSITE POWER TO ESF BUS

JPM No.: S1

Rev. No.: 1

STP Task: 44650 Transfer an Emergency Bus from the Emergency Diesel Generator to offsite power.

STP Objective: 44650 Transfer an ESF BUS from the Emergency Diesel Generator to offsite power IAW 0POP02-DG-0001/2/3 until the diesel is back in normal standby lineup.

Related K/A Reference:

062 A4.07 [3.1/3.1], Ability to manually operate and/or monitor in the control room: Synchronizing and paralleling of different AC supplies.

064 A3.06 [3.3/3.4], Ability to monitor automatic operation of the ED/G system, including: Start and stop.

064 A4.01 [4.0/4.3], Ability to manually operate and/or monitor in the control room: Local and remote operation of the ED/G.

References: 0POP02-DG-0003, Rev. 28, Emergency Diesel Generator 13(23)

Task Normally Completed By: RO/SRO

Method of Testing: Actual Performance

Location of Testing: Simulator

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 20 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A Large Break LOCA has occurred 5.5 hours ago. Additionally, a fault occurred on 4.16KV ESF BUS E1C supply breaker E1C/1. Emergency Diesel Generator 13 started and loaded normally. The C ESF BUS supply breaker E1C/1 has been repaired and re-installed.

INITIATING CUE:

The Unit Supervisor directs you to restore normal off-site power to 4.16KV ESF Bus C and place ESF Diesel Generator 13 in a cooldown cycle in accordance with OPOP02-DG-0003, Emergency Diesel Generator 13(23).

- The requirement for having a second operator and the Unit /Shift Supervisor available during the synchronization task has been waived by the Shift Supervisor.
- Per the Shift Supervisor, the time requirements in the unloading rate table of OPOP02-DG-0003 are waived

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

4.16KV ESF bus E1C is being supplied from its associated standby bus. ESF Diesel Generator 13 is in a cooldown cycle.

HANDOUTS:

Working copy of OPOP02-DG-0003, Emergency Diesel Generator 13(23) will be available in the simulator.

JOB PERFORMANCE MEASURE INFORMATION SHEET

NOTES:

1. This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. (NO Indication type Cues are provided).
2. The JPM will flow more smoothly if the evaluator provides the cues for the local operator.
3. Use the Simulator Setup section below to prepare the simulator.

SIMULATOR SETUP:

1. JPMs S1 and S2 are to run together. The following steps will set up the simulator for **BOTH** JPMs.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and Clean the following procedures:
 - OPOP05-EO-ES14, Transfer to Hot Leg Recirculation
 - OPOP02-DG-0003, Emergency Diesel Generator 13(23)
5. Reset to IC #69 and verify:
 - Step counter positions
 - ICS restored
 - Control Switch FLAGS reset

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain a copy of the applicable Emergency Diesel Generator procedure.

Standard:

The operator obtains a copy of OPOP02-DG-0003, Emergency Diesel Generator 13(23).

Comment:

Provide the Handout copy of OPOP02-DG-0003, or the operator may use the simulator copy of the procedure.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 2

The operator reviews the Notes and Precautions section of 0POP02-DG-0003, Emergency Diesel Generator 13(23).

Standard:

The operator reviews the Notes and Precautions section of the procedure and goes to "Section 9.0, Transferring 4.16 KV Bus E1C(E2C) from Diesel Generator 13(23) to Offsite Supply."

Comment:

Cue:

Throughout this JPM, **IF** applicant asks the local operator to investigate the cause of a "DG13 TROUBLE" alarm, report alarm is due to "Standpipe level off-normal".

Notes:

SAT/UNSAT Performance Step: 3

VERIFY Diesel Generator 13 is the only source of power to ESF Bus E1C. (Procedure step 9.1)

Standard:

The operator checks to ensure that Diesel Generator 13 is the only source of power to ESF Bus E1C.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 4

Verify breaker alignment for transfer of power supply from Diesel Generator 13 to Standby Bus 1H. (Procedure step 9.2)

Standard:

The Operator ENSURES each of the following is in the proper position on CP-010:

___ *"EMER BUS 1L TO XFMR E1C BKR SW-EMER" is OPEN*

___ *"EMER BUS 1L TO XFMR E1C DISC SW-EMER" is OPEN*

___ *"STBY BUS 1H TO XFMR E1C DISC SW-NORM" is CLOSED*

___ *"STBY BUS 1H TO XFMR E1C BKR SW-NORM" is CLOSED*

Comment:

If the operator asks for clarification, tell him that the Unit Supervisor has directed that the bus be energized from STBY Bus 1H (which is energized from UNIT 1 STBY XFMR).

Procedure step 9.3, Transferring ESF DG to Emergency Bus 1L, is N/A .

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 5

ENSURE any activated protective relays reset. {ZLP105} (Procedure step 9.4)

Standard:

The operator directs a Plant Operator to locally reset any protective relay that may have tripped.

Comment:

Cue:

- As Plant Operator, report no protective relays have tripped.
- If asked, as Plant Operator report that there are no local alarms present.

Notes:

SAT/UNSAT Performance Step: 6 (C)

ENSURE the Train C Load Sequencer reset. (Procedure step 9.5)

Standard:

The operator depresses the white sequencer RESET pushbutton on CP-003 for ESF Diesel Generator 13.

Comment:

- “LOOPWR” status lights will clear
- Computer Indication of sequencer reset is on ICS display 9713

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 7

Momentarily DEPRESS the Diesel Generator 13 "RESET" pushbutton to ensure the non-emergency trip logic reset. (Procedure step 9.6)

Standard:

The operator depresses the white RESET pushbutton on CP-003 for Diesel Generator 13.

Comment:

Cue:

If asked, the Unit Supervisor reports that **No** non-emergency trip signal was received while the diesel was running in the Emergency Mode.

If asked, the Unit Supervisor reports that Non-Class 1E 125 VDC control power **was not** lost while the diesel was operating in the Emergency Mode.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 8

Verify the MASTER TRIP CIRCUIT "RESET" light illuminated. {ZLP106} (Procedure step 9.7)

Standard:

The operator directs a Plant Operator to verify the MASTER TRIP CIRCUIT RESET light on ZLP-106 is illuminated.

Comment:

Cue:

As Plant Operator, report the Master Trip Circuit Reset light is on.

Notes:

SAT/UNSAT Performance Step: 9 (C)

DEPRESS the "RELEASE" from Emergency Mode Operation pushbutton. {CP003}
(Procedure step 9.8)

Standard:

The Operator depresses the white "RELEASE" (from Emergency Mode) pushbutton on CP-003 for ESF Diesel Generator 13.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 10

Verify the “Emergency Mode” white light is extinguished {ZLP 106}. (Procedure step 9.9)

Standard:

The operator directs a Plant Operator to verify the white “Emergency Mode” light on ZLP-106 is extinguished.

Comment:

Cue:

As Plant Operator, report the white “Emergency Mode” light on ZLP-106 is extinguished

Notes:

SAT/UNSAT Performance Step: 11

Ensure the ENGINE START MODE switch is in the IDLE position {ZLP 106} (Procedure step 9.10)

Standard:

The operator directs a Plant Operator to verify the ENGINE START MODE switch on ZLP-106 is in the IDLE position.

Comment:

Cue:

As Plant Operator, report the ENGINE START MODE switch is in the IDLE position.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 12

ENSURE the GOV MODE SEL switch in the PARALLEL position. {CP003}
(Procedure step 9.11)

Standard:

The operator verifies the GOV MODE SEL switch in the PARALLEL position.

Comment:

The switch should not have been repositioned from the PARALLEL position.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 13 (C)*

Parallel the diesel with off-site power. (Procedure steps 9.12 - 9.16)

Standard:

The operator performs ALL of the following for the diesel being shutdown:

- * A. *PLACEs the SYNCHROSCOPE for Diesel Generator 13 in the ON position. {CP003}*
- 1 B. *ENSUREs the US/SS is present when synchronizing Diesel Generator 13.*
- * C. *ADJUSTs engine speed to cause the synchroscope to move slowly in the SLOW direction using the GOV switch. {CP003}*
- * D. *ADJUSTS DG 13 Output voltage using DG 13 VOLT ADJ until DG 13 output voltage is equal to XFRMR E1C VOLTS*
- E. *MONITORS the DG 13 Voltage Meter for all three phases of voltage.*
- * F. *CLOSEs ESF Bus E1C Normal SPLY BKR E1C/1 when the synchroscope is approximately in the 12:05 position. {CP003}*
- G. *PLACEs the SYNCHROSCOPE switch in the OFF position. (CP003)*

Comment:

- * - Denotes critical portion of the step
- A second operator is NOT AVAILABLE to read the required steps per the procedure. THE EVALUATOR WILL NOT BE THE READER.

Cue:

1 The requirement for having a second operator and the Unit /Shift Supervisor available during the synchronization task has been waived by the Shift Supervisor.

Notes:

SAT/UNSAT Performance Step: 14 (C)

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

Unload the diesel. (Procedure steps 9.17 - 9.19)

Standard:

*The operator performs **ALL** of the following for the diesel to be shutdown:*

- ___ A. *Using the Diesel Generator 13 GOV switch, DECREASEs diesel generator load to approximately 100 KW .*
- ___ B. *Using the Diesel Generator VOLT ADJ switch, DECREASEs diesel generator Reactive Power to approximately +50 KVAR .*
- ___ C. *Opens the Diesel Generator 13 DG OUTP BKR. {CP003}*

Comment:

Actions 'A' and 'B' above may be simultaneously performed while unloading DG 13.

For time compression considerations in the simulator, the recommended Diesel Generator unloading rates of step 4.45 will not be followed.

Cue:

As US/SS, inform the candidate that the diesel is to be unloaded within 5 minutes.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 15

ENSURE ENGINE START MODE switch is in the RATED position {ZLP106}
(Procedure step 9.20)

Standard:

The operator directs a Plant Operator to ensure the ESF Diesel Generator 13 ENGINE START MODE switch in the RATED position.

Comment:

Cue:

- As Plant Operator, if asked the as found position of the switch, report that the ENGINE START MODE switch is in the IDLE position.
- As Plant Operator, report the ESF Diesel Generator 13 ENGINE START MODE switch is now in the RATED position

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 16 (C)

STOP Diesel Generator 13. (Procedure step 9.21)

Standard:

_____ *The operator TURNS Diesel Generator 13 NORMAL control switch to the STOP position. {CP003}*

_____ *WHEN Diesel Generator 13 has entered the cooldown cycle, THEN the operator verifies that generator voltage decays indicating proper operation of the Generator Exciter Shunt Relay (K-1) by observing generator voltage decay.*

Comment:

An ICS alarm comes in when securing ESF Diesel Generators associated with DG scaled (low) voltage and frequency.

Cue:

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: S1, RESTORE OFFSITE POWER TO ESF BUS

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A Large Break LOCA has occurred 5.5 hours ago. Additionally, a fault occurred on 4.16KV ESF BUS E1C supply breaker E1C/1. Emergency Diesel Generator 13 started and loaded normally. The C ESF BUS supply breaker E1C/1 has been repaired and re-installed.

INITIATING CUE:

The Unit Supervisor directs you to restore normal off-site power to 4.16KV ESF Bus C and place ESF Diesel Generator 13 in a cooldown cycle in accordance with OPOP02-DG-0003, Emergency Diesel Generator 13(23).

- The requirement for having a second operator and the Unit /Shift Supervisor available during the synchronization task has been waived by the Shift Supervisor.
- Per the Shift Supervisor, the time requirements in the unloading rate table of OPOP02-DG-0003 are waived

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: TRANSFER TO HOT LEG RECIRCULATION

JPM NO.: S2

REVISION: 1

LOCATION: Simulator

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: TRANSFER TO HOT LEG RECIRCULATION

JPM No.: S2

Rev. No.: 1

STP Task: 81637 - Transfer to Hot Leg Recirculation

STP Objective: 81637 - Transfer to Hot Leg Recirculation IAW OPOP05-E0-ES14

Related

K/A Reference: EPE 011 EA1.11 [4.2/4.2] - Ability to operate and monitor the following as they apply to a Large Break LOCA: Long-term cooling of the core.

References: OPOP05-E0-ES14, Rev. 4, Transfer to Hot Leg Recirculation

Task Normally Completed By: RO

Method of Testing: Actual Performance

Location of Testing: Simulator

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 15 Mins.

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A large break LOCA occurred 5.5 hours ago. The control room operators have completed OPOP05-E0-E010 and are evaluating long term plant status. Adverse Containment Conditions exist.

INITIATING CUE:

The Unit Supervisor directs you to transfer to hot leg recirculation on SI trains A and B in accordance with OPOP05-E0-ES14, Transfer to Hot Leg Recirculation.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

The Performer Transfers SI Recirculation Flow from Cold Leg to Hot Leg for Trains A and B Per OPOP05-E0-ES14.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Working copy of: 0POP05-E0-ES14, Transfer to Hot Leg Recirculation

NOTES:

1. This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. (NO Indication type Cues are provided).
2. Use the Simulator Setup section below to prepare the simulator.

SIMULATOR SETUP:

1. JPMs S1 and S2 are to run together. The following steps will set up the simulator for **BOTH** JPMs.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and Clean the following procedures:
 - 0POP05-E0-ES14, Transfer to Hot Leg Recirculation
 - 0POP02-DG-0003, Emergency Diesel Generator 13(23)
5. Reset to IC #69 and verify:
 - Step counter positions
 - ICS restored
 - Control Switch FLAGS reset

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain the procedure, OPOP05-E0-ES14, Transfer to Hot Leg Recirculation

Standard:

Copy of OPOP05-E0-ES14, Transfer to Hot Leg Recirculation obtained.

Comment:

The applicant may use the simulator copy of the procedure or a working copy provided by the evaluator.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 2

Check three SI trains operable (Procedure step 1)

Standard:

Three SI trains checked operable.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 3(C)

Align the first HHSI pump for Hot Leg Recirculation. (Procedure step 2.a)

Standard:

 * *Energizes selected SI train HHSI hot leg injection valve.*
(‘A’: MOV-0008A; ‘B’: MOV-0008B)

 * *Opens HHSI hot leg injection valve.*
(‘A’: MOV-0008A; ‘B’: MOV-0008B)

 * *Closes HHSI cold leg injection valve.*
(‘A’: MOV-0006A; ‘B’: MOV-0006B)

 Verifies hot leg injection flow.

 Deenergizes selected SI train HHSI hot leg injection valve.
(‘A’: MOV-0008A; ‘B’: MOV-0008B)

Comment:

1. Applicant may start with either A or B train.
2. Items marked with an “*” are the critical steps.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 4(C)

Align the first LHSI pump for Hot Leg Recirculation. (Procedure step 2.b)

Standard:

 * *Energizes selected SI train LHSI hot leg injection valve.*
 (*'A': MOV-0019A; 'B': MOV-0019B*)

 * *Opens LHSI hot leg injection valve.*
 (*'A': MOV-0019A; 'B': MOV-0019B*)

 * *Closes LHSI cold leg injection valve.*
 (*'A': MOV-0031A; 'B': MOV-0031B*)

 Verifies hot leg injection flow.

 Deenergizes selected SI train LHSI hot leg injection valve.
 (*'A': MOV-0019A; 'B': MOV-0019B*)

Comment:

1. Applicant may start with either A or B train.
2. Items marked with an "*" are the critical steps.

Cue:

Notes:

This step should be performed in a rapid sequence to prevent pump runout.

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 5(C)

Align the second HHSI pump for Hot Leg Recirculation. (Procedure step 3.a)

Standard:

 * *Energizes selected SI train HHSI hot leg injection valve.*
 (*'A': MOV-0008A; 'B': MOV-0008B*)

 * *Opens HHSI hot leg injection valve.*
 (*'A': MOV-0008A; 'B': MOV-0008B*)

 * *Closes HHSI cold leg injection valve.*
 (*'A': MOV-0006A; 'B': MOV-0006B*)

 Verifies hot leg injection flow.

 Deenergizes selected SI train HHSI hot leg injection valve.
 (*'A': MOV-0008A; 'B': MOV-0008B*)

Comment:

1. This step will be performed on either A or B trains, depending on which train was transferred first.
2. Items marked with an “*” are the critical steps.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 6(C)

Align the second LHSI pump for Hot Leg Recirculation. (Procedure step 3.b)

Standard:

 * *Energizes selected SI train LHSI hot leg injection valve.*
 (*'A': MOV-0019A; 'B': MOV-0019B*)

 * *Opens LHSI hot leg injection valve.*
 (*'A': MOV-0019A; 'B': MOV-0019B*)

 * *Closes LHSI cold leg injection valve.*
 (*'A': MOV-0031A; 'B': MOV-0031B*)

 Verifies hot leg injection flow.

 Deenergizes selected SI train LHSI hot leg injection valve.
 (*'A': MOV-0019A; 'B': MOV-0019B*)

Comment:

1. This step will be performed on either A or B trains, depending on which train was transferred first.
2. Items marked with an “*” are the critical steps.

Cue:

Notes:

This step should be performed in a rapid sequence to prevent pump runout.

JOB PERFORMANCE MEASURE CHECK SHEET (cont'd)

SAT/UNSAT Performance Step: 7

Dispatch an Operator to open and lock the breakers for the following valves: (Procedure step 4)

1. LHSI Pump 1A Disch to Loop 1 Cold Leg 1-SI-MOV-0031A
2. LHSI Pump 1B Disch to Loop 2 Cold Leg 1-SI-MOV-0031B
3. LHSI Pump 1C Disch to Loop 3 Cold Leg 1-SI-MOV-0031C

Standard:

A Plant Operator is dispatched to open and lock the breakers for the following valves:

- *LHSI Pump 1A Disch to Loop 1 Cold Leg 1-SI-MOV-0031A*
- *LHSI Pump 1B Disch to Loop 2 Cold Leg 1-SI-MOV-0031B*
- *LHSI Pump 1C Disch to Loop 3 Cold Leg 1-SI-MOV-0031C*

Comment:

Cue:

As Plant Operator, acknowledge the request to open and lock the above breakers.

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: S2, TRANSFER TO HOT LEG RECIRCULATION

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: Sat/Unsat

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A large break LOCA occurred 5.5 hours ago. The control room operators have completed OPOP05-E0-E010 and are evaluating long term plant status. Adverse Containment Conditions exist.

INITIATING CUE:

The Unit Supervisor directs you to transfer to hot leg recirculation on SI trains A and B in accordance with OPOP05-E0-ES14, Transfer to Hot Leg Recirculation.

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

**TITLE: RESPOND TO A SOURCE RANGE NUCLEAR INSTRUMENT
FAILURE**

JPM NO.: S3

REVISION: 1

LOCATION: Simulator

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: RESPOND TO A SOURCE RANGE NUCLEAR INSTRUMENT FAILURE

JPM No.: S3

Rev. No.: 1

STP Task: 86050, Respond to a Loss of Source Range Instrumentation

STP Objective: 86050, Respond to a Loss of Source Range Instrumentation per OPOP04-NI-0001

Related

K/A Reference: APE 032 AA2.05 [2.9/3.2], Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Nature of abnormality, from rapid survey of control room data.

References: OPOP04-NI-0001, Rev. 6, Nuclear Instrument Malfunction
OPOP09-AN-05M3, Rev. 17, Annunciator Lampbox Instructions

Task Normally Completed By: RO

Method of Testing: Actual Performance

Location of Testing: Simulator

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 20 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The Unit is shutdown in MODE 4. Annunciator 5M03 /E-1, "SR HI VOLT TRBL" has just actuated.

INITIATING CUE:

The Unit Supervisor directs you to take the appropriate actions.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Source Range channel NI-31 is determined to be de-energized and the actions associated with OPOP04-NI-0001, Nuclear Instrument Malfunction, are complete.

HANDOUTS:

Working copy of OPOP04-NI-0001, Nuclear Instrumentation Malfunction

JOB PERFORMANCE MEASURE INFORMATION SHEET (cont'd)

NOTES:

1. This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. (NO Indication type Cues are provided).
2. Use the Simulator Setup section below to prepare the simulator.

SIMULATOR SETUP:

1. JPMs S3 and S4 are to run together. The following steps will set up the simulator for **BOTH** JPMs.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and Clean the following procedures:
 - OPOP04-NI-0001, Nuclear Instrument Malfunction
 - OPOP04-RA-0001, Radiation Monitoring System Alarm Response
5. Reset to IC #70 and verify:
 - Step counter positions
 - ICS restored
 - Control Switch FLAGS reset
6. Tag the following handswitches:
 - HHSI Pp 1B - PTL - Danger Tag
 - CCP 1B - PTL - Danger Tag
 - Positive Displacement Charging Pump - PTL - Danger Tag
 - HHSI Pp 1C - PTL Caution Tag
7. Place the simulator in run and perform the following:
 - A. Ensure the RM-11 display is selected to Grid-3
 - B. Execute step #1 of lesson #5 in Lesson Group "lot13nrc"
 - Silence the RM-11 alarm by depressing the "SYSTEM ACK" button, but leave RT-8012 and RT-8013 blinking (DO NOT acknowledge)
8. Ensure the Audio Multiplier is selected to "10" and audio count rate is audible (may need to momentarily select N32 to adjust volume.)
9. Ensure N31 is selected for the Audio Count Rate Channel

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain appropriate annunciator response procedure.

Standard:

Obtains copy of 0POP09-AN-05M3, Annunciator Lampbox 5M03 Response Instructions, for annunciator window E-1.

Comment:

Cue:

Notes:

Applicant should use the simulator copy of the Annunciator Response Procedure.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Check status of P-6 permissive. (Ann. Response, step 1)

Standard:

Determines P-6 permissive is not satisfied. {CP-005}

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 3 (C)

Evaluate status of Source Range Channels N31 and N32. (Ann Response, step 3)

Standard:

Determines Source Range Channel N31 is de-energized. {CP-005}

Comment:

Cue:

- If/when the applicant starts to access Technical Specifications, inform him/her that the Unit Supervisor will investigate Tech Spec requirements/actions.

Notes:

Step 2 of the annunciator response does not apply since P-6 is not satisfied.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

Manually RESET the Source Range blocks at CP005 (Ann. Response, step 3.a)

Standard:

Manually resets (unblocks) the Source Range High Level Reactor Trip using the trains R and S manual block switches at CP-005.

Comment:

No change in control board indications will be seen when this step is performed.

Cue:

Notes:

SAT/UNSAT Performance Step: 5 (C)

Evaluate Status of Source Range Channel N31. (Ann. Response, step 3.b)

Standard:

Determines Source Range Channel N31 did not re-energize.

Comment:

Cue:

As Unit Supervisor, direct applicant to go to OPOP04-NI-0001, Nuclear Instrumentation Malfunction.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6(C)

Transition to OPOP04-NI-0001, Nuclear Instrument Malfunction.

Standard:

Transitions to OPOP04-NI-0001 as directed by annunciator response procedure.

Comment:

The applicant may use the simulator copy of the procedure or a working copy provided by the evaluator.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 7

Check Power Range Nuclear Instruments - NORMAL. (Procedure step 1.0)

Standard:

Determines that Power Range Nuclear Instruments are normal.

Comment:

Step 1 is an Immediate Action step.

Cue:

Notes:

SAT/UNSAT Performance Step: 8(C)

Check Source Range Nuclear Instruments - NORMAL. (Procedure step 2.0)

Standard:

Determines that Source Range Nuclear Instrument N31 is de-energized.

Comment:

A transition to Addendum 1 should be made.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 9(C)

Determine:

- A. If the Plant is in Mode 2 (Addendum 1, step 1.0)
- B. If the Plant is in Mode 6 (Addendum 1, step 4.0)
- C. If the Plant is in Mode 3, 4, or 5 (Addendum 1, step 7.0)

Standard:

Determines that the Plant is in Mode 4.

Comment:

Mode 4 plant status is part of the initial conditions.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 10 (C)

Ensure Audible Countrate in service. (Procedure step 8.0)

Standard:

- *Selects N32 for the Audible Countrate channel.*

OR

- *Initiates visual monitoring of either Source Range Nuclear Instruments or Extended Range Nuclear Instruments*

OR

- *Borates the RCS to the COLD, ARO 0.95 Keff value and notifies Chemistry to sample the RCS Boron Concentration at least once per 12 hours.*

Comment:

The Audio Countrate channel is selected to N31

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 11

Verify Reactor Trip Breakers open. (Procedure step 9.0)

Standard:

Determines the Reactor Trip Breakers are already open.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 12

Check High Flux at Shutdown Alarm in alarm. (Procedure step 10.0)

Standard:

Determines the High Flux at Shutdown Alarm is not in alarm.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 13

Check at least two Source Range or Extended Range (N31, N32, N45, or N46) Nuclear Instrumentation Channels operable. (Procedure step 14.0)

Standard:

Determines N32, N45 and N46 are operable.

Comment:

Cue:

If asked as the Unit Supervisor, no OAS entries exist for N32, N45 or N46.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 14

Check at least One Source Range or Extended Range (N31, N32, N45, or N46) Nuclear Instrumentation Channel functional. (Procedure step 15.0)

Standard:

Determines N32, N45 and N46 are functional.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 15

Select an Operable Source Range Channel on Nuclear Recorder NR-0045. (Procedure step 16.0)

Standard:

Selects N32 on recorder NR-0045.

Comment:

Cue:

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: S3, RESPOND TO A SOURCE RANGE NUCLEAR
INSTRUMENT FAILURE

Performer's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

The Unit is shutdown in MODE 4. Annunciator 5M03 /E-1, "SR HI VOLT TRBL" has just actuated.

INITIATING CUE:

The Unit Supervisor directs you to take the appropriate actions.

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: RESPOND TO A RADIATION MONITORING ALARM

JPM NO.: S4

REVISION: 2

LOCATION: Simulator

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: RESPOND TO A RADIATION MONITORING ALARM

JPM No.: S4

Rev. No.: 2

STP Task: 11700, Respond to Radiation Monitoring System alarms

STP Objective: 11700, Respond to Radiation Monitoring System alarms per OPOP04-RA-0001

Related

K/A Reference: APE 061 AA1.01 [3.6/3.6], Ability to operate and/or monitor the following as they apply to the Area Radiation Monitoring System Alarms: Automatic actuation.

APE 061 AA2.01 [3.5/3.7], Ability to determine and interpret the following as they apply to the Area Radiation Monitoring System Alarms: ARM panel displays.

References: OPOP04-RA-0001, Rev. 7, RADIATION MONITORING SYSTEM ALARM RESPONSE

Task Normally Completed By: RO/SRO

Method of Testing: Actual Performance

Location of Testing: Simulator

Time Critical Task: NO

Alternate Path JPM: YES

Validation Time: 20 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The Unit is in Mode 4. RCB Supplementary Purge is in progress.

INITIATING CUE:

You have just received a radiation monitor alarm on the RM-11. The Unit Supervisor directs you to investigate the alarm and take any action necessary.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

The Operator determines that RT-8012 indicates above the high alarm setpoint and isolates the Containment Ventilation system.

JOB PERFORMANCE MEASURE CHECK SHEET

HANDOUTS:

Working copy of OPOP04-RA-0001, Radiation Monitoring System Alarm Response.

NOTES:

1. This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. (NO Indication type Cues are provided).
2. Use the Simulator Setup section below to prepare the simulator.

SIMULATOR SETUP:

1. JPMs S3 and S4 are to run together. The following steps will set up the simulator for **BOTH** JPMs.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and Clean the following procedures:
 - OPOP04-NI-0001, Nuclear Instrument Malfunction
 - OPOP04-RA-0001, Radiation Monitoring System Alarm Response
5. Reset to IC #70 and verify:
 - Step counter positions
 - ICS restored
 - Control Switch FLAGS reset
6. Tag the following handswitches:
 - HHSI Pp 1B - PTL - Danger Tag
 - CCP 1B - PTL - Danger Tag
 - Positive Displacement Charging Pump - PTL - Danger Tag
 - HHSI Pp 1C - PTL Caution Tag
7. Place the simulator in run and perform the following:
 - A. Ensure the RM-11 display is selected to Grid-3
 - B. Execute step #1 of lesson #5 in Lesson Group "lot13nrc"
 - Silence the RM-11 alarm by depressing the "SYSTEM ACK" button, but leave RT-8012 and RT-8013 blinking (DO NOT acknowledge)

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1 (C)

Proceed to the RM-11 Panel and call up RT-8012

OR

Proceed to the RM-23 and identify RT-8012 high alarm lit.

Standard:

The Operator determines that RT-8012 indicates above the high alarm setpoint.

Comment:

- Alert setpoint is 5.0 E-5 µci/cc.
- High setpoint is 5.0 E-4 µci/cc.

Cue:

Notes:

RT-8013 is above the alert alarm setpoint, but the applicant should focus on the monitor above the high alarm setpoint (RT-8012)

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Obtain a copy of OPOP04-RA-0001, Radiation Monitoring System Alarm Response.

Standard:

The Operator obtains a copy of OPOP04-RA-0001.

Comment:

- The applicant may use the simulator copy of the procedure or a working copy provided by the evaluator.
- The JPM actions taken in Step 1 to determine the alarm condition(s) is considered “skill-of-the-craft” and Steps 1 - 4 of OPOP04-RA-0001 may be used by the applicant if desired.
- Applicant should transition to Addendum 3.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3 (C)

Ensure Containment Ventilation Isolation (CVI) valves are closed. (Addendum 3, Step 2a, b, & c)

Standard:

The operator determines Containment Ventilation Isolation Actuation did NOT occur, and manually closes the following valves:

- ___ SUPPL CNTMT PURGE "SPLY OCIV FV-9776
- ___ SUPPL CNTMT PURGE "SPLY ICIV MOV-0003
- ___ SUPPL CNTMT PURGE "EXH ICIV MOV-0005
- ___ SUPPL CNTMT PURGE "EXH OCIV FV-9777
- ___ CNTMT ATM SAMPLE ICIV RA-MOV-0001
- ___ CNTMT ATM SAMPLE OCIV RA-MOV-0004
- ___ CNTMT ATM RETURN ICIV RA-MOV-0003
- ___ CNTMT ATM RETURN OCIV RA-MOV-0006

Comment:

- Step 2a: Normal Containment Purge Valves are closed and de-energized, therefore no operator action is required.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

Normal and Supplementary Containment Purge Fans stopped. (Addendum 3, Step 2d &e)

Standard:

The Operator Places the Supplementary Containment Purge Fans in STOP:

___ *Supply Fan 11A(21A)*

___ *Supply Fan 11B(21B)*

___ *Exhaust Fan 11A(21A)*

___ *Exhaust Fan 11B(21B)*

Comment:

- Step 2d: Normal Containment Purge Fans are already stopped and no operator action is required.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5

Ensure RT-8011 RCB Atmosphere Radiation Monitor Sample Pump has stopped.
(Addendum 3, Step 3.0)

Standard:

The operator stops RT-8011 Sample Pump by performing either of the following:

depress the "PUMP ON/OFF" button for RT-8011 on ZCP-023

OR

select RT-8011 on the RM-11 and depress the "FLOW" pushbutton AFTER selecting RT-8011.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6

Refer to Technical Specifications 3.3.3.1 and 3.4.6.1 for further actions. (Addendum 3, Step 4.0)

Standard:

The applicant determines that operation may continue for up to 30 days provided:

T.S. 3.3.3.1: Containment atmosphere grab samples are obtained and analyzed at least once per 24 hours.

T.S. 3.4.6.1: Containment atmosphere grab samples are obtained and analyzed at least once per 24 hours OR that an RCS Inventory calculation is required once per 24 hours.

Comment:

Cue:

- If applicant does not refer to Technical Specifications, as Unit Supervisor direct applicant to refer to Technical Specifications.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 7

Notify Health Physics of the alarm condition. (Addendum 3, Step 5.0)

Standard:

The operator notifies Health Physics of the alarm condition.

Comment:

The applicant may notify Health Physics using a simulator phone.

Cue:

- Health Physics has been notified, and are taking appropriate actions.
- If asked, the Health Physics office RM-11 has the same alarm conditions present as the RM-11 in the Control Room.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8(C)

Notify Chemistry to obtain grab samples using the Post Accident Sampling System.
(Addendum 3, Step 6.0)

Standard:

The operator notifies Chemistry to obtain grab samples.

Comment:

The applicant may notify Chemistry using a simulator phone.

Cue:

Chemistry has been notified.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 9

Check for increased readings on RT-8010A, RT-8010B. (Addendum 3, Step 7.0)

Standard:

The operator checks the following Rad Monitors for increased readings:

___ RT-8010A

___ RT-8010B

Comment:

The operator should see NO increase in these readings.

Cue:

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: S4, RESPOND TO A RADIATION MONITORING ALARM

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The Unit is in Mode 4. RCB Supplementary Purge is in progress.

INITIATING CUE:

You have just received a radiation monitor alarm on the RM-11. The Unit Supervisor directs you to investigate the alarm and take any action necessary.

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: MAXIMIZE LETDOWN DUE TO HIGH RCS ACTIVITY

JPM NO.: S5

REVISION: 1

LOCATION: Simulator

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: MAXIMIZE LETDOWN DUE TO HIGH RCS ACTIVITY

JPM No.: S5

Rev. No: 1

STP Task: 86300, Respond to a high RCS activity greater than TS limits.

STP Objective: CRO 86300, Respond to a high RCS activity greater than TS limits per OPOP04-RC-0001.

**Related
K/A Reference:** 004 A1.11 [3.0/3.0] Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including letdown and charging flows.

References: OPOP04-RC-0001, Rev. 5, High Reactor Coolant System Activity
OPOP02-CV-0004, Rev. 23, Chemical and Volume Control System

**Task Normally
Completed By:** RO

**Method
of Testing:** Actual Performance

**Location
of Testing:** Simulator

**Time
Critical Task:** NO

**Alternate
Path JPM:** NO

**Validation
Time:** 20 mins

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The unit is in Mode 3 following a reactor trip with Centrifugal Charging Pump 1A and the 125 gpm letdown orifice in service. RCS samples indicate an increasing activity, and chemistry has determined that the in-service mixed bed demineralizer decontamination factor is adequate.

Chemistry has requested that Operations maximize letdown flow.

INITIATING CUE:

The Unit Supervisor directs you to place Centrifugal Charging Pump 1B in service, then maximize letdown by placing additional letdown orifices in service as necessary to establish 220-250 gpm letdown flow in accordance with OPOP02-CV-0004, Chemical and Volume Control System. You are not to exceed a steady state letdown flow rate of 250 gpm.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Charging pump 1B is placed in service and letdown is maximized with a steady state flow of 220-250 gpm.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Working copy 0POP02-CV-0004, Chemical and Volume Control System.

NOTES:

- 1) This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. (NO Indication type Cues are provided).
- 2) Use the Simulator Setup section below.

SIMULATOR SETUP

- 1) JPMs S5 and S6 are to run together. The following steps will set up the simulator for **BOTH** JPMs.
- 2) Ensure Radio volume for both stations are set to a reasonable level.
- 3) Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
- 3) Reset to IC #71 and verify:
 - Step counter positions
 - ICS restored
 - Control switch FLAGS reset
- 4) Check and clean the following procedures:
 - 0POP02-CV-0004, Chemical and Volume Control System Subsystem
 - 0POP05-EO-ES01, Reactor Trip Response
- 5) Place simulator in run.
- 6) Start lesson #6, (JPMs S5 and S6), but do not execute any steps.
 - A) If asked to isolate the Main Feedwater Reg Valve for SG B (JPM S6), trigger **STEP 1** (FW-0042)

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain a copy of procedure.

Standard:

Obtains a copy of OPOP02-CV-0004 and reviews notes and precautions.

Comment:

- 1) Provide the Handout copy of OPOP02-CV-0004, or the operator may use the simulator copy of the procedure.
- 2) The operator is expected to transition to procedure section 5.1 for starting a centrifugal charging pump with charging flow already established.

Cue:

A Plant Operator is standing by for start of Centrifugal Charging pump 1B.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Ensure applicable charging pump discharge valve is Open. (procedure step 5.1.1)

Standard:

Verifies CCP 1B "DISCH ISOL MOV-8377B" is open on CP-004.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 3

Place "CHG FLOW CONT FK-0205" in "MAN" while maintaining charging flow constant.
(procedure step 5.1.2)

Standard:

Places "CHG FLOW CONT FK-0205" in "MAN" and verifies charging flow remains constant on CP-004.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

Verify Centrifugal Charging Pump Aux Lube Oil Pump Running. (procedure step 5.1.3)

Standard:

Verifies Aux lube oil pump is running for CCP 1B by observing the white "L.O. AVAILABLE" light is illuminated on CP-004.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5(C)

Start CCP 1B. (procedure step 5.1.4)

Standard:

Starts CCP 1B by momentarily turning its handswitch to the "START" position on CP-004.

Comment:

- The operator is expected to verify the pump is ready to be started with the Plant Operator and make a plant page prior to pump start.
- After performance of this step the operator is expected to transition to procedure step 5.1.10 since plant conditions will require two CCPs to remain in operation.

Cue:

- If asked, as Plant Operator report that Charging Pump 1B is ready for a start and you are standing clear of the pump.
- If asked, as Plant Operator report that pump lube oil pressure is SAT.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6

Close miniflow valve for CCP 1B. (procedure step 5.1.10)

Standard:

Closes CCP 1B miniflow valve "RECIRC FCV-202" by taking handswitch on CP-004 to "CLOSE".

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 7

Perform post start charging pump checks and alignments. (procedure steps 5.1.11 through 5.1.14)

Standard:

Performs the following to ensure proper control of charging and seal injection after pump start:

- _____ *Places charging flow control valve "CHG FLOW CONT FK-0205" in AUTO .*
- _____ *Ensures charging flow and pressurizer level stabilize on CP-004.*
- _____ *Adjusts RCP seal injection as required to maintain 6-13 gpm to each RCP using "FLOW CONT HCV-0218" on CP-004.*
- _____ *Ensures cooling fan starts for CCP 1B by verifying status lights for "PUMP 1B SUPP CLR 11B" on CP-0022.*

Comment:

After verifying cooling fan started for CCP 1B, the operator should transition to procedure section 9.0 for placing a second or third letdown orifice in service with the RCS pressurized. (step 5.1.15 is N/A - a charging pump was not stopped)

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8

Ensure demineralizers bypassed per Section 7.0. (procedure step 9.1)

Standard:

Places "DIVERT TCV-0143" in "VCT" position on CP-004.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 9(C)

Place CVCS header pressure controller in MANUAL. (procedure step 9.2)

Standard:

Places "PRESS CONT PCV-0135" in "MAN" on CP-004.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 10

Adjust letdown pressure to approximately 200 psig . (procedure step 9.3)

Standard:

Adjusts letdown header pressure to approximately 200 psig by opening PCV-0135 on CP-004.

Comment:

- 1) PCV-0135 is a back-pressure control valve, therefore the operator must open the valve to reduce pressure from 380 psig to 200 psig.
- 2) A procedure NOTE states that the Letdown Relief to the PRT valve PSV-3100 shall be monitored during and after opening of PCV-0135 to ensure the relief does not lift. (600 psig)

Cue:

The Unit Supervisor directs the applicant to place the 85 gpm letdown orifice in service first (after letdown pressure has been adjusted to ~200 psig).

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 11(C)*

Open the appropriate letdown orifice isolation valve and stabilize conditions.
(procedure steps 9.4 and 9.5)

Standard:

___ * *Opens isolation valve for the 85 gpm letdown orifice by taking handswitch for "GPM FV-0013 ORIF ISOL VLV" to OPEN.*

___ *Adjusts "PRESS CONT PCV-0135" to maintain 350-380 psig after opening FV-0013 and places on AUTO.*

Comment:

- 2) * - denotes critical portion of step.
- 3) It is expected to that the operator will allow conditions to stabilize prior to placing the third letdown orifice in service.
- 4) The following annunciators may momentarily actuate until charging flow is sufficiently increased to match letdown flow:
 - 1) 4M08/C3 LETDN HX OUTL TEMP HI
 - 2) 4M08/D7 PRZR PRESS DEV LO B/U HTRS ON

Cue:

Notes:

The Applicant may increase charging flow to match the increased letdown flow using charging flow controller "CHG FLOW CONT FK-0205" OR pressurizer master level controller "LEVEL CONT LK-0665.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 12(C)*

Evaluate CVCS letdown flow and place final CVCS letdown orifice in service.
(repeat of procedure steps 9.3 through 9.5)

Standard:

___ *Determines third letdown orifice is needed to reach required flow.*

___ *Adjusts letdown header pressure to approximately 200 psig by opening PCV-0135 on CP-004.*

___ ** Opens isolation valve for the 25 gpm letdown orifice by taking handswitch for "GPM MOV-0014 ORIF ISOL VLV" to OPEN.*

___ *Adjusts "PRESS CONT PCV-0135" to maintain 350-380 psig after opening FV-0014 and places in AUTO.*

___ ** Ensures a steady state flow of 220 - 250 gpm is achieved.*

Comment:

* - denote critical portions of step.

Cue:

(If applicant asks for guidance)- Inform him/her (as Unit Supervisor) that the third letdown orifice is to be placed in service if letdown flow is currently less than 220 gpm and immediately removed from service if steady state letdown flow is greater than 250 gpm with it is placed in service.

Notes:

The Applicant may increase charging flow to match the increased letdown flow using charging flow controller "CHG FLOW CONT FK-0205" OR pressurizer master level controller "LEVEL CONT LK-0665."

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 13

Place Letdown Pressure Controller in AUTO. (procedure step 9.6)

Standard:

Places Letdown pressure controller PK-0135 in Automatic control on CP-004.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step 14

Ensure demineralizers in service per Section 7.0, as desired. (procedure step 9.7)

Standard:

___ *Transitions to Section 7.0 of the procedure.*

___ *Places the DIVERT TCV-0143 in the DEMIN position.*

Comment:

Cue:

If asked, as the Unit Supervisor, direct the applicant to place the demineralizers in service.

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure: S5, MAXIMIZE LETDOWN DUE TO HIGH RCS ACTIVITY

Applicant's Name: _____

SSN: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____

Signature _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU HAVE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The unit is in Mode 3 following a reactor trip with Centrifugal Charging Pump 1A and the 125 gpm letdown orifice in service. RCS samples indicate an increasing activity, and chemistry has determined that the in-service mixed bed demineralizer decontamination factor is adequate.

Chemistry has requested that Operations maximize letdown flow.

INITIATING CUE:

The Unit Supervisor directs you to place Centrifugal Charging Pump 1B in service, then maximize letdown by placing additional letdown orifices in service as necessary to establish 220-250 gpm letdown flow in accordance with OPOP02-CV-0004, Chemical and Volume Control System Subsystem. You are not to exceed a steady state letdown flow rate of 250 gpm.

NUCLEAR TRAINING DEPARTMENT
OPERATING JOB PERFORMANCE MEASURE

TITLE: RESTORE MAIN FEEDWATER FOLLOWING REACTOR TRIP

JPM NO.: S6

REVISION: 1

LOCATION: Simulator

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: RESTORE MAIN FEEDWATER FOLLOWING REACTOR TRIP

JPM No.: S6

Rev. No: 1

STP Task: 81658, Respond to a reactor trip.

STP Objective: 81658, Respond to a reactor trip per POP05-EO-ES01.

**Related
K/A Reference:** 059 A4.11 [3.1/3.3] Ability to manually operate and monitor in the control room: Recovery from automatic feedwater isolation.

References: OPOP05-EO-ES01, Rev. 17, Reactor Trip Response

**Task Normally
Completed By:** RO/SRO

**Method
of Testing:** Actual Performance

**Location
of Testing:** Simulator

**Time
Critical Task:** NO

**Alternate
Path JPM:** YES

**Validation
Time:** 20 minutes

Required Materials (Tools/Equipment):
None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A reactor trip has just occurred in Unit 1. The control room operators have completed the immediate actions of 0POP05-EO-EO00 and transition to 0POP05-EO-ES01 has been made.

INITIATING CUE:

The Unit Supervisor directs you to establish Main Feedwater flow to the A and B Steam Generators ONLY in accordance with Addendum 6 of 0POP05-EO-ES01, Reactor Trip Response and stabilize levels between 22% and 50%.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Main Feedwater is supplying A and B Steam Generators(SG) with the leaking B SG Main Feedwater Regulating Valve isolated and Auxiliary Feedwater secured to A and B SG.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Working copy of 0POP05-EO-ES01, Reactor Trip Response

NOTES:

- 1) This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. (NO Indication type Cues are provided).
- 2) Use the Simulator Setup section below to prepare the simulator.

SIMULATOR SETUP:

- 1) JPMs S5 and S6 are to run together. The following steps will set up the simulator for **BOTH** JPMs.
- 2) Ensure Radio volume for both stations are set to a reasonable level.
- 3) Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
- 4) Reset to IC #71 and verify:
 - Step counter positions
 - ICS restored
 - Control switch FLAGS reset
- 5) Check and clean the following procedures:
 - 0POP02-CV-0004. Chemical and Volume Control System Subsystem
 - 0POP05-EO-ES01, Reactor Trip Response
- 6) Place simulator in run.
- 7) Start lesson #6, (JPMs S5 and S6), but do not execute any steps.
 - If asked to isolate the Main Feedwater Reg Valve for SG B (JPM S6), trigger **STEP 1** (FW-0042)

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S₁, S₂, . . .).

JPM START TIME _____

SAT/UNSAT Performance Step: 1

Obtain a copy of the procedure.

Standard:

Obtains a copy of OPOP05-EO-ES01 and goes to Addendum 6.

Comment:

Provide the Handout copy of OPOP05-EO-ES01, or the operator may use the simulator copy of the procedure.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Verify the availability of the startup steam generator feedpump. (Addendum 6, steps 1 and 2)

Standard:

_____ *Verifies the S/U SGFP running*

_____ *Verifies the S/U SGFP discharge valve is open*

Comment:

The pump will be running with discharge valve open. (MOV-0518)

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3

Place feedwater regulating and low power feedwater regulating valves in manual and minimum demand. (Addendum 6, step 3)

Standard:

Verifies the feedwater regulating and low power feedwater regulating valves in manual and minimum demand.

Comment:

The valves will already be in manual and at minimum demand.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

Place the handswitches for the following valves in the closed position: (Addendum 6, step 4)

- Feedwater Isolation Valves
- Feedwater Isolation Bypass Valves
- Preheater Bypass Valves

Standard:

Places/ensures the handswitches for the following valves in the closed position:

_____ *Feedwater Isolation Valves (2); ('A': FV-7141; 'B': FV-7142)*

_____ *Feedwater Isolation Bypass Valves (2); ('A': FV-7148A; 'B': FV-7147A)*

_____ *Preheater Bypass Valves (2); ('A': FV-7189; 'B': FV-7190)*

Comment:

Handswitches for these valves will already be in the closed position.

Applicant may also verify these handswitches closed for C and D SGs.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5 (C)

Reset the feedwater isolation signal. (Addendum 6, steps 5 - 8)

Standard:

Resets the Feedwater Isolation Signal by performing the following:

- * *Depresses BOTH white “LOW Tavg” reset pushbuttons*
- * *Depresses BOTH white “FW CONT / BYP VLVS” reset pushbuttons*
- Depresses BOTH white “SI/SG HI-HI LEVEL” reset pushbuttons*
- * *Momentarily places (4) feedwater isolation safety-grade solenoid handswitches in the OPEN position. (This must be performed last)*
(‘A’: Feedwater Isolation, TRAIN ‘A’ and TRAIN ‘B’)
(‘B’: Feedwater Isolation, TRAIN ‘A’ and TRAIN ‘B’)

Comment:

Items marked with an “*” are the critical steps.

Cue:

If asked, as the Unit Supervisor, report that a S/G HI-HI Level actuation has NOT occurred previously.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6 (C)

Open the preheater bypass valves. (Addendum 6, step 9)

Standard:

Opens the preheater bypass valves (2); ('A': FV-7189; 'B': FV-7190)

Comment:

- 1) A caution in the procedure prior to this step warns the operator that the main feedwater regulating valve may need to be isolated if steam generator level increases uncontrollably after opening the respective preheater bypass valve.
- 2) The main feedwater regulating valves for steam generator "B" will begin leaking when its respective preheater bypass valve is opened.

Cue:

If the applicant reports, to the Unit Supervisor, the need to isolate feedwater to the B Steam Generator, direct the applicant to isolate feedwater to the B SG.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 7 (C)

Direct a Plant Operator to isolate the leaking main feedwater regulating valves.

Standard:

Directs a Plant Operator to isolate the following valves:

___ *Steam generator B main feedwater regulating valve Manual Isolation. (FW-0042)*

Comment:

This step may be performed out of sequence depending on when the applicant recognizes the uncontrolled increase in steam generator levels.

Cue:

If questioned, direct the applicant to contact the Plant Operator using the radio.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8 (C)

Establish steam generator main feedwater flow with the low power feedwater regulating valves.
(Addendum 6, step 10)

Standard:

Opens each (2) of the low power feedwater regulating valves to establish main feedwater flow to A and B steam generators. ('A': FV-7151; 'B': FV-7152)

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 9

Verify steam generator narrow range level in at least one steam generator - greater than 14%.
(Addendum 6, step 11)

Standard:

Verifies narrow range level in at least one steam generator is greater than 14%.

Comment:

All narrow range steam generator levels are greater than 14%.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 10

Check Auxiliary Feedwater in service to any steam generator. (Addendum 6, step 12)

Standard:

Determines Auxiliary Feedwater is in service to A and B steam generators.

Comment:

All four Auxiliary Feedwater Pumps are running.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 11(C)

Secure Auxiliary Feedwater to steam generators being supplied by main feedwater. (A and B SG)
(Addendum 6, step 13)

Standard:

Secures Auxiliary Feedwater Pumps 11 and 12 by performing the following:

- ___ *Depresses ALL (3) white SG LO-LO LVL "RESET (BLOCK)" pushbuttons*
- ___ *Closes (2) Auxiliary Feedwater OCIVs ('A': MOV-0048; 'B': MOV-0065)*
- ___ *Secures (2) Auxiliary Feedwater Pumps 11 and 12 by:*
 - *Turning the handswitches for the motor driven pumps to STOP, then to AUTO*
- ___ *Opens (2) Auxiliary Feedwater flow control valves. ('A': FV-7525; 'B': FV-7524)*

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 12

Control feedwater flow to maintain SG NR levels 22 - 50% (A and B SG).
(Addendum 6, Step 14)

Standard:

Controls Main Feedwater to A and B SGs to maintain levels between 22 - 50%.

Comment:

Cue:

Notes:

- TERMINATE THE JPM -

JPM STOP TIME _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A reactor trip has just occurred in Unit 1. The control room operators have completed the immediate actions of OPOP05-EO-EO00 and transition to OPOP05-EO-ES01 has been made.

INITIATING CUE:

The Unit Supervisor directs you to establish Main Feedwater flow to the A and B Steam Generators ONLY in accordance with Addendum 6 of OPOP05-EO-ES01, Reactor Trip Response and stabilize levels between 22% and 50%.

INITIAL LICENSE EXAM

OPERATING TEST #1

SCENARIO #1

September 18, 2001

Revision 2

SCENARIO OUTLINE

Facility: South Texas Project	Scenario No.: 1	Op-Test No.: 1
Source: New <u> X </u> Bank - Significantly Modified _____ Bank - Initial Condition Change _____		
(See Page 3 - Scenario Crew Assignments to determine Examiner/Operator assignments)		
Initial Conditions: 48% power, on hold for feedpump repair. Steam Generator Feedpump #11 is OOS for maintenance.		
Turnover: Shift Feedwater Booster Pumps for pump vibration inspection and maintain current power.		

Event (Time)	Malfunction No. & (Value)	Event Type*	Event Description and Timing
1 (0 min)	N/A	BOP (N) SRO (N)	Shift Feedwater Booster Pumps
2 (15 min)	05-12-03 (0.0)	BOP (I) SRO (I)	Steam Generator level transmitter LT-0539 fails low - after the discharge valve for FWBP #11 is opened or after 15 minutes
3 (25 min)	02-26-02 (1.0)	RO (I) SRO (I)	Loop 1B T-Cold RTD TT-420B fails high - after Tech Specs are addressed for LT-0539 or after 10 minutes
4 (45 min)	07-04-03 (true)	RO (R) BOP (C) SRO (C)	Steam Generator Feedpump #13 trips, Startup Feedpump does not/will not start requiring a manual load reduction - after Tech Specs are addressed for TT-420B or after 20 minutes.
5 (57 min)	02-12-01 (0.3) 01-12-02 (true)	ALL (M)	Pressurizer steam space break. ATWS - Reactor fails to trip from the control room. after the plant stabilizes following the power reduction or after 12 minutes.
6 (n/a)	08-02-01 (true)	BOP (C) SRO (C)	Turbine driven auxiliary feedwater pump overspeeds upon start.
7 (72 min)	04-13-02 (true)	RO (C) SRO (C)	High head safety injection pump 1B trips - after the HHSI pumps are verified running in FRS1. The scenario is terminated after RCPs are secured in E-0

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

Approved:

Facility: /s/ Ken Struble Date: 9/6/01

Chief Examiner: /s/ H F Bundy Date: 9/6/01

Scenario #1 Crew Assignments

SESSION 1 - CREW D

<u>Examiners:</u>	McCrory	<u>Operators:</u>	SRO -
	Sanchez		RO -
	Werner		BOP -

SESSION 2 - CREW A

<u>Examiners:</u>	Werner	<u>Operators:</u>	SRO -
	McCrory		RO -
	Bundy		BOP -

SESSION 3 - CREW B

<u>Examiners:</u>	Bundy	<u>Operators:</u>	SRO -
	Werner		RO -
	Sanchez		BOP -

SESSION 4 - CREW C

<u>Examiners:</u>	Bundy	<u>Operators:</u>	SRO -
	Sanchez		RO -
	McCrory		BOP -

SCENARIO MISCELLANEOUS INFORMATION

SIMULATOR BOOTH NOTES:

SIMULATOR SETUP

1. Reset to IC #65 and go to run.
2. Execute lesson plan #1 under lesson plan group "LOT13NRC"
3. Position and tag control switches as follows:
 - #11 SGFP discharge MOV (MOV-0119) - closed - Danger Tag
 - #11 SGFP reset pushbutton - not reset - Danger Tag

EXPECTED BOOTH OPERATIONS

1. Autograph file "/cae/rose/work/lot13nrcscenario1.agb.3" should load with lesson plan. At the conclusion of the scenario ensure the labels for the parameters on the autograph file are changed to include the verbal description by selecting "options", "label", then "description" before printing out the critical parameter trends from the autograph file.
2. When directed as Plant Operator to locally open the Reactor Trip Breakers, wait 2 minutes then trigger step 7 of the Lesson Plan.
3. If directed to reset the overspeed trip of the TDAFP, trigger step 8 of the Lesson Plan.

EXPECTED BOOTH COMMUNICATIONS

1. As TGB Operator, when asked to verify lube oil and seal oil systems in service for FWBP #13, report that the systems are operating normally and the pump is ready for a start. If asked, lube oil reservoir temperature is 85°F.
2. As TGB Operator (or CP Operator), when asked following the start of FWBP #13:
 - Lube oil pressure - 33 psig
 - Lube oil temperature - 110°F
 - Recirc valve position - report the recirc valve is closed
3. When called as I&C to trip bistables for LT-539, report that I&C Technicians will report to the control room in 30 minutes to trip bistables. (It will NOT be necessary to trip bistables in this scenario.)

SCENARIO MISCELLANEOUS INFORMATION

EXPECTED BOOTH COMMUNICATIONS (cont')

4. When called as I&C to trip bistables for TT-420B, report that I&C Technicians will report to the control room in 30 minutes to trip bistables. (It will NOT be necessary to trip bistables in this scenario.)
5. As Plant Operator, if asked to check SGFP #13 following its trip, after five minutes report:
 - All systems appear normal locally at the pump
 - The DCS printer shows "Unit #13 Cards 3 & 14 Failed trip"
6. As Plant Operator, if asked to check the SUFP following its failure to start, after 5 minutes report that all appears normal locally at the pump and at the breaker.
7. As Plant Operator, if asked to check the TDAFP following its overspeed trip, after 5 minutes report that the pump appears "normal" locally.
8. As Plant Operator, if asked to check HHSI pump 1B following its trip, after 3 minutes report that the 50/51 relay is tripped.

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be placed in an Autograph file for recall when the scenario is completed:

- Reactor Power
- SG C Narrow Range Level
- Total AFW Flow
- RCS Wide Range Pressure

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.
2. Actions required throughout the event are indicated as "(continuous)" in the position column.
3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: #1 Scenario No.: #1 Event No.: 1			
Event Description: Swap Feedwater Booster Pumps			
Time	Position	Applicant's Actions or Behavior	Notes
	SRO (continuous)	Direct the BOP to start Feedwater Booster Pump (FWBP) # 13 and secure Feedwater Booster Pump #11 per 0POP02-FW-0001, Main Feedwater.	
	BOP	Contact the TGB operator to verify Lube Oil and Seal Water Systems are in service for FWBP #13.	
	BOP	Verify adequate lube oil available for FWBP #13 by verifying the "L.O. AUX PMP TRBL" alarm is clear.	
	BOP	Verify the Deaerator Storage Tank is >30%	
	BOP	Verify FWBP #13 is properly warmed up by checking pump discharge temperature is within 50 degrees of Deaerator temperature on the Plant Computer.	
	BOP	Announce over the start of FWBP #13 over the plant paging system.	
	BOP	Ensure the handswitch for FWBP #13 discharge valve is in the closed position.	
	BOP	Start FWBP #13.	
	BOP	Contact the TGB operator to verify the following conditions after the start of FWBP #13: - Proper lube oil pressure - Proper recirc valve operation - Proper lube oil temperature	
	BOP	Take the FWBP #11 discharge valve to the closed position and Stop the FWBP when the discharge valve is closed.	
	BOP	Perform the following to place FWBP #11 in standby: - Discharge Valve open - Control Room handswitch in AUTO	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: #1 Event No.: 2			
Event Description: Steam Generator level transmitter LT-539 fails low			
Time	Position	Applicant's Actions or Behavior	Notes
	BOP	Acknowledges and reports annunciators on Control Panel CP006: <ul style="list-style-type: none"> • SG 1C LVL DEV HI/LO • SG 1C LVL LO • SG 1C LVL LO-LO ALERT 	
	SRO/BOP	Performs immediate actions of OPOP04-FW-001: <ul style="list-style-type: none"> • Places SG 1C Feedwater Regulating Valve controller in MANUAL • Adjusts controller output to match feed/steam flow and restore SG 1C level to program 	
	SRO (continuous)	Directs/ensures actions of OPOP04-FW-0001, Loss of Steam Generator Level Control.	
	BOP	Identifies that SG 1C level channel LT-539 has failed low.	
	BOP	Selects channel LT-573 for SG 1C level control.	
	SRO/RO	Initiates action to trip affected channel within 1 hour	
	BOP	Performs the following: <ul style="list-style-type: none"> • Verifies SG 1C level between 68% and 74% • Places SG 1C Feed Regulating Valve in AUTO 	
	SRO	Refers to Tech Specs 3.3.1 (6 hour action to trip bistables) and 3.3.2 (1 hour action to trip bistables).	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: #1 Event No.: 3			
Event Description: Loop 1B T-Cold TT-420B fails high			
Time	Position	Applicant's Actions or Behavior	Notes
	RO	Acknowledges and reports annunciators on Control Panel CP005 which are indicative of a RTD failure.	
	SRO (continuous)	Directs/ensures actions of OPOP04-RP-0004, Failure of RCS Loop RTD Protection Channel.	
	RO	Verifies rod control is in manual.	
	RO	Identifies/reports the failed channel as TI-420B.	
	RO	Selects Loop 2 Defeat on the following switches: <ul style="list-style-type: none"> • BYP SEL ? T • BYP SEL T AVG 	
	RO	Ensures Tavg is maintained within 1.5°F of Tref.	
	RO/BOP	Takes manual control of FCV-0205, CHG FLOW CONT, if necessary, to maintain pressurizer level at program.	
	RO/BOP	Ensures ? T and ? T Setpoints Recorder selected to an operable channel.	
	SRO	Initiates actions per Tech Spec 3.3.2, Action 20 to trip bistables within 1 hour.	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: #1 Event No.: 4			
Event Description: Steam Generator Feedpump #13 trips, Startup Feedpump does not/will not start requiring a manual load reduction.			
Time	Position	Applicant's Actions or Behavior	Notes
	BOP	Acknowledges and reports annunciator SGFPT 13 TRIP on Control Panel CP-006.	
	SRO/BOP	Performs Immediate Actions of OPOP04-FW-0002: <ul style="list-style-type: none"> • Attempts start of the Startup Steam Generator Feedpump • Starts a standby FW Booster Pump 	
	SRO	Directs/ensures actions of OPOP04-FW-0002, Addendum 1 to reduce turbine load.	
	SRO/RO	Determine 5 gals of boric acid per 10% power reduction required	
	RO	Ensures Rod Control is in automatic.	
	BOP	Reduces turbine load at $\leq 5\%/min$ to match steam/feed flow using one of the following methods: <ul style="list-style-type: none"> • Operator Auto • Turbine Manual • Governor Valve Limiter 	
	RO	Energizes pressurizer heaters as necessary.	
	BOP	Verifies/maintains VARS within the guidelines of the Plant Curve Book.	
	RO (Reactivity)	Commences boration of the RCS	
	RO (Reactivity)	Checks/restores Tavg to within 3°F of Tref.	
	RO	Checks/restores Pressurizer level and pressure to within limits	
	BOP	Checks/restores Steam Generator levels to within 68-74%	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: #1 Event No.: 5			
Event Description: Pressurizer steam space break. ATWS - Reactor fails to trip from the control room			
Time	Position	Applicant's Actions or Behavior	Notes
	ALL	Identify/report an excessive RCS leak as indicated by the following: <ul style="list-style-type: none"> Lowering RCS pressure Increasing containment pressure Increasing containment sump level 	
	SRO	Directs a manual reactor trip and safety injection based on low RCS pressure.	
	RO/BOP	Performs the immediate actions of EO00, Reactor Trip or Safety Injection	
	RO/BOP	When attempts fail to trip the reactor in Step 1 of EO00, performs the immediate actions of FRS1, Response to Nuclear Power Generation - ATWS: <ul style="list-style-type: none"> Inserts control rods Attempts to open breakers to LC 1K1 and 1L1 	
	ALL	Dispatches a plant operator to open the reactor trip breakers locally.	
	SRO (continuous)	Directs/ensures immediate actions of FRS1, Response to Nuclear Power Generation - ATWS are completed and direct subsequent actions.	<i>Event #6 occurs at this point after SG Levels lower to AFW actuation.</i>
	RO/BOP	Recloses breakers to LC 1K1 and 1L1 after reactor trip breakers are opened.	
	ALL	Ensures safety injection occurs automatically on low RCS pressure.	
	RO (continuous) C	INITIATE EMERGENCY BORATION OF THE RCS.	
	BOP (continuous)	Perform FRS1, Addendum 2, Verification of SI Equipment Operation, following safety injection.	<i>Event #7 occurs after pumps verified in Addendum 2. See Event #7 for actions on trip of HHSI Pump 1B.</i>
	BOP	Maintains total AFW flow ≥ 1080 gpm when narrow range level in all SGs are $< 14\%$ (34%) after step 9 of FRS1.	<i>See Event #6 for actions on overspeed trip of AFWP 14.</i>

	RO	Verifies dilution paths isolated: <ul style="list-style-type: none"> • Boric Acid flow controller set > 8.0 • Letdown demineralizer bypassed • Reactor Makeup Water (RMW) Pumps in PTL • RMW Non-Essential header isol. valves closed 	
	SRO/RO	Verifies Reactor is Subcritical: <ul style="list-style-type: none"> • < 5% on Extended Range NIs • Zero or Negative SUR on Extended Range NIs 	
	SRO	Verifies Adequate Shutdown Margin: <ul style="list-style-type: none"> • Requests RCS boron sample • Continues emergency boration until RCS boron is greater than SDM limit 	
	SRO	Transitions back to EO00, Reactor Trip or Safety Injection.	
	ALL C	TRIP ALL RCPs IF RCS PRESSURE IS < 1460 PSIG AND AT LEAST 1 HHSI PUMP IS IN OPERATION	<i>Terminate the scenario</i>

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: #1 Event No.: 6			
Event Description: Turbine driven auxiliary feedwater pump overspeeds upon start.			
Time	Position	Applicant's Actions or Behavior	Notes
	BOP	Acknowledges AFWP 14 T & T MECH OVERSP TRIP alarm and reports that AFWP #14 (TDAFP) has tripped.	
	BOP	Dispatches a Plant Operator to locally start/reset the TDAFP.	<i>Crew may opt to crosstie AFW to feed SG D.</i>
	SRO/BOP	Ensures that total AFW flow is > 1080 gpm (or > 576 gpm in E0) when narrow range levels in all SGs are < 14% (34%).	<i>Actions continue under event 5</i>

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: #1 Event No.: 7			
Event Description: High head safety injection pump 1B trips.			
Time	Position	Applicant's Actions or Behavior	Notes
	RO	Acknowledges HHSI PUMP 1B TRIP annunciator and reports that HHSI Pump 1B has tripped.	
	SRO	Directs RO to place HHSI Pump 1B handswitch in the PTL position per OPOP09-AN-01M2-D5.	
	RO	Places HHSI Pump 1B handswitch in the PTL, as directed.	
	SRO/RO	Ensures personnel are dispatched to investigate cause of HHSI Pump 1B trip.	<i>Actions continue under Event 5</i>

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
ALL C	TRIP ALL RCPs IF RCS PRESSURE IS < 1460 PSIG AND AT LEAST 1 HHSI PUMP IS IN OPERATION	Trip all RCPs so that an Orange Path on Core Cooling does not occur when forced circulation is lost (prior to entering E-10)	
RO (continuous) C	INITIATE EMERGENCY BORATION OF THE RCS.	Initiate emergency boration prior to exiting FRS1.	

TURNOVER INFORMATION

- Reactor power is 48%, on hold for feedpump repair, at step 7.32 of OPOP03-ZG-0005.
- Cycle burnup is 150 MWD/MTU
- RCS Boron Concentration is 1511 ppm.
- SGFP #11 is out of service for maintenance. Estimated return to service - 8 hours.
- Start FWBP #13 for a vibration analysis, and secure FWBP #11 as soon as possible following turnover. Engineering and the Turbine Building Plant Operator are standing by the pump and the CP watch is standing by the recirc valve.
- Maintain current power level until SGFP #11 is repaired.
- Xenon is burning out due to the power increase.
- Borating 3 gallons every half hour.
- Boric Acid Tanks A and B are at 7300 ppm.

INITIAL LICENSE EXAM

OPERATING TEST 1

SCENARIO 2

September 19, 2001

Revision 2

SCENARIO OUTLINE

Facility: South Texas Project		Scenario No.: 2		Op-Test No.: 1	
Source: New _____ Bank - Significantly Modified _____ Bank - Initial Condition Change <u> X </u>					
(See Page 3 - Scenario Crew Assignments to determine Examiner/Operator assignments)					
Initial Conditions: 75% power, with a power increase in progress. Train 'A' Control Room HVAC and Feedwater Booster Pump #13 are OOS for maintenance.					
Turnover: Load Steam Generator Feedpump #13 and continue power increase to 100%.					
Event (Time)	Malf. No. & (Value)	Event Type*	Event Description & Timing		
1 (0 min)	N/A	BOP (N) SRO (N)	Load Steam Generator Feedpump #13.		
2 (0 min)	N/A	RO (R)	Increase power to 100%.		
3 (20 min)	05-17-03 (1.0)	BOP (I) SRO (I)	Steam generator 1C PORV pressure transmitter fails high - after both a reactivity change occurs AND SGFP #13 loaded or after 20 minutes.		
4 (30 min)	50-R3-02 (True)	RO (I) SRO (I)	Power range channel N42 control power failure - after Tech Specs are addressed for SG 1C PORV or after 10 minutes.		
5 (45 min)	08-23-01 (True)	BOP (C) SRO (C)	Condensate Pump #11 trips - after Tech Specs are addressed for N42 or after 15 minutes.		
6 (52 min)	02-01-03 (0.7)	ALL (M)	Large Break LOCA on Loop C Cold Leg - after secondary conditions stabilize following the Condensate Pump trip or after 7 minutes.		
7 (n/a)	01-12-4B (T) bmp005 (1.0)	RO (C) SRO (C)	Containment Isolation, Phase 'A', Train 'B' automatic failure CV-MOV-0023, Letdown ICIV, Train A fails to close upon an automatic Phase A Isolation signal. The scenario is terminated after the crew aligns cold leg recirculation per ES13.		

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

Approved:

Facility: /s/ Ken Struble Date: 9/6/01

Chief Examiner: /s/ H F Bundy Date: 9/6/01

Scenario 2 Crew Assignments

SESSION 1 - CREW D

<u>Examiners:</u>	McCrary Werner Sanchez	<u>Operators:</u>	SRO - RO - BOP -
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SESSION 2 - CREW A

<u>Examiners:</u>	Werner Bundy McCrary	<u>Operators:</u>	SRO - RO - BOP -
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SESSION 3 - CREW B

<u>Examiners:</u>	Werner Sanchez Bundy	<u>Operators:</u>	SRO - RO - BOP -
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SESSION 4 - CREW C

<u>Examiners:</u>	Sanchez Bundy McCrary	<u>Operators:</u>	SRO - RO - BOP -
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SCENARIO MISCELLANEOUS INFORMATION

SIMULATOR BOOTH NOTES:

SIMULATOR SETUP

1. Reset to IC #66 and go to run.
2. Execute Lesson Plan # under Lesson Plan Group LOT13NRC.
3. Position and Tag control switches as follows:
 - CR HVAC SPLY AHU 11A - PTL - Danger Tag
 - CR HVAC RET FAN 11A - PTL - Danger Tag
 - CR HVAC C/U FAN 11A - PTL - Danger Tag
 - FWBP #13 - PTL - Danger Tag
 - FWBP #13 discharge valve - Danger Tag

EXPECTED BOOTH OPERATIONS

1. Autograph file "/cae/rose/work/lot13nrcscenario2.agb.3" should load with lesson plan. At the conclusion of the scenario ensure the labels for the parameters on the autograph file are changed to include the verbal description by selecting "options", "label", then "description" before printing out the critical parameter trends from the autograph file.

EXPECTED BOOTH COMMUNICATIONS

1. If asked, report that Aux. Steam header is warmed up.
2. As Plant Operator, if asked to monitor SGFP #13 as it is placed in service, report that no problems can be found locally.
3. As Plant Operator, if asked to check SGFP #13 oil temperature after loading, report oil cooler discharge temperature of 114 °F.
4. If contacted as Reactor Engineering, inform the Control Room that flux maps can/will be performed every 12 hours.
5. When called as I&C to trip bistables for N42, report that I&C Technicians will report to the control room in 30 minutes to trip bistables. (It will not be necessary to trip bistables in this scenario.)
6. As Plant Operator, if asked to investigate the cause for the Condensate Pump #11 trip, after 5 minutes report that the 50/51 relay is tripped locally.

SCENARIO MISCELLANEOUS INFORMATION

EXPECTED BOOTH COMMUNICATIONS CON'T

7. As Plant Operator, if asked to check Condensate Pump #13 prior to/after the start, report that the pump is ready for a start/running satisfactorily.

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be placed in an Autograph file for recall when the scenario is completed:

Reactor Power
SG C Steam Flow
SG C Narrow Range Level
RCS Wide Range Pressure
RWST Level

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.
2. Actions required throughout the event are indicated as "(continuous)" in the position column.
3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: 1 Scenario No.: 2 Event No.: 1			
Event Description: Load Steam Generator Feedpump (SGFP) #13.			
Time	Position	Applicant's Actions or Behavior	Notes
	SRO	Directs BOP to load SGFP 13 per OPOP02-FW-0002, S.G.F.P. Turbine.	
	BOP	Loads SGFP 13 as follows: <ul style="list-style-type: none"> • Checks SG LVL CONTROL light lit • Opens discharge valve MOV-0061 • Ensures the SGFP SPEED controller is in manual at minimum output • Raises SGFP speed to match required SGFP differential pressure • Places SPEED controller in AUTO when SGFP speed matches the SGFP MASTER SPEED controller <u>OR</u> any other operating SGFP speed 	
	BOP	Monitors SGFP speed controller for proper operation.	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 2 Event No.: 2			
Event Description: Increase power to 100%			
Time	Position	Applicant's Actions or Behavior	Notes
	SRO	Enters OPOP03-ZG-0008, Power Operations, at Step 7.2 and directs the RO to commence the power increase.	
	RO (Reactivity)	Dilutes RCS as necessary while raising turbine load to reach desired power level.	
	RO	Maintains Tave within 1.5 °F of Tref and maintains AFD within Tech Spec limits.	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 2 Event No.: 3			
Event Description: Steam Generator 1C PORV Pressure Transmitter Fails High			
Time	Position	Applicant's Actions or Behavior	Notes
	BOP	Acknowledges and reports annunciator SG PORV NOT CLOSE on Control Panel CP006.	
	BOP	Performs the following actions of OPOP09-AN-06M3-A1: <ul style="list-style-type: none"> ▶ Identifies that SG 1C PORV has lifted ▶ Verifies SG 1C pressure is <1225 psig ▶ Manually closes SG 1C PORV 	
	SRO	Ensures SG 1C PORV has been closed manually	
	BOP	Identifies SG 1C Pressure Transmitter PT-7431 has failed high.	
	SRO	Initiates actions per Tech Spec 3.7.1.6 and 3.3.5.1 (action 2) to restore SG PORV 1C to operable status within 7 days.	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 2 Event No.: 4			
Event Description: Power Range Channel N42 Control Power Failure			
Time	Position	Applicant's Actions or Behavior	Notes
	RO	Acknowledges and reports annunciators on Control Panel CP005 which are indicative of a Power Range NI failure and references OPOP09-AN-05M3.	
	RO/BOP	Reports that control power has failed to Power Range Channel N42.	
	RO	Performs immediate actions of OPOP04-NI-0001, Nuclear Instrument Malfunction: <ul style="list-style-type: none"> ▶ Ensures rod control is selected to MANUAL ▶ Verifies Low Power Feedwater Regulating Valves are not in service 	
	SRO	Enters OPOP04-NI-0001 and ensures that the immediate actions have been completed.	
	SRO (continuous)	Directs the actions of Addendum 3, Power Range NI Malfunction.	
	SRO/RO or BOP	Stop Main Turbine load changes	
	SRO/RO	Directs/performs actions to bypass Power Range Channel N42 input to: <ul style="list-style-type: none"> ▶ COMPARATOR CHANNEL DEFEAT ▶ POWER MISMATCH BYPASS ▶ ROD STOP BYPASS ▶ DET CURRENT COMPARATOR - UPPER SECTION ▶ DET CURRENT COMPARATOR - LOWER SECTION 	
	RO	Verifies the following Permissives in their correct state: <ul style="list-style-type: none"> ▶ P-7 permissive light - Extinguished ▶ P-8 permissive light - Extinguished ▶ P-9 permissive light - Extinguished ▶ P-10 permissive light - Illuminated 	

	RO/BOP	Performs the following: <ul style="list-style-type: none">▶ Select operable PR channel on NI recorder.▶ Contact Rx Engineering to perform flux maps.	
	SRO	Initiates actions per Tech Spec 3.3.1, Table 3.3-1, Action 2 - Bistables tripped within 6 hours.	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 2 Event No.: 5			
Event Description: Condensate Pump #11 Trips			
Time	Position	Applicant's Actions or Behavior	Notes
	BOP	Acknowledges and reports annunciator COND PMP TRIP on Control Panel CP009.	
	SRO (continuous)	Ensures actions of annunciator response are carried out to start a standby pump.	
	BOP	Performs the following actions of OPOP09-AN-09M1-A1: <ul style="list-style-type: none"> • Starts standby Condensate Pump • Opens respective Condensate Pump discharge valve • Dispatches Plant Operator to determine cause of the trip. 	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 2 Event No.: 6			
Event Description: Large Break LOCA on Loop C Cold Leg			
Time	Position	Applicant's Actions or Behavior	Notes
	RO/BOP	Completes the immediate actions of EO00, Reactor Trip or Safety Injection.	<i>Event #7 occurs at this point (Containment isolation Phase A actuate soon after trigger of Event #6).</i>
	SRO	Directs/ensures immediate actions of EO00, Reactor Trip or Safety Injection are completed.	
	ALL	Trips RCPs due to containment isolation Phase B actuation <u>OR</u> RCS pressure <1460 psig with at least 1 HHSI pump running.	
	RO/BOP	Maintains total AFW flow ≥ 576 gpm when narrow range level in all SGs are < 14% (34% adverse)	
	ALL (continuous)	Monitor/apply adverse containment values when containment pressure is ≥ 5 psig.	
	RO/BOP	Identifies and reports Containment Isolation Phase A, Train B has failed to automatically actuate and CV-MOV-0023 has failed to close automatically.	<i>See Event #7 for actions for failure of Containment Isolation Phase A and MOV 23 failure.</i>
	ALL	Complete all actions of EO00 up to Step 14 and transition to EO10, Loss of Reactor or Secondary Coolant.	
	ALL (continuous)	Monitor Critical Safety Functions upon exiting EO00 and determines RED Path on Integrity CSF.	
	SRO	Transitions to FRP1, Response to Imminent Pressurized Thermal Shock Condition, due to rapid RCS temperature decrease.	
	SRO/RO	Exits FRP1 at Step 1 (RNO) based on LHSI flow being > 500 gpm.	
	SRO	Transitions to FRZ1, Response to Containment High Pressure and directs operator actions based on ORANGE Path on Containment CSF.	

	SRO	Transitions to EO10, Loss of Reactor or Secondary Coolant and directs operator actions as time and conditions permit.	<i>Note: Depending on the rate of procedure progress, the crew may or may not perform steps of EO10.</i>
	RO	Resets the following: <ul style="list-style-type: none"> • Safety Injection • ESF Load Sequencers • Phase A and B Containment Isolation 	
	RO	Places containment hydrogen monitoring system in service.	
	SRO (continuous)	Transitions to ES13, Transfer to Cold Leg Recirculation, when RWST level decreases to less than 75,000 gallons.	
	RO	Aligns charging pump suction to the VCT: <ul style="list-style-type: none"> • Opens VCT outlet valves • Closes charging pump RWST suction valves • Sets boric acid flow controller to >8 • Opens RMW pump discharge isolation valves 	
	SRO/RO C	ALIGNS INJECTION FLOWPATHS FOR COLD LEG RECIRCULATION <ul style="list-style-type: none"> • Closes RWST to SI suction header valves • Resets SI Auto Recirc 	<i>Terminate Scenario</i>

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 2 Event No.: 7			
Event Description: Containment Isolation Phase A, Train B Automatic Failure <u>and</u> CV-MOV-0023, Letdown ICIV, Train A Fails to Close from Control Room (Results in Letdown Header CNTMT Penetration being Unisolated)			
Time	Position	Applicant's Actions or Behavior	Notes
	RO/BOP	Identifies/Reports Containment Isolation Phase A, Train B has failed to actuate and CV-MOV-0023 has failed to close.	
	SRO	Directs RO to manually actuate Containment Isolation Phase A and close CV-MOV-0023.	
	RO C	ENSURES CONTAINMENT ISOLATION PHASE A BY EITHER: <ul style="list-style-type: none"> • MANUALLY INITIATING CONTAINMENT ISOLATION PHASE A <li style="text-align: center;">OR • MANUALLY CLOSING CV-MOV-0024, LETDOWN OCIV 	
	RO	Attempts to manually close CV-MOV-0023, Letdown ICIV from the Control Room panel CP004.	<i>Actions continue under Event #6.</i>

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
ALL C	ENSURES CONTAINMENT ISOLATION PHASE A BY EITHER: <ul style="list-style-type: none"> • MANUALLY INITIATING CONTAINMENT ISOLATION PHASE A <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> • MANUALLY CLOSING CV-MOV-0024, LETDOWN OCIV 	Containment isolated such that at least one valve in the letdown header penetration is closed before the scenario is terminated.	
SRO/RO C	ALIGNS INJECTION FLOWPATHS FOR COLD LEG RECIRCULATION.	Transfer to cold leg recirculation and establish ECCS recirculation flow prior to RWST level decreasing to 48,000 gallons (6%) "RWST EMPTY" alarm receipt.	

TURNOVER INFORMATION

- 75% power on hold to start up SGFP #13
- Cycle burnup is 150 MWD/MTU, fuel is conditioned to 100% power.
- RCS Boron Concentration is 1423 ppm.
- Hourly dilutions to maintain this power level are approximately 10 gallons.
- Increase power to 100% using OPOP03-ZG-0008, Step 7.0
- While increasing power, load Steam Generator Feedpump #13.
 - Pre-Startup testing has been waived by the Shift Supervisor
- Feedwater Booster Pump #13 is OOS for motor bearing inspection.
 - Removed from service 4 hours ago. Expected to be returned to service tomorrow.
- Train 'A' Control Room HVAC is OOS for preventative maintenance.
 - Removed from service 2 hours ago. Expected to be returned to service in 6 hours
 - TS 3.7.7 - Return to service in 7 days.
- Boric Acid Tanks A and B are at 7300 ppm.

INITIAL LICENSE EXAM

OPERATING TEST #1

SCENARIO #3

September 19, 2001

Revision 3

SCENARIO OUTLINE

Facility: South Texas Project	Scenario No.: 3	Op-Test No.: 1
Source: New _____ Bank - Significantly Modified _____ Bank - Initial Condition Change <u> X </u>		
(See Page 3 - Scenario Crew Assignments to determine Examiner/Operator assignments)		
Initial Conditions: 27% power with a plant startup in progress. ESF Diesel Generator #13 is OOS for maintenance.		
Turnover: Continue with plant startup towards 100% power.		

Event (Time)	Malfunction No. & (Value)	Event Type*	Event Description and Timing
1 (0 min)	N/A	RO (R)	Load increase towards 100% power.
2 (15 min)	02-19-03 (V= 0)	RO (I) SRO (I)	Pressurizer pressure controlling channel (PT-457) fails low - after an observable reactivity change or after 15 minutes.
3 (30 min)	05-11-04 (V= 0)	BOP (C) SRO (C)	SG D steam flow channel fails low - after Tech Specs have been addressed for the PZR pressure channel or after 15 minutes.
4 (40 min)	03-23-05 (V= 1) 06-02-01 (V= True)	RO (C) SRO (C) BOP (C)	RCP 1C #1 seal failure (ramped in) - after all feedwater regulation valves are returned to AUTO or after 10 minutes. Main Turbine fails to automatically trip
5 (45 min)	05-02-01 (V= 1)	ALL (M)	Steam break in containment on SG 1A after manual reactor trip from RCP seal leakoff trip set point exceeded or after 5 minutes.
6 (59 min)	04-16-01 (V= 1)	RO (C) SRO (C)	1A Containment Spray Pump trips following verification or 14 minutes after the steam break.

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

- Shaded events were not administered per the Chief Examiners direction.

Approved:

Facility: /s/ Ken Struble Date: 9/6/01

Chief Examiner: /s/ H F Bundy Date: 9/6/01

Scenario 3 Crew Assignments

SESSION 1 - CREW C

Examiners: Bundy
McCrary
Sanchez

Operators: SRO -
RO -
BOP -

SCENARIO MISCELLANEOUS INFORMATION

SIMULATOR BOOTH NOTES:

SIMULATOR SETUP

1. Reset to IC #67 and go to run
2. Trigger Lesson Plan #3 from Lesson Plan Group LOT13NRC
3. Position and tag control switches as follows:
 - ESF DG #13 Output Bkr - PTL - Danger Tag
 - ESF DG #13 Emergency Stop - Pulled - Danger Tag

EXPECTED BOOTH OPERATIONS

1. Autograph file "cae/rose/work/lot13nrcscenario3.agb.1" should load with lesson plan. At the conclusion of the scenario ensure the labels for the parameters on the autograph file are changed to include the verbal description by selecting "options", "label", then "description" before printing out the critical parameter trends from the autograph file.

EXPECTED BOOTH COMMUNICATIONS

1. If asked as I&C to trip Channel 3 bistables for PT-457, tell the Control Room a crew will be there in about 30 minutes. Note, it is not necessary to trip bistables for this scenario.
2. If asked as PO to check status of 1A Containment Spray Pump, wait 3 minutes and report that 1A CSP has no local indications for reason of trip.
3. If asked as PO to check status of 1A Containment Spray Pump breaker, wait 3 minutes and report that the breaker has a 50/51 relay tripped.

SCENARIO MISCELLANEOUS INFORMATION

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be placed in an Autograph file for recall when the scenario is completed:

- RCP 1C Seal Leakoff Flow
- RCB Pressure
- SG 1D Narrow Range Level
- RCS Wide Range Pressure

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.
2. Actions required throughout the event are indicated as "(continuous)" in the position column.
3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: 1 Scenario No.: 3 Event No.: 1			
Event Description: Load increase towards 100% power			
Time	Position	Applicant's Actions or Behavior	Notes
	SRO (continuous)	Directs RO increase reactor power and turbine load per OPOP03-ZG-0005, Plant Startup to 100%, Step 7.28	
	RO (reactivity)	Performs dilution of RCS to raise Tave and raises turbine load.	
	RO	Controls Tave to within 1.5°F of Tref and maintains AFD within Tech Spec limits.	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 3 Event No.: 2			
Event Description: Pressurizer pressure controlling channel (PT-457) fails low.			
Time	Position	Applicant's Actions or Behavior	Notes
	ALL	Identify and respond to annunciators on CP004 indicative of a failed Pressurizer pressure channel.	
	RO	Identifies the failed pressure channel as failed low.	
	SRO (continuous)	Enters OPOP04-RP-0001, Loss of Automatic Pressurizer Pressure Control.	
	RO	Places Pressurizer Master Pressure Controller in MANUAL.	
	RO	Removes failed channel RC-PI-0457 from control by selecting 455/456..	
	RO	ENSURES Pressurizer pressure between 2220 and 2250 and controller output signal between 15 and 35%.	
	RO	Places pressure controller in Auto and VERIFY Pressurizer pressure controlling between 2220 and 2250 psig.	
	SRO	NOTIFIES I&C to trip Channel 3 bistables for P0457 per OPOP04-RP-0001, Addendum 2 and INITIATES corrective action.	
	SRO	Refers to Technical Specifications and determines that 3.3.2, Action 20 is the most limiting (requires the channel to be placed in the tripped condition within 1 hour). 3.3.1 also applies (6 hour action)	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 3 Event No.: 3			
Event Description: SG D steam flow channel fails low.			
Time	Position	Applicant's Actions or Behavior	Notes
	ALL	Identify and respond to annunciators on CP006 indicative of a failed steam flow channel.	
	BOP	Identifies SG D level below set point and takes FCV-0554 to manual to restore SG NR level to 69 to 74%.	
	BOP	Verifies SGFP speed controllers responding in Automatic.	
	SRO (continuous)	Enters OPOP04-FW-0001, Loss of Steam Generator Level Control, and directs BOP to restore SG D NR level to 68 to 74%.	
	BOP	Identifies Steam Flow channel FT-0542 failed low and selects FT-0543 for control.	
	BOP	Places FCV-0554 in Auto and monitors for proper operation.	
	SRO	Initiates corrective action for FT-0542 and determines no Tech Spec actions are required for the failure.	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 3 Event No.: 4			
Event Description: RCP 1C #1 seal failure (ramp over 5 minutes) Main Turbine fails to automatically trip			
Time	Position	Applicant's Actions or Behavior	Notes
	ALL	Identify and respond to annunciators on CP004 indicative of a RCP 1C #1 seal failure.	
	SRO (continuous)	Enters 0POP04-RC-0002, Reactor Coolant Pump Off Normal, for indications of abnormal RCP #1 seal indication.	
	RO	Identifies RCP 1C trip criteria on high #1 seal leak off flow (>6gpm) and trips the Reactor and RCP 1C.	If #1 Seal Leakoff does not indicate >6.0 gpm, then #1 Seal DP trip criteria will be reached after several minutes.
	BOP C	MANUALLY TRIPS MAIN TURBINE	
	RO	CLOSES RCP 1C #1 seal leakoff isolation (FV-3156) between 3 to 5 minutes after stopping RCP 1C.	Will not be performed if #1 Seal Leakoff does not indicate >6.0 gpm.
	SRO (continuous)	Enters 0POP05-EO-0000, Reactor Trip or Safety Injection.	

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 3 Event No.: 5			
Event Description: Steam break in containment on SG 1A after manual reactor trip from RCP seal leakoff trip set point exceeded.			
Time	Position	Applicant's Actions or Behavior	Notes
	ALL	Responds to the following annunciators, 5M03-F7, CNTMT PRESS HI-1 SI ALERT; 5M04-E2, CNTMT PRESS HI-1 SI, FIRST-OUT ALARM; SI-ESF STATUS MONITORING; PHASE A ISOL, ESF STATUS MONITORING.	
	SRO	Directs RO/BOP to manually initiate SI and/or ensures that SI actuates when required.	
	RO/BOP	Manually initiates SI when directed by the US / verifies AUTO actuation.	
	ALL	Complete immediate actions of EO00 .	
	ALL	Trips remaining RCPs when RCS pressure is <1460 psig or following Phase B isolation.	
	RO	Verifies Containment Spray initiated and Containment Isolation Phase B actuated.	<i>Event #6 occurs <u>after</u> Cont. Spray verified.</i>
	SRO (continuous)	Transitions to EO20, Faulted SG Isolation	
	ALL	Commence Critical Safety Function Status Tree usage.	
	ALL	Evaluate plant conditions and alert the crew of an orange path on containment CSF and that entry into FRZ1 is required.	
	SRO (continuous)	Transitions to FRZ1 on an orange path on containment CSF.	
	SRO	Directs/ensures isolation of FAULTED SG A	
	ALL C	ISOLATES FAULTED SG A: <ul style="list-style-type: none"> • Reset SI • Reset S/G Lo-Lo level actuation • Close A S/G AFW OCIV 	<i>Once the faulted S/G is identified, the AFW pump may be placed in Pull-To-Lock (this could occur earlier)</i>
	SRO	Returns to EO20, after completing the actions of FRZ1.	

	SRO (continuous)	Transitions to ES11, SI Termination.	<i>Depending on how the crew progresses through the procedures, a short transition to EO10 could occur first.</i>
	RO	Resets Containment Isolation Phase A and B	
	RO/BOP	Restores instrument air to containment	
	RO	Restores cooling to the Spent Fuel Pool Heat Exchanger	
	RO	Secures all LHSI and HHSI pumps as directed.	<i>Terminate scenario.</i>

OPERATOR ACTIONS (Cont')

Op-Test No.: 1 Scenario No.: 3 Event No.: 6			
Event Description: 1A Containment Spray Pump trips (following verification).			
Time	Position	Applicant's Actions or Behavior	Notes
	RO	Identifies that Containment Spray Pump 1A tripped and references 0POP09-AN-02M2 \ C4.	
	SRO/RO	Places Containment Spray Pump 1A in PTL per 0POP09-AN-02M2.	
	RO	Dispatches a Plant Operator to investigate trip of the pump.	<i>Scenario continues with Event #5</i>

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
ALL C	MANUALLY TRIPS MAIN TURBINE	MAIN TURBINE TRIPPED PRIOR TO ORANGE PATH CONDITION FOR SUBCRITICALITY OR INTEGRITY IS REACHED, OR TRANSITION TO EC21.	
SRO/BOP C	ISOLATES FAULTED SG A	SG A ISOLATED PRIOR TO TRANSITION OUT OF EO20	

TURNOVER INFORMATION

- Plant is holding at 27% power following a reactor startup.
- Cycle burnup is 150 MWD/MTU, fuel is conditioned to 100% power.
- RCS Boron Concentration is 1622 ppm.
- Hourly dilutions to maintain this power level are approximately 25 gallons. Xenon is building in slowly.
- Boric Acid Tanks A and B are at 7,300 ppm boron.
- ESF DG #13 is OOS for planned maintenance.
 - Removed from service 5 hours ago; estimated time for return to service is 35 hours.
 - TS 3.8.1.1, action b - Perform 0PSP03-EA-0002 every 8 hours (last completed 4.5 hours ago)
 - TS 3.8.1.1, action b - Return to service within 14 days (EAOT will apply after 72 hours)
- Continue power increase at Step 7.28 of 0POP03-ZG-0005, Plant Startup to 100%.

INITIAL LICENSE EXAM

OPERATING TEST #1

BACKUP SCENARIO

September ____, 2001

Revision 1

SCENARIO OUTLINE

Facility: South Texas Project	Scenario No.: Backup (spare)	Op-Test No.: 1
Source: New _____ Bank - Significantly Modified _____ Bank - Initial Condition Change <u> X </u>		
(Examiner/Operator position assignments will be determined by the Chief Examiner if and when it is necessary to administer this backup scenario in whole or in part)		
Initial Conditions: 100% power Circulating Water Pump #14 is OOS for maintenance		
Turnover: Shift Centrifugal charging Pumps for upcoming maintenance. Reduce power to 90% to remove a Steam Generator Feedpump from service		

Event (Time)	Malfunction No. & (Value)	Event Type*	Event Description and Timing
1 (0 min)	N/A	RO (N) SRO (N)	Shift Centrifugal Charging Pumps.
2 (0 min)	N/A	RO (R)	Reduce power to 90%.
3 (18 min)	03-09-02 (true)	RO (C) SRO (C)	1B Centrifugal Charging Pump trips - after both a reactivity change occurs AND charging pumps are swapped or after 18 minutes.
4 (23 min)	08-15-01 (true)	BOP (I) SRO (I)	1A Steam Generator controlling feedwater flow channel fails low - after Tech Specs are addressed for Charging Pump 1B or after 5 minutes.
5 (33 min)	50-BM-01 (1.0)	RO (I) SRO (I)	VCT level transmitter LT-113 fails high - after feedwater regulating valves are in AUTO or after 10 minutes.
6 (40 min)	05-03-02 (0.16)	ALL (M)	1B Steam Generator Tube Rupture (~ 700 gpm ramped over 10 minutes) - after letdown divert valve is closed or after 7 minutes.
7 (65 min)	05-04-02 (1.0)	BOP (C) SRO (C)	Steam Generator 1B Main Steam Safety Valve fails open - after the MSIV is closed in E30 or after 25 minutes.

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

Approved:

Facility: /s/ Ken Struble Date: 9/6/01

Chief Examiner: /s/ H F Bundy Date: 9/6/01

SCENARIO MISCELLANEOUS INFORMATION

SIMULATOR BOOTH NOTES:

SIMULATOR SETUP

1. Reset to IC #68 and go to run.
2. Execute Lesson Plan #4 under Lesson Plan Group LOT13NRC
3. Position and tag control switches as follows:
 - Circulating Water Pump #14 - PTL - Danger Tag

EXPECTED BOOTH OPERATIONS

1. Autograph file "cae/rose/work/lot13nrcscenario4.agb.2" should load with lesson plan. At the conclusion of the scenario ensure the labels for the parameters on the autograph file are changed to include the verbal description by selecting "options", "label", then "description" before printing out the critical parameter trends from the autograph file.

EXPECTED BOOTH COMMUNICATIONS

1. As Plant Operator, if asked to check Charging Pump 1B for a start, report that the pump is ready for a start (you are already in place per the turnover). After pump is started, report the pump running satisfactorily.
2. As Plant Operator, if asked to investigate CCP 1B trip, after 5 minutes report that the 50/51 relay is tripped locally.
3. As Plant Operator, if asked to check CCP 1A following its start, after 3 minutes report that the pump is running satisfactorily.
4. As I&C, if asked to investigate failed feedflow channel, report that a crew will be sent to the Control Room to troubleshoot. Further action is not required.
5. As I&C, if asked to investigate failed VCT level channel, report that a crew will be sent to the control room to troubleshoot. Further action is not required.

SCENARIO MISCELLANEOUS INFORMATION

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be placed in an Autograph file for recall when the scenario is completed:

- SG B Wide Range Level
- SG B Pressure
- SG B AFW Flow
- SG A Narrow Range Level
- RCS Wide Range Pressure

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.
2. Actions required throughout the event are indicated as "(continuous)" in the position column.
3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: #1 Scenario No.: Backup (spare) Event No.: 1			
Event Description: Shift Centrifugal Charging Pumps			
Time	Position	Applicant's Actions or Behavior	Notes
	SRO	Directs the RO to Start Centrifugal Charging Pump 1B and Secure Centrifugal Charging Pump 1A per POP02-CV-0004, Chemical and Volume Control System Subsystem.	
	RO	Ensures CVCS System is prepared for Centrifugal Charging Pump 1B start. <ul style="list-style-type: none"> • Ensures discharge valve open • Charging flow control valve in manual • CCP Aux lube oil pump running 	
	RO/BOP	Announces intention to start CCP 1B over the plant page and dispatches operator to check locally.	
	RO	Starts CCP 1B and monitors the following: <ul style="list-style-type: none"> • Charging flow • RCP Seal injection flows 	
	RO	Performs valve alignments and shuts down CCP 1A.	
	RO	Places charging flow control valve in auto and monitors the following while adjusting seal injection flow control valve as necessary: <ul style="list-style-type: none"> • Charging flow • RCP Seal injection flows • Pressurizer level 	
	RO	Ensure cooling fan starts for CCP 1B and secures cooling fan for CCP 1A	
	RO	Reports to the SRO that CCPs have been shifted.	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: Backup (spare) Event No.: 2			
Event Description: Reduce power to 90%			
Time	Position	Applicant's Actions or Behavior	Notes
	SRO	Enters OPOP03-ZG-0008, Power Operations, at step 6.1 and directs the RO to commence power reduction to 90%	
	RO (reactivity)	Borates as necessary while reducing turbine load to reach desired power level.	
	RO	Maintains Tave within 1.5 °F of Tref and maintains AFD within Tech Spec Limits.	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: Backup (spare) Event No.: 3			
Event Description: 1B Centrifugal Charging Pump trips			
Time	Position	Applicant's Actions or Behavior	Notes
	RO	Acknowledges and reports all (4) RCP SEAL WATER INJ FLOW LO annunciators and CHG FLOW HI/LO annunciator on Control Panel CP004.	
	SRO/RO	Recognizes and reports that CCP 1B has tripped.	
	SRO	Directs/ensures 0POP09-AN-04M8-F3 annunciator response actions to manually start CCP 1A.	
	RO	Ensures the following: <ul style="list-style-type: none"> FCV-0205, CHG FLOW CONT VLV is closed MOV-8377A, CCP 1A DISCH ISOL is open FCV-0201, CCP 1A RECIRC is open CCP 1A white L.O. AVAILABLE light is lit 	
	RO	Start Centrifugal Charging Pump 1A.	
	RO	Adjusts charging flow and seal injection flow as necessary.	
	RO	Performs the following: <ul style="list-style-type: none"> Closes FCV-0201, CCP 1A RECIRC Returns FCV-0205, CHG FLOW CONT to AUTO. 	
	SRO	Declares CCP 1B inoperable and refers to Technical Requirement Manual 3.1.2.4, <u>Charging Pumps Operating</u> , and enters Action statement to restore CCP 1B to operable status within 7 days.	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: Backup (spare) Event No.: 4			
Event Description: 1A Steam Generator controlling feedwater flow channel fails low.			
Time	Position	Applicant's Actions or Behavior	Notes
	BOP	Acknowledges and reports annunciators on Control Panel CP006: <ul style="list-style-type: none"> • SG 1A LVL DEV HI/LO • SG 1A STM/FW FLOW MSMTCH 	
	SRO/BOP	Performs immediate actions of OPOP04-FW-0001: <ul style="list-style-type: none"> • Places SG 1A feedwater reg. valve controller in MANUAL • Adjusts controller output to match feed/steam flow and restore SG 1A level to program 	
	SRO (continuous)	Directs/ensures actions of OPOP04-FW-0001, Loss of Steam Generator Level Control.	
	BOP	Identifies that feedwater flow channel FI-0510 for SG 1A has failed low.	
	BOP	Selects FT-511 for SG 1A level control.	
	BOP	Performs the following: <ul style="list-style-type: none"> • Places LK-7406 DA Storage Tank Level Controller in Manual • Maintains DA Storage Tank level between 65% and 80% 	
	BOP	Performs the following: <ul style="list-style-type: none"> • Verifies SG 1A level between 68% and 74% • Places SG 1A Feed Regulating Valve in AUTO 	
	SRO	Checks Tech Specs 3.3.1, 3.3.2, 3.3.3.6 and determines that a Tech Spec LCO is not entered.	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: Backup (spare) Event No.: 5			
Event Description: VCT level transmitter LT-113 fails high.			
Time	Position	Applicant's Actions or Behavior	Notes
	RO	Acknowledges and reports annunciator VCT LEVEL HI/LO on Control Panel CP004	
	RO	Performs the following actions of OPOP09-AN-04M8-E2: <ul style="list-style-type: none"> • Determines LT-113 is failed using ICS computer • Monitors computer points to control VCT level 	
	SRO	Directs LCV-0112A, Divert Valve, be placed in the VCT position.	
	RO	Places LCV-0112A handswitch to the VCT position and ensures valve position changes	
	SRO/RO/ BOP	Contacts I&C to investigate failure	

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: Backup (spare) Event No.: 6			
Event Description: 1B Steam Generator Tube Rupture (~700 gpm ramped over 10 minutes).			
Time	Position	Applicant's Actions or Behavior	Notes
	RO/BOP	Acknowledges and announces radiation monitoring alarms and begins an investigation into possible tube leak.	
	SRO	Begins investigation of SG tube leakage by directing RO/BOP to monitor RCS leakage and identify the affected SG.	
	RO/BOP	Identifies the affected SG.	
	SRO (continuous)	Directs/ensures operator actions of OPOP04-RC-0004, Steam Generator Tube Leakage.	<i>Actions of OPOP04-RC-0004 may not be performed depending on how quickly the leak is diagnosed and leak rate estimated.</i>
	SRO/BOP	Ensures blowdown is isolated from SG B	
	RO	Control and monitor CVCS charging and letdown to maintain VCT level greater than 15% and pressurizer level greater than 17%	
	SRO	Ensures that BOP/RO monitor and report status of pressurizer level, VCT level and SG B feed flow steam flow mismatch.	
	SRO	Direct performance of POP03-ZG-0006, Plant Shutdown From 100% to Hot Standby such that the plant is in Mode 3 in ≤ 6 hours.	
	ALL	Manually initiates SI when directed or prior to pressurizer level decreasing to $< 17\%$.	
	SRO	Ensures that the crew enters OPOP05-EO-EO00, Reactor Trip or Safety Injection.	
	RO/BOP	Completes immediate actions of EO00, Reactor Trip/SI.	
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed.	

	SRO/BOP (continuous)	Ensures that AFW flow is isolated to SG B when level is >14% narrow range.	
	ALL	Completes the actions of EO00 up to the EO30, Ruptured Steam Generator, transition point.	
	SRO	Transitions to EO30, SGTR based on SG radiation abnormal.	
	ALL (continuous)	Monitors the status of Critical Safety Functions when the crew transitions to OPOP05-EO-EO30.	
	BOP	Identifies Ruptured SG as SG B.	
	SRO/BOP C	ISOLATES FEEDWATER FLOW INTO AND STEAM FLOW FROM SG B BY: <ul style="list-style-type: none"> • ADJUSTING SG B PORV SETPOINT TO BETWEEN 1260 AND 1265 PSIG • CLOSING SG B MSIV • ISOLATING AFW TO SG B 	<i>Event #7 occurs at this point</i>
	BOP	Recognizes SG B is depressurizing and determines a safety valve is stuck open.	
	ALL (continuous)	Ensures RCPs are tripped if RCS pressure drops to less than 1460 psig.	
	SRO	Transitions to E20 based on CIP entry (any SG depressurizing in an uncontrolled manner).	<i>See Event #7 for actions on failed open SG safety.</i>
	SRO	Transitions back from E20 to E30 step 1 based on high main steam line radiation readings	<i>Actions continues from Event #7</i>
	SRO/BOP	Determine SG B pressure is < 426 psig	
	SRO	Transitions to OPOP05-EO-EC31, SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired, and directs RO/BOP actions.	
	RO/BOP	Restores IA to containment when directed by resetting Containment Isolation Phase A and opening the IA OCIV.	
	RO	Restores CCW cooling to the Spent Fuel Pool Heat Exchanger	
	SRO/RO	Secures LHSI pumps when RCS pressure is determined to be > 415 psig	

	RO	Establishes charging flow if not already completed.	
	SRO/BOP C	ESTABLISH RCS COOLDOWN RATE AT < 100 ° F/HR	<i>Terminate the scenario</i>

OPERATOR ACTIONS (Cont')

Op-Test No.: #1 Scenario No.: Backup (spare) Event No.: 7			
Event Description: Steam Generator 1B Main Steam Safety Valve fails open when actions are taken to isolate the steam generator during the tube rupture.			
Time	Position	Applicant's Actions or Behavior	Notes
	BOP	Determines SG B is faulted based on the following: <ul style="list-style-type: none"> • SG B pressure decreasing • Computer indication of Safety open 	
	SRO	Transitions to EO20, Faulted SG Isolation, and directs RO/BOP actions.	
	SRO/BOP	Closes all MSIVs AND MSIBs.	
	SRO/BOP	Ensures that AFW is isolated on SG B.	
	BOP/RO	When directed, resets SI, SG LO-LO level AFW actuation, SG blowdown and sample isolation.	
	SRO	Notifies Chemical Analysis to sample all SGs for activity.	<i>Operator actions continue at event #6</i>

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/BOP	ISOLATES FEEDWATER FLOW INTO AND STEAM FLOW FROM SG B.	Isolates SG B feedwater and steam flow before a transition to EC31 occurs	
SRO/BOP	ESTABLISH RCS COOLDOWN RATE AT < 100 °F/HR	Cooldown the RCS to cold shutdown at the highest rate allowed by procedure (< 100 °F/hr), but such that a severe (Orange path) challenge to the Integrity CSF is not encountered.	

TURNOVER INFORMATION

- Reactor power is 100%
- Cycle burnup is 150 MWD/MTU
- RCS Boron Concentration is 1358 ppm.
- Circulating Water Pump #14 is out of service for maintenance. Estimated return to service - 4 days.
- Hourly dilutions to maintain current power are approximately 10 gallons. Xenon is at equilibrium conditions.
- Boric Acid Tanks A and B are at 7300 ppm.
- Start Charging Pump 1B and secure Charging Pump 1A for upcoming maintenance. The MAB watch is standing by for the pump start.
- Reduce reactor power to 90% to facilitate removal of SGFP #11 from service to repair an oil leak.
- No liquid waste discharges are in progress or planned.