Draft Submittal

(Pink Paper)

1. ADMINISTRATIVE TOPICS OUTLINE (ES-301-1)
2. CONTROL ROOM SYSTEMS & FACILITY WALK-THROUGH TEST OUTLINE (ES-301-2)
3. ADMINISTRATIVE JPMS
4. IN-PLANT JPMS
5. CONTROL ROOM JPMS (SIMULATOR JPMS)

SURRY 2008-301

DRAFT

Facility: Surry	Date of Examination: March 2008
Examination Level: RO ☑ SRO ☐	Operating Test Number: 2008-301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations		
Conduct of Operations G2.1.7 (3.7/4.4)	N, R	Title: Perform a Quadrant Power Tilt Ratio calculation (QPTR). Description: Given plant conditions determine the QPTR in accordance with QPTR worksheet.
Equipment Control G2.2.12 (3.0/3.4)	N, R	Title: Perform Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger (CCHX) 1CC-E-1A Surveillance (RO only) Description: Determine status of the CCHX given plant data and associated graphs from 1-OSP-SW-002 to include completion of procedure acceptance criteria and follow-on tasks.
Radiation Control G2.3.2 (2.5/2.9)	M, R	Title: Calculate radiation exposure when performing task in containment (varying fields and use of personnel) Description: Job to be performed in CTMT. Select number of personnel to perform the job in accordance with ALARA practices and determine the expected dose.
Emergency Plan G2.4.43 (2.8/3.5)	D, S	Title: Complete Report of Emergency to State and Local Governments (RO only). Description: Complete report per EPIP-2.01, Notification of State and Local Governments (Met data and stability class determination required).

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria: (C)ontrol room, (S)imulator or Class(R)oom
(D)irect from bank (3 for ROs; 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (1)
(P)revious 2 exams (1; randomly selected)

Facility:	Surry	Date of Examination:	March 2008
Examination Level: RO ☐ SRO ☑		Operating Test Number:	2008-301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations G2.1.5 (2.3/3.4)	M, R	Title: Evaluate Overtime Eligiblity. (SRO only) Description: Given various Operator hours of work for previous week, determine which operator is eligible to perform overtime.
Conduct of Operations G2.1.7 (3.7/4.4)	N, R	Title: Perform a Quadrant Power Tilt Ratio calculation (QPTR). Description: Given plant conditions determine the QPTR in accordance with QPTR worksheet.
Equipment Control G2.2.12 (3.0/3.4)	N, R	Title: Perform a review of a performance test to verify operability of associated components. (SRO only) Description: Review 1-OPT-CS-006 (RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test) for accuracy.
Radiation Control G2.3.2 (2.5/2.9)	M, R	Title: Calculate radiation exposure when performing task in containment (varying fields and use of personnel) Description: Job to be performed in CTMT. Select number of personnel to perform the job in accordance with ALARA practices and determine the expected dose.
Emergency Plan G2.4.41 (2.3/4.1)	M, S	Title: Classify an event in accordance with EPIP-1.01 (SRO only). Description: Facility JPM 88.05. Modified such that EPIP-1.01 will be performed with requested approval of faulted EPIP-2.01 form.

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria: (C)ontrol room, (S)imulator or Class(R)oom
(D)irect from bank (3 for ROs; 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (1)
(P)revious 2 exams (1; randomly selected)

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Administrative Job Performance Measure G2.1.7

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

Perform a Quadrant Power Tilt Calculation.

K/A: G.2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Applicability	Estimated Time	Actual Time
RO/SRO(D)/SRO(U)	15 Minutes	

Conditions

- Task is to be PERFORMED in the classroom.

Standards

- Correctly calculates Quadrant Power Tilt for given core conditions on the Radial Tilt Calculation Worksheet. This Worksheet constitutes the approved procedure for this task.

Initiating Cues

- A dropped rod has occurred on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00. Rod Control System Malfunction.
- When you have determined the Quadrant Power Tilt, inform the examiner.

Terminating Cues

- Applicant has completed the QPTR Calculation.

Tools and Equipment

- Calculator
- NIS Setpoints and Power Range Currents Data Sheet

Safety Considerations

- None

Initial Conditions:

- Unit 1 was at 100% power when a dropped rod occurred.

Initiating Cues

- A dropped rod has occurred on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00. Rod Control System Malfunction.
- The Shift Manager directs you to perform the Quadrant Power Tilt Calculation on the attached "Radial Tilt Calculation Worksheet".
- The Shift Manager directs you to perform these calculations to 4 significant digits.
- When you have determined the Quadrant Power Tilt, inform the examiner.

Notes

Here are the actual detector currents taken from the Power Range NIs:

N-41 Upper Detector Current	109.8
N-41 Lower Detector Current	122.4
N-42 Upper Detector Current	123.4
N-42 Lower Detector Current	119.4
N-43 Upper Detector Current	100.2
N-43 Lower Detector Current	118.3
N-44 Upper Detector Current	117.8
N-44 Lower Detector Current	122.0

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

STEP 1: Transcribes information from data sheets onto Quadrant Power Tilt Calculation Worksheet. **STANDARD:** Places PR NI currents and Normalized Currents in appropriate location on Quadrant Power Tilt Calculation Worksheet. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: Performs calculations to obtain normalized values for Upper Detectors. **STANDARD:** Divides Upper Detector current by Normalized currents for each detector. (See attached Quadrant Power Tilt Calculation Worksheet for calculations.) **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 3: Performs calculations to obtain average normalized value for Upper Detectors. **STANDARD:** Adds Upper Detector Normalized currents for all detectors and divides by 4. (See attached Quadrant Power Tilt Calculation Worksheet for calculations.) **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 4: Calculates Radial Tilt for Upper Detectors. **STANDARD:** Divides highest PR NI normalized current (N-42) for upper detectors by average NI normalized current for upper detectors. (See attached Quadrant Power Tilt Calculation Worksheet for calculations.) **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 5: Performs calculations to obtain normalized values for Lower Detectors. **STANDARD:** Divides Lower Detector current by Normalized currents for each detector. (See attached Quadrant Power Tilt Calculation Worksheet for calculations.) **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 6: Performs calculations to obtain average normalized value for Lower Detectors. **STANDARD:** Adds Lower Detector Normalized currents for all detectors and divides by 4. (See attached Quadrant Power Tilt Calculation Worksheet for calculations.) **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 7: Calculates Radial Tilt for Lower Detectors. **STANDARD:** ***Divides highest PR NI normalized current (N-42) for lower detectors by average NI normalized current for lower detectors. (See attached Quadrant Power Tilt Calculation Worksheet for calculations.)** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 8: Determines final Quadrant Power Tilt Value. **STANDARD:** ***Determines final Quadrant Power Tilt Value from above calculations to be 1.022 or 2.2% Tilt.** **EVALUATOR NOTES:** **1.02 to 1.023 or 2.0% to 2.3% acceptable.** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

Radial Tilt Calculation Worksheet
Unit _____

Upper Flux Channels **ANSWER KEY**

Time	Data	NI-41	NI-42	NI-43	NI-44	Average NI 41+42+43+44 / 4	Peak NI-_42_	Radial Tilt PEAK / AVERAGE
	Actual	109.8	123.4	100.2	117.8			
	Normalized	111.0	123.8	101.4	119.5			
	Actual÷Normalized	.9892	.9968	.9882	.9895	.9900	.9968	1.0069
	Actual							
	Normalized							
	Actual÷Normalized							
	Actual							
	Normalized							
	Actual÷Normalized							

Lower Flux Channels

Time	Data	NI-41	NI-42	NI-43	NI-44	Average NI 41+42+43+44 / 4	Peak NI-_42_	Radial Tilt PEAK / AVERAGE
	Actual	122.4	119.4	118.3	122.0			
	Normalized	117.8	112.7	115.0	119.8			
	Actual÷Normalized	1.0390	1.0595	1.0287	1.0184	1.0364	1.0595	1.0223
	Actual							
	Normalized							
	Actual÷Normalized							
	Actual							
	Normalized							
	Actual÷Normalized							

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the classroom.
- Perform a Quadrant Power Tilt calculation.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- Unit 1 was at 100% power when a dropped rod occurred.

Initiating Cues

- A dropped rod has occurred on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00. Rod Control System Malfunction.
- The Shift Manager directs you to perform the Quadrant Power Tilt Calculation on the attached "Radial Tilt Calculation Worksheet".
- The Shift Manager directs you to perform these calculations to 4 significant digits.
- Also provided is a copy of the Power Range Currents from the NIS Data Book providing the 100% Normalized Values.
- When you have determined the Quadrant Power Tilt, inform the examiner.

Here are the actual detector currents taken from the Power Range NIs:

N-41 Upper Detector Current	109.8
N-41 Lower Detector Current	122.4
N-42 Upper Detector Current	123.4
N-42 Lower Detector Current	119.4
N-43 Upper Detector Current	100.2
N-43 Lower Detector Current	118.3
N-44 Upper Detector Current	117.8
N-44 Lower Detector Current	122.0

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions:

- Unit 1 was at 100% power when a dropped rod occurred.

Initiating Cues

- A dropped rod has occurred on Unit 1.
- A Quadrant Power Tilt Calculation needs to be performed as directed by 0-AP-1.00. Rod Control System Malfunction.
- The Shift Manager directs you to perform the Quadrant Power Tilt Calculation on the attached "Radial Tilt Calculation Worksheet".
- The Shift Manager directs you to perform these calculations to 4 significant digits.
- Also provided is a copy of the Power Range Currents from the NIS Data Book providing the 100% Normalized Values.
- When you have determined the Quadrant Power Tilt, inform the examiner.

Here are the actual detector currents taken from the Power Range NIs:

N-41 Upper Detector Current	109.8
N-41 Lower Detector Current	122.4
N-42 Upper Detector Current	123.4
N-42 Lower Detector Current	119.4
N-43 Upper Detector Current	100.2
N-43 Lower Detector Current	118.3
N-44 Upper Detector Current	117.8
N-44 Lower Detector Current	122.0

DATE	%	N41		N42		N43		N44	
		Upper Channel	Lower Channel	Upper Channel	Lower Channel	Upper Channel	Lower Channel	Upper Channel	Lower Channel
02/07 2008	100	111.0	117.8	123.8	112.7	101.4	115.0	119.5	119.8
02/07 2008	120	136.2	148.4	145.7	138.6	130.5	135.6	140.2	141.4
	100								
	120								
	100								
	120								
	100								
	120								
	100								
	120								
	100								
	120								

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Administrative Job Performance Measure G2.1.5

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

Evaluate Overtime Eligibility

K/A: G.2.1.5 Ability to locate and use procedures and directives related to shift staffing and activities.

Applicability	**Estimated Time**	**Actual Time**
SRO(D)/SRO(U)	20 Minutes	

Conditions

- Task is to be PERFORMED in the classroom.

Standards

- Correctly determines which operator(s) is/are able to stay over for two hours without prior overtime approval IAW VPAP-0103, Working Hours and Limitations (REV 9).

Initiating Cues

- Evaluate the work history for all six (6) operators.
- Determine which operator(s), if any, can be held over for two hours without prior overtime approval, and determine which operators CANNOT be held over for two hours without prior overtime approval.
- A copy of VPAP-0103 is available for use during this JPM.
- When you are finished responding to the questions, inform an examiner.

Terminating Cues

- Applicant has evaluated all operators and determined their overtime eligibility.

Tools and Equipment

- Calculator
- Overtime History

Safety Considerations

- None

Initial Conditions:

- A start-up is planned for the following shift. One Reactor Operator must be held over two hours for the start-up.
- Attached is the work history (excluding shift turnover time) of the available Reactor Operators on shift.
- A break of at least 8 hours occurred between all work periods.
- All operators began their shift at the same time each day. (Day Shift)
- The computer program for calculating overtime eligibility is not available.

Initiating Cues

You have been directed to:

- Evaluate the work history for all six (6) operators.
- Determine which operator(s), if any, can be held over for an additional two hours without prior overtime approval and determine which operator(s), if any, CANNOT be held over for two hours without prior overtime approval.
- State the reason the operators can or cannot be held over for the additional two hours.
- All six operators have tomorrow (Day 9) off.

Notes

The applicable procedure, VPAP-0103 - Working Hours and Limitations, should be distributed to the applicant with the directions.

Work History

Day	1	2	3	4	5	6	7	8 (Today)
Operator #1	12	0	12	12	12	12	8	14
Operator #2	0	12	12	12	12	12	0	12
Operator #3	0	12	12	12	0	0	12	12
Operator #4	12	0	12	12	12	12	0	13
Operator #5	12	12	12	12	0	0	0	15
Operator #6	0	12	12	12	12	8	8	8

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

STEP 1: OBTAINS A CURRENT COPY OF VPAP-0103, WORKING HOURS AND LIMITATIONS. **STANDARD:** a) Obtains a copy of VPAP-0103. This can be accomplished by either requesting a copy of the procedure from the evaluator or by logging on to a network computer and obtaining an electronic version of the procedure. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEPS CAN BE PERFORMED IN ANY ORDER STEP 2: DETERMINES THE ELIGIBILITY OF OPERATOR #1. **STANDARD:** ***a) Identifies that Operator #1 would not exceed any overtime limits.** **EVALUATOR NOTES:** *Days 2-8 will reach 72 hours, but not exceed it. Day 7 and 8 will reach 24 hours, but not exceed it. Day 8 will reach 16 hours, but not exceed it.* **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEPS CAN BE PERFORMED IN ANY ORDER STEP 3: DETERMINES THE ELIGIBILITY OF OPERATOR #2. **STANDARD:** ***a) Identifies that Operator #2 would exceed hours limitations.** **EVALUATOR NOTES:** *Days 2 - 8 already have 72 hours in a 7-day period. The additional two hours would yield 74 hours in a 7-day period, which would require management approval.* **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEPS CAN BE PERFORMED IN ANY ORDER STEP 4: DETERMINES THE ELIGIBILITY OF OPERATOR #3. **STANDARD:** ***a) Identifies that Operator #3 would exceed hours limitations.** **EVALUATOR NOTES:** *Day 7 and 8 already have 24 hours in a 48 hour period. The additional two hours would yield 26 hours in a 48 hour period, which would require management approval.* **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEPS CAN BE PERFORMED IN ANY ORDER STEP 5: DETERMINES THE ELIGIBILITY OF OPERATOR #4. **STANDARD:** ***a) Identifies that Operator #4 would not exceed any overtime limits.** **EVALUATOR NOTES:** *No limits are exceeded.* **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEPS CAN BE PERFORMED IN ANY ORDER STEP 6: DETERMINES THE ELIGIBILITY OF OPERATOR #5. **STANDARD:** ***a) Identifies that Operator #5 would exceed hours limitations.** **EVALUATOR NOTES:** *Day 8 already has 15 hours in a 24 hour period. The additional two hours would yield 17 hours in a 24 hour period, which would require management approval.* **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEPS CAN BE PERFORMED IN ANY ORDER STEP 7: DETERMINES THE ELIGIBILITY OF OPERATOR #6. **STANDARD:** ***a) Identifies that Operator #6 would exceed hours limitations.** **EVALUATOR NOTES:** *Days 2 - 8 already have 72 hours in a 7-day period. The additional two hours would yield 74 hours in a 7-day period, which would require management approval.* **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 4: REPORTS ELIGIBILITY OF ALL OPERATORS. **STANDARD:** Applicant reports that Operators 1 and 4 are eligible to receive the overtime without prior management approval and the others are not. Table correctly filled out. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

_____

_____

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_____

_____

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_____

_____

_____

ANSWER KEY

Work History

Day	1	2	3	4	5	6	7	8 (Today)
Operator #1	12	0	12	12	12	12	8	14
Operator #2	0	12	12	12	12	12	0	12
Operator #3	0	12	12	12	0	0	12	12
Operator #4	12	0	12	12	12	12	0	13
Operator #5	12	12	12	12	0	0	0	15
Operator #6	0	12	12	12	12	8	8	8

***ALL BLOCKS OF THIS TABLE ARE CRITICAL STEPS**

	Eligible for 2 hours of additional overtime without management approval?	Reason, if any, for **NOT** being eligible for overtime without prior management approval.
Operator #1	***Yes**	
Operator #2	***No**	***Exceeds 72 hours in 7 day period**
Operator #3	***No**	***Exceeds 24 hours in 48 hour period**
Operator #4	***Yes**	
Operator #5	***No**	***Exceeds 16 hours in 24 hour period**
Operator #6	***No**	***Exceeds 72 hours in 7 day period**

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the classroom.
- Evaluate the work history for all six (6) operators. Determine which operator(s), if any, can be held over for an additional two hours without prior overtime approval and determine which operator(s), if any, CANNOT be held over for two hours without prior overtime approval. State the reason the operators can or cannot be held over for the additional two hours. All six operators have tomorrow (Day 9) off.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- A start-up is planned for the following shift. One Reactor Operator must be held over two hours for the start-up.
- Attached is the work history (excluding shift turnover time) of the available Reactor Operators on shift.
- A break of at least 8 hours occurred between all work periods.
- All operators began their shift at the same time each day. (Day Shift)
- The computer program for calculating overtime eligibility is not available.

Initiating Cues

You have been directed to:

- Evaluate the work history for all six (6) operators.
- Determine which operator(s), if any, can be held over for an additional two hours without prior overtime approval and determine which operator(s), if any, CANNOT be held over for two hours without prior overtime approval.
- State the reason the operators can or cannot be held over for the additional two hours.
- All six operators have tomorrow (Day 9) off.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions:

- A start-up is planned for the following shift. One Reactor Operator must be held over two hours for the start-up.
- Attached is the work history (excluding shift turnover time) of the available Reactor Operators on shift.
- A break of at least 8 hours occurred between all work periods.
- All operators began their shift at the same time each day. (Day Shift)
- The computer program for calculating overtime eligibility is not available.

Initiating Cues

You have been directed to:

- Evaluate the work history for all six (6) operators.
- Determine which operator(s), if any, can be held over for an additional two hours without prior overtime approval and determine which operator(s), if any, CANNOT be held over for two hours without prior overtime approval.
- State the reason the operators can or cannot be held over for the additional two hours.
- All six operators have tomorrow (Day 9) off.

(TO BE GIVEN TO APPLICANT)

Work History

Day	1	2	3	4	5	6	7	8 (Today)
Operator #1	12	0	12	12	12	12	8	14
Operator #2	0	12	12	12	12	12	0	12
Operator #3	0	12	12	12	0	0	12	12
Operator #4	12	0	12	12	12	12	0	13
Operator #5	12	12	12	12	0	0	0	15
Operator #6	0	12	12	12	12	8	8	8

	Eligible for 2 hours of additional overtime without management approval?	Reason, if any, for **NOT** being eligible for overtime without prior management approval.
Operator #1		
Operator #2		
Operator #3		
Operator #4		
Operator #5		
Operator #6		

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SR08301
Administrative Job Performance Measure G2.2.12

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

Periodic Test Review (1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1A)

K/A: G.2.2.12 Knowledge of surveillance procedures. (3.0/3.4)

Applicability	**Estimated Time**	**Actual Time**
RO	20 Minutes	

Conditions

- Task is to be PERFORMED in the classroom.

Standards

- Completes 1-OSP-SW-002 (REV 18), Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger, 1-CC-E-1A, and determines if the test was completed satisfactorily or not.

Initiating Cues

- Here is a copy of 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger (1-CC-E-1A), I need you to complete the procedure and turn it in to me for review.
- The necessary data has been collected, but not analyzed or plotted.
- When you are finished, inform your examiner of the results of the surveillance procedure.

Terminating Cues

- Applicant has completed the procedure and informed the examiner of the results of the surveillance procedure.

Tools and Equipment

- Calculator
- Straight Edge (ruler)
- Partially completed copy of 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger (1-CC-E-1A)

Safety Considerations

- None

Initial Conditions:

- Unit 1 is at 100% power.
- 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger, 1-CC-E-1A, is partially completed and needs to be finalized.

Initiating Cues

- Here is a copy of 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger (1-CC-E-1A), I need you to complete the procedure and turn it into me for review.
- The necessary data has been collected, but not analyzed or plotted.
- When you are finished, inform your examiner of the results of the surveillance procedure.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

STEP 1: Review the purpose of the procedure (Section 1.0) **STANDARD:** • Reviews the following: To provide instructions to monitor flow through the Service Water side of the Component Cooling Heat Exchanger 1-CC-E-1A, and to use the flow readings obtained to determine operability of the heat exchanger with respect to the amount of tubesheet macrofouling. Determining the extent of tubesheet macrofouling provides an aging management basis for License Renewal. **EVALUATOR NOTES:** • If asked: No maintenance has been performed on the Component Cooling Heat Exchangers. • Review of this section is not required, but may be performed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: Review the References section (Section 2.0) **STANDARD:** • Reviews section 2.1, Source Documents, 2.2 Technical Specifications, 2.3 Technical References, and 2.4 Commitment Documents. **EVALUATOR NOTES:** • Review of this section is not required, but may be performed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: Verifies the Initial Conditions are met (Section 3.0) **STANDARD:** • Reviews the following: Shift Supervision has granted permission to perform this test. **EVALUATOR NOTES:** • If asked: The procedure was performed on its scheduled day and permission to perform the test was granted. • Review of this section is not required, but may be performed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: Reviews the Precautions and Limitations (Section 4.0) **STANDARD:** _____ (Step 4.1) Notify Health Physics prior to opening any SW instrument drain valves. _____ (Step 4.2) In order to limit undesired increases in CC temperature, isolation of SW flow through a CC Heat Exchanger shall be minimized. _____ (Step 4.3) To prevent excessive cooling of the CC System during seasons when SW temperature is low, the CC outlet valve, on the heat exchanger being tested, may be closed as allowed by this procedure. _____ (Step 4.4) Technical Specification 3.13 requires two operable Component Cooling Heat Exchangers during one unit operation and three operable CC HXs for two unit operation. _____ (Step 4.5) The amount of SW that is drained to the trough surrounding the CC HXs shall be minimized. **EVALUATOR NOTES:** • If asked: HP was notified about SW valve manipulations. • Review of this section is not required, but may be performed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 5: Reviews Section 6.1, Work Preparation, and verifies all initials are signed, as required. **STANDARD:** • This section is reviewed and applicant notes that Step 6.1.1 and 6.1.3 were initialed as completed while step 6.1.2 is marked N/A. **EVALUATOR NOTES:** • If asked: No maintenance has been performed on the Component Cooling Heat Exchangers. • A detailed review of this section is not required, but may be performed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 6: Reviews Section 6.2, Measuring CC HX Flow, and verifies all initials are signed, as required, up to and including step 6.2.18. **STANDARD:** • This section is reviewed and the applicant notes that Step 6.2.1 and Step 6.2.17 were marked N/A, while all other steps (up to and including step 6.2.18) were initialed as completed. **EVALUATOR NOTES:** • If asked: No maintenance has been performed on the Component Cooling Heat Exchangers. • If asked: An extended duration full flow flush was not required. • A detailed review of this section is not required, but may be performed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

***STEP 7: The applicant performs Step 6.2.19.** **STANDARD:** _____ 6.2.19 Select an Attachment 2 graph illustrating the closest temperature that is equal to or higher than the current Circulating Water Inlet Temperature recorded on Attachment 1. • *** Applicant selects the graph from Attachment 2 associated with 75°F (Page 2 of 6 from Attachment 2 or Page 17 of 21 in the procedure).** • Applicant initials next to Step 6.2.19 upon completion of graph selection. **EVALUATOR NOTES:** • If asked: Circulating Water Temperature is listed on Attachment 1 (73 °F). **COMMENTS:**	_____ **SAT** _____ **UNSAT**
***STEP 8: The applicant performs Step 6.2.20.** **STANDARD:** _____ 6.2.20 Using a straightedge, mark on the appropriate Attachment 2 graph the intersection of the highest flow point Barton and Annubar ΔP readings from Attachment 1. IF the highest flow point Barton and Annubar ΔP readings are offscale to the right of the graph, THEN the point is in the operable range. • *** Applicant plots the highest flow point Barton and Annubar ΔP readings from Attachment and identifies that the CC HX is inoperable.** • Applicant initials next to Step 6.2.20 upon completion of marking graph. **EVALUATOR NOTES:** • The applicant may plot all data, only the highest flow point Barton and Annubar ΔP readings are required to be plotted. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 9: Reviews Section 7.1, Acceptance Criteria. **STANDARD:** • Reviews the following: IF the stated Acceptance Criteria are met, THEN the test shall be considered satisfactory. • The recorded parameters fall within the Operable or Alert band on Attachment 2. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
***STEP 10: Performs Section 7.2, Follow-on Task** **STANDARD:** • *** Records the Test Result as UNSATISFACTORY by marking the test as unsatisfactory.** • Notes that Step 7.2.1 and 7.2.2 are not applicable, since the test was not satisfactory nor was the Heat Exchanger in Alert. **EVALUATOR NOTES:** • If told, acknowledge that the test was unsatisfactory. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 11: Performs Follow-on Actions associated with Unsatisfactory Results **STANDARD:** _____ 7.2.3 IF results fall in the Inoperable Range, THEN mark UNSATISFACTORY AND perform the following: a. Notify Shift Supervision b. Notify System Engineering of the Inoperable condition and record the name of the person notified. c. For unacceptable testing results that are due to macrofouling, the System Engineer will consider the potential material degradation effects (loss of material and cracking) of macrofouling that affect the aging management basis of license renewal. d. Submit a Condition Report and record the number. e. Verify the requirements of Technical Specifications 3.13A and 3.14A are met. f. Submit a Work Request (or not if one is outstanding) to clean the heat exchanger and record the number. _____ 7.2.4 Personnel participating in performance of this procedure shall complete the table below. • Applicant signs his name, prints his name and fills in the date in the table of step 7.2.4. **EVALUATOR *CUE*:** • When informed of the Unsatisfactory test results, the examiner will state that he will complete Steps 7.2.3. **Please continue with Step 7.2.4.** **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 12: Completes the Table in Step 7.2.4 **STANDARD:** _____ 7.2.4 Personnel participating in performance of this procedure shall complete the table below. • Applicant signs and prints his name and fills in the date in the table of step 7.2.4. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 13: Completes Step 7.2.5, documenting procedure completion **STANDARD:** • Applicant signs his name and may state in the comment section the reason for the procedure being unsatisfactory. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 14: Submits paperwork to examiner/supervisor for review **STANDARD:** • Applicant submits the completed paperwork to the evaluator for review. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

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_____

_____

_____

_____

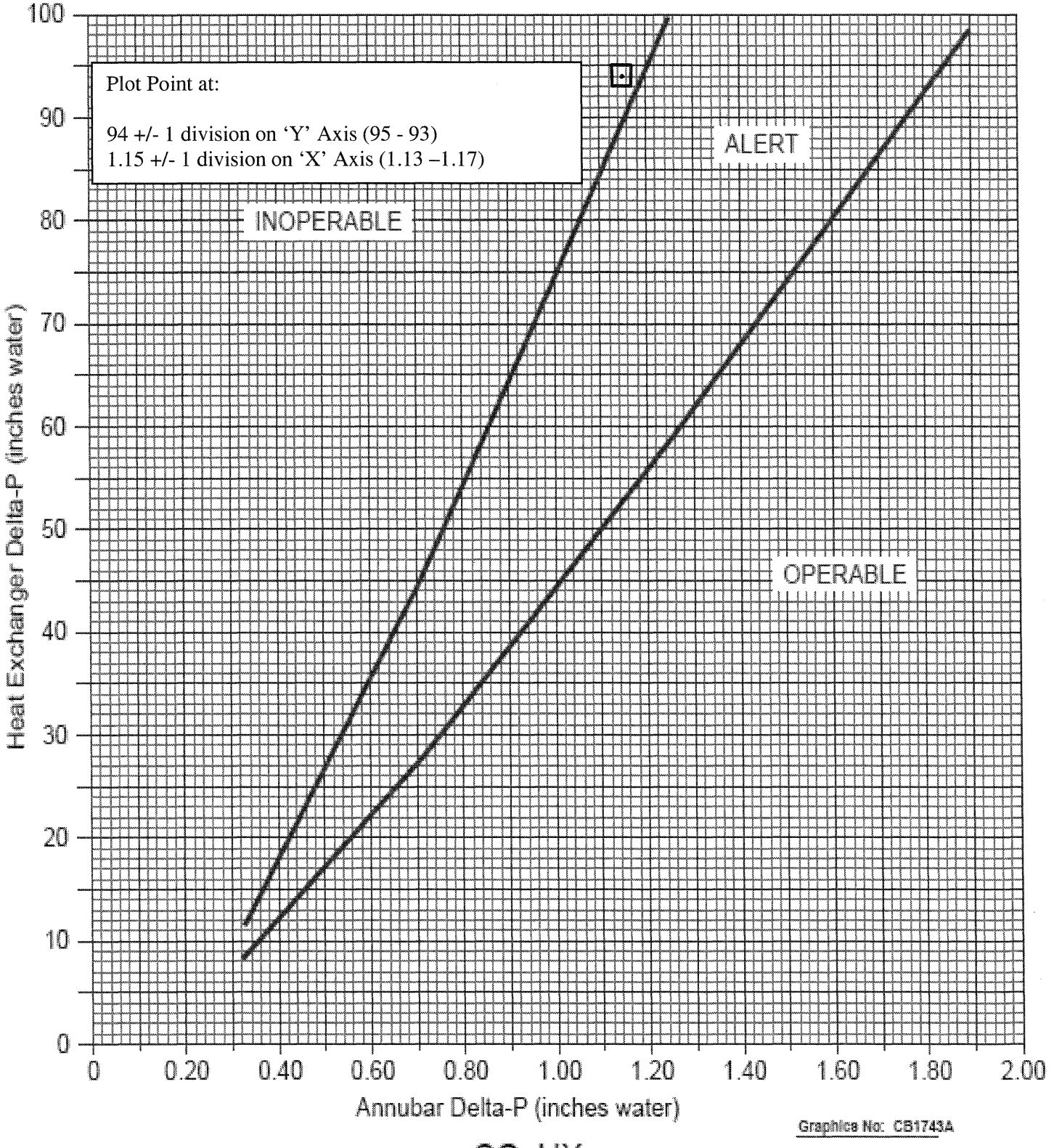
_____

_____

_____

_____

ANSWER KEY



CC HX
OPERABILITY LIMITS
(75) °F

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the classroom.
- Completes 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger, 1-CC-E-1A; and determines if the test was completed satisfactorily or not.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- Unit 1 is at 100% power.
- 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger, 1-CC-E-1A, is partially completed and needs to be finalized.

Initiating Cues

- Here is a copy of 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger (1-CC-E-1A), I need you to complete the procedure and turn it into me for review.
- The necessary data has been collected, but not analyzed or plotted.
- When you are finished, inform your examiner of the results of the surveillance procedure.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions:

- Unit 1 is at 100% power.
- 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger, 1-CC-E-1A, is partially completed and needs to be finalized.

Initiating Cues

- Here is a copy of 1-OSP-SW-002, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger (1-CC-E-1A), I need you to complete the procedure and turn it into me for review.
- The necessary data has been collected, but not analyzed or plotted.
- When you are finished, inform your examiner of the results of the surveillance procedure.

Dominion	PROCEDURE NO: 1-OSP-SW-002
SURRY POWER STATION	REVISION NO: 18
PROCEDURE TYPE: OPERATIONS SURVEILLANCE PROCEDURE	UNIT NO: 1

PROCEDURE TITLE:

MEASUREMENT OF MACROFOULING BLOCKAGE OF COMPONENT COOLING HEAT EXCHANGER 1CC-E-1A

PMT	LR					

REVISION SUMMARY:

Made the following changes in response to PI S-2006-1372.

- Added Commitment Document 2.4.5 on Page 4.
- Revised Step 6.2.2 on Page 7.
- Revised Note and Step 6.2.15 on Page 10.
- Revised Step 6.2.17 on Page 11.
- Revised Step 7.2.2 on Page 12.
- Revised Step 7.2.3 on Page 13.

Added noun name for 1-SW-39 in Step 6.2.2 on Page 7.

UNIT ONE

CONTINUOUS USE

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1.0 PURPOSE

1.1 To provide instructions to monitor flow through the Service Water side of the Component Cooling Heat Exchanger 1-CC-E-1A, and to use the flow readings obtained to determine operability of the heat exchanger with respect to the amount of tubesheet macrofouling. Determining the extent of tubesheet macrofouling provides an aging management basis for License Renewal. **(Ref. 2.4.4)**

2.0 REFERENCES

2.1 Source Documents

2.1.1 EWR 89-152, Installation of permanent annubar

2.1.2 UFSAR 9.9, 9.4, 10.3

2.2 Technical Specifications - Surry Power Station Unit 1 and 2

2.2.1 Technical Specification Sections 3.13 and 3.14

2.3 Technical References

2.3.1 11448-FM-71A, Sheets 1 and 4

2.3.2 PES Calculation ME-0281, R0

2.3.3 DCP 01-008, Instrument and Controls Upgrade Project, Unit 1

2.3.4 ER-AA-AMP-101, Implementation of Activities Performed by License Renewal Aging Management Coordinators

2.4 Commitment Documents

2.4.1 CTS 89-1365-001

2.4.2 PI S-2001-0044

2.4.3 PI S-2004-0011, CC Temperature Change Effect on IX Train

2.4.4 NUREG-1766, Safety Evaluation Report Related to the License Renewal of North Anna Power Station Units 1 and 2, and Surry Power Station Units 1 and 2, January 28, 2003.

2.4.5 PI S-2006-1372, An extended duration flush is required when the CCHX SW discharge valve is less than 1/3 open.

Init **Verif**

3.0 INITIAL CONDITIONS

M

3.1 Shift Supervision has granted permission to perform this test.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Notify Health Physics prior to opening any SW instrument drain valves.

4.2 In order to limit undesired increases in CC temperature, isolation of SW flow through a CC Heat Exchanger shall be minimized.

4.3 To prevent excessive cooling of the CC System during seasons when SW temperature is low, the CC outlet valve, on the heat exchanger being tested, may be closed as allowed by this procedure.

4.4 Technical Specification 3.13 requires two operable Component Cooling Heat Exchangers during one unit operation and three operable CC HXs for two unit operation.

4.5 The amount of SW that is drained to the trough surrounding the CC HXs shall be minimized.

5.0 SPECIAL TOOLS AND EQUIPMENT

None

Init **Verif**

6.0 INSTRUCTIONS

6.1 Work Preparation

M 6.1.1 Personnel participating in this procedure shall initial, sign, and print name in the space provided in Subsection 7.2.

N/A M 6.1.2 IF test is performed to prove operability following maintenance, THEN record Work Order Number and Mark Number. Otherwise, enter N/A.

WO Number: N/A

Mark Number: N/A

M 6.1.3 Verify open 1-CC-587, HX 1B Outlet Valve (Component Cooling).

6.2 Measuring CC HX Flow

N/A 6.2.1 IF desired for fine control of Component Cooling temperature, THEN close 1-CC-583, HX 1A Outlet Valve (Component Cooling). Otherwise, enter N/A.

M 6.2.2 Close 1-SW-39, CC HX A SW Outlet, and record number of turns to full closed. IF valve is found in the full open position, THEN enter FULL OPEN. IF valve is found in the full closed position, THEN enter FULL CLOSED.

21 turns

As found less than or equal to 1/3 open. yes / no (Circle one.)

6.2.3 Bleed entrapped air from 1-SW-FI-150A low side instrument line.

M a. Open 1-SW-953, 1-SW-FI-150A Equalizer.

M b. Open 1-SW-815, CC HX A SW Inlet FI-150A (L) Isol.

M c. Verify open or open 1-SW-949, 1-SW-FI-150A (L) Isol.

M d. Open 1-SW-947, 1-SW-FI-150A (L) Vent, to bleed off trapped air (thirty seconds minimum).

M e. Close 1-SW-947.

6.2.4 Bleed entrapped air from 1-SW-FI-150A high side instrument line.

M a. Open 1-SW-814, CC HX A SW Inlet FI-150A (H) Isol.

M b. Verify open or open 1-SW-950, 1-SW-FI-150A (H) Isol.

M c. Open 1-SW-948, 1-SW-FI-150A (H) Vent, to bleed off trapped air (thirty seconds minimum).

M d. Close 1-SW-948.

M e. Close 1-SW-953.

M 6.2.5 Verify closed or close 1-SW-655, 1-SW-PDI-132A Equalizer Valve.

6.2.6 Bleed entrapped air from low side instrument lines.

M a. Close 1-SW-595, CC HX A SW Inlet DPI-132A (L) Vent.

M b. Slowly open 1-SW-591, CC HX A SW Inlet DPI-132A (L) Isol.

M c. Open 1-SW-595 to bleed off trapped air (thirty seconds minimum).

M d. Re-close 1-SW-595.

6.2.7 Bleed entrapped air from high side instrument lines.

M a. Close 1-SW-594, CC HX A SW Inlet DPI-132A (H) Vent.

M b. Slowly open 1-SW-590, CC HX A SW Inlet DPI-132A (H) Isol.

M c. Open 1-SW-594 to bleed off trapped air (thirty seconds minimum).

M d. Re-close 1-SW-594.

M 6.2.8 Open 1-SW-39, to obtain 10 to 15 inches ΔP on the Barton 1-SW-PDI-132A.

6.2.9 Record the following on Attachment 1.

M a. Barton ΔP

M b. Annubar gauge ΔP, 1-SW-FI-150A

M c. Circulating Water Inlet Temperature for any flowing waterbox, as read on the PCS Computer.

M 6.2.10 Continue to open 1-SW-39 to obtain an additional 10 to 20 inches ΔP on the Barton 1-SW-PDI-132A.

M a. Record data on Attachment 1.

M b. Repeat until either Barton ΔP exceeds 95 inches OR Annubar ΔP exceeds 4.0 inches.

M 6.2.11 Close 1-SW-815, CC HX A SW Inlet FI-150A (L) Isol.

M 6.2.12 Close 1-SW-814, CC HX A SW Inlet FI-150A (H) Isol.

6.2.13 Close the following valves.

M a. 1-SW-590, CC HX A SW Inlet DPI-132A (H) Isol

M b. 1-SW-591, CC HX A SW Inlet DPI-132A (L) Isol

6.2.14 Perform the following steps to depressurize 1-SW-PDI-132A.

M a. Open 1-SW-655, 1-SW-PDI-132A Equalizer Valve.

M b. Slowly open 1-SW-594, CC HX A SW Inlet DPI-132A (H) Vent.

M c. Slowly open 1-SW-595, CC HX A SW Inlet DPI-132A (L) Vent.

M d. WHEN ΔP is reduced to zero, THEN re-close 1-SW-655.

CAUTION

In order to prevent excessive CC cooldown during heat exchanger flushing, 1-CC-583 should be closed during seasons when SW temperature is low.

NOTE: The extended duration full flow flush is done to reduce tube fouling due to sedimentation. The extended duration full flow flush is required when the as found CCHX SW discharge valve position is less than or equal to 1/3 open. (Step 6.2.2) **(Ref. 2.4.5)**

6.2.15 IF the as found SW discharge valve position is more than 1/3 open, THEN start a 5 minute flush of the CC HX IAW the following instructions. IF an extended duration full flow flush is required, THEN enter N/A in this step and in Step 6.2.16. **(Ref. 2.4.5)**

M a. IF desired to limit CC System cooldown, THEN verify closed or close 1-CC-583. Otherwise, enter N/A.

M b. Fully open 1-SW-39.

M 6.2.16 WHEN 1-SW-39 has been open for at least five minutes, THEN return 1-SW-39 to the position recorded in Step 6.2.2, OR to the position specified by Shift Supervision.

6.2.17 Start an extended duration full flow flush IAW the following instructions. IF the extended full flow flush is NOT required, THEN enter N/A in this step. **(Ref. 2.4.3) (Ref. 2.4.5)**

N/A m

a. Verify Cation Bed is not in service on either Unit 1 or Unit 2.

b. Place 1-CH-TCV-1143, Letdown Line Divert, in DIVERT/VCT.

c. Place 2-CH-TCV-2143, Letdown Line Divert, in DIVERT/VCT.

d. Verify closed or close 1-CC-583.

e. Fully open 1-SW-39.

f. WHEN 1-SW-39 has been open at least 1 hour (2 hrs preferred), THEN return 1-SW-39 to the position recorded in Step 6.2.2, OR to the position specified by Shift Supervision.

g. Open 1-CC-583.

h. Allow CC temperature to stabilize.

i. Place 1-CH-TCV-1143, Letdown Line Divert, in AUTO/DEMIN.

j. Place 2-CH-TCV-2143, Letdown Line Divert, in AUTO/DEMIN.

M D

6.2.18 IF 1-CC-583 was closed in Step 6.2.1 or Substep 6.2.15.a, THEN verify open or open 1-CC-583. Otherwise, enter N/A.

6.2.19 Select an Attachment 2 graph illustrating the closest temperature that is equal to or higher than the current Circulating Water Inlet Temperature recorded on Attachment 1.

6.2.20 Using a straightedge, mark on the appropriate Attachment 2 graph the intersection of the highest flow point Barton and Annubar ΔP readings from Attachment 1. IF the highest flow point Barton and Annubar ΔP readings are offscale to the right of the graph, THEN the point is in the Operable Range.

Init **Verif**

7.0 FOLLOW-ON

7.1 Acceptance Criteria

IF the stated Acceptance Criteria are met, THEN the test shall be considered satisfactory.

- The recorded parameters fall within the Operable or Alert band on Attachment 2.

7.2 Follow-on Tasks

Test Result: (✓)

( ) SATISFACTORY ( ) UNSATISFACTORY

_____ 7.2.1 IF the test was satisfactory in the OPERABLE Range, THEN check SATISFACTORY AND enter N/A for Steps 7.2.2 and 7.2.3.

7.2.2 IF the test was satisfactory but in the ALERT Range, THEN check SATISFACTORY AND perform the following. Enter N/A for Step 7.2.3.

_____ a. Notify Shift Supervision.

_____ b. Submit a Work Request to clean the heat exchanger and record the number.

WR Number: _____

_____ c. Submit a Condition Report and record the number.

CR Number: _____

7.2.3 IF results fall in the Inoperable Range, THEN mark UNSATISFACTORY AND perform the following:

_____ a. Notify Shift Supervision.

_____ b. Notify System Engineering of the Inoperable condition and record the name of the person notified.

_____ _____
System Engineer

_____ c. For unacceptable testing results that are due to macrofouling, the System Engineer will consider the potential material degradation effects (loss of material and cracking) of macrofouling that affect the aging management basis of license renewal.

_____ d. Submit a Condition Report and record the number.

CR Number: _____

_____ SRO e. Verify the requirements of Technical Specifications 3.13.A and 3.14.A are met.

_____ f. Submit a Work Request (or note if one is outstanding) to clean the heat exchanger and record the number.

WR Number: _____

7.2.4 Personnel participating in performance of this procedure shall complete the table below.

Initials	Signature	Printed Name	Date
M	WWMarshall	BILL MARSHALL	TODAY
DW	[illegible]	DAVID H WILSON	TODAY

_____ 7.2.5 Notify Shift Supervision of test completion.

Comments: _____

_____

_____

_____

_____

Completed by: _____ Date: _____

7.3 **Review**

Comments: _____

_____

_____

_____

Reviewed by: _____ Date: _____
Shift Supervision

Forward original procedure to Engineering Testing.

Comments: _____

_____

_____

_____

Reviewed by: _____ Date: _____
System Engineer

7.4 **Records**

Submit original procedure to Station Records in accordance with approved Administrative procedures.

(Page 1 of 1)

Attachment 1
1-CC-E-1A MACROFOULING DATA SHEET

Transfer the highest flow point Barton and Annubar ΔP readings to the Attachment 2 graph illustrating the closest temperature that is equal to or higher than the current Circulating Water Inlet Temperature to determine HX acceptability. Other points are gathered for information only. IF the highest flow point Barton and Annubar ΔP readings are offscale to the right of the graph, THEN the point is in the Operable Range.

HEAT EXCHANGER ΔP	ANNUBAR ΔP
21	0.5
56	0.85
75	1.00
94	1.15

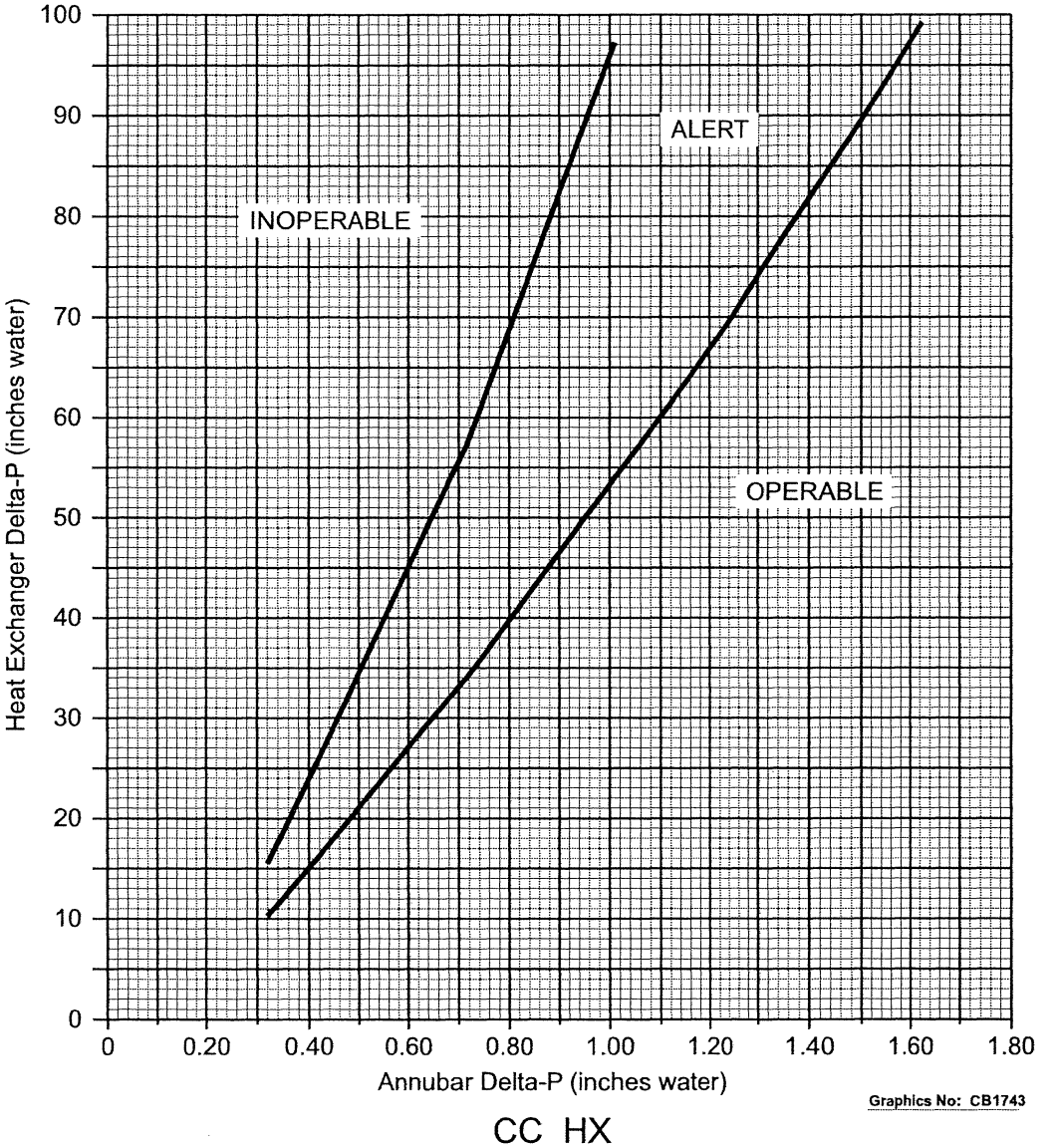
Circulating Water Inlet Temperature: 73 °F

Completed by: W W Markell Date: TODAY

(Page 1 of 6)

Attachment 2

1-CC-E-1A OPERABILITY LIMITS

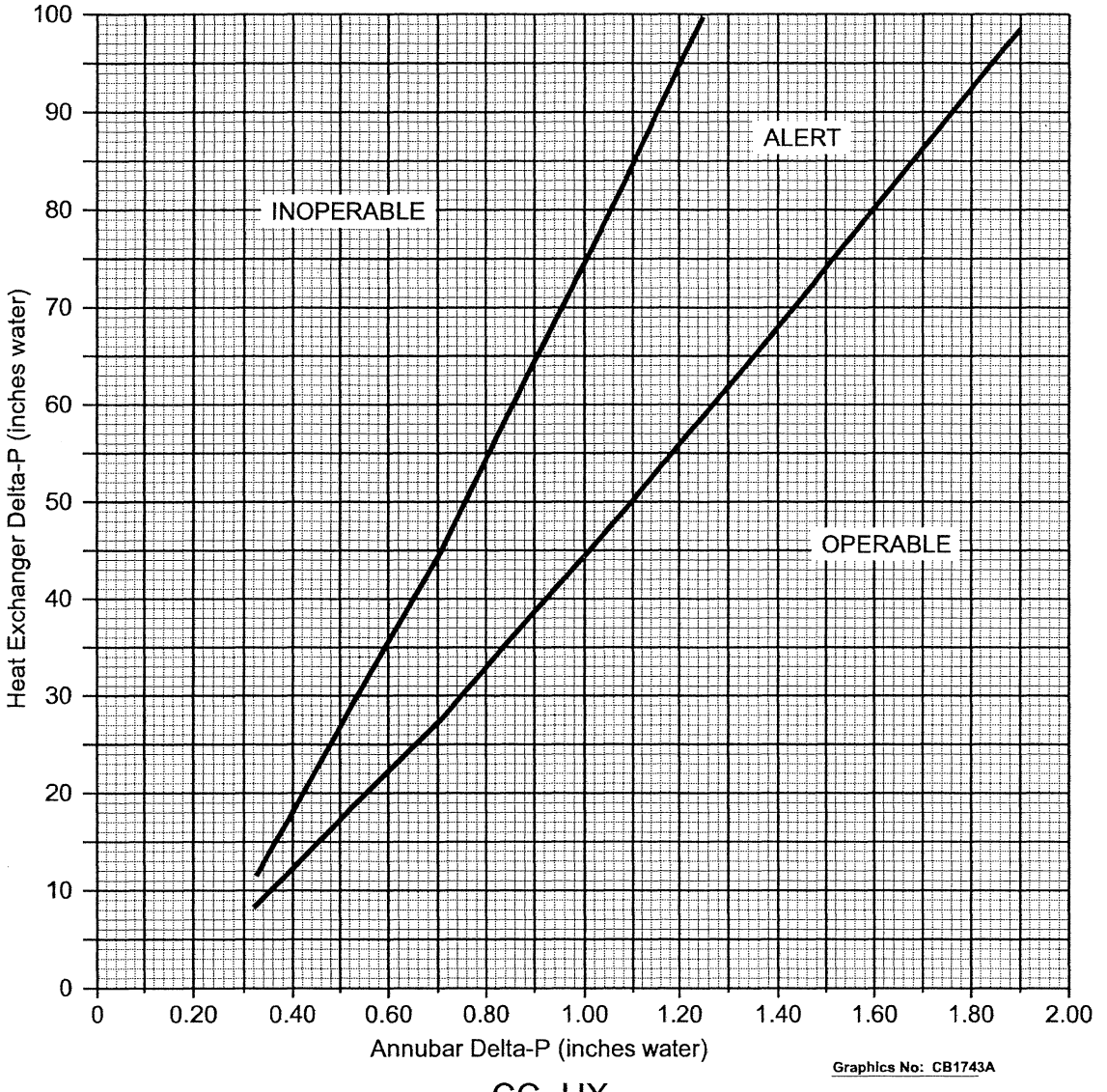


CC HX
OPERABILITY LIMITS
(70) °F

(Page 2 of 6)

Attachment 2

1-CC-E-1A OPERABILITY LIMITS

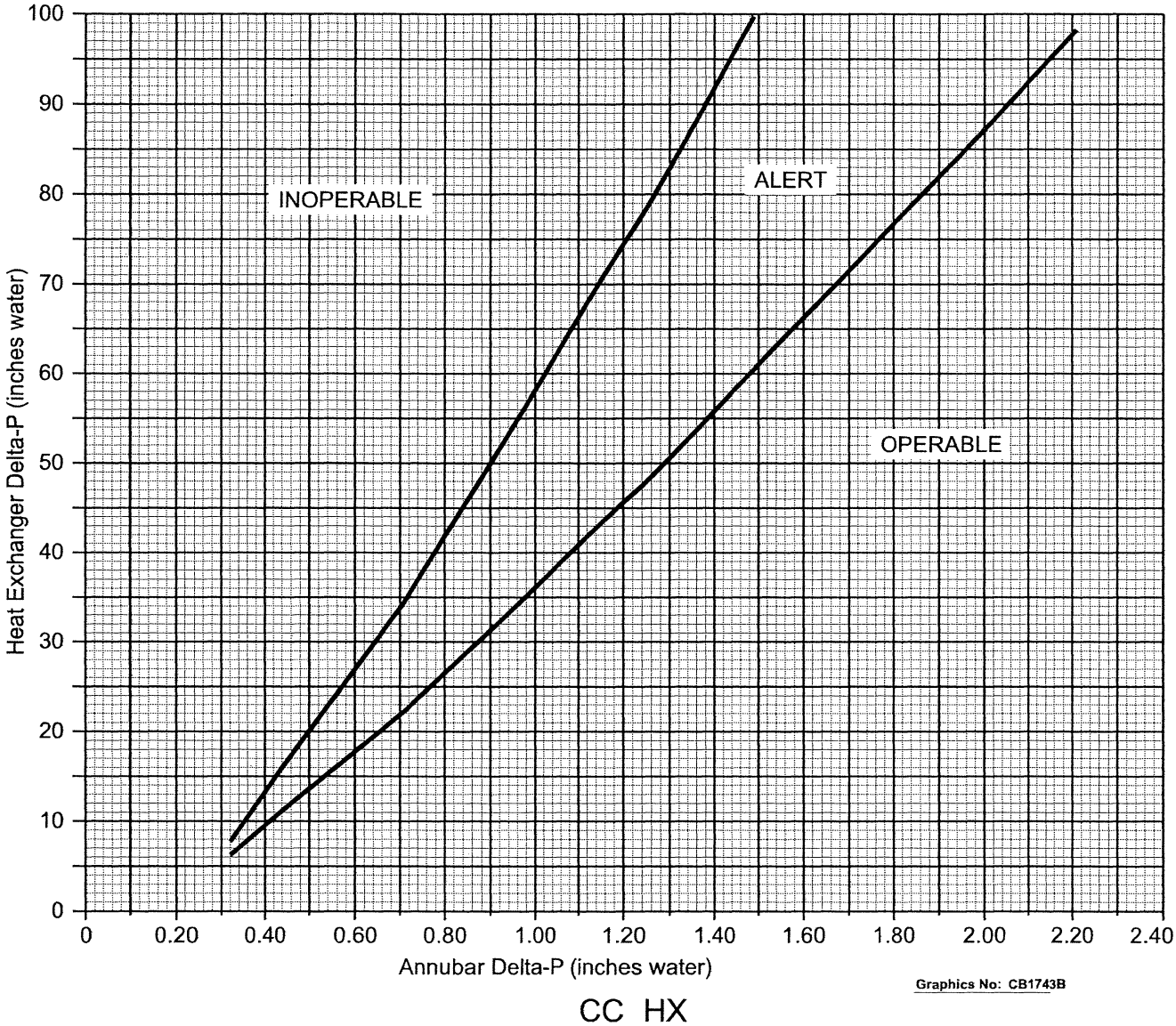


CC HX
OPERABILITY LIMITS
(75) °F

(Page 3 of 6)

Attachment 2

1-CC-E-1A OPERABILITY LIMITS



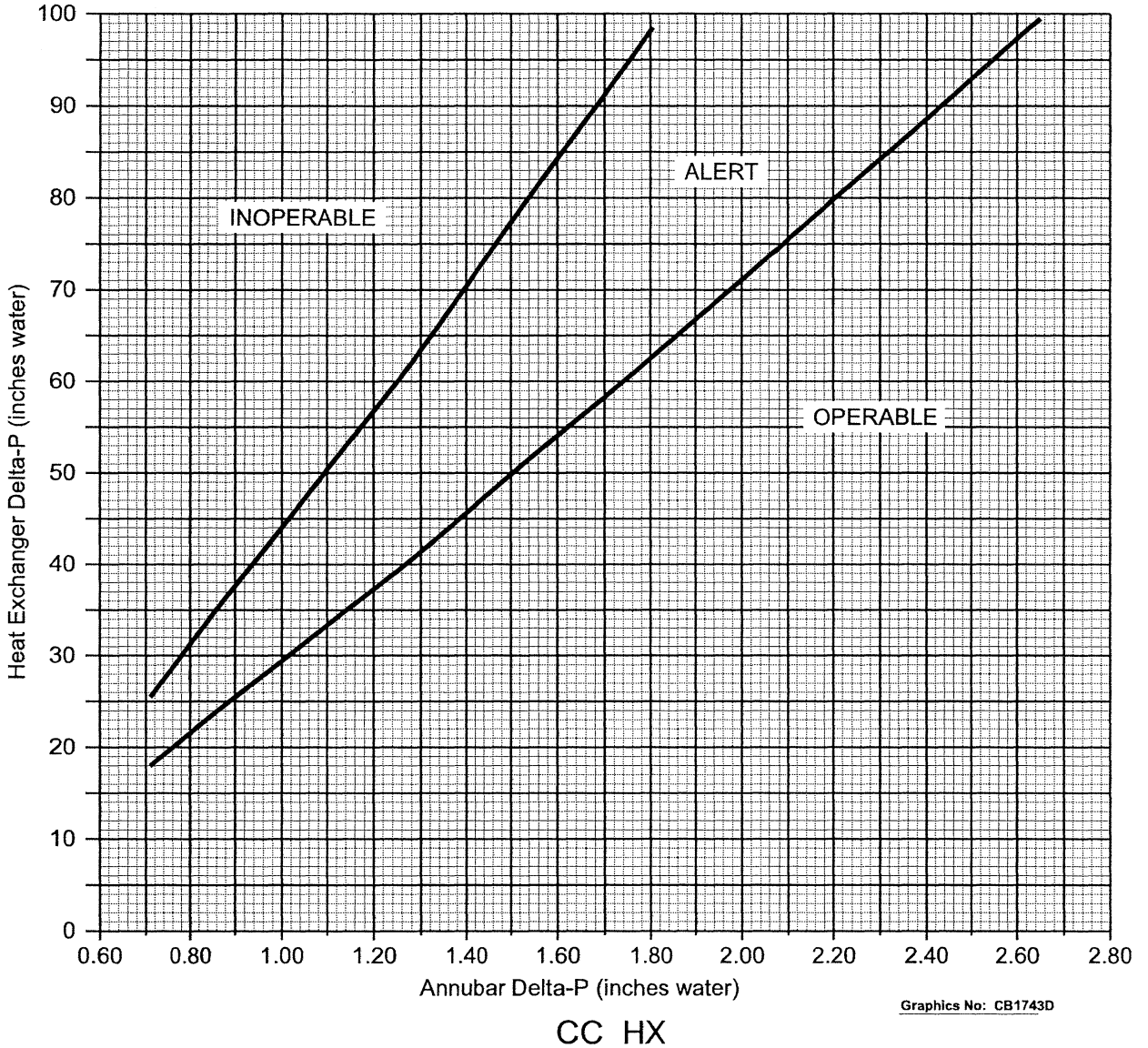
Graphics No: CB1743B

CC HX
OPERABILITY LIMITS
(80) °F

(Page 4 of 6)

Attachment 2

1-CC-E-1A OPERABILITY LIMITS

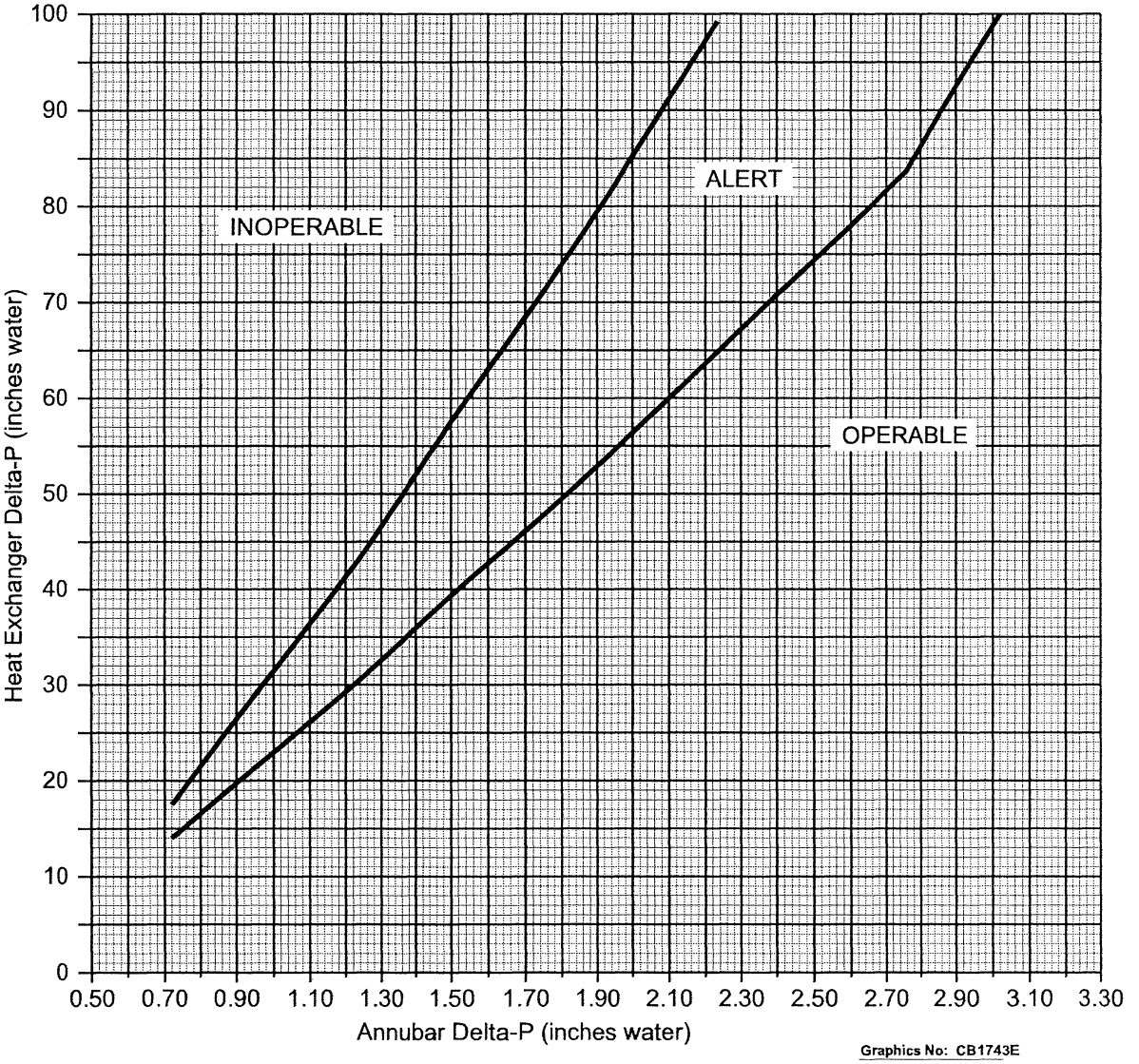


CC HX
OPERABILITY LIMITS
(85) °F

(Page 5 of 6)

Attachment 2

1-CC-E-1A OPERABILITY LIMITS



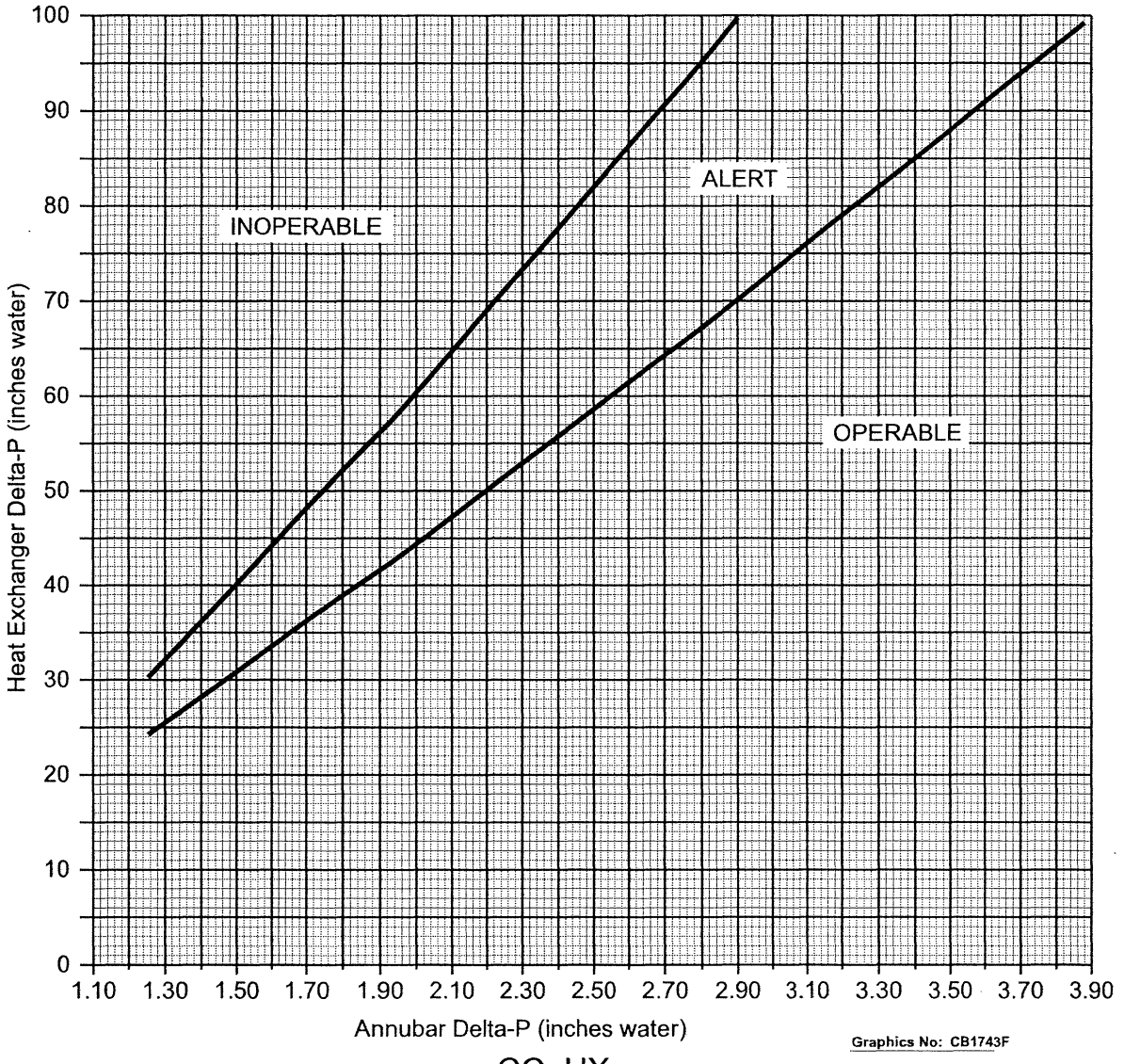
Graphics No: CB1743E

CC HX
OPERABILITY LIMITS
(90) °F

(Page 6 of 6)

Attachment 2

1-CC-E-1A OPERABILITY LIMITS



CC HX
OPERABILITY LIMITS
(95) °F

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Administrative Job Performance Measure G2.2.12

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

Periodic Test Review (1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test)

K/A: G2.2.12 Knowledge of surveillance procedures. (3.0/3.4)

Applicability	**Estimated Time**	**Actual Time**
SRO(I)/SRO(U)	30 Minutes	

Conditions

- Task is to be PERFORMED in the classroom.

Standards

- Correctly identifies errors in 1-OPT-CS-006 (REV 9), RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test.

Initiating Cues

- I am the Shift Manager and you are the Unit Supervisor. Here is a copy of 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, which has just been completed.
- No maintenance has been performed on the Containment Spray system.
- Review 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, for completeness and accuracy.
- List ALL discrepancies noted on the ANSWER SHEET provided.
- When you are finished, inform your examiner of ALL problems noted in the procedure.

Terminating Cues

- Applicant has completed the procedure review and discussed problems with examiner.

Tools and Equipment

- Calculator
- Copy of completed 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test.

Safety Considerations

- None

Notes

- If candidate wants to review Technical Specifications based on identified discrepancies, state that the Shift Manager will review and be responsible for Technical Specification LCOs.

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

STEP 1: Review the purpose of the procedure (Section 1.0) **STANDARD:** _____ Reviews NOTE concerning procedure performance when the Unit is shutdown. _____ Reviews Step 1.1 to identify the procedure provides for verifying proper operation of Containment Spray MOVs on a quarterly basis and to obtain chemistry samples to ensure chemical contamination has not occurred due to valve leakage. _____ Reviews Step 1.2 to determine the OPT also provides instructions to return Containment Spray valves to service following maintenance. **EVALUATOR NOTES:** • If asked: No maintenance has been performed on the Containment Spray System. • A detailed review of this section is not required (no sign-offs). **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: Review the References section (Section 2.0) **STANDARD:** _____ Reviews section 2.1, Source Documents, 2.2 Technical Specifications, 2.3 Technical References, and 2.4 Commitment Documents. **EVALUATOR NOTES:** • A detailed review of this section is not required (no sign-offs). **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: Verifies the Initial Conditions are met (Section 3.0) **STANDARD:** _____ Reviews Step 3.1. This procedure has PSA significance. IF this procedure is being performed on a day other than its POD scheduled date, THEN notify Shift Supervision that a PSA evaluation is required for the performance of this procedure. **EVALUATOR NOTES:** • If asked: The procedure was performed on its scheduled day. • A detailed review of this section is not required (no sign-offs). **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: Reviews the Precautions and Limitations (Section 4.0) **STANDARD:** _____ (Step 4.1) Notes that testing more than one MOV at a time is not permitted. _____ (Step 4.2) The initials identification block in Subsection 7.3 must be completed before the procedure is closed out. _____ (Step 4.3) When stroking MOVs, timing should be performed from the time of the initiation of the manual control panel switch to the time that the final control panel light is extinguished. _____ (Step 4.4) MOVs 1-CS-MOV-101A, 101C, and 100A cannot be closed unless the breaker for 1-CS-P-1A is in TEST or CONNECT. MOVs 1-CS-MOV-101B, 101D, and 100B cannot be closed unless the breaker for 1-CS-P-1A is in TEST or CONNECT. **EVALUATOR NOTES:** • A detailed review of this section is not required (no sign-offs). **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 5: 5.0 SPECIAL TOOLs AND EQUIPMENT (Section 5.0) **STANDARD:** _____ (Step 5.1) Needs hoses and sample containers. _____ (Step 5.2) Needs a stopwatch. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 6: 6.0 INSTRUCTIONS (Section 6.0) **STANDARD:** _____ 6.1 Work Preparation NOTE: Subsections and steps may be performed out of sequence with Shift Supervion permission. _____ 6.1.1 IF this procedure is used to prove operability of equipment after maintenance, THEN record the Work Order Number and Mark Number below or attach a copy of the Work Order Tracking sheet to the completed procedure. Otherwise, enter N/A. **EVALUATOR NOTES:** Maintenance has not been performed, therefore step will be marked N/A and initialed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 7: 6.2 Cycle of 1-CS-MOV-102A. **STANDARD:** _____ Reads NOTE: Isolating a Containment Spray Subsystem when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO. _____ Reads NOTE: A proper hose with a quick disconnect fitting should be located on a rack in the safeguards basement near the Auxiliary Feed Booster Pumps. This will be used to back flush the caustic soda between the MOVs and manual isolation valve. _____ 6.2.1 Connect the quick disconnect fitting of the hose to 1-CS-120, Refueling Wtr Chem Add Tk Otlt Hdr Drain, for 1-CS-MOV-102A. _____ 6.2.2 Run hose from 1-CS-120 to a floor drain. _____ 6.2.3 Declare a Containment Spray Subsystem inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A. _____ _____ 6.2.4 Verify closed or close 1-CS-38, Refueling Water Chem Add Tk Outlet SV MOV-102A Isol. _____ Reads NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV. _____ 6.2.5 From the Control Room, open 1-CS-MOV-102A from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. Time to open in seconds: __18.9_____ Reference Time: 19.6 seconds Acceptable Range: 16.7 to 22.5 seconds Stopwatch SQC Number: __3698_____ Stopwatch Cal Due Date: __5/22/08_____ **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 7: 6.2 Cycle of 1-CS-MOV-102A. (Continued) **STANDARD:** _____ _____ 6.2.6 Close 1-CS-MOV-102A. SV _____ 6.2.7 Throttle open 1-CS-120 one and one half turns. _____ _____ 6.2.8 Open 1-CS-38. SV _____ 6.2.9 Adjust flow to prevent overflowing the floor drain by throttling open 1-CS-120 as required. _____ 6.2.10 AFTER draining approximately 25 gallons OR after flushing for approximately five minutes, THEN close 1-CS-120. _____ 6.2.11 Remove the quick disconnect with the hose from 1-CS-120. _____ 6.2.12 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 8: 6.3 Cycle of 1-CS-MOV-102B **STANDARD:** _____ Reads NOTE: Isolating a Containment Spray Subsystem when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO. _____ 6.3.1 Connect the quick disconnect fitting of the hose to 1-CS-112, Refueling Wtr Chem Add Tk Otlt Hdr Drain, for 1-CS-MOV-102B. _____ 6.3.2 Run hose from 1-CS-112 to a floor drain. _____ 6.3.3 Declare a Containment Spray Subsystem inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A. _____ 6.3.4 Verify closed or close 1-CS-43, Refueling Water Chem Add Tk Outlet MOV-102B Isol. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 8: 6.3 Cycle of 1-CS-MOV-102B (Continued)

_____ **SAT**

_____ **UNSAT**

STANDARD:

_____ Reads NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV.

_____ 6.3.5 From the Control Room, open 1-CS-MOV-102B from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data.

***Time to open in seconds: __23.6__**

Reference Time: 19.87 seconds

Acceptable Range: 16.9 to 22.8 seconds

Stopwatch SQC Number: __3698__

Stopwatch Cal Due Date: __5/22/08__

_____ _____ 6.3.6 Close 1-CS-MOV-102B.
SV

_____ 6.3.7 Throttle open 1-CS-112 one and one half turns.

_____ _____ 6.3.8 Open 1-CS-43.

_____ 6.3.9 Adjust flow to prevent overflowing the floor drain by throttling open 1-CS-112 as required.

_____ 6.3.10 AFTER draining approximately 25 gallons OR flushing for approximately five minutes, THEN close 1-CS-112.

_____ 6.3.11 Remove the quick disconnect with the hose from 1-CS-112.

_____ 6.3.12 Completely drain the hose into the floor drain.

_____ 6.3.13 WHEN the draining is complete, THEN place hose neatly back on rack located in safeguards basement near the Auxiliary Feed Booster Pumps.

_____ 6.3.14 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A.

EVALUATOR NOTES: ***Candidate identifies that the stroke open time exceeds the Acceptable Range values. He should also identify OPT was checked SAT instead of UNSAT** and that no comments were made regarding These items.

COMMENTS:

STEP 9: 6.4 Cycle of 1-CS-P-1A MOVs and Sample of Discharge Header	_____ **SAT**
STANDARD:	_____ **UNSAT**
_____ Reads NOTE: Isolating 1-CS-P-1A when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO.	
_____ 6.4.1 Declare 1-CS-P-1A inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A.	
_____ 6.4.2 Place 1-CS-P-1A in PULL TO LOCK. (Ref. 2.4.3)	
_____ 6.4.3 Verify closed or close 1-CS-MOV-100A, CS PUMP A SUCTION.	
_____ Reads NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV.	
_____ 6.4.4 From the Control Room, open 1-CS-MOV-101A from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-101A is NOT required to be tested, THEN enter N/A.	
***Time to open in seconds: 13.4**	
Reference Time: 17.0 seconds	
Acceptable Range: 14.5 to 19.5 seconds	
Stopwatch SQC Number: 3697	
Stopwatch Cal Due Date: 12/16/07	
EVALUATOR NOTES: ***Candidate identifies that the stroke open time exceeds the Acceptable Range values. He should also identify the OPT was checked SAT instead of UNSAT** and that no comments were made regarding these items. He should also identify that the stopwatch CAL DATE is past due.	
COMMENTS:	

STEP 9: 6.4 Cycle of 1-CS-P-1A MOVs and Sample of Discharge Header (Continued)	_____ **SAT**
STANDARD:	_____ **UNSAT**
_____ 6.4.5 From the Control Room, close 1-CS-MOV-101A from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101A is NOT required to be tested, THEN enter N/A. Time to close in seconds: __14.8__ Reference Time: 17.1 seconds Acceptable Range: 14.6 to 19.6 seconds Stopwatch SQC Number: __3697__ Stopwatch Cal Due Date: __12/16/07__	
EVALUATOR NOTES: The candidate should also identify that the stopwatch CAL DATE is past due.	
_____ 6.4.6 From the Control Room, open 1-CS-MOV-101B from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-101B is NOT required to be tested, THEN enter N/A. Time to open in seconds: __16.6__ Reference Time: 17.1 seconds Acceptable Range: 14.6 to 19.6 seconds Stopwatch SQC Number: __3698__ Stopwatch Cal Due Date: __5/22/08__	
COMMENTS:	

STEP 9: 6.4 Cycle of 1-CS-P-1A MOVs and Sample of Discharge Header (Continued)	_____ **SAT**
STANDARD:	_____ **UNSAT**
_____ 6.4.7 From the Control Room, close 1-CS-MOV-101B from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101B is NOT required to be tested, THEN enter N/A. Time to close in seconds: ___16.7___ Reference Time: 16.8 seconds Acceptable Range: 14.3 to 19.3 seconds Stopwatch SQC Number: ___3698___ Stopwatch Cal Due Date: __5/22/08__	
_____ 6.4.8 From the Control Room, open 1-CS-MOV-100A from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-100A is NOT required to be tested, THEN enter N/A for the following data. Time to open in seconds: ___53.4___ Reference Time: 55.9 seconds Acceptable Range: 47.6 to 64.2 seconds Stopwatch SQC Number: ___3698___ Stopwatch Cal Due Date: __5/22/08__	
COMMENTS:	

STEP 9: 6.4 Cycle of 1-CS-P-1A MOVs and Sample of Discharge Header (Continued)

_____ **SAT**

_____ **UNSAT**

STANDARD:

_____ 6.4.9 Place 1-CS-P-1A in AUTO AFTER STOP. Enter N/A if 1-CS-P-1A is to be left in PTL. (Ref. 2.4.3)

_____ 6.4.10 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A.

_____ 6.4.11 Vent and sample 1-CS-P-1A discharge header IAW the following substeps. IF vent and sample are NOT required, THEN enter N/A for the following substeps.

_____ a. Slowly open 1-CS-57, CTMT Spray Pump 1A Casing Vent.

_____ b. WHEN vent is water solid, THEN close 1-CS-57.

_____ c. Open 1-CS-67, CS Pump 1A Recirc Line Vent, and flush at least 500 ml.

_____ d. Obtain a 1000 ml sample from 1-CS-67.

_____ e. Close 1-CS-67.

_____ f. Label the sample 1-CS-P-1A, and take to Chemistry for analysis.

_____ g. WHEN Chemistry analyzes the sample results, THEN record the results for 1-CS-P-1A discharge header below AND indicate Sat if the results were less than or equal to the Acceptance Criteria or Unsat if results were greater than the Acceptance Criteria.

Chemical	Acceptance Criteria	Results	Sat	Unsat
Cl	0.15 ppm	0.08	_____	_____
F	0.15 ppm	0.04	_____	_____
Na	500 ppm	640	_____	_____

EVALUATOR NOTES: **Candidate identifies that the chemistry results for Na exceeds the Acceptable Criteria value.** He should also identify that no comments were made regarding this and Notifications were not made to the System Engineer and Chemistry.

COMMENTS:

STEP 10: 6.5 Cycle of 1-CS-P-1B MOVs and Sample of Discharge Header	_____ **SAT**
STANDARD:	_____ **UNSAT**
_____ Reads NOTE: Isolating 1-CS-P-1B when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO.	
_____ 6.5.1 Declare 1-CS-P-1B inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A.	
_____ 6.5.2 Place 1-CS-P-1B in PULL TO LOCK. (Ref. 2.4.3)	
_____ 6.5.3 Verify closed or close 1-CS-MOV-100B, CS PUMP B SUCTION.	
_____ Reads NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV.	
_____ 6.5.4 From the Control Room, open 1-CS-MOV-101C from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the followingdata. IF 1-CS-MOV-101C is NOT required to be tested, THEN enter N/A.	
Time to open in seconds: __15.9__	
Reference Time: 16.1 seconds	
Acceptable Range: 13.7 to 18.5 seconds	
Stopwatch SQC Number: __3698__	
Stopwatch Cal Due Date: __5/22/08__	
COMMENTS:	

STEP 10: 6.5 Cycle of 1-CS-P-1B MOVs and Sample of Discharge Header (Continued)	_____ **SAT**
STANDARD:	_____ **UNSAT**
_____ 6.5.5 From the Control Room, close 1-CS-MOV-101C from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101C is NOT required to be tested, THEN enter N/A. Time to close in seconds: __15.8__ Reference Time: 16.3 seconds Acceptable Range: 13.9 to 18.7 seconds Stopwatch SQC Number: __3698__ Stopwatch Cal Due Date: __5/22/08__	
_____ 6.5.6 From the Control Room, open 1-CS-MOV-101D from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-101D is NOT required to be tested, THEN enter N/A. Time to open in seconds: __15.8__ Reference Time: 15.8 seconds Acceptable Range: 13.5 to 18.1 seconds Stopwatch SQC Number: __3698__ Stopwatch Cal Due Date: __5/22/08__	
COMMENTS:	

STEP 10: 6.5 Cycle of 1-CS-P-1B MOVs and Sample of Discharge Header (Continued)	_____ **SAT**
STANDARD:	_____ **UNSAT**
_____ 6.5.7 From the Control Room, close 1-CS-MOV-101D from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101D is NOT required to be tested, THEN enter N/A. Time to close in seconds: ___15.6___ Reference Time: 15.8 seconds Acceptable Range: 13.5 to 18.1 seconds Stopwatch SQC Number: __3698___ Stopwatch Cal Due Date: __5/22/08__	
_____ 6.5.8 From the Control Room, open 1-CS-MOV-100B from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-100B is NOT required to be tested, THEN enter N/A for the following data. Time to open in seconds: ___64.2___ Reference Time: 60 seconds Acceptable Range: 51.0 to 69.0 seconds Stopwatch SQC Number: __3698___ Stopwatch Cal Due Date: __5/22/08__	
COMMENTS:	

STEP 10: 6.5 Cycle of 1-CS-P-1B MOVs and Sample of Discharge Header (Continued)

_____ **SAT**

_____ **UNSAT**

STANDARD:

_____ 6.5.9 Place 1-CS-P-1B in AUTO AFTER STOP. Enter N/A if 1-CS-P-1B is to be left in PTL. (Ref. 2.4.3)

_____ 6.5.10 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A.

_____ 6.5.11 Vent and sample 1-CS-P-1B discharge header IAW the following substeps. IF vent and sample are NOT required, THEN enter N/A for the following substeps.

_____ a. Slowly open 1-CS-60, CTMT Spray Pump 1B Casing Vent.

_____ b. WHEN vent is water solid, THEN close 1-CS-60.

_____ c. Open 1-CS-66, CS Pump 1B Recirc Line Vent, and flush at least 500 ml.

_____ d. Obtain a 1000 ml sample from 1-CS-66.

_____ e. Close 1-CS-66.

_____ f. Label the sample 1-CS-P-1B, and take to Chemistry for analysis.

_____ g. WHEN Chemistry analyzes the sample results, THEN record the results for 1-CS-P-1B discharge header below AND indicate Sat if the results were less than or equal to the Acceptance Criteria or Unsat if results were greater than the Acceptance Criteria.

Chemical	Acceptance Criteria	Results	Sat	Unsat
Cl	0.15 ppm	0.02	_____	_____
F	0.15 ppm	0.01	_____	_____
Na	500 ppm	0.94	_____	_____

COMMENTS:

STEP 11: 7.0 FOLLOW-ON

_____ **SAT**

_____ **UNSAT**

STANDARD:

7.1 Acceptance Criteria

_____ 7.1.1 Evaluate the test results by reviewing the Acceptance Criteria for the components tested. ( )

Each valve tested traveled fully in each direction AND the time to travel full open or full close was in the Acceptable Range.

_____ 1-CS-MOV-102A, CHEM ADD TK OUTLT
_____ 1-CS-MOV-102B, CHEM ADD TK OUTLT
_____ 1-CS-MOV-100A, CS PUMP A SUCT
_____ 1-CS-MOV-100B, CS PUMP B SUCT
_____ 1-CS-MOV-101A, CS PUMP A DISCH
_____ 1-CS-MOV-101B, CS PUMP A DISCH
_____ 1-CS-MOV-101C, CS PUMP B DISCH
_____ 1-CS-MOV-101D, CS PUMP B DISCH

_____ 7.1.2 Document the test results. ( )

***____ Satisfactory ____ Unsatisfactory**

EVALUATOR NOTES: ***Candidate should identify that the test was checked Satisfactory instead of Unsatisfactory.**

Candidate should also identify that the following valves were incorrectly checked as satisfactory:

- 1-CS-MOV-102B for open time exceeding Acceptable Range
- 1-CS-MOV-101A for open time being less than the Acceptable Range

COMMENTS:

STEP 11: 7.0 FOLLOW-ON (Continued)	_____ **SAT**
STANDARD:	_____ **UNSAT**
7.2 Follow-On Tasks	
7.2.1 IF the test was unsatisfactory as a result of valve performance, THEN perform the following actions. Otherwise, enter N/A.	
_____ a. Document the reason for the unsatisfactory test in Operator Comments.	
_____ b. Notify the System Engineer and record the name.	
_____ _____ System Engineer Date	
_____ c. Notify the IST Engineer and record the name.	
_____ _____ IST Engineer Date Date	
_____ d. Initiate a Condition Report and record the number.	
CR No. _____	
_____ e. Initiate a Work Request and record the number.	
Work Request No. _____	
EVALUATOR NOTES: Candidate identifies that this section is marked N/A when the test was actually Unsatisfactory and notifications should be made.	
COMMENTS:	

STEP 11: 7.0 FOLLOW-ON (Continued)

_____ **SAT**

_____ **UNSAT**

STANDARD:

_____ 7.2.2 IF the chemical analysis performed for each Containment Spray Pump discharge header are greater than the maximum values indicated, THEN perform the following actions. Otherwise, enter N/A.

_____ a. Document the reason for the unsatisfactory chemical analysis in Operator Comments.

_____ b. Notify the System Engineer and record the name. System Engineer Date

_____ c. Notify the Chemistry Shift Leader and record the name. Chemistry Shift Leader Date

_____ d. Initiate a Condition Report and record the number.

CR No.

_____

_____ e. Perform 1-OSP-CS-001, containment spray System Chemistry Sample as necessary.

_____ f. Once 1-OSP-CS-001 has been performed satisfactorily then perform 1-OPT-CS-001, FLUSHING SENSITIZED PIPING FOR THE CONTAINMENT SPRAY SYSTEM, Subsection 6.4 or 6.5 as necessary.

_____ 7.2.3 IF a partial test was performed, THEN document the reason for the partial test in Operator Comments. Otherwise, enter N/A.

_____ 7.2.4 Make or verify an entry in the M&TE Usage Log for each SQC device used during this test.

EVALUATOR NOTES: Candidate identifies that section 7.2.2 is marked N/A when chemistry was actually Unsatisfactory and notifications should be made.

COMMENTS:

STEP 11: 7.0 FOLLOW-ON (Continued) **STANDARD:** 7.3 Notification, Documentation, and Procedure Closeout 7.3.1 Notify Shift Supervision that the test is complete. The Initials in this procedure will be identified by the Printed Name. Operator Comments: _____ Completed by: _____ Date: _____ 7.4 Review Shift Supervision Comments: _____ Reviewed by: _____ Date: _____ Shift Supervision Forward original procedure to Engineering Testing. Engineering Comments: _____ Reviewed by: _____ Date: _____ IST Engineer **EVALUATOR NOTES:** Candidate identifies that no Operator Comments were made even though numerous Unsatisfactory conditions existed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

_____

ANSWER KEY
1-OPT-CS-006 REVIEW

1. **Step 6.3.5, 1-CS-MOV-102B exceeds open stroke time limits. (CRITICAL TASK)**
2. **Step 6.4.4, 1-CS-MOV-101A exceeds open stroke time limits. (CRITICAL TASK)**
3. Step 6.4.4, stopwatch cal date is past due.
4. Step 6.4.5, stopwatch cal date is past due.
5. Sodium (Na) concentration exceeds limits.
6. Step 7.1.1, 1-CS-MOV-102B and CS-MOV-101A are checked as meeting the acceptance criteria.
7. **7.1.2, PT is marked as SAT versus UNSAT. (CRITICAL TASK)**
8. Step 7.2.1, step marked N/A when notifications to engineering should be made and Condition Reports/Work Requests should be submitted.
9. Step 7.2.2, step marked N/A when notifications to Chemistry should be made for OOS Sodium.
10. No comments made in the Operator Comments section.

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the classroom.
- Review 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, for completeness and accuracy.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- Unit 1 is at 100% power.
- 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, has just been completed.

Initiating Cues

- I am the Shift Manager and you are the Unit Supervisor. Here is a copy of 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, which has just been completed.
- No maintenance has been performed on the Containment Spray system.
- Review 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, for completeness and accuracy.
- List ALL discrepancies noted on the ANSWER SHEET provided.
- When you are finished, inform your examiner of ALL problems noted in the procedure.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions:

- Unit 1 is at 100% power.
- 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, has just been completed.

Initiating Cues

- I am the Shift Manager and you are the Unit Supervisor. Here is a copy of 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, which has just been completed.
- No maintenance has been performed on the Containment Spray system.
- Review 1-OPT-CS-006, RWST Chemical Addition Tank and Containment Spray System MOV Stroke Test, for completeness and accuracy.
- List ALL discrepancies noted on the ANSWER SHEET provided.
- When you are finished, inform your examiner of ALL problems noted in the procedure.

ANSWER SHEET
1-OPT-CS-006 REVIEW

Dominion	PROCEDURE NO: 1-OPT-CS-006
SURRY POWER STATION	REVISION NO: 9
PROCEDURE TYPE: **OPERATIONS PERIODIC TEST**	UNIT NO: 1

PROCEDURE TITLE:

RWST CHEMICAL ADDITION TANK AND CONTAINMENT SPRAY SYSTEM MOV STROKE TEST

IST	PMT	PSA				

REVISION SUMMARY:

Revised in response to Operations Feedback, OP FB 07-0348. Added P&L 4.4.

UNIT ONE

CONTINUOUS USE

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1.0 PURPOSE

NOTE: If the reactor is shutdown and a test has not been performed within the previous 92 days, a test must be performed within 92 days prior to exceeding 350 degrees and 450 psig. (Reference 2.2.2)

1.1 To provide instructions for verifying the following on a quarterly basis when the RCS is greater than or equal to 350 degrees and 450 psig.

- To verify proper operation of the following MOVs.

  1-CS-MOV-102A, CHEM ADD TK OUTLT

  1-CS-MOV-102B, CHEM ADD TK OUTLT

  1-CS-MOV-100A, CS PUMP A SUCT

  1-CS-MOV-100B, CS PUMP B SUCT

  1-CS-MOV-101A, CS PUMP A DISCH

  1-CS-MOV-101B, CS PUMP A DISCH

  1-CS-MOV-101C, CS PUMP B DISCH

  1-CS-MOV-101D, CS PUMP B DISCH

- To obtain a Chemistry sample of the Containment Spray system to ensure chemical contamination has not occurred due to leakage through the Chemical Addition Tank isolation MOVs.

1.2 To provide instructions to return Containment Spray valves to service following maintenance.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR 6.3.1, Spray Systems

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specification 3.4, Spray Systems

2.2.2 Technical Specification 4.5, Spray Systems Tests

2.2.3 Technical Specification 6.4, Inservice Testing Program

2.3 Technical References

2.3.1 11448-FM-084A, Containment Spray System

2.3.2 ASME OM Code, Section IST, Rules for Inservice Testing of Light-Water Reactor Nuclear Power Plants

2.3.3 Inservice Testing Program Plan for Pumps and Valves

2.3.4 EWR 94-015, Revise valve stroke times to meet new Code Requirements

2.3.5 ET NAF 98-0174, Rev. 0, Containment Spray Discharge MOV Stroke Time Limits

2.3.6 ET S-01-0087, Stroke Time Acceptance Criteria for 1-CS-MOV-101A, B, C, D

2.4 **Commitment Documents**

2.4.1 QA Audit 87-01, Finding 2, Recording of Work Order and Mark Numbers

2.4.2 CTS 1438, Revised PT's to require performance prior to entry into the applicable mode

2.4.3 DR S-97-0063, LHSI/CS pumps in PTL when suction source is isolated

2.4.4 CTS 4349, PMT Stamp and Review

2.4.5 CTS 4675, Maintenance activity was performed with no prior PSA evaluation

2.4.6 PI S-2000-1953, CS Piping Chemistry Control

3.0 INITIAL CONDITIONS

3.1 This procedure has PSA significance. IF this procedure is being performed on a day other than its POD scheduled date, THEN notify Shift Supervision that a PSA evaluation is required for the performance of this procedure. **(Reference 2.4.5)**

4.0 PRECAUTIONS AND LIMITATIONS

4.1 This procedure should be performed on only one MOV at a time.

4.2 The initials identification block in Subsection 7.3 must be completed before the procedure is closed out.

4.3 When stroking MOVs, timing should be performed from the time of the initiation of the manual control panel switch to the time that the final control panel light is extinguished (i.e., if stroking an MOV closed, timing should be performed from the time that the switch is moved to the "Close" position to the time that the red indicating light goes out).

4.4 MOVs 1-CS-MOV-101A, 101C, and 100A cannot be closed unless the breaker for 1-CS-P-1A is in TEST or CONNECT. MOVs 1-CS-MOV-101B, 101D, and 100B cannot be closed unless the breaker for 1-CS-P-1B is in TEST or CONNECT.

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Hoses and Sample Containers necessary to obtain Chemistry samples

5.2 SQC Stopwatch

6.2 Cycle of 1-CS-MOV-102A

NOTE:
- Isolating a Containment Spray Subsystem when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO.
- A proper hose with a quick disconnect fitting should be located on a rack in the safeguards basement near the Auxiliary Feed Booster Pumps. This will be used to back flush the caustic soda between the MOVs and manual isolation valve.

M 6.2.1 Connect the quick disconnect fitting of the hose to 1-CS-120, Refueling Wtr Chem Add Tk Otlt Hdr Drain, for 1-CS-MOV-102A.

M 6.2.2 Run hose from 1-CS-120 to a floor drain.

M 6.2.3 Declare a Containment Spray Subsystem inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A.

M SV 6.2.4 Verify closed or close 1-CS-38, Refueling Water Chem Add Tk Outlet MOV-102A Isol.

NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV.

M 6.2.5 From the Control Room, open 1-CS-MOV-102A from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data.

Time to open in seconds: 18.9

Reference Time: 19.6 seconds

Acceptable Range: 16.7 to 22.5 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M SV 6.2.6 Close 1-CS-MOV-102A.

M 6.2.7 Throttle open 1-CS-120 one and one half turns.

M 6.2.8 Open 1-CS-38.

M 6.2.9 Adjust flow to prevent overflowing the floor drain by throttling open 1-CS-120 as required.

M 6.2.10 AFTER draining approximately 25 gallons OR after flushing for approximately five minutes, THEN close 1-CS-120 .

M 6.2.11 Remove the quick disconnect with the hose from 1-CS-120.

M 6.2.12 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A.

6.3 Cycle of 1-CS-MOV-102B

NOTE: Isolating a Containment Spray Subsystem when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO.

M 6.3.1 Connect the quick disconnect fitting of the hose to 1-CS-112, Refueling Wtr Chem Add Tk Otlt Hdr Drain, for 1-CS-MOV-102B.

M 6.3.2 Run hose from 1-CS-112 to a floor drain.

M 6.3.3 Declare a Containment Spray Subsystem inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A.

M SV 6.3.4 Verify closed or close 1-CS-43, Refueling Water Chem Add Tk Outlet MOV-102B Isol.

NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV.

M 6.3.5 From the Control Room, open 1-CS-MOV-102B from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data.

Time to open in seconds: 23.6

Reference Time: 19.87 seconds

Acceptable Range: 16.9 to 22.8 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M SV 6.3.6 Close 1-CS-MOV-102B.

M 6.3.7 Throttle open 1-CS-112 one and one half turns.

M 6.3.8 Open 1-CS-43.

M 6.3.9 Adjust flow to prevent overflowing the floor drain by throttling open 1-CS-112 as required.

M 6.3.10 AFTER draining approximately 25 gallons OR flushing for approximately five minutes, THEN close 1-CS-112.

M 6.3.11 Remove the quick disconnect with the hose from 1-CS-112.

M 6.3.12 Completely drain the hose into the floor drain.

M 6.3.13 WHEN the draining is complete, THEN place hose neatly back on rack located in safeguards basement near the Auxiliary Feed Booster Pumps.

M 6.3.14 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A.

6.4 Cycle of 1-CS-P-1A MOVs and Sample of Discharge Header

NOTE: Isolating 1-CS-P-1A when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO.

M 6.4.1 Declare 1-CS-P-1A inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A.

M 6.4.2 Place 1-CS-P-1A in PULL TO LOCK. **(Ref. 2.4.3)**

M 6.4.3 Verify closed or close 1-CS-MOV-100A, CS PUMP A SUCTION.

NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV.

M 6.4.4 From the Control Room, open 1-CS-MOV-101A from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-101A is NOT required to be tested, THEN enter N/A.

Time to open in seconds: 13.4

Reference Time: 17.0 seconds

Acceptable Range: 14.5 to 19.5 seconds

Stopwatch SQC Number: 3697

Stopwatch Cal Due Date: 12/16/07

M

6.4.5 From the Control Room, close 1-CS-MOV-101A from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101A is NOT required to be tested, THEN enter N/A.

Time to close in seconds: 14.8

Reference Time: 17.1 seconds

Acceptable Range: 14.6 to 19.6 seconds

Stopwatch SQC Number: 3697

Stopwatch Cal Due Date: 12/16/07

M

6.4.6 From the Control Room, open 1-CS-MOV-101B from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-101B is NOT required to be tested, THEN enter N/A.

Time to open in seconds: 16.6

Reference Time: 17.1 seconds

Acceptable Range: 14.6 to 19.6 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.4.7 From the Control Room, close 1-CS-MOV-101B from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101B is NOT required to be tested, THEN enter N/A.

Time to close in seconds: 16.7

Reference Time: 16.8 seconds

Acceptable Range: 14.3 to 19.3 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.4.8 From the Control Room, open 1-CS-MOV-100A from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-100A is NOT required to be tested, THEN enter N/A for the following data.

Time to open in seconds: 53.4

Reference Time: 55.9 seconds

Acceptable Range: 47.6 to 64.2 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.4.9 Place 1-CS-P-1A in AUTO AFTER STOP. Enter N/A if 1-CS-P-1A is to be left in PTL. **(Ref. 2.4.3)**

M

6.4.10 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A.

6.4.11 Vent and sample 1-CS-P-1A discharge header IAW the following substeps. IF vent and sample are NOT required, THEN enter N/A for the following substeps.

M a. Slowly open 1-CS-57, CTMT Spray Pump 1A Casing Vent.

M b. WHEN vent is water solid, THEN close 1-CS-57.

M c. Open 1-CS-67, CS Pump 1A Recirc Line Vent, and flush at least 500 ml.

M d. Obtain a 1000 ml sample from 1-CS-67.

M e. Close 1-CS-67.

M f. Label the sample 1-CS-P-1A, and take to Chemistry for analysis.

M g. WHEN Chemistry analyzes the sample results, THEN record the results for 1-CS-P-1A discharge header below AND indicate Sat if the results were less than or equal to the Acceptance Criteria or Unsat if results were greater than the Acceptance Criteria.

Chemical	Acceptance Criteria	Results	Sat	Unsat
Cl	0.15 ppm	0.08	✓	
F	0.15 ppm	0.04	✓	
Na	500 ppm	640	✓	

6.5 Cycle of 1-CS-P-1B MOVs and Sample of Discharge Header

NOTE: Isolating 1-CS-P-1B when the RCS is equal to or greater than 350 degrees and 450 psig will start a Technical Specification LCO.

M 6.5.1 Declare 1-CS-P-1B inoperable and start the appropriate Tech Spec Clock. IF Tech Spec Clock does NOT apply, THEN enter N/A.

M 6.5.2 Place 1-CS-P-1B in PULL TO LOCK. **(Ref. 2.4.3)**

M 6.5.3 Verify closed or close 1-CS-MOV-100B, CS PUMP B SUCTION.

NOTE: Refer to Precaution and Limitation 4.3 prior to stroking MOV.

M 6.5.4 From the Control Room, open 1-CS-MOV-101C from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-101C is NOT required to be tested, THEN enter N/A.

Time to open in seconds: 15.9

Reference Time: 16.1 seconds

Acceptable Range: 13.7 to 18.5 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.5.5 From the Control Room, close 1-CS-MOV-101C from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101C is NOT required to be tested, THEN enter N/A.

Time to close in seconds: 15.8

Reference Time: 16.3 seconds

Acceptable Range: 13.9 to 18.7 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.5.6 From the Control Room, open 1-CS-MOV-101D from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-101D is NOT required to be tested, THEN enter N/A.

Time to open in seconds: 15.8

Reference Time: 15.8 seconds

Acceptable Range: 13.5 to 18.1 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.5.7 From the Control Room, close 1-CS-MOV-101D from a full-open position. Using Control Room valve position indication, verify valve closes fully and record the following data. IF 1-CS-MOV-101D is NOT required to be tested, THEN enter N/A.

Time to close in seconds: 15.6

Reference Time: 15.8 seconds

Acceptable Range: 13.5 to 18.1 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.5.8 From the Control Room, open 1-CS-MOV-100B from a full-closed position. Using Control Room valve position indication, verify valve opens fully and record the following data. IF 1-CS-MOV-100B is NOT required to be tested, THEN enter N/A for the following data.

Time to open in seconds: 64.2

Reference Time: 60 seconds

Acceptable Range: 51.0 to 69.0 seconds

Stopwatch SQC Number: 3698

Stopwatch Cal Due Date: 5/22/08

M

6.5.9 Place 1-CS-P-1B in AUTO AFTER STOP. Enter N/A if 1-CS-P-1B is to be left in PTL. **(Ref. 2.4.3)**

M

6.5.10 Stop Tech Spec clock. IF a Tech Spec clock was NOT started, THEN enter N/A.

6.5.11 Vent and sample 1-CS-P-1B discharge header IAW the following substeps. IF vent and sample are NOT required, THEN enter N/A for the following substeps.

M a. Slowly open 1-CS-60, CTMT Spray Pump 1B Casing Vent.

M b. WHEN vent is water solid, THEN close 1-CS-60.

M c. Open 1-CS-66, CS Pump 1B Recirc Line Vent, and flush at least 500 ml.

M d. Obtain a 1000 ml sample from 1-CS-66.

M e. Close 1-CS-66.

M f. Label the sample 1-CS-P-1B, and take to Chemistry for analysis.

M g. WHEN Chemistry analyzes the sample results, THEN record the results for 1-CS-P-1B discharge header below AND indicate Sat if the results were less than or equal to the Acceptance Criteria or Unsat if results were greater than the Acceptance Criteria.

Chemical	Acceptance Criteria	Results	Sat	Unsat
Cl	0.15 ppm	0.02	✓	
F	0.15 ppm	0.01	✓	
Na	500 ppm	0.94	✓	

7.0 FOLLOW-ON

7.1 Acceptance Criteria

M 7.1.1 Evaluate the test results by reviewing the Acceptance Criteria for the components tested. (✓)

Each valve tested traveled fully in each direction AND the time to travel full open or full close was in the Acceptable Range.

✓ 1-CS-MOV-102A, CHEM ADD TK OUTLT (Step 6.2.5)

✓ 1-CS-MOV-102B, CHEM ADD TK OUTLT (Step 6.3.5)

✓ 1-CS-MOV-100A, CS PUMP A SUCT (Step 6.4.8)

✓ 1-CS-MOV-100B, CS PUMP B SUCT (Step 6.5.8)

✓ 1-CS-MOV-101A, CS PUMP A DISCH (Step 6.4.4 and Step 6.4.5)

✓ 1-CS-MOV-101B, CS PUMP A DISCH (Step 6.4.6 and Step 6.4.7)

✓ 1-CS-MOV-101C, CS PUMP B DISCH (Step 6.5.4 and Step 6.5.5)

✓ 1-CS-MOV-101D, CS PUMP B DISCH (Step 6.5.6 and Step 6.5.7)

M 7.1.2 Document the test results. (✓)

✓ Satisfactory ____ Unsatisfactory

7.2 Follow-On Tasks

7.2.1 IF the test was unsatisfactory as a result of valve performance, THEN perform the following actions. Otherwise, enter N/A.

N/A

a. Document the reason for the unsatisfactory test in Operator Comments.

b. Notify the System Engineer and record the name.

_____ System Engineer _____ Date

c. Notify the IST Engineer and record the name.

_____ IST Engineer _____ Date

d. Initiate a Condition Report and record the number.

CR No. _____

e. Initiate a Work Request and record the number.

Work Request No. _____

N/A

7.2.2 IF the chemical analysis performed for each Containment Spray Pump discharge header are greater than the maximum values indicated, THEN perform the following actions. Otherwise, enter N/A.

a. Document the reason for the unsatisfactory chemical analysis in Operator Comments.

b. Notify the System Engineer and record the name.

_____ System Engineer _____ Date

c. Notify the Chemistry Shift Leader and record the name.

_____ Chemistry Shift Leader _____ Date

N/A

d. Initiate a Condition Report and record the number.

CR No. _____

e. Perform 1-OSP-CS-001, containment spray System Chemistry Sample as necessary.

f. Once 1-OSP-CS-001 has been performed satisfactorily then perform 1-OPT-CS-001, FLUSHING SENSITIZED PIPING FOR THE CONTAINMENT SPRAY SYSTEM, Subsection 6.4 or 6.5 as necessary.

7.2.3 IF a partial test was performed, THEN document the reason for the partial test in Operator Comments. Otherwise, enter N/A.

M

7.2.4 Make or verify an entry in the M&TE Usage Log for each SQC device used during this test.

7.3 Notification, Documentation, and Procedure Closeout

M

7.3.1 Notify Shift Supervision that the test is complete.

The Initials in this procedure will be identified by the Printed Name.

Initials	Printed Name
M	BILL MARSHALL
[illegible]	DAVID H WILSON

Operator Comments: _____

Completed by: W W Marshall Date: TODAY

7.4 **Review**

Shift Supervision Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reviewed by: _____ Date: _____
Shift Supervision

Forward original procedure to Engineering Testing.

Engineering Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reviewed by: _____ Date: _____
IST Engineer

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Administrative Job Performance Measure G2.3.2

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

Calculate the radiation exposure when locally operating 2-SI-MOV-2865B.

K/A: G2.3.2 Knowledge of facility ALARA program. (2.5/2.9)

Applicability	**Estimated Time**	**Actual Time**
RO/SRO(I)/SRO(U)	25 Minutes	

Conditions

- Task is to be PERFORMED in the classroom.

Standards

- Correctly calculates radiation exposure.

Initiating Cues

- You are to answer the radiation control question, placing your response on the paper containing the question.
- When you are finished responding to the questions, inform an examiner.

Terminating Cues

- Applicant informs the examiner that the answer to the question has been completed.

Tools and Equipment

- Calculator
- Survey Data

Safety Considerations

- None

Initial Conditions:

- Unit 2 is in a refueling outage and leakage out of the 'B' SI Accumulator has been noted.
- The operating team has attempted to close 2-SI-MOV-2865B; the valve cannot be closed from the MCR and needs to be locally closed.
- You have been tasked with entering containment and locally closing 2-SI-MOV-2865B and then exiting containment.
- HP has reported that there is airborne contamination in the area of 2-SI-MOV-2865B and have asked that the use of SCBAs be considered, although they have not required it.
- HP has stated that if respirators are **NOT** worn, the internal dose rate while manipulating 2-SI-MOV-2865B is **60 mrem/hr**; this dose rate is in addition to the radiation field (external dose rate = 70 mrem/hr) where the valve is located.
- HP has also stated that the average dose rate from the containment entry point to the valve is 20 mrem/hr and there is no airborne contamination while traveling to and from 2-SI-MOV-2865B.
- A second operator is available to aid you in performance of this task, if you deem it necessary.
- HP personnel are currently unavailable to provide assistance for dose determination.

Initiating Cues

Given the travel times, times to perform the task and dose rates on the attached table, calculate which one of the following will result in the lowest total dose for this task (Travel to and from the valve and close the valve)?

a. One operator wearing an SCBA

b. Two operators not wearing an SCBA

Notes

Times to perform the task:

Two way travel time to 2-SI-MOV-2865B without a SCBA	12 minutes
Two way travel time to 2-SI-MOV-2865B with a SCBA	16 minutes
Time for two people without SCBAs to close 2-SI-MOV-2865B	5 minutes
Time for one person with a SCBA to close 2-SI-MOV-2865B	16 minutes

Dose rates for the Areas

Average Dose Rate while traveling to and from 2-SI-MOV-2865B	20 mrem/hr
Average External Dose Rate while closing 2-SI-MOV-2865B	70 mrem/hr
Average Internal Dose Rate while closing 2-SI-MOV-2865B (if applicable)	60 mrem/hr

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

STEPS CAN BE PERFORMED IN ANY ORDER STEP 1: APPLICANT CALCULATES THE TOTAL EXPOSURE FROM TRAVELING TO AND FROM 2-SI-MOV-2865B. **STANDARD:** ***a) One operator, with SCBA** **Total travel time is 16 minutes.** **Average Dose Rate during travel is 20 mrem/hr.** **(20 mrem/hr) x (1 hr / 60 minutes) x (16 minutes) = 5.33 mrem [5 – 6 mrem]** **Total Travel Time Dose: 5.33 mrem** b) Two operators, **NO** SCBAs Total travel time is 12 minutes. Average Dose Rate during travel is 20 mrem/hr. (20 mrem/hr) x (1 hr / 60 minutes) x (12 minutes) = 4 mrem (2 operators) x (4 mrem) = 4 mrem Total Travel Time Dose: 8 mrem **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEPS CAN BE PERFORMED IN ANY ORDER STEP 2: APPLICANT CALCULATES THE TOTAL EXPOSURE FROM CLOSING 2-SI-MOV-2865B. **STANDARD:** ***a) One operator, <u>with</u> SCBA** **Time to close the valve is 16 minutes.** **Average External Dose Rate 70 mrem/hr.** **(70 mrem/hr) x (1 hr / 60 minutes) x (16 minutes) = 18.67 mrem external.** **Total dose to close the valve: <u>18.67 mrem [18 – 19 mrem]</u>** b) Two operators, **NO** SCBAs Time to close the valve is 5 minutes. Average External Dose Rate 70 mrem/hr. Average Internal Dose Rate 60 mrem/hr. (70 mrem/hr) x (1 hr / 60 minutes) x (5 minutes) = 5.83 mrem external. (60 mrem/hr) x (1 hr / 60 minutes) x (5 minutes) = 5 mrem internal. (2 operators) x (5.83 mrem + 5 mrem) = 21.66 mrem Total dose to close the valve: <u>21.66 mrem</u> [21 – 22 mrem] **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEPS CAN BE PERFORMED IN ANY ORDER STEP 3: APPLICANT DETERMINES TOTAL JOB DOSE. **STANDARD:** ***a) One operator, <u>with</u> SCBA** **Total dose to close the valve: 18.67 mrem [18 – 19 mrem]** **Total Travel Time Dose: 5.33 mrem [5 – 6 mrem]** **Total Job Dose: <u>24 mrem</u> [23 – 25 mrem]** b) Two operators, **NO** SCBAs Total dose to close the valve: 21.66 mrem [21 –22 mrem] Total Travel Time Dose: 8 mrem Total Job Dose: <u>29.66 mrem</u> [29 – 30 mrem] **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEPS CAN BE PERFORMED IN ANY ORDER STEP 4: TASK TEAM DETERMINATION. **STANDARD:** Applicant reports that one operator with a respirator is the team that will perform the task with the minimum total dose. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

_____

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the classroom.
- Determine the number of operators and whether or not the use of an SCBA will be required to perform the task (travel to and from 2-SI-MOV-2865B and then close 2-SI-MOV-2865B, and then exit containment) and yield the lowest total dose.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- Unit 2 is in a refueling outage and leakage out of the 'B' SI Accumulator has been noted.
- The operating team has attempted to close 2-SI-MOV-2865B; the valve cannot be closed from the MCR and needs to be locally closed.
- You have been tasked with entering containment and locally closing 2-SI-MOV-2865B and then exiting containment.
- HP has reported that there is airborne contamination in the area of 2-SI-MOV-2865B and have asked that the use of SCBAs be considered, although they have not required it.
- HP has stated that if respirators are **NOT** worn, the internal dose rate while manipulating 2-SI-MOV-2865B is **60 mrem/hr**; this dose rate is in addition to the radiation field (external dose rate = 70 mrem/hr) where the valve is located.
- HP has also stated that the average dose rate from the containment entry point to the valve is 20 mrem/hr and there is no airborne contamination while traveling to and from 2-SI-MOV-2865B.
- A second operator is available to aid you in performance of this task, if you deem it necessary.
- HP personnel are currently unavailable to provide assistance for dose determination.

Initiating Cues

Given the travel times, times to perform the task and dose rates on the attached table, calculate which one of the following will result in the lowest total dose for this task (Travel to and from the valve and close the valve)?

a. One operator wearing an SCBA

b. Two operators not wearing an SCBA

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Task

- Task is to be performed in the classroom.
- Determine the number of operators and whether or not the use of an SCBA will be required to perform the task (travel to and from 2-SI-MOV-2865B and then close 2-SI-MOV-2865B, and then exit containment) and yield the lowest total dose.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- Unit 2 is in a refueling outage and leakage out of the 'B' SI Accumulator has been noted.
- The operating team has attempted to close 2-SI-MOV-2865B; the valve cannot be closed from the MCR and needs to be locally closed.
- You have been tasked with entering containment and locally closing 2-SI-MOV-2865B and then exiting containment.
- HP has reported that there is airborne contamination in the area of 2-SI-MOV-2865B and have asked that the use of SCBAs be considered, although they have not required it.
- HP has stated that if respirators are **NOT** worn, the internal dose rate while manipulating 2-SI-MOV-2865B is **60 mrem/hr**; this dose rate is in addition to the radiation field (external dose rate = 70 mrem/hr) where the valve is located.
- HP has also stated that the average dose rate from the containment entry point to the valve is 20 mrem/hr and there is no airborne contamination while traveling to and from 2-SI-MOV-2865B.
- A second operator is available to aid you in performance of this task, if you deem it necessary.
- HP personnel are currently unavailable to provide assistance for dose determination.

Initiating Cues

Given the travel times, times to perform the task and dose rates on the attached table, calculate which one of the following will result in the lowest total dose for this task (Travel to and from the valve and close the valve)?

a. One operator wearing an SCBA

b. Two operators not wearing an SCBA

Times to perform the task:

Two way travel time to 2-SI-MOV-2865B without a SCBA	12 minutes
Two way travel time to 2-SI-MOV-2865B with a SCBA	16 minutes
Time for two people without SCBAs to close 2-SI-MOV-2865B	5 minutes
Time for one person with a SCBA to close 2-SI-MOV-2865B	16 minutes

Dose rates for the Areas

Average Dose Rate from while traveling to and from 2-SI-MOV-2865B	20 mrem/hr
Average External Dose Rate while closing 2-SI-MOV-2865B	70 mrem/hr
Average Internal Dose Rate while closing 2-SI-MOV-2865B (if applicable)	60 mrem/hr

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Administrative Job Performance Measure G2.4.43
TIME CRITICAL

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

Transmit Report of Emergency to State and Local Governments

K/A: G2.4.43 Knowledge of the emergency communications systems and techniques. (2.8/3.5)

Applicability	**Estimated Time**	**Actual Time**
RO	15 Minutes	

Conditions

- Task should be performed in the simulator.

Standards

- Report of Emergency to State and Local Governments, EPIP-2.01 Attachment 2, form completed.

Initiating Cues

- Nuclear Shift Manager direction.

Terminating Cues

- EPIP-2.01 Attachment 2 completed.

Procedures

- EPIP-2.01, NOTIFICATIONS OF STATE AND LOCAL GOVERNMENTS (REV 36)

Tools and Equipment

- None

Safety Considerations

- None

Initiating Cues

- The Shift Manager has just declared a Site Area Emergency for a failure of the reactor to automatically or manually trip from the main control room. The reactor has been tripped from outside the main control room. The Shift Manager has directed you to complete EPIP-2.01, Notification of State and Local Governments, including filling out Attachment 2, Report of Emergency to State and Local Governments. Transmission of the report is NOT required.

Directions to the Applicant

- This is a TIME CRITICAL JPM.
- The Unit 1 operator was unable to trip the reactor automatically or manually from the main control room.
- The reactor has been tripped from outside the main control room.
- The Shift Manager just declared a Site Area Emergency due to the failure.
- The Shift Manager has directed you to complete EPIP-2.01, Notification of State and Local Governments, including filling out Attachment 2, Report of Emergency to State and Local Governments.
- Transmission of the report is NOT required.
- You are in the Main Control Room.
- This is the first report that will be made to the State and Local Governments.
- On-site weather instruments indicate wind is from the North East (45 degrees) with an average wind speed of 10 mph.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

STEP 1:	INITIATE PROCEDURE: **Standards** Completes Step 1 of EPIP-2.01 • By: _____ • Date:_____ • Time:_____ • Location:_____ **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**
STEP 2:	CHECK FIRST REPORT OF EMERGENCY FOR EVENT - REQUIRED. **Standards** Recalls that this is the first report of the emergency (or asks). *If asked, state that this is the first report of the emergency.* **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**

STEP 3:	RECORD INFORMATION ON ATTACHMENT 2 (REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS). **Standards** Reviews the following NOTES: • The initial notification of any emergency classification must be made (meaning contact initiated with the first agency) within 15 minutes of declaring the emergency class. • Items 6 though 9 on Attachment 2 are optional for a message reporting initial entry into the Emergency Plan or an emergency class change, including emergency termination and may be check 'Excluded from this message.' • Attachment 1, Instructions for Completing Report of Emergency to State and Local Governments, may be referenced as needed. Proceeds to Attachment 2 of EPIP-2.01 **EVALUATOR CUE:** **Time SAE declared is 2 minutes before present clock time.** Provide this cue when applicant is filling out Attachment 2. **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**

STEP 3:	RECORD INFORMATION ON ATTACHMENT 2 (Continued) **Standards** Fills out Attachment 2 (bolded below): MESSAGE # ____**1**____ APPROVAL: _____ (Station Emergency Manager or Recovery Manager) TIME NOTIFICATION STARTED: _____ This is Surry Power Station [**X**] Control Room [ ] TSC [ ] LEOF [ ] CEOF. Standby for a roll-call followed by an emergency message. Use a Report of Emergency form to copy this message. (Conduct a roll-call and check boxes as each party answers) [ ] Surry County [ ] State EOC [ ] Williamsburg [ ] York County [ ] James City County [ ] Isle of Wight County [ ] Newport News The emergency message is as follows: (READ SLOWLY) <u>Item 1: Emergency Class</u>: [ ] Notification of Unusual Event Declared at _____ on _____ [ ] Alert (24-hr time) (date) **[X] Site Area Emergency *(CRITICAL TASK)** [ ] General Emergency [ ] Emergency Terminated	_____ **SAT** _____ **UNSAT**

STEP 3:	RECORD INFORMATION ON ATTACHMENT 2 (Continued) Standards Fills out Attachment 2 (bolded below): Item 2: Release of radioactive material: [**X**] Is within federal limits and NOT related to the event [ ] Related to the event is presently occurring [Place release in context in Item 5] [ ] Related to the event has occurred and is now terminated [Place release in context in Item 5] [ ] Related to the event is projected to occur [Place projected release in context in Item 5] *If asked, no radioactive release is in progress; however, a normal steam release is ongoing through the TDAFW pump.* Item 3: [ ] We will transmit a Report of Radiological Conditions to the State EOC. [**X**] We will not issue a Report of Radiological Conditions. *If asked, a report of radiological conditions is not required..* Item 4: Meteorological Data: AVE Wind Direction from **45** degrees (0 to 360), Compass Point: **North East**; AVE Wind Speed **10** mph Based on: [**X**] On-site Measurements [ ] Off-site Measurements [ ] Not available Item 5: Remarks / Description of event and release, as applicable. (Do not use abbreviations, marknumbers and acroynms.): **Unit 1 reactor failed to trip. The reactor is now tripped. (or words to this effect).** ***(CRITICAL TASK)**	_____ **SAT** _____ **UNSAT**

STEP 3: RECORD INFORMATION ON ATTACHMENT 2 (Continued) Standards Fills out Attachment 2 (bolded below): **NOTE:** Items 6 - 9 are optional for a message reporting initial entry into the Emergency Plan or an emergency class change, including emergency termination and may be checked 'Excluded from this message.' "**Items 6 - 9 are excluded from this message**" may be read in lieu of each item. Item 6: Assistance requested or being provided: [**X**] Excluded from this message [ ] None _____(#) Fire Units from _____ _____(#) Rescue Units from _____ _____(#) Police Units from_____ _____(#) Other _____ *If asked, no off-site assistance is required.* Item 7: Emergency response actions underway: [**X**] Excluded from this message [ ] None [ ] Station monitoring teams dispatched off-site [ ] Other _____ [ ] Station emergency personnel called in *If asked, no off-site assistance is required station emergency personnel called in.* Item 8: Evacuation or Company Dismissal of on-site personnel: [**X**] Excluded from this message [ ] No [ ] Yes, evacuated to: [ ] Primary Remote Assembly Area. [ ] Secondary Remote Assembly Area. [ ] Other_____ [ ] Company Dismissal of non-essential personnel: [ ] is planned. [ ] is in progress. [ ] has been completed. *If asked, evacuation or dismissal is planned.*	_____ **SAT** _____ **UNSAT**

STEP 3:	RECORD INFORMATION ON ATTACHMENT 2 (Continued) Standards Fills out Attachment 2 (bolded below): Item 9: Prognosis of Situation: [**X**] Excluded from this message [ ] Improving [ ] Stable [ ] Worsening [ ] Other _____ *If asked, condition is stable.* Item 10: This is (name) _____/Emergency Communicator. Please acknowledge receipt of this message. **(Conduct roll-call and check boxes)** [ ] Surry County [ ] State EOC [ ] Williamsburg [ ] York County [ ] James City County [ ] Isle of Wight County [ ] Newport News This is Surry Power Station [**X**] Control Room [ ] TSC [ ] LEOF [ ] CEOF out at _____ on _____. (24-hr time) (date)	_____ **SAT** _____ **UNSAT**

STEP 3:	RECORD INFORMATION ON ATTACHMENT 2 (Continued) Standards Fills out Attachment 2 (bolded below): **NOTE:** • When transmitted, the following information is for state use only. Transmit to State EOC using the DEM ARD. • The remainder of this report is not transmitted when the message reports emergency termination. This is Surry Power Station [**X**] Control Room [ ] TSC [ ] LEOF [ ] CEOF continuing the message. Item 11: Recommended off-site protective actions are: [**X**] None [ ] Shelter-in-place: Mile radius (360) and Miles downwind in the following sectors _____. [ ] Evacuate: Mile radius (360) and Miles downwind in the following sectors: _____. [ ] Beyond 10 Mile EPZ: [ ] Evacuate Area: _____ Centerline (degrees); _____ Distance (Miles); _____ Width (feet) [ ] Shelter-in-place: _____ Centerline (degrees); _____ Distance (Miles); _____ Width feet) [ ] Potassium Iodide: Recommend implementation of Potassium Iodide (KI) strategies for the general public. The projected dose at the site boundary is > 5 Rem Thyroid CDE. *If asked, Protective Actions are not required..* Item 12: Update schedule: [ ] 60 minute; [ ] Other _____ Name of State EOC Duty Officer: _____ This is Surry Power Station [**X**] Control Room [ ] TSC [ ] LEOF [ ] CEOF out at _____ on _____. (24-hr time) (date) RETURNS TO STEP 4 IN BODY OF PROCEDURE.	_____ **SAT** _____ **UNSAT**

STEP 4: CHECK EMERGENCY - REMAINS IN EFFECT **Standards** Determines the emergency remains in effect. *If asked, state that the emergency remains in effect.* **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**
STEP 5: HAVE SEM / RM APPROVE REPORT (initial/sign at top of Attachment 2) **Standards** Obtains SEM / RM signature **EVALUATOR CUE:** **Sign Approval for Candidate** (upper right hand corner) **EVALUATOR CUE:** **If applicant does not recall this is the termination point for the JPM, inform applicant that JPM is complete.** **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

_____

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task can be performed in the simulator or classroom.
- The Shift Manager has just declared a Site Area Emergency for a failure of the reactor to automatically or manually trip from the main control room. The reactor has been tripped from outside the main control room. The Shift Manager has directed you to complete EPIP-2.01, Notification of State and Local Governments, including filling out Attachment 2, Report of Emergency to State and Local Governments.
- Transmission of the report is NOT required.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- This is a TIME CRITICAL JPM.
- The Unit 1 operator was unable to trip the reactor automatically or manually from the main control room.
- The reactor has been tripped from outside the main control room.
- The Shift Manager just declared a Site Area Emergency due to the failure.
- The Shift Manager has directed you to complete EPIP-2.01, Notification of State and Local Governments, including filling out Attachment 2, Report of Emergency to State and Local Governments.
- Transmission of the report is NOT required.
- You are in the Main Control Room.
- This is the first report that will be made to the State and Local Governments.
- On-site weather instruments indicate wind is from the North East (45 degrees) with an average wind speed of 10 mph.

Initiating Cues

- The Shift Manager has just declared a Site Area Emergency for a failure of the reactor to automatically or manually trip from the main control room. The reactor has been tripped from outside the main control room. The Shift Manager has directed you to complete EPIP-2.01, Notification of State and Local Governments, including filling out Attachment 2, Report of Emergency to State and Local Governments. Transmission of the report is NOT required.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions:

- This is a TIME CRITICAL JPM.
- The Unit 1 operator was unable to trip the reactor automatically or manually from the main control room.
- The reactor has been tripped from outside the main control room.
- The Shift Manager just declared a Site Area Emergency due to the failure.
- The Shift Manager has directed you to complete EPIP-2.01, Notification of State and Local Governments, including filling out Attachment 2, Report of Emergency to State and Local Governments.
- Transmission of the report is NOT required.
- You are in the Main Control Room.
- This is the first report that will be made to the State and Local Governments.
- On-site weather instruments indicate wind is from the North East (45 degrees) with an average wind speed of 10 mph.

Initiating Cues

- The Shift Manager has just declared a Site Area Emergency for a failure of the reactor to automatically or manually trip from the main control room. The reactor has been tripped from outside the main control room. The Shift Manager has directed you to complete EPIP-2.01, Notification of State and Local Governments, including filling out Attachment 2, Report of Emergency to State and Local Governments. Transmission of the report is NOT required.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Administrative Job Performance Measure G2.4.41
TIME CRITICAL

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

Classify an event in accordance with EPIP-1.01

K/A: G2.4.41 Knowledge of the emergency action level thresholds and classifications. (2.3/4.1)

Applicability	**Estimated Time**	**Actual Time**
SRO(I)/SRO(U)	15 Minutes	

Conditions

- Task may be PERFORMED in the simulator or classroom.

Standards

- "Site Area Emergency" declared IAW EPIP-1.01.

Initiating Cues

- Significant event notification.
- EPIP-1.01, Emergency Manager Controlling Procedure.

Terminating Cues

- Report received of event classification and approval for transmitting EPIP-2.01.

Procedures

- EPIP-1.01, EMERGENCY MANAGER CONTROLLING PROCEDURE (REV 51)
- EPIP-2.01, NOTIFICATION OF STATE AND LOCAL GOVERNMENTS (REV 36)

Safety Considerations

- None

Initial Conditions:

- This is a TIME CRITICAL JPM.
- You are the Nuclear Shift Manager.
- While the unit was at 100% power, the 'A' and 'B' Main Feed Pumps tripped. Steam generator levels in all three steam generators (all channels) rapidly decreased off-scale low (i.e., below narrow range indication).
- The team identified a first out (1E-G10, STM GEN LO-LO LVL) due to the low steam generator levels with the reactor trip breakers still closed.
- The team then attempted to manually trip the reactor. The reactor could not be tripped from the main control room.
- Here is a copy of EPIP-1.01, Emergency Manager Controlling Procedure. I need you to perform EPIP-1.01 and determine if this event should be classified.
- If a classification is warranted, complete EPIP-1.01 until you have reviewed and approved EPIP-2.01, Notification of State and Local Governments.
- On-site weather instruments indicate wind is from the North East (45 degrees) with an average wind speed of 10 mph.
- If performed in the classroom, announcing classification (if required) out loud is not required.
- When you finish the actions necessary to accomplish this, please inform me of your findings and classification, if applicable.

Initiating Cues

- Perform EPIP-1.01, Emergency Manager Controlling Procedure and approve EPIP-2.01, Notification of State and Local Governments.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

STEP 1:	REVIEWS CAUTION AND NOTE PRIOR TO STEP 1 OF EPIP-1.01. **Standards** a) Reviews the following CAUTION: Declaration of the highest emergency class for which an Emergency Action Level is exceeded shall be made. b) Reviews the following NOTE: The PCS is potentially unreliable in the event of an earthquake. Therefore, PCS parameters should be evaluated for accuracy should an earthquake occur. **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**

STEP 2:	EVALUATE EMERGENCY ACTION LEVELS: (Step 1 of EPIP-1.01). **Standards** a) Determine event category using Attachment 1, Emergency Action Level Table Index. Turns to EPIP-1.01, Attachment 1, Page 1, EAL Table Index. b) Review EAL Tab associated with event category. Determines event category to be SAFETY, SHUTDOWN OR ASSESSMENT SYSTEM EVENT and turns to Tab A. c) Use Control Room monitors, PCS, and outside reports to get indications of emergency conditions listed in the EAL Table. *If asked, state that the reactor trip breakers are closed, the team is performing FR-S.1 and annunciator 1E-G10 (STM GEN LO-LO LVL) is lit red.* ***Determines event is A-5, Failure of the reactor to trip (ATWT) and classifies the event as a SITE AREA EMERGENCY. (CRITICAL TASK)** d) Verify EAL – CURRENTLY EXCEEDED e) Initiate a chronological log of events **Evaluator's Comments** The time criticality associated with this JPM ends upon declaration of the Site Area Emergency. **DECLARATION TIME:**	_____ **SAT** _____ **UNSAT**

STEP 3: RECORD EAL TAB, TIME EMERGENCY DECLARED AND SM/SEM NAME: (Step 2 of EPIP-1.01).

_____ **SAT**

_____ **UNSAT**

Standards

Completes the table below:

Emergency Classification	EAL TAB	Time Declared	SM /SEM Name
Notification of Unusual Event			
Alert			
Site Area Emergency			
General Emergency			

Evaluator's Comments

STEP 4: ANNOUNCES THE FOLLOWING DECLARATIONS: (Step 3 of EPIP-1.01).

_____ **SAT**

_____ **UNSAT**

Standards

Announces the following information:

- Station Emergency Manager position
- Emergency Classification
- EAL Tab
- Time Declared

Evaluator's Comments

STEP 5: CHECK – CONDITIONS ALLOW FOR NORMAL IMPLEMENTATION OF EMERGENCY RESPONSE ACTIONS: (Step 4 of EPIP-1.01).

_____ **SAT**

_____ **UNSAT**

Standards

Determines that plant conditions allow for normal implementation of the emergency response organization

If asked, state that there are no other events in progress that could hinder the activation of the emergency response organization.

Evaluator's Comments

STEP 6:	NOTIFY PLANT STAFF OF ALERT OR HIGHER CLASSIFICATION: (Step 5 of EPIP-1.01). **Standards** a) Check classification – ALERT OR HIGHER b) Check if emergency assembly and accountability – PREVIOUSLY CONDUCTED *If asked, accountability was not previously conducted.* c) Sound emergency alarm and make announcement on the station Gai-Tronics system as follows: "Site Area Emergency has been declared due to a failure of the reactor to trip" (or words to this effect) d) Repeat step 5.c. *If asked, as Unit 2 sound the emergency alarm for 15 seconds.* **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**

STEP 7:	INITIATE SUPPORTING PROCEDURES: (Step 6 of EPIP-1.01). **Standards** Reviews the following CAUTION: All further instructions should be continued unless otherwise directed. a) INITIATE SUPPORTING PROCEDURES: 1) EPIP-2.01, NOTIFICATIONS OF STATE AND LOCAL GOVERNMENTS 2) EPIP-2.02, NOTIFICATION OF NRC b) Check if classification announcement made using Gai-Tronics system ***Evaluator's Cue*** **Provide the previously completed EPIP-2.01 to the applicant.** (*Give applicant the incorrect EPIP-2.01. If he classifies the event as SAE, give out the EPIP-2.01 marked "ALERT". If he classifies the event as ALERT, give out the EPIP-2.01 marked "SAE".*) **STATE "For purposes of this exam, I will not review this with you. Please review for accuracy, completion and sign for approval."** ***Determines that EPIP-2.01 is incorrectly filled out. Alert is checked instead of Site Area Emergency. (CRITICAL TASK)** **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**

STEP 8:	APPLICANT REPORTS COMPLETION OF TASK. **Standards** Applicant reports completion of the task. ***Evaluator's Cue*** **If applicant continues in EPIP-1.01, if him that this is the end of the JPM.** **Evaluator's Comments**	_____ **SAT** _____ **UNSAT**

STOP TIME:

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task may be PERFORMED in the simulator or classroom.
- Classify an event in accordance with EPIP-1.01, Emergency Manager Controlling Procedure and approve EPIP-2.01, Notification of State and Local Governments.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions:

- This is a TIME CRITICAL JPM.
- You are the Nuclear Shift Manager.
- While the unit was at 100% power, the 'A' and 'B' Main Feed Pumps tripped. Steam generator levels in all three steam generators (all channels) rapidly decreased off-scale low (i.e., below narrow range indication).
- The team identified a first out (1E-G10, STM GEN LO-LO LVL) due to the low steam generator levels with the reactor trip breakers still closed.
- The team then attempted to manually trip the reactor. The reactor could not be tripped from the main control room.
- Here is a copy of EPIP-1.01, Emergency Manager Controlling Procedure. I need you to perform EPIP-1.01 and determine if this event should be classified.
- If a classification is warranted, complete EPIP-1.01 until you have reviewed and approved EPIP-2.01, Notification of State and Local Governments.
- On-site weather instruments indicate wind is from the North East (45 degrees) with an average wind speed of 10 mph.
- If performed in the classroom, announcing classification (if required) out loud is not required.
- When you finish the actions necessary to accomplish this, please inform me of your findings and classification, if applicable.

Initiating Cues

- Perform EPIP-1.01, Emergency Manager Controlling Procedure and approve EPIP-2.01, Notification of State and Local Governments.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions:

- This is a TIME CRITICAL JPM.
- You are the Nuclear Shift Manager.
- While the unit was at 100% power, the 'A' and 'B' Main Feed Pumps tripped. Steam generator levels in all three steam generators (all channels) rapidly decreased off-scale low (i.e., below narrow range indication).
- The team identified a first out (1E-G10, STM GEN LO-LO LVL) due to the low steam generator levels with the reactor trip breakers still closed.
- The team then attempted to manually trip the reactor. The reactor could not be tripped from the main control room.
- Here is a copy of EPIP-1.01, Emergency Manager Controlling Procedure. I need you to perform EPIP-1.01 and determine if this event should be classified.
- If a classification is warranted, complete EPIP-1.01 until you have reviewed and approved EPIP-2.01, Notification of State and Local Governments.
- On-site weather instruments indicate wind is from the North East (45 degrees) with an average wind speed of 10 mph.
- If performed in the classroom, announcing classification (if required) out loud is not required.
- When you finish the actions necessary to accomplish this, please inform me of your findings and classification, if applicable.

Initiating Cues

- Perform EPIP-1.01, Emergency Manager Controlling Procedure and approve EPIP-2.01, Notification of State and Local Governments.
- When you finish the actions necessary to accomplish this, please inform me.

MESSAGE # 1 ; APPROVAL: _____
(Station Emergency Manager or Recovery Manager)

TIME NOTIFICATION STARTED: _____

This is Surry Power Station [X] Control Room [ ] TSC [ ] LEOF [ ] CEOF. Standby for a roll-call followed by an emergency message. Use a Report of Emergency form to copy this message.
(Conduct a roll-call and check boxes as each party answers)

[ ] Surry County [ ] State EOC [ ] Williamsburg [ ] York County
[ ] James City County [ ] Isle of Wight County [ ] Newport News

The emergency message is as follows: **(READ SLOWLY)**

Item 1: Emergency Class:

[ ] Notification of Unusual Event	[ ] Site Area Emergency
[X] Alert	[ ] General Emergency

Declared at TIME YOU DECLARED (24-hr time) on TODAY (date)

[ ] Emergency Terminated

Item 2: Release of radioactive material:

[X] Is within federal limits and NOT related to the event

[ ] Related to the event is presently occurring [Place release in context in Item 5]

[ ] Related to the event has occurred and is now terminated [Place release in context in Item 5]

[ ] Related to the event is projected to occur [Place projected release in context in Item 5]

Item 3: [ ] We will transmit a Report of Radiological Conditions to the State EOC.

[ ] We will not issue a Report of Radiological Conditions.

Item 4: Meteorological Data:

AVE Wind Direction from 45 degrees (0° to 360°), Compass Point NE ;

AVE Wind Speed 10 mph

Based on: [X] On-site Measurements [ ] Off-site Measurements [ ] Not available

Item 5: Remarks / Description of event and release, as applicable. (Do not use abbreviations, mark numbers and acroynms.): UNIT 1 REACTOR FAILED TO TRIP FROM THE MAIN CONTROL ROOM WHEN REQUIRED.

(ATTACHMENT 2 CONTINUED ON NEXT PAGE)

MESSAGE # 1

NOTE: Items 6 - 9 are optional for a message reporting initial entry into the Emergency Plan or an emergency class change, including emergency termination and may be checked 'Excluded from this message.' **"Items 6 - 9 are excluded from this message"** may be read in lieu of each item.

Item 6: Assistance requested or being provided: [X] Excluded from this message

[ ] None

____ (#) Fire Units from _____ _____ (#) Police Units from _____

____ (#) Rescue Units from _____ _____ (#) Other _____

Item 7: Emergency response actions underway: [X] Excluded from this message

[ ] None

[ ] Station monitoring teams dispatched off-site [ ] Station emergency personnel called in

[ ] Other _____

Item 8: Evacuation or Company Dismissal of on-site personnel: [X] Excluded from this message

[ ] No

[ ] Yes, evacuated to:

[ ] Primary Remote Assembly Area. [ ] Secondary Remote Assembly Area.

[ ] Other_____

[ ] Company Dismissal of non-essential personnel:

[ ] is planned. [ ] is in progress. [ ] has been completed.

Item 9: Prognosis of Situation: [X] Excluded from this message

[ ] Improving [ ] Stable

[ ] Worsening [ ] Other _____

Item 10: This is (name) _____/Emergency Communicator.

Please acknowledge receipt of this message. **(Conduct roll-call and check boxes)**

[ ] Surry County [ ] State EOC [ ] Williamsburg [ ] York County

[ ] James City County [ ] Isle of Wight County [ ] Newport News

This is Surry Power Station [X] Control Room [ ] TSC [ ] LEOF [ ] CEOF out at _____ on _____.
(24-hr time) (date)

(ATTACHMENT 2 CONTINUED ON NEXT PAGE)

MESSAGE # 1

NOTE:
- When transmitted, the following information is for state use only. Transmit to State EOC using the DEM ARD.
- The remainder of this report is not transmitted when the message reports emergency termination.

This is Surry Power Station [X] Control Room [ ] TSC [ ] LEOF [ ] CEOF continuing the message.

Item 11: Recommended off-site protective actions are:

[X] None

[ ] Shelter-in-place: ____ Mile radius (360°) and ____ Miles downwind in the following sectors _____.

[ ] Evacuate: ____ Mile radius (360°) and ____ Miles downwind in the following sectors:_____.

[ ] Beyond 10 Mile EPZ:

[ ] Evacuate Area: _____ Centerline (degrees); _____ Distance (Miles); _____ Width (feet)

[ ] Shelter-in-place: _____ Centerline (degrees); _____ Distance (Miles); _____ Width feet)

[ ] Potassium Iodide: Recommend implementation of Potassium Iodide (KI) strategies for the general public. The projected dose at the site boundary is ≥ 5 Rem Thyroid CDE.

Item 12: Update schedule: [ ] 60 minute; [ ] Other _____.

Name of State EOC Duty Officer: _____

This is Surry Power Station [X] Control Room [ ] TSC [ ] LEOF [ ] CEOF out at _____ on _____.
(24-hr time) (date)

MESSAGE # 1 ; APPROVAL: _____
(Station Emergency Manager or Recovery Manager)

TIME NOTIFICATION STARTED: _____

This is Surry Power Station [x] Control Room [ ] TSC [ ] LEOF [ ] CEOF. Standby for a roll-call followed by an emergency message. Use a Report of Emergency form to copy this message.
(Conduct a roll-call and check boxes as each party answers)

[ ] Surry County [ ] State EOC [ ] Williamsburg [ ] York County
[ ] James City County [ ] Isle of Wight County [ ] Newport News

The emergency message is as follows: **(READ SLOWLY)**

Item 1: Emergency Class:

[ ] Notification of Unusual Event	[X] Site Area Emergency
[ ] Alert	[ ] General Emergency

Declared at TIME YOU DECLARED (24-hr time) on TODAY (date)

[ ] Emergency Terminated

Item 2: Release of radioactive material:

[X] Is within federal limits and NOT related to the event

[ ] Related to the event is presently occurring [Place release in context in Item 5]

[ ] Related to the event has occurred and is now terminated [Place release in context in Item 5]

[ ] Related to the event is projected to occur [Place projected release in context in Item 5]

Item 3: [ ] We will transmit a Report of Radiological Conditions to the State EOC.

[X] We will not issue a Report of Radiological Conditions.

Item 4: Meteorological Data:

AVE Wind Direction from 45 degrees (0° to 360°), Compass Point NE ;

AVE Wind Speed 10 mph

Based on: [X] On-site Measurements [ ] Off-site Measurements [ ] Not available

Item 5: Remarks / Description of event and release, as applicable. (Do not use abbreviations, mark numbers and acroynms.): UNIT 1 REACTOR FAILED TO TRIP FROM THE MAIN CONTROL ROOM WHEN REQUIRED.

(ATTACHMENT 2 CONTINUED ON NEXT PAGE)

MESSAGE # 1

NOTE: Items 6 - 9 are optional for a message reporting initial entry into the Emergency Plan or an emergency class change, including emergency termination and may be checked 'Excluded from this message.' **"Items 6 - 9 are excluded from this message"** may be read in lieu of each item.

Item 6: Assistance requested or being provided: [X] Excluded from this message

[ ] None

____ (#) Fire Units from _____ _____ (#) Police Units from _____

____ (#) Rescue Units from _____ _____ (#) Other _____

Item 7: Emergency response actions underway: [X] Excluded from this message

[ ] None

[ ] Station monitoring teams dispatched off-site [ ] Station emergency personnel called in

[ ] Other _____

Item 8: Evacuation or Company Dismissal of on-site personnel: [X] Excluded from this message

[ ] No

[ ] Yes, evacuated to:

[ ] Primary Remote Assembly Area. [ ] Secondary Remote Assembly Area.

[ ] Other_____

[ ] Company Dismissal of non-essential personnel:

[ ] is planned. [ ] is in progress. [ ] has been completed.

Item 9: Prognosis of Situation: [X] Excluded from this message

[ ] Improving [ ] Stable

[ ] Worsening [ ] Other _____.

Item 10: This is (name) _____/Emergency Communicator.

Please acknowledge receipt of this message. **(Conduct roll-call and check boxes)**

[ ] Surry County [ ] State EOC [ ] Williamsburg [ ] York County

[ ] James City County [ ] Isle of Wight County [ ] Newport News

This is Surry Power Station [X] Control Room [ ] TSC [ ] LEOF [ ] CEOF out at _____ on _____.
(24-hr time) (date)

(ATTACHMENT 2 CONTINUED ON NEXT PAGE)

MESSAGE # 1

NOTE:
- When transmitted, the following information is for state use only. Transmit to State EOC using the DEM ARD.
- The remainder of this report is not transmitted when the message reports emergency termination.

This is Surry Power Station [X] Control Room [ ] TSC [ ] LEOF [ ] CEOF continuing the message.

Item 11: Recommended off-site protective actions are:

[X] None

[ ] Shelter-in-place: ____ Mile radius (360°) and ____ Miles downwind in the following sectors _____.

[ ] Evacuate: ____ Mile radius (360°) and ____ Miles downwind in the following sectors:_____.

[ ] Beyond 10 Mile EPZ:

[ ] Evacuate Area: _____ Centerline (degrees); _____ Distance (Miles); _____ Width (feet)

[ ] Shelter-in-place: _____ Centerline (degrees); _____ Distance (Miles); _____ Width feet)

[ ] Potassium Iodide: Recommend implementation of Potassium Iodide (KI) strategies for the general public. The projected dose at the site boundary is ≥ 5 Rem Thyroid CDE.

Item 12: Update schedule: [ ] 60 minute; [ ] Other _____.

Name of State EOC Duty Officer: _____

This is Surry Power Station [X] Control Room [ ] TSC [ ] LEOF [ ] CEOF out at _____ on _____.
(24-hr time) (date)

Facility: Surry Date of Examination: March, 2008
Exam Level: RO ☑ SRO-I ☐ SRO-U ☐ Operating Test No.: 2008-301

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

	System / JPM Title	Type Code*	Safety Function
a.	CVCS / Perform a blended flow make-up to the Unit 1 RWST in accordance with 1-OP-CS-004. K/A - 004A4.04 (3.2/3.6)	S/N	I
b.	ESFAS / Transfer the SI System to Cold Leg Recirculation Mode (1-ES-1.3). K/A - 013A4.01 (4.5/4.8)	S/L/A/EN/D	II
c.	RHR / Initiate RHR alternate decay heat removal by forced feed cooling with a charging pump. K/A - 005A2.03 (2.9/3.1) and APE25AA1.02 (3.8/3.9)	S/L/D	IV - P
d.	CS / Secure containment depressurization equipment. 026A2.08 (3.2/3.7)	S/L/A/M	V
e.	NI / Remove a failure source range NI from service during a reactor startup. 015A4.03 (3.8/3.9)	S/L/A/D	VII
f.	CW / Respond to a low level transient. 075A2.02 (2.5/2.7)	S/D	VIII
g.	WGDS / Initiate the release of a waste gas decay tank. 071A4.26 (3.1/3.9)	S/A/N	IX
h.	PPC / Depressurize the RCS to minimize SGTR breakflow EPE038 EA1.04 (4.3/4.1)	S/D	III

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i.	RC / Locally establish RCS and SG HI/LO interface integrity. APE068.AA1.21 (3.9/4.1) / APE067.AA2.16 (3.3/4.0)	E/D	VIII
j.	AFW / Establish make-up to the ECST in accordance with 2-ES-3.1 Attachment 4. 061A1.04 (3.9/3.9)	E/L/A/R/N	IV - S
k.	EDG / Manually start an emergency diesel generator at the local panel. 064A4.01 (4.0/4.3)	E/A/M	VI

@ All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path (C)ontrol room	4-6 / 4-6 / 2-3

(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥ 1
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3/ ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥
(S)imulator	

Facility: Surry
Exam Level: RO ☐ SRO-I ☐ SRO-U ☑

Date of Examination: March, 2008
Operating Test No.: 2008-301

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

	System / JPM Title	Type Code*	Safety Function
a.	ESFAS / Transfer the SI System to Cold Leg Recirculation Mode (1-ES-1.3). K/A - 013A4.01 (4.5/4.8)	S/L/A/EN/D	II
b.	RHR / Initiate RHR alternate decay heat removal by forced feed cooling with a charging pump. K/A - 005A2.03 (2.9/3.1) and APE25AA1.02 (3.8/3.9)	S/L/D	IV - P
c.	CS / Secure containment depressurization equipment. 026A2.08 (3.2/3.7)	S/L/A/M	V
d.			
e.			
f.			
g.			
h.			

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i.	RC / Locally establish RCS and SG HI/LO interface integrity. APE068.AA1.21 (3.9/4.1) / APE067.AA2.16 (3.3/4.0)	E/D	VIII
j.	AFW / Establish make-up to the ECST in accordance with 2-ES-3.1 Attachment 4. 061A1.04 (3.9/3.9)	E/L/A/R/N	IV - S
k.			

@ All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥ 1
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3/ ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥
(S)imulator	

Facility: Surry | Date of Examination: March, 2008
Exam Level: RO ☐ SRO-I ☑ SRO-U ☐ | Operating Test No.: 2008-301

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

	System / JPM Title	Type Code*	Safety Function
a.	CVCS / Perform a blended flow make-up to the Unit 1 RWST in accordance with 1-OP-CS-004. K/A - 004A4.04 (3.2/3.6)	S/N	I
b.	ESFAS / Transfer the SI System to Cold Leg Recirculation Mode (1-ES-1.3). K/A - 013A4.01 (4.5/4.8)	S/L/A/EN/D	II
c.	RHR / Initiate RHR alternate decay heat removal by forced feed cooling with a charging pump. K/A - 005A2.03 (2.9/3.1) and APE25AA1.02 (3.8/3.9)	S/L/D	IV - P
d.	CS / Secure containment depressurization equipment. 026A2.08 (3.2/3.7)	S/L/A/M	V
e.	NI / Remove a failure source range NI from service during a reactor startup. 015A4.03 (3.8/3.9)	S/L/A/D	VII
f.	CW / Respond to a low level transient. 075A2.02 (2.5/2.7)	S/D	VIII
g.	WGDS / Initiate the release of a waste gas decay tank. 071A4.26 (3.1/3.9)	S/A/N	IX
h.			

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i.	RC / Locally establish RCS and SG HI/LO interface integrity. APE068.AA1.21 (3.9/4.1) / APE067.AA2.16 (3.3/4.0)	E/D	VIII
j.	AFW / Establish make-up to the ECST in accordance with 2-ES-3.1 Attachment 4. 061A1.04 (3.9/3.9)	E/L/A/R/N	IV - S
k.	EDG / Manually start an emergency diesel generator at the local panel. 064A4.01 (4.0/4.3)	E/A/M	VI

@ All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1

(EN)gineered safety feature	- / - / ≥ 1
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3/ ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥
(S)imulator	

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure 004A2.27

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

PERFORM A BLENDED FLOW MAKEUP TO THE UNIT 1 RWST.

K/A: 004A2.27 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Improper RWST boron concentration. (3.5/4.2)

Applicability	**Estimated Time**	**Actual Time**
RO/SRO(I)	10 Minutes	

Conditions

- Task is to be PERFORMED in the simulator.
- Unit 1 RWST level needs to be raised by approximately 1%.

Standards

- 1-OP-CS-004, Refueling Water Storage Tank Makeup

Initiating Cues

- I am the Nuclear Shift Manager. Unit 1 RWST level needs to be raised by approximately 1%.
- Here's a copy of 1-OP-CS-004, Refueling Water Storage Tank Makeup, Section 5.1. I need you to initiate a blended flow makeup from the Unit 1 blender at 2300 ppm boron concentration. The present RWST boron concentration is 2470 ppm.
- The Unit SRO has calculated and the STA verified the POT SETTINGS for a 2300 ppm boron concentration makeup to be:
    - PG – 80 gpm – 5.36 pot setting
    - BA – 15.75 gpm – 6.32 pot setting
- No personnel are at the bottom of the Unit 1 Safeguards Valve Pit and HP is restricting access/work to the area.
- Another operator has verified that Unit 1 Safeguards Building Ventilation System is in the UNFILTER mode in accordance with 0-OP-VS-005
- The STA has been notified that Unit 1 RWST will be filled.
- Field operators are available, if required.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- Initiate makeup to Unit 1 RWST by completing up to Step 5.1.18 of 1-OP-CS-004, Refueling Water Storage Tank Makeup.

Procedures

- 1-OP-CS-004, Refueling Water Storage Tank Makeup (REV12)
- DRP-003, Curve Book

Tools and Equipment

- Straight Edge
- Calculator

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize.
- Set BA pot to 1.8 and the PG pot for 6.67.

Initiating Cues

- Unit 1 RWST level needs to be raised by approximately 1%.

Directions to the Applicant

- I am the Nuclear Shift Manager. Unit 1 RWST level needs to be raised by approximately 1%.
- Here's a copy of 1-OP-CS-004, Refueling Water Storage Tank Makeup, Section 5.1. I need you to initiate a blended flow makeup from the Unit 1 blender at 2300 ppm boron concentration. The present RWST boron concentration is 2470 ppm.
- The Unit SRO has calculated and the STA verified the POT SETTINGS for a 2300 ppm boron concentration makeup to be:
    - PG – 80 gpm – 5.36 pot setting
    - BA – 15.75 gpm – 6.32 pot setting
- No personnel are at the bottom of the Unit 1 Safeguards Valve Pit and HP is restricting access/work to the area.
- Another operator has verified that Unit 1 Safeguards Building Ventilation System is in the UNFILTER mode in accordance with 0-OP-VS-005.
- The STA has been notified that Unit 1 RWST will be filled.
- Field operators are available, if required.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: NOTIFY THE STA THAT UNIT 1 RWST WILL BE FILLED. ***(Step 5.1.1)*** **STANDARD:** Notifies STA that Unit 1 RWST will be filled. **EVALUATOR'S NOTE:** • If asked: The STA has been informed that the Unit 1 RWST will be filled. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: VERIFY THAT THE VCT IS AT DESIRED LEVEL AND BLENDER IS NOT NEEDED FOR MAKEUP. ***(Step 5.1.2)*** **STANDARD:** • Checks VCT level at approximately 40% • Determines blender is not needed for makeup to VCT. **EVALUATOR'S NOTE:** • If asked: Blender is not needed for makeup at this time. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: VERIFY EMERGENCY BORATE FLOWPATH IS AVAILABLE. ***(Step 5.1.3)*** **STANDARD:** • Notes flowpath is available by observing CH-MOV-1350 energized. **EVALUATOR'S NOTE:** • If asked: Emergency borate flowpath is available. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: VERIFY THAT THE BLENDER IS NOT NEEDED FOR NORMAL BORIC ACID CONTROL OF THE RCS. ***(Step 5.1.4)*** **STANDARD:** • Determines blender is not needed by noting Tave and Tref matched and stable. **EVALUATOR'S NOTE:** • If asked: Blender is not needed for makeup at this time. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 5: RECORD PRESENT BLENDER SETPOINTS FOR A RETURN TO SERVICE REFERENCE. ***(Step 5.1.5)*** **STANDARD:** a) Records present setting on Boric Acid Controller 1-CH-FC-1113A (1.8) b) Records present setting on Primary Grade Water Controller 1-CH-FC-1114 (6.67) **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 6: PLACE MAKEUP MODE CONTROL SWITCH TO STOP. ***(Step 5.1.6)*** **STANDARD:** • Places Makeup Mode Control Switch to STOP. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 7: PLACE THE CONTROL SWITCHES FOR BLENDER VALVES IN CLOSE. ***(Step 5.1.7)*** **STANDARD:** a) Places control switch for 1-CH-FCV-1113A in CLOSE and verifies green light ON and red light OFF. ***b) Places control switch for 1-CH-FCV-1113B in CLOSE and verifies green light ON and red light OFF.** ***c) Places control switch for 1-CH-FCV-1114B in CLOSE and verifies green light ON and red light OFF.** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 8: DIRECTS OPENING VARIOUS VALVES TO PROVIDE ALIGNMENT OUTSIDE THE MCR. ***(Steps 5.1.8 thru 5.1.11)*** **STANDARD:** a) Directs operator to open or verify open 1-CH-208, Boric Acid Blender 1 Outlet Isol. b) Directs operator to open or verify open 1-CH-210, Boric Acid Blender 1 Outlet Hdr Isol. c) Directs operator to open or verify open 1-CH-391, B.A. Blender 1 Outlet to RWST. d) Directs operator to close or verify closed 1-FC-71, Unit 1 RWST Return Isol. **EVALUATOR'S NOTE:** • If asked: Field operators are available for valve manipulations. • If asked: Field operators have been briefed for the task. • If contacted, the field operators will manipulate the valves as directed and report back that the valves have been manipulated as directed. **COMMENTS:** **INSTRUCTOR NOTE:** When directed to perform the above actions, open CH-208. Perform a time compression and report all above valves have been positioned as directed.	_____ **SAT** _____ **UNSAT**
STEP 9: SET THE BORIC ACID AND PRIMARY WATER BATCH INTEGRATORS. ***(Step 5.1.12)*** **STANDARD:** a) Sets Boric Acid Integrator for 500 gpm. b) Sets Primary Grade Water Integrator for 5000 gpm. **EVALUATOR'S NOTE:** • Actual values entered into the integrators are not of consequence, as long as a blended make-up can be performed. • If asked: Set the Boric Acid Integrator at 500 gallons and PG at 5000 gallons. However, I want you to stop the makeup manually after adding 1% to the RWST. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 10: SET THE BA FLOW CONTROLLER AND PRIMARY WATER FLOW CONTROLLER FOR THE REQUIRED CONCENTRATION OF MAKEUP. ***(Step 5.1.13)*** **STANDARD:** a) Sets Boric Acid Flow Controller for 15.75 gpm. (6.32 ± .2 Pot Setting) (15.3 to 16.3 gpm) b) Sets Primary Grade Water Flow Controller for 80 gpm. (5.36 ± .2 Pot Setting) (78 to 84 gpm) **EVALUATOR'S NOTE:** Tolerance to be ± .2 Pot Setting. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 11: PLACE THE MAKE-UP MODE SEL SWITCH TO THE MANUAL POSITION ***(Step 5.1.14)*** **STANDARD:** • ***Places Makeup Mode Selector Switch to the MANUAL position.** **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 12: IF THE UNIT IS IN CSD OR RSD ... ***(Step 5.1.15)*** **STANDARD:** a) Reads NOTE before step about CSD and RSD. Determines plant is at 100% power and the NOTE is Not Applicable. b) Reads step about CSD and RSD. Determines plant is at 100% power and the Step is Not Applicable. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 13: PLACE THE CONTROL SWITCH FOR 1-CH-FCV-1113A, BORIC ACID TO BLENDER, TO AUTO ***(Step 5.1.16)*** **STANDARD:** • ***Places control switch for 1-CH-FCV-1113A to the AUTO position** **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 14: START THE MAKEUP BY PLACING THE MAKEUP MODE CONTROL SWITCH TO THE START POSITION ***(Step 5.1.17)*** **STANDARD:** ***a) Places Makeup Mode Control Switch to the START position.** b) Observes that blender makeup begins by noting boric acid and PG flow. ***c) Prior to completion, flow must be in the following ranges:** • **Boric Acid – 15.3 to 16.3 gpm** • **PG Water – 78 to 84 gpm** **EVALUATOR'S NOTE:** If applicant identifies wrong flowrate, state "Please set flow rates as originally discussed". Once the makeup has been initiated, the evaluator will indicate that the JPM has been completed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

_____

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Perform a blended flow makeup to Unit 1 RWST.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Unit 1 is at 100% power.
- Unit 1 RWST needs to be raised by approximately 1%.

Initiating Cues

- I am the Nuclear Shift Manager. Unit 1 RWST level needs to be raised by approximately 1%.
- Here's a copy of 1-OP-CS-004, Refueling Water Storage Tank Makeup, Section 5.1. I need you to initiate a blended flow makeup from the Unit 1 blender at 2300 ppm boron concentration. The present RWST boron concentration is 2470 ppm.
- The Unit SRO has calculated and the STA verified the POT SETTINGS for a 2300 ppm boron concentration makeup to be:
    - PG – 80 gpm – 5.36 pot setting
    - BA – 15.75 gpm – 6.32 pot setting
- No personnel are at the bottom of the Unit 1 Safeguards Valve Pit and HP is restricting access/work to the area.
- Another operator has verified that Unit 1 Safeguards Building Ventilation System is in the UNFILTER mode in accordance with 0-OP-VS-005
- The STA has been notified that Unit 1 RWST will be filled.
- Field operators are available, if required.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- Unit 1 is at 100% power.
- Unit 1 RWST needs to be raised by approximately 1%.

Initiating Cues

- I am the Nuclear Shift Manager. Unit 1 RWST level needs to be raised by approximately 1%.
- Here's a copy of 1-OP-CS-004, Refueling Water Storage Tank Makeup, Section 5.1. I need you to initiate a blended flow makeup from the Unit 1 blender at 2300 ppm boron concentration. The present RWST boron concentration is 2470 ppm.
- The Unit SRO has calculated and the STA verified the POT SETTINGS for a 2300 ppm boron concentration makeup to be:
    - PG – 80 gpm – 5.36 pot setting
    - BA – 15.75 gpm – 6.32 pot setting
- No personnel are at the bottom of the Unit 1 Safeguards Valve Pit and HP is restricting access/work to the area.
- Another operator has verified that Unit 1 Safeguards Building Ventilation System is in the UNFILTER mode in accordance with 0-OP-VS-005
- The STA has been notified that Unit 1 RWST will be filled.
- Field operators are available, if required.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure 013A4.01
Alternate Path

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

TRANSFER THE SI SYSTEM TO COLD LEG RECIRCULATION MODE

K/A: 013A4.01 Ability to manually operate and/or monitor in the control room: ESFAS-initiated equipment which fails to actuate (4.5/4.8)

Applicability	Estimated Time	Actual Time
RO/SRO(I)/SRO(U)	10 Minutes	

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA has occurred on Unit 1. The RWST is near the RMT swapover point.

Standards

- 1-ES-1.3, Transfer to Cold Leg Recirculation, Steps 1-5.

Initiating Cues

- 1-E-1, Loss of Reactor or Secondary Coolant, Step 21.
- Nuclear Shift Manager direction.

Terminating Cues

- Completion of 1-ES-1.3, Transfer to Cold Leg Recirculation, Steps 1-5.

Procedures

- 1-ES-1.3, Transfer to Cold Leg Recirculation. (REV 17)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize. Place simulator in RUN.
- Initiate the following annunciator overrides:
  V1AE2 to OFF.
- Initiate the following switch overrides:
  CSRMTA_REFUEL to REFUEL,
  CSRMTB_REFUEL to REFUEL.
- Initiate malfunction for A loop cold leg rupture (RC0101).
- Perform E-0 & transition to 1-E-1. Perform 1-E-1 through Step 21, which checks for transition to ES-1.3.
- Two (2) LHSI pumps, two (2) HHSI pumps & all ISRS pumps, OSRS pumps and CS pumps should be running. HHSI pumps should be on redundant flowpath alignment and charging pump mini-flow recirc valves should be closed.
- When RWST level is ~ 21%, place the control switch for 1-CS-P-1A in PTL and rackout breaker 14H5
- When RWST level is ~15% (CSM101 of 6.0×10^5), freeze simulator for performance.

Initiating Cues

- A Large-Break LOCA has occurred on Unit 1. RWST level is less than 20%.
- The team has just transitioned to 1-ES-1.3.

Directions to the Applicant

- I am the Nuclear Shift Manager. A Large-Break LOCA has occurred on Unit 1.
- RWST level is less than 20%.
- 1-CS-P-1A is tagged out.
- Here's a copy of 1-ES-1.3, Transfer to Cold Leg Recirculation. I need you to perform Steps 1-5.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: STEP 1, CAUTIONS and NOTES ***(Step 1)*** **STANDARD:** a) Reads caution that SI recirc flow to RCS must be maintained at all times. b) Reads caution that transfer to recirculation may cause high radiation in the Auxiliary Building. c) Notes that Steps 1 through 5 should be performed without delay and FRs should not be implemented before completion of these steps. d) Notes that if sump blockage or a complete loss of sump suction capability occurs, FRs should NOT be implemented until directed in Attachment 1, or in 1-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION. e) Verifies BOTH RMT Transfer Switches in RMT position. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: RESETS SAFETY INJECTION. ***(Step 2)*** **STANDARD:** Depresses both SI Reset Pushbuttons on Benchboard 1-1. **EVALUATOR'S NOTE:** If SI previously reset, verification of SI reset by noting annunciators A-F-3 & 4 (SI Initiated) clear will suffice. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: CHECKS SW FLOW ESTABLISHED TO AT LEAST TWO RSHXs. ***(Step 3a)*** **STANDARD:** Checks the following flow indications for SW flow to at least two RS HXs: a) 1-SW-FI-106A (SW flow to "A" RSHX). b) 1-SW-FI-106B (SW flow to "B" RSHX). c) 1-SW-FI-106C (SW flow to "C" RSHX). d) 1-SW-FI-106D (SW flow to "D" RSHX). **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: VERIFIES AC EMERGENCY BUSES - ENERGIZED BY OFF-SITE POWER. ***(Step 3b)*** **STANDARD:** a) Checks "H" Bus voltage indicated (between 4000 and 4400 volts). b) Checks "H" Bus normal supply breaker, 15H8, closed (red light on & green off). c) Checks "J" Bus voltage indicated (between 4000 and 4400 volts). d) Checks "J" Bus normal supply breaker, 15J8, closed (red light on & green off). **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 5: CHECKS RS PUMPS ASSOCIATED WITH RS HXs SUPPLIED BY SW AT LEAST TWO RUNNING. ***(Step 3c)*** **STANDARD:** Checks if the following pumps are running (breaker indication red light on and amps indicated): a) 1-RS-P-1A (associated w/ A RSHX). b) 1-RS-P-1B (associated w/ B RSHX). c) 1-RS-P-2A (associated w/ C RSHX). d) 1-RS-P-2B (associated w/ D RSHX). **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 6: VERIFIES LHSI PUMPS - BOTH RUNNING. ***(Step 4)*** **STANDARD:** a) Checks 1-SI-P-1A breaker indication red light on and amps indicated. b) Checks 1-SI-P-1B breaker indication red light on and amps indicated. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 7: ALIGNS SI SYSTEM FOR RECIRC. ***(Step 5a & b)*** **STANDARD:** a) Notes CAUTION that if suction source is lost to any SI or CS pump, the pump should be stopped. b) Checks 1-CH-MOV-1275A closed by observing green light on and red light off. c) Checks 1-CH-MOV-1275B closed by observing green light on and red light off. d) Checks 1-CH-MOV-1275C closed by observing green light on and red light off. e) Checks RWST level less than 13% on the following indicators: • 1-CS-LI-100A • 1-CS-LI-100B • 1-CS-LI-100C • 1-CS-LI-100D f) If RWST level not less than 13%, waits for level to reach 13%. **EVALUATOR'S NOTE:** If annunciators 1A-A2, 1A-B2, 1A-C2, and 1A-D2 are lit, the operator should identify auto RMT failure and proceed to Step 5c. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 8: ATTEMPTS INITIATION OF RECIRC MODE TRANSFER - PHASE 1. ***(Step 5c(1))*** **STANDARD:** a) Checks Phase 1 White Status light not lit. (Goes to RNO) b) Pushes both RMT actuation pushbuttons for Train A. c) Pushes both RMT actuation pushbuttons for Train B. **EVALUATOR'S NOTE:** • Phase 1 White Status light is not lit. • RMT actuation pushbuttons will not function when pushed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 9: ALIGNS LHSI PUMP DISCHARGE TO THE HHSI PUMP SUCTION. ***(Step 5c(2))*** **STANDARD:** ***a) Opens 1-SI-MOV-1863A by placing control switch to OPEN.** b) Checks valve open by observing red light on & green off. ***c) Opens 1-SI-MOV-1863B by placing control switch to OPEN.** d) Checks valve open by observing red light on & green off. **EVALUATOR'S NOTE:** • 1-SI-MOV-1863A or 1-SI-MOV-1863B will provide sufficient head to the HHSI pumps, therefore only one needs to be performed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 10: CLOSE THE LHSI PUMP RECIRCULATION PATH TO THE RWST. ***(Step 5c(3))*** **STANDARD:** ***a) Closes 1-SI-MOV-1885A by placing control switch to CLOSE.** b) Checks 1-SI-MOV-1885A closed by observing green light on & red off. ***c) Closes 1-SI-MOV-1885B by placing control switch to CLOSE.** d) Checks 1-SI-MOV-1885B closed by observing green light on & red off. ***e) Closes 1-SI-MOV-1885C by placing control switch to CLOSE.** f) Checks 1-SI-MOV-1885C closed by observing green light on & red off. ***g) Closes 1-SI-MOV-1885D by placing control switch to CLOSE.** h) Checks 1-SI-MOV-1885D closed by observing green light on & red off. **EVALUATOR'S NOTE:** 1-SI-MOV-1885A and D supply "A" LHSI pump, 1-SI-MOV-1885B and C supply "B" LHSI pump. Only one valve per pump is required to be closed to satisfy the intent of this step. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 11: CHECK PHASE 2 AMBER STATUS LIGHT ON BENCHBOARD - LIT. ***(Step 5d(1))*** **STANDARD:** a) Checks Phase 2 Amber Status light not lit. b) Ensures 1minute elapsed prior to continuing. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 12: OPENS LHSI PUMP CONTAINMENT SUMP SUCTION ISOLATION VALVES. ***(Step 5d(2))*** **STANDARD:** ***a) Opens 1-SI-MOV-1860A by placing control switch to OPEN.** b) Checks 1-SI-MOV-1860A open by observing red light on & green off. ***c) Opens 1-SI-MOV-1860B by placing control switch to OPEN.** d) Checks 1-SI-MOV-1860B open by observing red light on & green off. **EVALUATOR'S NOTE:** These valves take approximately 1 minute to open. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 13: CLOSES LHSI PUMP RWST SUCTION ISOLATION VALVES. ***(Step 5d(3))*** **STANDARD:** ***a) Closes 1-SI-MOV-1862A by placing control switch to CLOSE.** b) Checks 1-SI-MOV-1862A closed by observing green light on & red off. ***c) Closes 1-SI-MOV-1862B by placing control switch to CLOSE.** d) Checks 1-SI-MOV-1862B closed by observing green light on & red off. **EVALUATOR'S NOTE:** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 14: CLOSES CHG PUMP RWST SUCTION ISOLATION VALVES. ***(Step 5d(4))*** **STANDARD:** ***a) Closes 1-CH-MOV-1115B by placing control switch to CLOSE.** b) Checks 1-CH-MOV-1115B closed by observing green light on & red off. ***c) Closes 1-CH-MOV-1115D by placing control switch to CLOSE.** d) Checks 1-CH-MOV-1115D closed by observing green light on & red off. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 15: VERIFIES RECIRCULATION FLOW ESTABLISHED. ***(Step 5e)*** **STANDARD:** Verifies SI flow to the Rx core via both cold leg flowpaths by checking the following flow instrumentation: • 1-SI-FI-1945 (A LHSI FT), • 1-SI-FI-1946 (B LHSI FT), • 1-SI-FI-1961 (A Loop FT), • 1-SI-FI-1962 (B Loop FT), • 1-SI-FI-1963 (C Loop FT), • 1-SI-FI-1943 (Total flow normal hdr), • 1-SI-FI-1943A (Total flow normal hdr), • 1-SI-FI-1940 (Total flow alt hdr), • 1-SI-FI-1940A (Total flow alt hdr). **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 16: REPORTS TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that cold leg recirculation established. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

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Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Perform Steps of 1-ES-1.3, Transfer to Cold Leg Recirculation, to establish cold leg recirculation flow.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- A Large-Break LOCA has occurred on Unit 1. RWST level is less than 20%.
- The team has just transitioned to 1-ES-1.3, Transfer to Cold Leg Recirculation.

Initiating Cues

- I am the Nuclear Shift Manager. A Large-Break LOCA has occurred on Unit 1.
- RWST level is less than 20%.
- 1-CS-P-1A is tagged out.
- Here's a copy of 1-ES-1.3, Transfer to Cold Leg Recirculation. I need you to perform Steps 1-5.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- A Large-Break LOCA has occurred on Unit 1. RWST level is less than 20%.
- The team has just transitioned to 1-ES-1.3, Transfer to Cold Leg Recirculation.

Initiating Cues

- I am the Nuclear Shift Manager. A Large-Break LOCA has occurred on Unit 1.
- RWST level is less than 20%.
- 1-CS-P-1A is tagged out.
- Here's a copy of 1-ES-1.3, Transfer to Cold Leg Recirculation. I need you to perform Steps 1-5.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure 005A2.03
Alternate Path

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

INITIATE RHR ALTERNATE DEACY HEAT REMOVAL BY FORCED FEED COOLING WITH A CHARGING PUMP.

K/A: 005A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR pump/motor malfunction (2.9/3.1)

K/A: APE 025AA1.02 Ability to operate and/or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS inventory (3.8/3.9)

Applicability	Estimated Time	Actual Time
RO/SRO(I)/SRO(U)	25 Minutes	

Conditions

- Task is to be PERFORMED in the simulator.
- Plant is at mid-loop with RHR cooling lost and non-recoverable.
- 1-AP-27.00, Loss of Decay Heat Removal Capability, in progress

Standards

- Feed & Bleed cooling established IAW 1-AP-27.00, Attachment 6

Initiating Cues

- The Plant is currently operating at mid-loop on RHR and has had a non-recoverable loss of RHR cooling. The reactor has been S/D for 230 hours.
- Here is a copy of AP-27.00, Attachment 6 & 7. I need you to initiate alternate decay heat removal by performing forced feed cooling, using a Charging pump to a hot leg flow path by completing Attachment 6.
- "A" and "B" Charging Pumps are tagged out.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- 1-AP-27.00, Attachment 6, step 23 completed, and hot leg SI flow established.

Procedures

- 1-AP-27.00, Loss of Decay Heat Removal Capability, Attachment 6 (REV 17)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up mid-loop RHR IC and initialize. Set SIMOV869A and B = 0. SIMOV869A and B_Rack in = T. Set CSM101 to equate to ~90% RWST level.
- On VCT Float makeup (No charging pumps operating); Place red magnets on A & B Chg pumps; Rack in C Chg pp normal bkr & ensure C Chg pp alt bkr racked out, with red magnets.
- Close 1-CH-MOV-1287C, 1270B and 1275C.
- Drain to ≤ 12.0 feet; Lock out both RHR pumps; Verify RMT key switches are in the RMT position. Insert Hot Leg SI MOV keys into respective key switches.
- Freeze simulator for JPM performance.

Initiating Cues

- The Plant is currently operating at mid-loop on RHR and has had a non-recoverable loss of RHR cooling. The reactor has been S/D for 230 hours.

Directions to the Applicant

- The Plant is currently operating at mid-loop on RHR and has had a non-recoverable loss of RHR cooling. The reactor has been S/D for 230 hours.
- Here is a copy of AP-27.00, Attachment 6 and 7. I need you to initiate alternate decay heat removal by performing forced feed cooling, using a Charging pump to a hot leg flow path by completing Attachment 6.
- "A" and "B" Charging Pumps are tagged out.
- Both LHSI pumps are tagged out.
- Pressurizer Safety Valves are not removed.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- Core boiling will result in this JPM being declared Unsat. Core boiling occurs ~ 40 minutes after JPM begins.
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: READS AP-27.00, ATTACHMENT 6 CAUTIONS: • PERSONNEL WORKING IN CTMT SHOULD BE WARNED BEFORE THE RCS IS FILLED TO AVOID INADVERTENT CONTAMINATION OF PERSONNEL WORKING NEAR RCS OPENINGS. • ONLY BORATED WATER SHOULD BE ADDED TO THE RCS TO MAINTAIN ADEQUATE SHUTDOWN MARGIN. • THE INTENT OF THIS ATTACHMENT IS TO MAINTAIN SUBCOOLED CONDITIONS IN THE RCS. ***(Step 1 CAUTIONS)*** **STANDARD:** Reads and acknowledges cautions. **EVALUATOR'S NOTE:** • If asked: No personnel are in CTMT. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 2: READS AP-27.00 NOTE: THE HOT LEG FLOW PATH IS PREFERRED FOR RCS FEED AND BLEED, THE COLD LEG SHOULD BE USED IF THE HOT LEG IS NOT AVAILABLE OR THE PRZR CANNOT BE FILLED DUE TO MAINTENANCE. ***(Step 1 Note)*** **STANDARD:** a) Reads and acknowledges note. b) Determines that hot leg flow path is available by checking HHSI to hot leg valves, 1-SI-MOV-1869A and B, available. c) Determines from SS that PRZR is also available. **EVALUATOR'S NOTE:** • If asked: LHSI pumps are not available. • If asked: Provide cue no maintenance is being conducted on the PRZR. Hot leg flow path is available. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 3: READS STEP 1, AP-27.00, ATTACHMENT 6, AND TRANSITIONS TO STEP 13. ***(Step 1)*** **STANDARD:** a) Reads step 1. b) Determines that Chg pump is to be used based on initial directions, and transitions to step 13. **EVALUATOR'S NOTE:** • If asked: Chg pump is to be used. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 4: OPENS CHARGING PUMP SUCTION VALVES FROM RWST. ***(Step 13a)*** **STANDARD:** ***a) Places 1-CH-MOV-1115B control switch in the OPEN position until valve position lights indicate valve is open.** ***b) Places 1-CH-MOV-1115D control switch in the OPEN position until valve position lights indicate valve is open.** **EVALUATOR'S NOTE:** • Since the RWST suction valves are parallel flowpaths, only one of these are necessary to satisfy the critical step requirement. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 5: CLOSES CHARGING PUMP SUCTION VALVES FROM VCT. ***(Step 13b)*** **STANDARD:** ***a) Places 1-CH-MOV-1115C control switch in the CLOSE position until valve position lights indicate valve is closed.** ***b) Places 1-CH-MOV-1115E control switch in the CLOSE position until valve position lights indicate valve is closed.** **EVALUATOR'S NOTE:** • Since the VCT suction valves are series isolations, only one of these are necessary to satisfy the critical step requirement. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 6: DETERMINES WHICH CHG PUMP IS TO BE STARTED. ***(Step 14)*** **STANDARD:** a) Verifies 1-CH-P-1C (Normal) is available by determining 1-CH-P-1A, 1B, and 1C (Alternate) are tagged out by observing the RED magnets placed beside the pump control switches. **EVALUATOR'S NOTE:** • If asked: Provide cue 1-CH-P-1C (Normal) is available, with its breaker racked in. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 7: VERIFIES VALVES ASSOCIATED WITH 1-CH-P-1C (NORMAL) OPEN. ***(Step 15)*** **STANDARD:** a) Checks "C" Charging pump valves open: • 1-CH-MOV-1270A • 1-CH-MOV-1270B • 1-CH-MOV-1275C • 1-CH-MOV-1286C • 1-CH-MOV-1287C • 1-CH-MOV-1373 b) Identifies that 1-CH-MOV-1287C, 1270B and 1275C are not open and manually opens valves. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 8: STARTS ONE CHARGING PUMP. ***(Step 16)*** **STANDARD:** ***a) Starts 1-CH-P-1C (normal) by removing control switch from PTL position.** b) Verifies pump start by observing breaker status lights (RED light lit and GREEN light off) and pump amp meter. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 9: ESTABLISHES RCS BLEED PATH. ***(Step 17)*** **STANDARD:** a) Determines the required minimum SI flow for decay heat removal from Attachment 7 is 320 gpm (+/- 10 gpm) b) Determines that PRZR Safety Valve not removed, by consulting initial directions or asking SM. c) Determines time after shutdown is 230 hours, by consulting initial directions or asking SM, and that one PORV and associated Block MOVs is required for adequate bleed path. d) Verifies both Przr block valves open by observing valve position indicating lights show RED on and GREEN off for both 1-RC-MOV-1535 and 1-RC-MOV-1536. e) Verifies both PORVs open by observing valve position indication lights show RED on and GREEN off. **EVALUATOR'S NOTE:** • If asked: Provide cue PRZR Safety Valves are installed. • If asked: Provide cue Time since shutdown is 230 hours. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 10: ESTABLISHES SI FLOW PATH BY LOCAL THROTTLING OF SELECTED MOVS. ***(Step 18)*** **STANDARD:** a) Reads note that the hot leg flow path is preferred for RCS feed and bleed. b) Directs Auxiliary Building Operator to go to Auxiliary Building basement. c) Directs Service Building Operator to open breaker for MOV-1869A, (1H1-1 3C) or MOV-1869B (1J1-1 9A), depending on which is selected. d) Determines, using attachment 7, flow rate necessary for adequate decay heat removal to be 320 gpm (allowable 310-330 gpm) based on 230 hours since shutdown. ***e)** **Directs the Auxiliary Building Operator to throttle open MOV-1869A or B until flow rate determined in 9(a) above is achieved. (A minimum flow of 310 gpm must be achieved to successfully complete this JPM)** Observe SI flow indicated on the following flow transmitters: • 1-SI-FI-1943 & 1943A (Total hdr flow), if MOV-1869B selected, or • 1-SI-FI-1940 & 1940A (Total alt flow), if MOV-1869A selected • 1-SI-FI-1933 (A loop flow) • 1-SI-FI-1960 (B loop flow) • 1-SI-FI-1932 (C loop flow) f) If hot leg injection NOT controlling RCS temperature as indicated by increasing pressurizer liquid and vapor space temperatures or by decreasing subcooling, then do either of the following: 1. Increase SI flow rate (or) 2. Swap to cold leg injection (If adequate flow exists temperatures will not be increasing) g) GO TO Step 22 **EVALUATOR'S NOTE:** • If asked: Provide cue time since shutdown is 230 hours. Booth will open breakers and manipulate valves as directed by candidate. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 11: MONITORS RWST LEVEL. ***(Step 22 & 23)*** **STANDARD:** a) Identify that when RWST level decreases to 20%, a transition is made to Step 24. b) Identify that when RHR system is available, must return to procedure Step 23. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 12: REPORTS TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that forced feed cooling established with 1 charging pump. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Perform Attachment 6 of AP-27.00 to initiate alternate decay heat removal by performing forced feed cooling, using a Charging pump to a hot leg flow path

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Plant is at mid-loop with RHR cooling lost and non-recoverable.
- 1-AP-27.00, Loss of Decay Heat Removal Capability, in progress.

Initiating Cues

- The Plant is currently operating at mid-loop on RHR and has had a non-recoverable loss of RHR cooling. The reactor has been S/D for 230 hours.
- Here is a copy of AP-27.00, Attachment 6 and 7. I need you to initiate alternate decay heat removal by performing forced feed cooling, using a Charging pump to a hot leg flow path by completing Attachment 6.
- "A" and "B" Charging Pumps are tagged out.
- Both LHSI pumps are tagged out.
- Pressurizer Safety Valves are not removed.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- Plant is at mid-loop with RHR cooling lost and non-recoverable.
- 1-AP-27.00, Loss of Decay Heat Removal Capability, in progress.

Initiating Cues

- The Plant is currently operating at mid-loop on RHR and has had a non-recoverable loss of RHR cooling. The reactor has been S/D for 230 hours.
- Here is a copy of AP-27.00, Attachment 6 and 7. I need you to initiate alternate decay heat removal by performing forced feed cooling, using a Charging pump to a hot leg flow path by completing Attachment 6.
- "A" and "B" Charging Pumps are tagged out.
- Both LHSI pumps are tagged out.
- Pressurizer Safety Valves are not removed.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure 026A2.08
ALTERNATE PATH

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

SECURE CONTAINMENT DEPRESSURIZATION EQUIPMENT.

K/A: 026A2.08 Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Safe securing of containment spray (when it can be done). (3.2/3.6)

Applicability	**Estimated Time**	**Actual Time**
RO/SRO(I)/SRO(U)	10 Minutes	

Conditions

- Task is to be PERFORMED in the Simulator.
- A large break LOCA has occurred from 100% power. 1-E-0 has been performed and transition made to 1-E-1. 1-E-1 has been performed through Step 8. Power has been lost to the Low Level Intake Structure and all ESW pumps are running.

Standards

- Containment spray equipment secured IAW 1-E-1 Steps 9 through 12.

Initiating Cues

- You are the Unit RO & I am the Nuclear Shift Manager. A loss of all power at the Low Level Intake Structure occurred due to lightning striking 1G and 2G transformers.
- We subsequently had a large-break LOCA. 1-E-0 has been performed and we have performed 1-E-1 through Step 8 where the Outside Operator has started all Emergency Service Water Pumps.
- When Hi-Hi CLS initiated, 1-CS-P-1B tripped and could not be restarted.
- Annunciator A-A-7, RWST LO LEVEL, was just received. Another operator is performing ES-1.3, Transfer to Cold Leg Recirculation, and is monitoring the operation of RMT.
- Here's a copy of 1-E-1 Steps 9 through 12. I need you to secure the Containment depressurization equipment IAW Steps 9 through 12.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- Report received that 1-E-1 Step 12 completed.

Procedures

- 1-E-1, Loss of Reactor or Secondary Coolant (REV 29)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize.
- De-energize 1G and 2G transformers
- Start all 3 ESW Pumps
- Initiate LBLOCA (RC0101) and perform E-0 followed by E-1 up to step 9.
- Run until RWST level is < 20%.
- Place 1-CS-P-1B in PTL.
- Defeat ability to operate CS-MOV-101A and B

Initiating Cues

- 1-E-1, Loss of Reactor or Secondary Coolant, Step 9.

Directions to the Applicant

- You are the Unit RO & I am the Nuclear Shift Manager. A loss of all power at the Low Level Intake Structure occurred due to lightning striking 1G and 2G transformers.
- We subsequently had a large-break LOCA. 1-E-0 has been performed and we have performed 1-E-1 through Step 8 where the Outside Operator has started all Emergency Service Water Pumps.
- When Hi-Hi CLS initiated, 1-CS-P-1B tripped and could not be restarted.
- Annunciator A-A-7, RWST LO LEVEL, was just received. Another operator is performing ES-1.3, Transfer to Cold Leg Recirculation, and is monitoring the operation of RMT.
- Here's a copy of 1-E-1 Steps 9 through 12. I need you to secure the Containment depressurization equipment IAW Steps 9 through 12.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor will be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: CHECK IF SW FLOW TO RS HXs CAN BE REDUCED. ***(Step 9)*** **STANDARD:** a) Acknowledges CAUTION 1 prior to Step 9 that if only one train of ESF is operating, SW flow should not be isolated on the operating train. b) Acknowledges CAUTION 2 prior to Step 9 that operation of an OSRS pump without an operating CS pump could cause cavitation. c) Acknowledges NOTE prior to Step 9 about isolating SW to inoperable components on each SW header. d) Checks containment pressure less than 14 psia by observing: • 1-LM-PI-100A, • 1-LM-PI-100B, • 1-LM-PI-100C and/or • 1-LM-PI-100D. ***e) Resets CLS by depressing both Train A and Train B CLS Reset Pushbuttons.** h) Checks AC emergency buses both energized by observing voltage indicated on: • 1H Emerg Bus voltmeter (#1 EDG panel), • 1J Emerg Bus voltmeter (#3 EDG panel). i) Notes both emergency buses energized and continues step 9. **EVALUATOR'S NOTE:** If CLS reset is missed at this point, it is acceptable to reset later when manipulating components. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 2: VERIFY ALL SPRAY SYSTEM COMPONENTS ON THE SW 'A' HEADER OPERATING. ***(Step 9d)*** **STANDARD:** a) Verify all spray system components on the SW 'A' header operating by checking the following components: • 1-CS-P-1B – Running • 1-RS-P-1A – Running • 1-RS-P-2B – Running • 1-RS-MOV-155B- Open • 1-RS-MOV-156B – Open • 1-SW-MOV-103A or B – Open • 1-SW-MOV-104A and D – Open • 1-SW-MOV-105A and D – Open b) Identifies 1-CS-P-1B is not running and GOES TO RNO column. **EVALUATOR'S NOTE:** Candidate may go straight to RNO after checking 1-CS-P-1B not running. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: VERIFY ALL SPRAY SYSTEM COMPONENTS ON THE SW 'B' HEADER OPERATING. ***(Step 9d RNO)*** **STANDARD:** a) Verify all spray system components on the SW 'B' header operating by checking the following components: • 1-CS-P-1A – Running • 1-RS-P-1B – Running • 1-RS-P-2A – Running • 1-RS-MOV-155A- Open • 1-RS-MOV-156A – Open • 1-SW-MOV-103C or D – Open • 1-SW-MOV-104B and C – Open • 1-SW-MOV-105B and C – Open b) If all SW 'B' header components are operating, then do the following: 1) Stops the following pumps by taking the control switch to OFF: • 1-SW-P-5A • 1-SW-P-5D ***2) Manually or locally close the following MOVs:** • **1-SW-MOV-104A and D – Close** • **1-SW-MOV-105A and D – Close** ***3) Stop the following pumps and put in PTL:** • **1-RS-P-1A** • **1-RS-P-2B** 4) GO TO Step 11 **COMMENTS:** **INSTRUCTOR NOTE: May need to add RWST leak (CS10) to expedite RWST drawdown. When RS-P-1A and B are secured, implement CS10 @ 50% deg. Set CS10 deg to 0 when RWST level is 3%.**	_____ **SAT** _____ **UNSAT**

STEP 4: CHECK EMERGENCY SERVICE WATER PUMPS – THREE RUNNING. ***(Step 11)*** **STANDARD:** Recalls from initial directions that three ESW pumps are running (or) Asks Shift Manager status of ESW pumps **EVALUATOR'S NOTE:** • If asked: Three Emergency Service Water Pumps are running **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 5: CHECK IF CONTAINMENT SPRAY PUMPS CAN BE STOPPED ***(Step 12a)*** **STANDARD:** Checks the following: • RWST level less than 3% (and) • CS Pump amps – FLUCTUATING Notes both conditions exist and continues with Step 12b **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 9: VERIFY BOTH TRAINS OF CLS RESET. ***(Step 12b)*** **STANDARD:** a) Recalls that CLS was reset in a previous step (or) b) Resets CLS by pushing both CLS RESET pushbuttons **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 10: STOP OUTSIDE RECIRC SPRAY PUMP AND PUTS SWITCH IN AUTO. ***(Step 12c)*** **STANDARD:** ***a) Secures 1-RS-P-2A ("A" OSRS pump) and returns switch to AUTO.** **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 11 STOP CONTAINMENT SPRAY PUMP AND PUTS SWITCH IN AUTO. ***(Step 12d)*** ***(Step 1)*** **STANDARD:** *** Secures 1-CS-P-1A ("A" CS pump) and returns switch to AUTO.** **EVALUATOR'S NOTE:** 1-CS-P-1B ("B" CS pump) does not need to be secured due pump previously tripping. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 12 CLOSE CONTAINMENT SPRAY DISCHARGE VALVES. ***(Step 12e)*** **STANDARD:** Closes the following valves by taking the control switch to the close position: • 1-CS-MOV-101A • 1-CS-MOV-101B • 1-CS-MOV-101C • 1-CS-MOV-101D Identifies 1-CS-MOV-101A and 1-CS-MOV-101B do not close and goes to RNO column. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 13: CLOSE SUCTION MOV ON CS PUMP(S) WITH AN OPEN DISCHARGE MOV. ***(Step 12e RNO)*** **STANDARD:** Closes the following valve by taking the control switch to the close position: • 1-CS-MOV-100A **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 14: CLOSE CHEMICAL ADDITION TANK OUTLET VALVES. ***(Step 12f)*** **STANDARD:** Closes the following valves by taking the control switch to the close position: • 1-CS-MOV-102A • 1-CS-MOV-102B **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 15: REPORT TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that depressurization equipment secured. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Secure Containment Depressurization Equipment.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Unit 1 was at 100% power.
- 1G and 2G transformers were lost due to lightning strikes. 3 ESW pumps are running.
- A Large Break LOCA is in progress with the team performing 1-E-1, Loss of Reactor or Secondary Coolant.
- When Hi-Hi CLS initiated, 1-CS-P-1B tripped and could not be restarted.
- Annunciator A-A-7, RWST LO LEVEL, was just received. Another operator will perform ES-1.3, Transfer to Cold Leg Recirculation, and monitor the operation of RMT when the setpoint is reached.

Initiating Cues

- You are the Unit RO & I am the Nuclear Shift Manager. A loss of all power at the Low Level Intake Structure occurred due to lightning striking 1G and 2G transformers.
- We subsequently had a large-break LOCA. 1-E-0 has been performed and we have performed 1-E-1 through Step 8 where the Outside Operator has started all Emergency Service Water Pumps.
- When Hi-Hi CLS initiated, 1-CS-P-1B tripped and could not be restarted.
- Annunciator A-A-7, RWST LO LEVEL, was just received. Another operator is performing ES-1.3, Transfer to Cold Leg Recirculation, and is monitoring the operation of RMT.
- Here's a copy of 1-E-1 Steps 9 through 12. I need you to secure the Containment depressurization equipment IAW Steps 9 through 12.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- Unit 1 was at 100% power.
- 1G and 2G transformers were lost due to lightning strikes. 3 ESW pumps are running.
- A Large Break LOCA is in progress with the team performing 1-E-1, Loss of Reactor or Secondary Coolant.
- When Hi-Hi CLS initiated, 1-CS-P-1B tripped and could not be restarted.
- Annunciator A-A-7, RWST LO LEVEL, was just received. Another operator will perform ES-1.3, Transfer to Cold Leg Recirculation, and monitor the operation of RMT when the setpoint is reached.

Initiating Cues

- You are the Unit RO & I am the Nuclear Shift Manager. A loss of all power at the Low Level Intake Structure occurred due to lightning striking 1G and 2G transformers.
- We subsequently had a large-break LOCA. 1-E-0 has been performed and we have performed 1-E-1 through Step 8 where the Outside Operator has started all Emergency Service Water Pumps.
- When Hi-Hi CLS initiated, 1-CS-P-1B tripped and could not be restarted.
- Annunciator A-A-7, RWST LO LEVEL, was just received. Another operator is performing ES-1.3, Transfer to Cold Leg Recirculation, and is monitoring the operation of RMT.
- Here's a copy of 1-E-1 Steps 9 through 12. I need you to secure the Containment depressurization equipment IAW Steps 9 through 12.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure 015A4.03
Alternate Path

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

REMOVE A FAILED SOURCE RANGE NI FROM SERVICE DURING A REACTOR STARTUP

K/A: 015A4.03 Ability to manually operate and/or monitor in the control room: Trip bypasses (3.8/3.9)

Applicability	Estimated Time	Actual Time
RO/SRO(I)	5 Minutes	

Conditions

- Task is to be PERFORMED in the simulator.
- N-31 has failed low with reactor power at 1.3 x 10^{-10} amps during a startup, and the SR high voltage cannot be removed from either N-31 or N-32.

Standards

- 1-AP-4.00, Nuclear Instrumentation Malfunction.

Initiating Cues

- During a reactor startup, when P-6 was reached the operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. However, N-31 failed low instead, and the high voltage was not removed from either detector (N-31 or N-32).
- I need you to respond to a failure of both Source Range NIs, IAW 1-AP-4.00, so the reactor startup can continue.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- Completion of 1-AP-4.00, Nuclear Instrumentation Malfunction.

Procedures

- 1-AP-4.00, Nuclear Instrumentation Malfunction (REV 22)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up Reactor Startup IC and initialize.
- Perform the startup to obtain power at ≈1.3 x 10^{-10} amps (or slightly greater), then implement malfunction (MNI0101, 1 sec, 50 to 0%), N-31 failure in the low direction. Implement switch overrides (SRTRP_BLK_TRA_PB AND SRTRP_BLK_TRB_PB, ACTIVE), Flux Level Trip Cutout Pushbuttons. Freeze the simulator until ready for operator to perform JPM.
- Do not allow the SUR to be greater than +0.1 dpm. (0 DPM preferred)

Initiating Cues

- During a reactor startup, when P-6 was reached the operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. However, N-31 failed low instead, and the high voltage was not removed from either detector (N-31 or N-32).

Directions to the Applicant

- During a reactor startup, when P-6 was reached the operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. However, N-31 failed low instead, and the high voltage was not removed from either detector (N-31 or N-32).
- I need you to respond to a failure of both Source Range NIs, IAW 1-AP-4.00, so the reactor startup can continue.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*). If substeps of a critical element also are bolded and have an asterisk (*), then only those substeps are critical to performance of that task element.
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: DETERMINES PROCEDURAL STEPS TO RESPOND TO SRNI FAILURE. **STANDARD:** a) Enters 1-AP-4.00 at Step 1. b) Determines failure not in Power Range NI and goes to step 10. c) Determines failure not in Intermediate Range NI and goes to step 19. d) Identifies failure in the SRNIs. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: STABILIZES UNIT CONDITIONS **STANDARD:** a) Verifies unit conditions stable with a zero startup rate. b) Maintains power with approximately zero startup rate. **EVALUATOR'S NOTE:** A manual reactor trip is **NOT** an acceptable action. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: CHECKS REACTOR POWER – GREATER THAN P- 6 (1 X 10^{-10} AMPS) **STANDARD:** Checks reactor power level by observing INT RNG FLUX meters NI-1-35B and NI-1-36B (on Benchboard 1-2) or the meters on the IR NIS cabinets. (Reactor power should be above 1 x 10^{-10} amps). **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: VERIFY BOTH SOURCE RANGE CHANNEL – HIGH VOLTAGE OFF **STANDARD:** Checks both SR channels, determines that both are still energized and goes to the RNO Column.	_____ **SAT** _____ **UNSAT**

*** STEP 5:** REMOVE FAILED SOURCE RANGE NI FROM OPERATION. **STANDARD:** a) Pushes "1/N 33A TR A" pushbutton and "1/N 33B TR B" pushbutton. b) Notes that N-31 and N-32 still have high voltage applied to the detectors. c) Informs operator that annunciator G-D-1, "Source or INT RNG NIS TRIP BYP" will be received. **d) * Places LEVEL TRIP switch for N-31 in BYPASS.** **e) * Removes INSTRUMENT POWER fuses for N-31.** **f) * Places LEVEL TRIP switch for N-32 in BYPASS.** **g) * Removes INSTRUMENT POWER fuses for N-32.** h) Notes requirement to refer to Tech Spec Table 3.7-1 Item 4. i) Notes requirement to make entry in PSL and shift turnover to reinstall fuses. j) Goes to step 38 of 1-AP-4.00. **EVALUATOR'S NOTE:** • It is acceptable to place both SRNI in LEVEL TRIP BYPASS before removing the INSTRUMENT POWER fuses. • It is acceptable to stop at i) (step 22 RNO steps 4 & 5). AP-4.00 may remain open until repairs completed or shutdown performed. **CUES** • **Tell operator** (or if asked): The SS will ensure that Tech Specs are checked and that appropriate log entries will be made. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 6: REPORT TO SHIFT SUPERVISOR (EVALUATOR). **STANDARD:** Verbal status report that N-31 and N-32 have been removed from service IAW AP-4.00. **EVALUATOR'S NOTE:** • Candidate may make notifications to the Instrument Shop and OMOC before terminating JPM. **STOP TIME:** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Perform Steps of 1-AP-4.00, Nuclear Instrumentation Malfunction, to allow reactor startup to continue.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- N-31 has failed low with reactor power at 1.3×10^{-10} amps during a startup, and the SR high voltage cannot be removed from either N-31 or N-32.

Initiating Cues

- During a reactor startup, when P-6 was reached the operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. However, N-31 failed low instead, and the high voltage was not removed from either detector (N-31 or N-32).

- I need you to respond to a failure of both Source Range NIs, IAW 1-AP-4.00, so the reactor startup can continue.

- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- N-31 has failed low with reactor power at 1.3 x 10^{-10} amps during a startup, and the SR high voltage cannot be removed from either N-31 or N-32.

Initiating Cues

- During a reactor startup, when P-6 was reached the operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. However, N-31 failed low instead, and the high voltage was not removed from either detector (N-31 or N-32).
- I need you to respond to a failure of both Source Range NIs, IAW 1-AP-4.00, so the reactor startup can continue.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure 075A2.02

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

RESPOND TO A LOW LEVEL TRANSIENT (CW)

K/A: 075A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the circulating water system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of circulating water pumps (2.5/2.7)

Applicability	Estimated Time	Actual Time
RO/SRO(I)	10 Minutes	

Conditions

- Task is to be PERFORMED in the simulator.
- Both units are at 100% power when a lightning strike trips 2G screenwell transformer.

Standards

- Circ Water Pumps restored in accordance with AP-12.01, Loss of Intake Canal Level.

Initiating Cues

- LLIS TROUBLE annunciator.
- Unit Two Circ Water Pumps secured.

Terminating Cues

- 0-AP-12.01, Loss of Intake Canal Level, completed.

Procedures

- 0-AP-12.01, Loss of Intake Canal Level. (REV 25)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% IC and initialize.
- Implement EL0802 and place simulator in RUN.
- Allow canal level to decrease to ~25.5 feet.
- Set CW MOV pots to 30 seconds.
- Verify Canal Level trend on wide range scale.
- Acknowledge all annunciators and place simulator in FREEZE.

Initiating Cues

- LLIS TROUBLE annunciator.
- Unit Two Circ Water Pumps secured.

Directions to the Applicant

- You are the third license and I am the Unit One Unit Supervisor. Alarm VSP L-7 "LLIS TROUBLE" has alarmed and security reports a lightning strike in the vicinity of the low level intake resulting in loss of 2G Screenwell Transformer. All Unit 2 Circulating Water Pumps were running.
- Unit One and Unit Two Reactor Operators are currently throttling CW MOVs to conserve intake canal level.
- Here's a copy of AP-12.01. You are to perform AP-12.01 in its entirety in response to the loss of 2G screenwell transformer.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- A reactor trip will result in this JPM being declared Unsat. Trip occurs at 23.5 feet canal level.
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: CHECKS ENTRY INTO THIS PROCEDURE -FROM AN EOP OR AN AP TO RESTORE SW FLOW TO THE CCHXs ***(Step 1)*** **STANDARD:** a) Acknowledges note that EPIPs may be applicable. b) Determines, based on initial conditions, that AP was entered due to loss of screenwell transformer and goes to step 3. **EVALUATOR'S NOTE:** If asked: No actions have been taken in regard to CCHX SW flow. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 2: TRIES TO MAINTAIN INTAKE CANAL LEVEL. ***(Step 3)*** **STANDARD:** a) Acknowledges CAUTION prior to step 3 regarding turbine stall flutter and reference to AP-14, if vacuum cannot be maintained b) Acknowledges note prior to step 3 regarding potential need to trip one unit to reduce rate of intake canal drawdown. c) Recalls that initial conditions revealed that Unit ROs were throttling waterboxes as required. **EVALUATOR'S NOTE:** • If asked: Both units are currently throttling waterbox outlet MOVs as required due to loss of circ water pumps. • If asked: Unit SRO will direct unit ramping as required. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 3: CHECKS INTAKE CANAL LEVEL- DECREASING. ***(Step 4)*** **STANDARD:** a) Trainee identifies that 3 CW pumps are insufficient to supply two units CW flow requirements. b) Trainee reads intake canal level indicator and determines downward trend. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 4: STARTS CIRC WATER PUMPS AS REQUIRED FROM THE MCR IAW ATTACHMENT 3. ***(Step 5)*** **STANDARD:** Trainee goes to attachment 3 **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 5: ATTACHMENT 3- REMOTE START OF CIRCULATING WATER PUMPS. ***(Att 3 Step 1)*** **STANDARD:** a) Trainee acknowledges NOTE prior to step (a) that requires 5-minute coastdown of CW pumps prior to starting. b) Trainee verifies 1G-2G Bus Tie Bkr (15G8) Closed using "LLIS Electrical" PCS screen. c) Trainee verifies that CW pumps are not in local by noting no white box around Unit 2 CW pumps on CW Pump PCS screen. ***d) Trainee calls up soft control box pumps to start CW pump by clicking on CW pump ICON on PCS CW screen.** ***e) Trainee enables soft control box for pump to be started by clicking on mark number box and verifies red border.** ***f) Trainee hits "Start" button for pump to control that is active.** g) Trainee verifies proper amp indication for pump started. ***h) Trainee completes steps (c) through (e) of attachment 3 for remaining pumps to be started.** i) Trainee directs outside operator to perform post-start checks IAW respective OP Procedure (OP-48.1, Starting any CW Pump). **EVALUATOR'S NOTE:** • <u>If asked</u>: Greater than 5 minutes have elapsed since loss of transformer. • <u>If asked</u>: All Circ Water Pumps are in REMOTE. • <u>If asked</u>: 2A, 2B, 2C and 2D circ water pumps were previously in service. • ***Only six Circulating Water Pumps running are required to meet critical task.** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 6: SENDS OPERATOR TO LOW LEVEL INTAKE TO PERFORM THE FOLLOWING PROCEDURES. ***(Step 6)*** **STANDARD:** a) Trainee acknowledges Note prior to step 6 regarding a key is required for entry into the Low Level Switchgear Room and statement regarding CW pump restrictions when 1G-2G busses are crosstied. b) Sends an Operator to Low Levels to perform Attachment 2 and OP-48.1.1. c) May direct an operator to perform 0-OP-SW-002. **EVALUATOR'S NOTE:** • <u>If asked</u>: Operator is performing 0-SW-OP-002. • <u>If asked</u>: Operator will perform Attachment 2. • <u>If asked</u>: Operator is performing OP-48.1.1. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 7: CHECKS INTAKE CANAL LEVEL - GREATER THAN TRIP SETPOINT. ***(Step 7)*** **STANDARD:** Trainee determines that Intake canal level is greater than 23.5 feet and annunciator F-G-1 not lit. **UNIT (2) CUE:** If asked: F-G-1(Intake Canal Low Level) is not lit on Unit 2 **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 8: CHECK CW LOSS – SUSTAINED WITH NO EXPECTATION OF RECOVERY ***(Step 8)*** **STANDARD:** Identifies that CW pumps have been restarted and canal level is recovering RNO - Goes to Step 10 **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 9: CONTINUES TO REDUCE UNIT LOAD AS NECESSARY TO MAINTAIN VACUUM. ***(Step 10)*** **STANDARD:** Trainee determines that no actions are required based on number of CW pumps running. **EVALUATOR'S NOTE:** • <u>If asked:</u> Both unit's Reactor Operators have stopped throttling CW MOVs. • <u>If asked:</u> No load reduction occurred. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 10: CHECKS INTAKE CANAL LEVEL – STABLE OR INCREASING. ***(Step 11)*** **STANDARD:** a) Trainee evaluates canal level indication and/or trend recorder to verify canal level increasing. b) Trainee then goes to Step 27. **EVALUATOR'S NOTE:** This is the end of the JPM. You may stop the candidate at this point. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

_____

_____

_____

_____

_____

_____

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Perform AP-12.01 in its entirety in response to the loss of 2G screenwell transformer.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Both units are at 100% power when a lightning strike trips 2G screenwell transformer.

Initiating Cues

- You are the third license and I am the Unit One Unit Supervisor. Alarm VSP L-7 "LLIS TROUBLE" has alarmed and security reports a lightning strike in the vicinity of the low level intake resulting in loss of 2G Screenwell Transformer. All Unit 2 Circulating Water Pumps were running.
- Unit One and Unit Two Reactor Operators are currently throttling CW MOVs to conserve intake canal level.
- Here's a copy of AP-12.01. You are to perform AP-12.01 in its entirety in response to the loss of 2G screenwell transformer.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- Both units are at 100% power when a lightning strike trips 2G screenwell transformer.

Initiating Cues

- You are the third license and I am the Unit One Unit Supervisor. Alarm VSP L-7 "LLIS TROUBLE" has alarmed and security reports a lightning strike in the vicinity of the low level intake resulting in loss of 2G Screenwell Transformer. All Unit 2 Circulating Water Pumps were running.
- Unit One and Unit Two Reactor Operators are currently throttling CW MOVs to conserve intake canal level.
- Here's a copy of AP-12.01. You are to perform AP-12.01 in its entirety in response to the loss of 2G screenwell transformer.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure 071A4.26
ALTERNATE PATH

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

RELEASE A WASTE GAS DECAY TANK (WGDT).

K/A: 071A4.26 Ability to manually operate and/or monitor in the control room: Authorized waste gas release, conducted in compliance with radioactive gas discharge permit. (3.1/3.9)

Applicability	Estimated Time	Actual Time
RO/SRO(I)	10 Minutes	

Conditions

- Task is to be PERFORMED in the Simulator.
- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.

Standards

- OP-23.2.3 – Release of Waste Gas Decay Tank 1A.

Initiating Cues

- You are the 3rd License and I am the Nuclear Shift Manager.
- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.
  - The following are the results of the sample on "A" WGDT
    - Hydrogen Concentration 96%
    - Oxygen Concentration 0.05%
- Here's a copy of OP-23.2.3 – Release of Waste Gas Decay Tank 1A. I need you to initiate release of the "A" WGDT in accordance with Section 5.3 and 5.4.
- The Maximum Release Rate from the Release Form is 7.5 scfm.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- OP-23.2.3, Release of Waste Gas Decay Tank 1A, section 5.4 complete.

Procedures

- OP-23.2.3 – Release of Waste Gas Decay Tank 1A. (REV 14)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize.

Initiating Cues

- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.

Directions to the Applicant

- You are the 3rd License and I am the Nuclear Shift Manager.
- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.
  - The following are the results of the sample on "A" WGDT
    - Hydrogen Concentration 96%
    - Oxygen Concentration 0.05%
- Here's a copy of OP-23.2.3 – Release of Waste Gas Decay Tank 1A. I need you to initiate release of the "A" WGDT in accordance with Section 5.3 and 5.4.
- The Maximum Release Rate from the Release Form is 7.5 scfm.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: REVIEWS INITIAL CONDITIONS AND PRECAUTIONS AND LIMITATIONS ***(SECTION 3 & 4)*** **STANDARD:** a) Reads Initial Conditions. b) Reads Precautions and Limitations c) Goes to Section 5.3 **EVALUATOR'S NOTES:** • If asked: All channels of the Surry Radioactive Gaseous Effluent Monitoring Instrumentation for the Process Vent System are in service. • If asked: Both WGDT Gas Analyzers are in service. • If asked: The operations computer calculation program is not available. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 2: WASTE GAS DECAY TANK 1A VALVE ALIGNMENT FOR RELEASE. ***(Step 5.3)*** **STANDARD:** a) Verifies closed 1-GW-FCV-101, Process Vent WGDT Effluent Flow Controller by checking zero demand on Demand Signal output meter. b) Verifies the following valves closed by dispatching an operator to locally check valve postion: • 1-GW-19, WGDT 1A Inlet Isolation. (Step 5.3.2) • 1-GW-24, WGDT 1B Release Isolation. (Step 5.3.3) • 1-GW-21, WGDT 1A Recycle Isolation (Step 5.3.4) c) Verifies the following valves open by dispatching an operator to locally check valve postion: • 1-GW-20, WGDT 1A Outlet Isolation. (Step 5.3.5) • 1-GW-23, WGDT 1A Release Isolation (Step 5.3.6) **INSTRUCTOR NOTE:** When directed to perform these manipulations, state that a time compression has occurred and the valves have been positioned as directed. (steps 5.3.2 thru 5.3.6) **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 3: TURN 1-GW-FCV-101, DECAY TANK BLEED ISOLATION SWITCH TO OPEN. ***(Step 5.4.1)*** **STANDARD:** ***a) Places switch for 1-GW-FCV-101 in the OPEN position. (CRITICAL STEP)** b) Observes green light OFF and red light ON for 1-GW-FCV-101. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 4: SLOWLY OPENS 1-GW-FCV-101 TO ESTABLISH LESS THAN .5 SCFM FLOW. ***(Step 5.4.2)*** **STANDARD:** a) Reads NOTE about allowing pressure and flow to stabilize after opening 1-GW-FCV-101. b) Slowly opens 1-GW-FCV-101 by slowly turning the dial on the controller clockwise. c) Monitors WGDT flow on 1-GW-FI-101 to achieve < 0.5 scfm flow **EVALUATOR NOTE:** Momentarily going above 0.5 scfm is allowable. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 5: CHECK WGDT PRESSURE. ***(Step 5.4.3)*** **STANDARD:** a) Checks that WGDT pressure on 1-GW-PI-103 indicates between 4.5 and 6.5 psig b) Notes that pressure is between 4.5 and 6.5 psig and that no adjustments are necessary. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 6: MONITOR INDICATIONS FOR PROPER OPERATION. ***(Step 5.4.4)*** **STANDARD:** Monitor the following indications for proper operation: • 1-RM-RR-132, Process Vent Radiation Monitor Recorder • 1-RM-RR-133, Vent #2 Radiation Monitor Recorder • 1-GW-FI-101, WGDT Effluent Flow • 1-GW-FR-101, WGDT to Process Vent **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 7: RECORD WGDT HYDROGEN CONCENTRATION. ***(Step 5.4.5)*** **STANDARD:** a) Recalls from initial conditions that Hydrogen concentration is 96% (or) b) Calls chemistry to get Hydrogen Concentration **EVALUATOR'S NOTES:** • If asked: Hydrogen concentration is 96% **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 8: REFERS TO TABLE IN ATTACHMENT 4 TO DETERMINE MAXIMUM INDICATED FLOWRATE FROM WGDT. ***(Step 5.4.6)*** **STANDARD:** a) Reads CAUTION about Hydrogen concentration greater than 80% limitations b) Notes hydrogen concentration is greater than 80% and refers to Attachment 4 to determine maximum flow rate from WGDT. **EVALUATOR'S NOTES:** • If asked: Hydrogen concentration is 96% **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 9: DETERMINES MAXIMUM WGDT FLOWRATE FROM ATTACHMENT 4 ***(Attachment 4)*** **STANDARD:** • ***Refers to Attachment 4 and determines maximum WGDT flowrate is 3.5% (CRITICAL STEP)** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 10: ADJUST 1-GW-FCV-101 TO ACHIEVE DESIRED FLOWRATE. ***(Step 5.4.7)*** **STANDARD:** a) Reads NOTE about calculating actual flowrate. b) Determines flow limit on Attachment 4 is less than the Release Form limit. ***c) Adjusts 1-GW-FCV-101 to achieve a flowrate less than limit on Attachment 4. (CRITICAL STEP)** **EVALUATOR NOTE:** AUTO control may be used on 1-GW-FCV-101. Momentarily exceeding flowrate limit is acceptable. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 14: REPORT TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that WGDT is being released. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

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Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Release a Waste Gas Decay Tank.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Unit 1 is at 100% power.
- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.

Initiating Cues

- You are the 3rd License and I am the Nuclear Shift Manager.
- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.
    - The following are the results of the sample on "A" WGDT
        - Hydrogen Concentration 96%
        - Oxygen Concentration 0.05%
- Here's a copy of OP-23.2.3 – Release of Waste Gas Decay Tank 1A. I need you to initiate release of the "A" WGDT in accordance with Section 5.3 and 5.4.
- The Maximum Release Rate from the Release Form is 7.5 scfm.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- Unit 1 is at 100% power.
- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.

Initiating Cues

- You are the 3rd License and I am the Nuclear Shift Manager.
- 1-GW-TK-1A ("A" WGDT) has been sampled, analyzed and is ready for release.
  - The following are the results of the sample on "A" WGDT
    - Hydrogen Concentration 96%
    - Oxygen Concentration 0.05%
- Here's a copy of OP-23.2.3 – Release of Waste Gas Decay Tank 1A. I need you to initiate release of the "A" WGDT in accordance with Section 5.3 and 5.4.
- The Maximum Release Rate from the Release Form is 7.5 scfm.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Simulator Job Performance Measure EPE038EA1.04
ALTERNATE PATH

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

DEPRESSURIZE THE RCS TO MINIMIZE SGTR BREAKFLOW.

K/A: EPE038EA1.04 Ability to operate and monitor the following as they apply to a SGTR: PZR spray, to reduce coolant system pressure (4.3/4.1)

Applicability	Estimated Time	Actual Time
RO	10 Minutes	

Conditions

- Task is to be PERFORMED in the simulator.
- A SGTR in "C" SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. 1-E-3 has been performed up to Step 19 and the team is ready to perform the RCS depressurization to minimize SGTR breakflow.

Standards

- 1-E-3, Steam Generator Tube Rupture, Step 19 and 20.

Initiating Cues

- I am the Nuclear Shift Manager. We have a SGTR in the "C" SG. The SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. We are at Step 19 of 1-E-3 and ready to perform the RCS depressurization to minimize the SGTR breakflow.
- Here's a copy of the 1-E-3 depressurization steps; I want you to depressurize the RCS IAW 1-E-3.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- Report received that RCS depressurization completed.

Procedures

- 1-E-3, Steam Generator Tube Rupture. (REV 36)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize.
- Enter malfunction for SGTR in "C" SG at ~450 gpm (RC2403 @ 50% degradation).
- Call up the "C" Main Steam line & close 1-MS-158.
- Place sim in RUN, trip Unit, perform 1-E-0 and transition to 1-E-3. Perform 1-E-3 up to Step 19, (incl SI blocks). RCPs should still be running & subcooling greater than 50°F. Throttle AFW flow to A & B SGs down to ~175 gpm.
- Verify SR NIS detectors are energized and the SR scale is indicated on 1-NI-NR-A/B.
- Freeze simulator until ready for JPM performance.
- Set the following switch overrides:
  - RCPC444J_AUTO, OFF
  - RCPC444J_MANUAL, ON
  - RCPC444J_LOWER, OFF
  - RCPC444J_RAISE, OFF
  - RCPC444G_AUTO, ON
  - RCPC444H_AUTO, ON
- Set the following lamp overrides:
  - RCPC444J_RED, OFF
  - RCPC444J_WHITE, ON

Initiating Cues

- There is a SGTR in the "C" SG. The SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. We are at Step 19 of 1-E-3 and ready to perform the RCS depressurization to minimize the SGTR breakflow.

Directions to the Applicant

- I am the Nuclear Shift Manager. We have a SGTR in the "C" SG. The SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. We are at Step 19 of 1-E-3 and ready to perform the RCS depressurization to minimize the SGTR breakflow.

- Here's a copy of 1-E-3 depressurization steps; I want you to depressurize the RCS.

- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

STEP 1: CHECKS NORMAL PRESSURIZER SPRAY AVAILABLE. ***(Step 19a)*** **STANDARD:** a) Checks RCP-C and 1-RC-PCV-1455B ('C' Spray Valve) – Both Available. OR b) RCPs A and B, AND 1-RC-PCV-1455A ('A' Spray Valve) – Both Available **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: SPRAYS PRESSURIZER WITH MAXIMUM AVAILABLE SPRAY. ***(Step 19b)*** **STANDARD:** a) Places PZR spray valve controllers (1-RC-PC-1444G and 1-RC-PC-1444H) in MANUAL and attempts to increase demand to open the spray valves. **AND/OR** b) Attempts to place PZR Master Controller (1-CH-PC-1444J) in MANUAL. c) Identifies that neither of the above methods work; goes to RNO and goes to step 20. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: ***(Step 20 CAUTIONS AND NOTE)*** **STANDARD:** a) Acknowledges Caution that PRT may rupture if a pressurizer PORV is used for RCS Depressurization, rupturing the PRT may result in abnormal containment conditions. b) Acknowledges Caution that cycling of the pressurizer PORV should be minimized. c) Acknowledges Note that the upper head region may void during RCS depressurization if RCPs are not running. This will result in a rapidly increasing pressurizer level. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: ***(Step 20a and b)*** DEPRESSURIZE RCS USING PRZR PORV TO MINIMIZE BREAK FLOW AND REFILL PRESSURIZER. ***(Step 20)*** **STANDARD:** a) Determines that at least one pressurizer PORV is available. ***b) Open one pressurizer PORV until ANY of the following conditions satisfied:** **<u>See next page for criteria.</u>** **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 5: DETERMINES IF PORV CLOSING CRITERIA SATISFIED. ***(Step 19c)*** **STANDARD:** ***a) Determines if PZR level is greater than 69% by observing 1-RC-LI-1459A, 1-RC-LI-1460 and/or 1-RC-LI-1461.** **OR** ***b) Determines if RCS subcooling is less than 30°F by observing ICCM Train A (1-RC-ICCM-A) and/or Train B (1-RC-ICCM-B).** **OR** ***c) Determines if:** **1) RCS pressure is less than ruptured SG pressure by comparing RCS pressure (1-RC-PI-1402-1, PI-1-402, 1-RC-ICCM-A and/or 1-RC-ICCM-B) to SG pressure (1-MS-PI-1484, 1-MS-PI-1485 and/or 1-MS-PI-1486)** **AND** **2) PZR level is greater than 22% by observing 1-RC-LI-1459A, 1-RC-LI-1460 and/or 1-RC-LI-1461.** d) If none of these criteria are met, maintains PORV open until one of the three criteria are met. ***e) When one of the criteria are met, closes the pressurizer PORV.** **EVALUATOR'S NOTE:** Exceeding either of the following limits will result in an UNSAT JPM performance: • Pressurizer going solid (or) • RCS subcooling indicating saturated conditions in RCS **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 6: REPORTS TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that RCS depressurization completed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be performed in the simulator.
- Depressurize the RCS to minimize SGTR breakflow IAW 1-E-3.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- A SGTR in "C" SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. 1-E-3 has been performed up to Step 19 and the team is ready to perform the RCS depressurization to minimize SGTR breakflow.

Initiating Cues

- I am the Nuclear Shift Manager. We have a SGTR in the "C" SG. The SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. We are at Step 19 of 1-E-3 and ready to perform the RCS depressurization to minimize the SGTR breakflow.
- Here's a copy of the 1-E-3 depressurization steps; I want you to depressurize the RCS IAW 1-E-3.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- A SGTR in "C" SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. 1-E-3 has been performed up to Step 19 and the team is ready to perform the RCS depressurization to minimize SGTR breakflow.

Initiating Cues

- I am the Nuclear Shift Manager. We have a SGTR in the "C" SG. The SG has been identified and isolated, SI has been blocked and the RCS cooled down to the target temperature. We are at Step 19 of 1-E-3 and ready to perform the RCS depressurization to minimize the SGTR breakflow.
- Here's a copy of the 1-E-3 depressurization steps; I want you to depressurize the RCS IAW 1-E-3.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Job Performance Measure APE068.AA1.21

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

LOCALLY ESTABLISH RCS AND SG HI/LO INTERFACE INTEGRITY.

K/A: APE068.AA1.21 Ability to operate and/or monitor the following as they apply to the Control Room Evacuation: Transfer of controls from control room to shutdown panel or local control (3.9/4.1)

Applicability	Estimated Time	Actual Time
RO/SRO(I)/SRO(U)	5 Minutes	

Conditions

- Task is to be SIMULATED in the plant.
- A limiting MCR fire has occurred and forced MCR evacuation. 0-FCA-1.00 is in progress at step 4.

Standards

- FCA-1.00, Limiting MCR Fire, Attachment 1.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. You are the 4th RO on shift. A fire has forced evacuation of the control room.
- Here is Attachment 1 of FCA-1.00. I need you to locally establish RCS & SG HI/LO interface integrity for Unit 1 only IAW steps 4 and 5 of Attachment 1 of FCA-1.00.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- Locally establish RCS & SG HI/LO interface integrity for Unit 1 IAW steps 4 and 5 of Attachment 1 of FCA-1.00.

Procedures

- FCA-1.00, Limiting MCR Fire, Attachment 1. (REV 40)

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Initiating Cues

- A limiting MCR fire has occurred and forced MCR evacuation. 0-FCA-1.00 is in progress at step 4.

Notes to the Evaluator.

- **Task briefing should occur in the Unit 2 Computer Room.**
- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are bolded and denoted by an asterisk (*).

Directions to the Applicant

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. You are the 4th RO on shift. A fire has forced evacuation of the control room.
- Here is Attachment 1 of FCA-1.00. I need you to locally establish RCS & SG HI/LO interface integrity for Unit 1 only IAW steps 4 and 5 of Attachment 1 of FCA-1.00.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).

- **START TIME:**

STEP 1: OPEN UNIT 1 AUXILIARY SHUTDOWN PANEL DOOR. ***(Attachment 1 Step 4)*** **STANDARD:** a) Proceeds to Unit 1 Emergency Switchgear Room and goes to the Auxiliary Shutdown Panel (ASDP). b) Obtains Key to unlock door of ASDP from box on the panel, unlocks and opens the door. (SIMULATES unlocking and opening door) **EVALUATOR'S NOTE:** • DO NOT allow candidate to unlock ASDP door – Simulate Only **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 2: ESTABLISH RCS AND SG HIGH/LOW INTERFACE INTEGRITY ON UNIT 1. ***(Attachment 1 Step 5)*** **STANDARD:** a) Acknowledges NOTE concerning primary and secondary high/low pressure boundary valve operation under SS direction after evaluation of system integrity. b) Acknowledges NOTE that 1-CH-LCV-1460A will require a CTMT entry or MCR access to be operated after isolation. ***c) Places the following HI/LO control switches to the DISABLE position:** • **1-RC-SOV-100A-1/2 and RC-SOV-101A-1/2, Reactor/PRZR Vent Valves.** • **1-RC-PCV-1455C, PRZR PORV.** • **1-CH-LCV-1460A, Letdown Line Isolation.** • **1-RC-SOV-100B-1/2 and RC-SOV-101B-1/2, Reactor/PRZR Vent Valves.** • **1-RC-PCV-1456, PRZR PORV.** • **1-CH-HCV-1137, Excess Letdown Flow.** **EVALUATOR'S <u>CUE</u>:** • If applicant identifies a label discrepancy for 1-RC-SOV-100A-1/2, 1-RC-SOV-101A-1/2, 1-RC-SOV-100B-1/2, and/or 1-RC-SOV-101B-1/2, direct the applicant to continue with switch positioning as directed. The label discrepancy for the 1/2 at the end of each valve number will be resolved by shift management. **EVALUATOR'S NOTE:** • DO NOT allow candidate to manipulate any controls – Simulate Only. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: REPORTS TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that you have completed locally establishing RCS & SG HI/LO interface integrity for Unit 1 only IAW steps 4 and 5 of Attachment 1 of FCA-1.00 **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

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Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be SIMULATED in the plant.
- Locally establish RCS & SG HI/LO interface integrity for Unit 1 IAW steps 4 and 5 of Attachment 1 of FCA-1.00.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- A limiting MCR fire has occurred and forced MCR evacuation. 0-FCA-1.00 is in progress at step 4.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. You are the 4th RO on shift. A fire has forced evacuation of the control room.
- Here is Attachment 1 of FCA-1.00. I need you to locally establish RCS & SG HI/LO interface integrity for Unit 1 only IAW steps 4 and 5 of Attachment 1 of FCA-1.00.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- A limiting MCR fire has occurred and forced MCR evacuation. 0-FCA-1.00 is in progress at step 4.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. You are the 4th RO on shift. A fire has forced evacuation of the control room.
- Here is Attachment 1 of FCA-1.00. I need you to locally establish RCS & SG HI/LO interface integrity for Unit 1 only IAW steps 4 and 5 of Attachment 1 of FCA-1.00.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Job Performance Measure 061A1.04
ALTERNATE PATH

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

ESTABLISH MAKEUP TO THE EMERGENCY CONDENSATE STORAGE TANK.

K/A: 061A1.04 Ability to predict and/or monitor changes in parameters (to prevent exceeding limits) associated with operating the AFW controls including: AFW source tank level (3.9/3.9)

Applicability	**Estimated Time**	**Actual Time**
RO/SRO(I)/SRO(U)	20 Minutes	

Conditions

- Task is to be SIMULATED in the plant beginning in Unit 2 Computer Room.
- A simulated loss of secondary heat sink is in progress. The Unit 2 Above Ground ECST is below 20% level and it is desired to makeup to the tank using 2-CN-150.

Standards

- 2-ES-3.1, Post-SGTR Cooldown using Backfill.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. Unit 2 is currently experiencing a SGTR. The AFW pumps are aligned to the ECST, which has gone below 20%.
- Here's a copy of 2-ES-3.1, Post-SGTR Cooldown using Backfill, Attachment 4. I need you to locally makeup to the Unit 2 Above Ground Emergency Condensate Storage Tank from 2-CN-TK-2 using 2-CN-150.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- Completion of 2-ES-3.1 Attachment 4 Step 2g.

Procedures

- 2-ES-3.1, Post-SGTR Cooldown using Backfill. (REV 18)

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Initiating Cues

- A simulated loss of secondary heat sink is in progress. The Unit 2 Above Ground ECST is below 20% level and it is desired to makeup to the tank using 2-CN-150.

Notes to the Evaluator.

- **Task briefing should occur in the Unit 2 Computer Room.**
- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are bolded and denoted by an asterisk (*).

Directions to the Applicant

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. Unit 2 is currently experiencing a SGTR. The AFW pumps are aligned to the ECST, which has gone below 20%.
- Here's a copy of 2-ES-3.1, Post-SGTR Cooldown using Backfill, Attachment 4. I need you to locally makeup to the Unit 2 Above Ground Emergency Condensate Storage Tank from 2-CN-TK-2 using 2-CN-150.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).

- **START TIME:**

STEP 1: LOCALLY OPEN 2-CN-150. ***(Attachment 4, Step 1)*** **STANDARD:** a) Proceeds to Turbine Building basement and locates 2-CN-150 in South West corner. b) Attempts to open 2-CN-150. **EVALUATOR'S CUES:** **a) When candidate attempts to open 2-CN-150, report that the handwheel will not turn regardless of how much force is used.** **b) Direct the candidate to align both AFW Booster Pumps to the suction of the AFW Pumps IAW 2-ES-3.1, Attachment 4, Step 2 - Alignment of the AFW Booster Pumps.** **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: VERIFY 2-CN-TK-3 LEVEL GREATER THAN 20%. ***(Attachment 4, Step 2a)*** **STANDARD:** Checks 2-CN-TK-3 (Underground ECST) level greater than 20% by either: • requesting information from control room operator, • reading MCR meter for 2-CN-TK-3 or • checking TK-3 local meter. **EVALUATOR'S NOTE:** • If asked: Control room level indication reads 100%. • If asked: Local meter reads 17 feet 10 inches. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: LOCALLY OPEN BOOSTER PUMP DISCHARGE ISOLATION TO AFW PUMPS. ***(Attachment 4, Step 2b)*** **STANDARD:** Proceeds to AFW pumps area and opens the following valves (by turning handwheel in the counter-clockwise direction): ***a) 2-FW-283 (for FW-P-2) (CRITICAL TASK)** ***b) 2-FW-284 (for FW-P-3A) (CRITICAL TASK)** ***c) 2-FW-285 (for FW-P-3B) (CRITICAL TASK)** **EVALUATOR'S NOTE:** • If asked: All AFW pumps are available • If asked: (Prior to opening) valve stem is down (~½ inch showing). • If asked: (If properly operated) valve stem rises. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: LOCALLY VERIFY BOOSTER PUMP SUCTION VALVES OPEN. ***(Attachment 4, Step 2c)*** **STANDARD:** Proceeds to the basement of Safeguards, and a) Verifies 2-FW-277 open (for FW-P-4A), b) Verifies 2-FW-280 open (for FW-P-4B). **EVALUATOR'S NOTE:** • If asked: It is desired to start both Booster Pumps, 2-FW-P-4A and 2-FW-P-4B. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 5: LOCALLY OPEN BOOSTER PUMP DISCHARGE VALVES. ***(Attachment 4, Step 2d)*** **STANDARD:** a) Opens or verifies 2-FW-279 open (for FW-P-4A). b) Opens or verifies 2-FW-282 open (for FW-P-4B). **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 6: LOCALLY START THE ALIGNED BOOSTER PUMPS. ***(Attachment 4, Step 2e)*** **STANDARD:** ***a) Starts FW-P-4A by taking control switch to START position. (CRITICAL TASK)** ***b) Starts FW-P-4B by taking control switch to START position. (CRITICAL TASK)** **EVALUATOR'S NOTE:** It is only necessary to start one of the two pumps to satisfy the critical component of this step. • If asked: It is desired to start both Booster Pumps, 2-FW-P-4A and 2-FW-P-4B. • Tell operator: (When pumps started,) pump running noise is heard. • If asked: Booster pump disch pressures read ~45#. • If asked: When switch to START, green light goes out & red light on. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 7: LOCALLY VERIFY AFW PUMP SUCTION PRESSURE AVAILABLE. ***(Attachment 4, Step 2f)*** **STANDARD:** Returns to AFW pump area and checks AFW pump suction pressure gauges to verify pressure available: a) 2-FW-PI-256A (for FW-P-2), b) 2-FW-PI-256B (for FW-P-3A), c) 2-FW-PI-256C (for FW-P-3B). **EVALUATOR'S NOTE:** • If asked: Point to 30 psi on the gauges. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 8: LOCALLY CLOSE THE NORMAL AFW PUMP SUCTION VALVES. ***(Attachment 4, Step 2g)*** **STANDARD:** Closes the normal AFW pump suction paths (by turning handwheels in the clockwise direction): ***a) Closes 2-FW-153 (for FW-P-2). (CRITICAL TASK)** ***b) Closes 2-FW-168 (for FW-P-3A). (CRITICAL TASK)** ***c) Closes 2-FW-183 (for FW-P-3B). (CRITICAL TASK)** **EVALUATOR'S NOTE:** When the valves are operated properly, valve stem inserts until handwheel will not turn. If asked (after the valves are closed), state that the AFW pumps are continuing to operate normally. If operator attempts to call the MCR to verify AFW flow, report that flow is 150 gpm to each SG. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 9: REPORTS TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that the ECST is being filled using the Booster Pumps. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

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Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be SIMULATED in the plant.
- Establish makeup to the Emergency Condensate Storage Tank.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- A simulated loss of secondary heat sink is in progress. The ECST is below 20% level and it is desired to makeup to the tank using 2-CN-150.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. Unit 2 is currently experiencing a SGTR. The AFW pumps are aligned to the ECST, which has gone below 20%.
- Here's a copy of 2-ES-3.1, Post-SGTR Cooldown using Backfill, Attachment 4. I need you to locally makeup to the Unit 2 Above Ground Emergency Condensate Storage Tank from 2-CN-TK-2 using 2-CN-150.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- A simulated loss of secondary heat sink is in progress. The ECST is below 20% level and it is desired to makeup to the tank using 2-CN-150.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. Unit 2 is currently experiencing a SGTR. The AFW pumps are aligned to the ECST, which has gone below 20%.
- Here's a copy of 2-ES-3.1, Post-SGTR Cooldown using Backfill, Attachment 4. I need you to locally makeup to the Unit 2 Above Ground Emergency Condensate Storage Tank from 2-CN-TK-2 using 2-CN-150.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR08301
Job Performance Measure 064A4.01
ALTERNATE PATH

Applicant_____ Start Time_____

Examiner_____

Date _____ Stop Time_____

Title

MANUALLY START AN EMERGENCY DIESEL GENERATOR AT THE LOCAL PANEL.

K/A: 064A4.01 Ability to manually operate and/or monitor in the Control Room: Local and remote operation of the EDG. (4.0/4.3)

Applicability	Estimated Time	Actual Time
RO/SRO(I)	30 Minutes	

Conditions

- Task is to be SIMULATED in the plant beginning in #1 ESGR at the Aux S/D Panel.
- A Safe Shutdown Area fire has resulted in a loss of Offsite power, evacuation of the MCR to the ESGR, and failure of #1 EDG to start.

Standards

- 0-FCA-12.00, Emergency Diesel Generator Operation.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. You are an extra RO on shift. We currently have a fire with a loss of offsite power. #1 EDG failed to auto-start and the MCR has been evacuated.
- Here is a copy of 0-FCA-12.00. I need you to manually start the #1 Emergency Diesel Generator at the local panel. The Service Bldg operator will close the stub bus breaker and complete the procedure once the EDG is loaded on the bus.
- Since I am going to accompany you, we won't be using radio headsets.
- When you finish the actions necessary to accomplish this, please inform me.

Terminating Cues

- Report received that 0-FCA-12.00, Step 31 completed.

Procedures

- 0-FCA-12.00, Emergency Diesel Generator Operation. (REV 11)

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Initiating Cues

- A Safe Shutdown Area fire has resulted in a loss of Offsite power, evacuation of the MCR to the ESGR, and failure of #1 EDG to start.

Notes to the Evaluator.

- **Task briefing should occur in the #1 ESGR at the Aux S/D Panel.**

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.

- Task critical elements are bolded and denoted by an asterisk (*).

Directions to the Applicant

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. You are an extra RO on shift. We currently have a fire with a loss of offsite power. #1 EDG failed to auto-start and the MCR has been evacuated.
- Here is a copy of 0-FCA-12.00. I need you to manually start the #1 Emergency Diesel Generator at the local panel. The Service Bldg operator will close the stub bus breaker and complete the procedure once the EDG is loaded on the bus.
- Since I am going to accompany you, we won't be using radio headsets.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

'B'Charging pump running

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).

- **START TIME:**

STEP 1: REVIEWS CAUTION AND NOTE PRIOR TO STEP 1. ***(Step 1 Cautions and Notes)*** **STANDARD:** Reads CAUTION statements covering portable radio and radio head set usage, and SPEED DROOP control dial setting if paralleling EDG with the grid. Reads the note about what will require the EMERG GEN PUSH BUTTON RESET to be rest. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 2: VERIFIES SWITCH POSITIONS AT THE #1 EDG ROOM DIESEL ISOL PANEL. ***(Step 1)*** **STANDARD:** Proceeds to #1 EDG room diesel isolation panel and verifies switches are in the desired positions as follows: (a) 15H8 sync switch - OFF (b) 15H3 sync switch - OFF (c) EDG isolation switch - OFF (d) 15H8 normal feed control switch - AFTER CLOSE (red flag) (e) 15H3 Emergency feed control switch - AFTER TRIP (green flag) (f) "H" Emergency Bus voltmeter switch – Any position other than OFF (g) Fast start defeat switch - OFF (h) Generator Field Flash switch - OFF **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 3: VERIFIES "AUTO/LOCAL" SELECTOR SWITCH ON ENGINE CONTROL CABINET IN "AUTO". ***(Step 2)*** **STANDARD:** Checks Engine Control Cabinet "AUTO/LOCAL" selector switch in the "AUTO" position. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 4: OBTAINS DIP ISOLATION SWITCH KEY. ***(Step 3 Note)*** **STANDARD:** a) Reads NOTE prior to step 3 concerning EDG isolation lockout relays and which control and indication functions are transferred to the local EDG panel. b) Locates storage box on wall (on left behind DIP). c) Breaks storage box front glass or break-away lock. d) Obtains the DIP isolation switch key. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 5: TRANSFERS EDG TO LOCAL CONTROL. ***(Step 3)*** **STANDARD:** ***a) Inserts key into Isolation Switch.** ***b) Rotates switch to the ON position.** c) Verifies all three isolation lockout relays - red trip light off and they rotate approximately 45°. **EVALUATOR'S NOTE:** • If asked: All isolation relays move 45° and red trip lights out. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 6: CHECK CHARGING PUMPS – AT LEAST ON RUNNING ***(Step 4)*** **STANDARD:** a) Reads CAUTION about Seal Injection being lost and seal isolation b) Determines 'B' Charging pump is running by asking Shift Manager. **EVALUATOR'S NOTE:** • If asked: 'B' Charging pump is running on Unit 1 **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 7: CHECKS OFF-SITE POWER AVAILABLE. ***(Step 5)*** **STANDARD:** a) Recalls from initial conditions that a loss of off-site power has occurred, (OR), b) Asks Nuclear Shift Manager for status of off-site power. c) Step 5 RNO directs operator to Step 8. **EVALUATOR'S NOTE:** • If asked: Off-site power is not available. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 8: VERIFIES THAT #1 EDG HAS FAILED TO AUTO START. GOES TO STEP 22 OF 0-FCA-12.00. ***(Step 8)*** **STANDARD:** a) No RPM indicated. b) No engine or start noise heard. c) RNO Step 8 directs operator to Step 22. **EVALUATOR'S NOTE:** • If asked: Point to an RPM indication of zero (0) and no change in room noise level. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 9: OBSERVES NOTES PRIOR TO STEP 22. ***(Step 22 Notes)*** **STANDARD:** a) Observes NOTE that if EDG has failed to start after three auto-start attempts, a start failure alarm will occur. It should be investigated and reset. b) Observes NOTE that an overspeed condition will immediately shutdown the EDG and lockout the EDG until reset. c) Observes NOTE for which signals will place the EDG into the cooldown cycle. d) Observes NOTE that the operator should check the EDG Annunciator Panel to aid in determining cause of EDG failures. **EVALUATOR'S NOTE:** • If asked: No annunciators are lit that would indicate the cause of the EDG failing to start. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 10: VERIFIES THE EDG DIFFERENTIAL LOCKOUT RELAY IS NOT TRIPPED. ***(Step 22)*** **STANDARD:** Checks EDG differential lockout relay. Notes that the black flag is indicated and red light is on. **EVALUATOR'S NOTE:** • If asked: Black flag is indicated on differential lockout relay. • If asked: Red light is on for differential lockout relay. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 11: LOCALLY VERIFIES EDG OVERCURRENT NOT PRESENT. ***(Step 23)*** **STANDARD:** a) Proceeds to breaker 15H3. b) Verifies no orange flag drops on 15H3. **EVALUATOR'S NOTE:** • If asked: No orange flag drops exist on 15H3. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 12: LOCALLY VERIFY EMER GEN # 1 PUSH BUTTON RESET – RESET (AUX TRIP RELAY). ***(Step 24)*** **STANDARD:** a) Proceeds to #1 EDG-DIP in #1 ESGR. b) Pushes EMERG GEN #1 PUSH BUTTON RESET. c) Verifies amber light for Auto Start Disabled is off. **EVALUATOR'S NOTE:** • If asked: Amber light for Auto Start Disabled is off. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 13: VERIFIES BREAKER POSITIONS AT REMOTE EXCITATION CABINET. ***(Step 25)*** **STANDARD:** Proceed to remote excitation cabinet and verify following breakers closed: a) CB alarm b) CB start 1 c) CB start 2 d) AC control e) DC control **EVALUATOR'S NOTE:** • If asked: Indicate that all breakers are closed. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 14: CHECKS EDG BATTERY VOLTAGE NORMAL. ***(Step 26)*** **STANDARD:** Observe battery voltage on EDG battery charger meter between 120 – 124 volts. **EVALUATOR'S NOTE:** • If asked: Point to a battery voltage indication of 122 volts. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 15: VERIFIES STARTING AIR AVAILABLE. ***(Step 27)*** **STANDARD:** a) Observes NOTE that lister diesel may be operated to provide starting air. b) Check all six air bottle stop valves - open. c) Verify pressure in both banks greater than 175 PSIG at Engine Control Cabinet (ECC). **EVALUATOR'S NOTE:** • If asked: All six air bottle stop valves are in line with piping. • If asked: Point to an air pressure in both banks of 185 PSIG at ECC. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 16: CHECKS ENGINE BASE TANK LEVEL GREATER THAN OR EQUAL TO 100 GALLONS. ***(Step 28)*** **STANDARD:** Verify engine base tank greater than 100 gallons by observing level gauge (below lube oil circ. pump motor on base plate). **EVALUATOR'S NOTE:** • If asked: Point to an engine base tank level of ~ 3/4 full. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 17: CHECKS ELECTRIC FUEL PUMP - RUNNING. ***(Step 29)*** **STANDARD:** a) Observes NOTE about using fuel prime button when starting EDG if electric fuel oil pump not running prior to pushing fuel prime pushbutton. b) Observe Fuel System 1 filter inlet pressure < 10 PSIG at ECC. ***c) Push the fuel prime pushbutton and verify FO pressure indicates > 10 PSIG.** **EVALUATOR'S NOTE:** • If asked: Point to a fuel system 1 filter pressure of zero (0) PSIG. • If asked: After fuel prime pushbutton pushed, point to a fuel system 1 filter pressure of 15 PSIG. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 18: PREPARES FOR LOCAL START AT THE ENGINE CONTROL CABINET. ***(Step 30)*** **STANDARD:** a) Places the AUTO/LOCAL selector switch to the LOCAL position. b) Verifies NO FIELD alarm is clear. c) Positions personnel to observe the exhaust from air start motors. **EVALUATOR'S NOTE:** • If asked: NO FIELD alarm is clear. (NOT AUTO alarm light is lit, all others are clear) • If asked personnel are stationed to observe air start motor exhaust. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 19: DEPRESSES START PUSHBUTTON. ***(Step 31a)*** **STANDARD:** a) Reads CAUTION that personnel in the EDG Room should be wearing hearing protection. b) Reads NOTE that a local EDG start will cause both start circuits to actuate simultaneously. ***c) Momentarily depresses the ENGINE START pushbutton on ECC.** **EVALUATOR'S NOTE:** • Tell operator: Engine starter noise heard followed by engine running noise. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 20: ADJUSTS ENGINE SPEED TO 900 RPM. ***(Step 31b)*** **STANDARD:** a) Checks EDG RPM meter. b) Takes governor control to RAISE and brings engine speed to 900 RPM. **EVALUATOR'S NOTE:** • If asked prior to adjusting governor control: Point to an engine speed of 850 RPM. • If asked after adjusting governor control: Point to an engine speed of 900 RPM. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STEP 21: VERIFIES EDG OUTPUT BREAKER CLOSED. ***(Step 31d)*** **STANDARD:** a) Checks EDG output breaker (15H3) is closed by noting red light on, green light off and 4300 volts on "H" bus. **EVALUATOR'S NOTE:** • If asked: Breaker 15H3 indication shows red light on and green light off. • If asked: "H" bus voltage indicates 4300 volts. **COMMENTS:**	_____ **SAT** _____ **UNSAT**
STEP 22: REPORTS TO NUCLEAR SHIFT MANAGER (EVALUATOR). **STANDARD:** Verbal status report made that #1 EDG started and loaded on the bus. **COMMENTS:**	_____ **SAT** _____ **UNSAT**

STOP TIME:

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Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)

Task

- Task is to be SIMULATED in the plant.
- Manually start the #1 Emergency Diesel Generator at the local panel.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- A Safe Shutdown Area fire has resulted in a loss of Offsite power, evacuation of the MCR to the ESGR, and failure of #1 EDG to start.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. You are an extra RO on shift. We currently have a fire with a loss of offsite power. #1 EDG failed to auto-start and the MCR has been evacuated.
- Here is a copy of 0-FCA-12.00. I need you to manually start the #1 Emergency Diesel Generator at the local panel. The Service Bldg operator will close the stub bus breaker and complete the procedure once the EDG is loaded on the bus.
- Since I am going to accompany you, we won't be using radio headsets.
- When you finish the actions necessary to accomplish this, please inform me.

Operator Directions Handout
(TO BE GIVEN TO APPLICANT)

Initial Conditions

- A Safe Shutdown Area fire has resulted in a loss of Offsite power, evacuation of the MCR to the ESGR, and failure of #1 EDG to start.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager. You are an extra RO on shift. We currently have a fire with a loss of offsite power. #1 EDG failed to auto-start and the MCR has been evacuated.
- Here is a copy of 0-FCA-12.00. I need you to manually start the #1 Emergency Diesel Generator at the local panel. The Service Bldg operator will close the stub bus breaker and complete the procedure once the EDG is loaded on the bus.
- Since I am going to accompany you, we won't be using radio headsets.
- When you finish the actions necessary to accomplish this, please inform me.