Final Submittal

(Blue Paper)

1. Administrative Questions/JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)

SURRY EXAM 2002-301

50-280, 281/2002-301
MARCH 18 - 28, 2002

Facility: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Examination Level (circle one): **SRO (I & U)** Operating Test Number: 2

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1		Take actions IAW OPAP-0008 for mis-positioned locked valve that makes TS system inoperable. (KA2.1.33)(SRO)
		Obtain VCT trend from computer and determine estimated leak rate. (KA2.1.19)(RO&SRO)
A.2		Determine that work order cannot be released due to improper plant conditions for PMT. (KA2.2.17)(SRO)
A.3		Determine pathway to and from work site that yields the lowest dose using a survey map. (KA2.3.10)(SRO)
A.4		Notification determination IAW EPIP 1.01(KA2.4.41)(SRO)

Facility: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Examination Level (circle one): **RO** / SRO Operating Test Number: 1

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1		Perform valve position verifications (KA2.1.29)(RO)
		Obtain VCT trend from computer and determine estimated leak rate. (KA2.1.19)(RO&SRO)
A.2		Perform component tag out (KA2.2.13)(RO)
A.3		Perform Attachment 1 of 0-OSP-RC-002, Primary to Secondary leak-rate using condenser air ejector rad monitor. (KA2.3.11)(RO)
A.4		Stability Class Calculation IAW EPIP 2.01(KA2.4.39)(RO)

Developed for the Surry, March 2002, Initial Examination
Examination Report Number 2002-301

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

ADMINISTRATION

NRC-ADMIN-A.2-RO

CLASS ROOM/CONTROL ROOM

TITLE:

TAGGING ELEMENTS/BOUNDARY DETERMINATION

APPLICANT: _____

EXAMINER: _____

REV. 0

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Determine Tagging Elements/Boundary Determination

Alternate Path:

NO

Facility JPM #:

NEW

K/A Ratings:

G 2.1.24 (2.8/3.1) Ability to obtain and interpret station electrical and mechanical drawings.
G 2.2.13 (3.6/3.8) Knowledge of tagging and clearance procedures.

Task Standard:

Preferred Evaluation Location:

Simulator _____ In-plant _____

Preferred Evaluation Method:

Perform _____ Simulate ____

References:
USFAR, Section 10.3.5, Condensate and Feedwater, TRM, 3.7, Plant Systems, 11448-FM-068A, Feed water system.
Validation Time: Critical Time: NO

Applicant: _____ Start _____
Name Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____
Name

COMMENTS

READ TO THE OPERATOR

DIRECTION TO THE APPLICANT:

TASK TO BE PERFORMED ANYWHERE

I will explain the initial conditions and state the task to be performed. I will provide any initiating cues and reports on other actions when directred by you. Ensure you indicate to me when you understand your assigned task. To indicate you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the third license. 1-FW-P-4A, "AFW Booster Pump," requires a seal package replacement. This will require the pump casing to be drained.

INITIATING CUES:

You are requested to determine ALL requirements/elements necessary to prepare this system for the required maintenance (Tag out elements, valve positions, etc/Boundaries). Use the attached table to identify all components.

NOTE: (RESTRICT MIND access to plant drawings and administrative procedures. MOP'S are NOT authorized.)

NOTE: The order in which tags should be placed is not necessary.

NOTE: The number of blanks on the attached table is not indicative of the number of item necessary to complete the JPM

	COMPONENT ID NUMBER/ NAME	POSITION	DANGER TAG REQUIREMENT (YES/NO)
1	1-EP-BKR-1H1-2N10C, AFW Booster Pump 1-FW-P-4A	OPEN	YES (Critical Step)
2	1-FW-279 AFW Booster Pump 4 A discharge	CLOSE	YES (Critical Step)
3	1-FW-293 AFW Pump 4 A Recirc Valve	CLOSE	YES (Critical Step)
4	1-FW-277 AFW Booster Pump 4 A suction.	CLOSE	YES (Critical Step)
5	1-FW-296	Pipe Cap Removed	NO (Critical Step)
6	Attach Drain Hose to 1-FW -296 And Run to Floor Drain.	NA	NA
7	1-FW-296	OPEN	YES (Only Part That Is Critical, Is to Have it Opened)
8	1-FW-307 AFW Booster Pump Disch PI-160A isolation.	Open	Yes (Critical Step)
9	1-FW-600, AFW Booster Pump Disch PI-160A	Pipe Cap Removed	NO (Critical Step)
10	Attach Drain Hose to 1-FW-600 and Run to Floor Drain	NA	NA
11	1-FW-600	OPEN	YES (Only Part That Is Critical, Is to Have it Opened)

	COMPONENT ID NUMBER/ NAME	POSITION	DANGER TAG REQUIREMENT (YES/NO)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			

APPLICANT CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

I will explain the initial conditions and state the task to be performed. I will provide any initiating cues and reports on other actions when directred by you. Ensure you indicate to me when you understand your assigned task. To indicate you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the third license. 1-FW-P-4A, "AFW Booster Pump," requires a seal package replacement. This will require the pump casing to be drained.

INITIATING CUES:

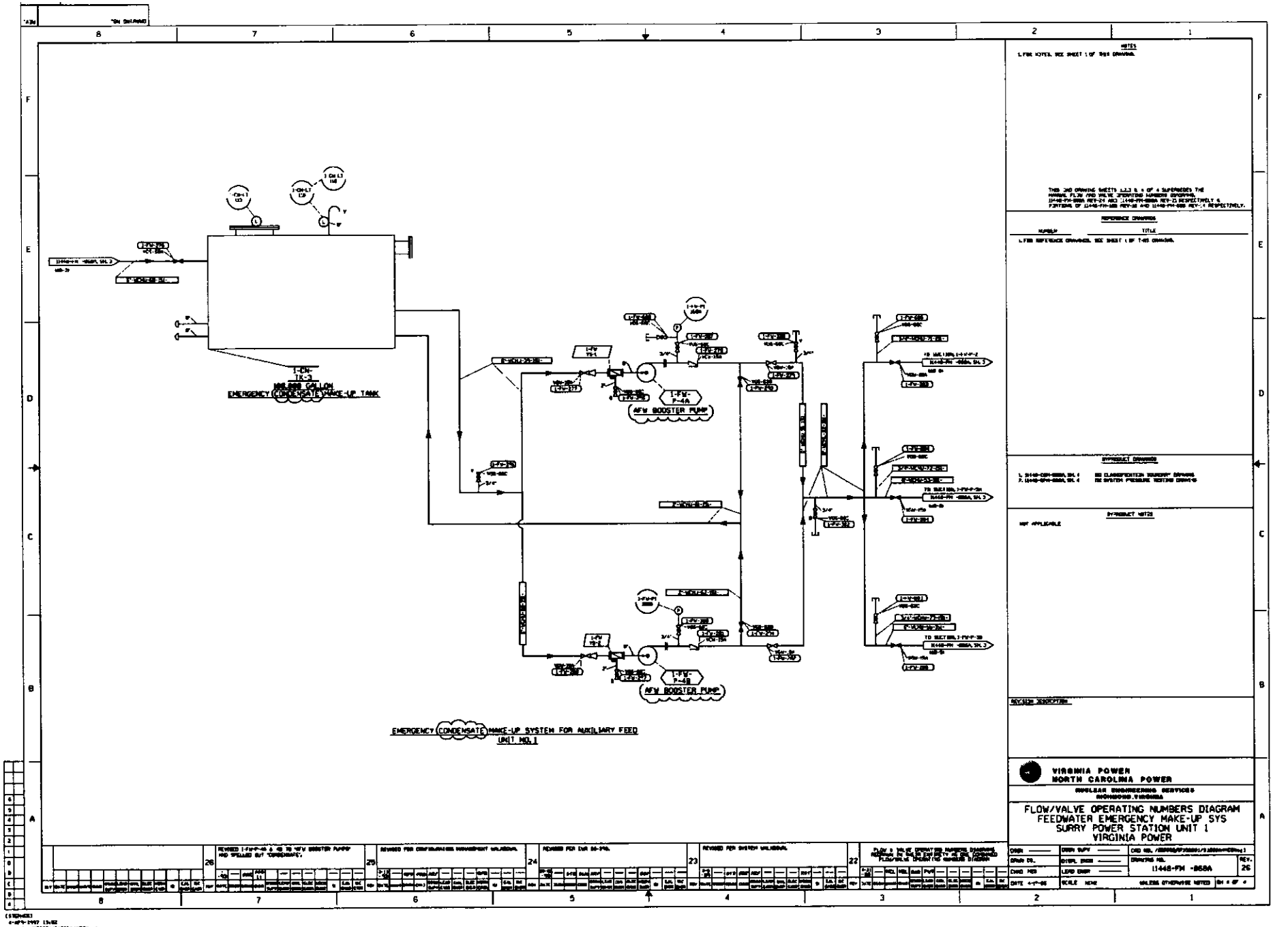
You are requested to determine ALL requirements/elements necessary to prepare this system for maintenance (Tag out elements, valve positions, etc/Boundaries). Use the attached table to identify all components.

NOTE: (RESTRICT MIND access to plant drawings and administrative procedures. MOP'S are NOT authorized.)

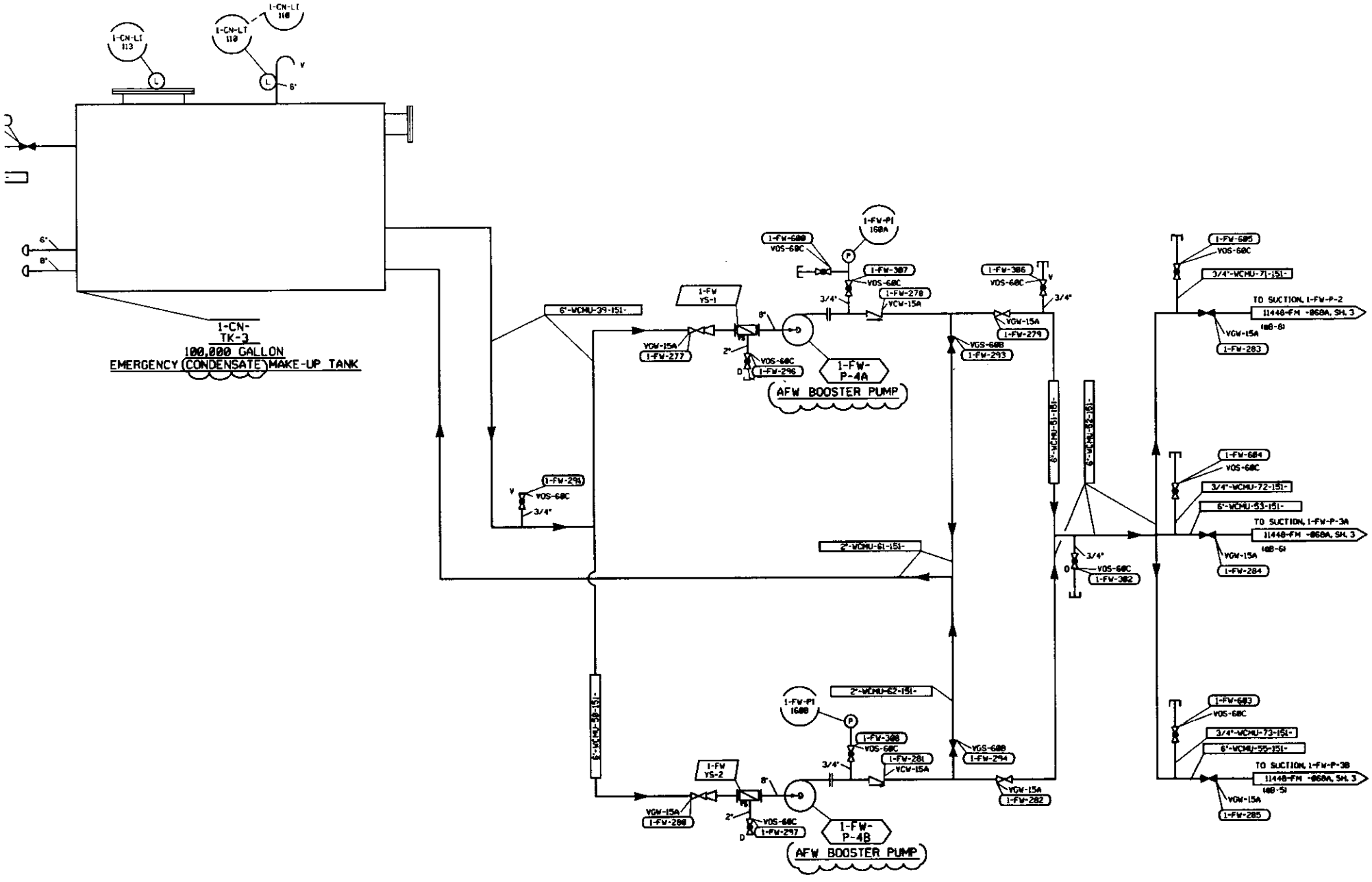
NOTE: The order in which tags should be placed is not necessary.

NOTE: The number of blanks on the attached table is not indicative of the number of item necessary to complete the JPM

** DO NOT USE FOR WORK IN PLANT. DATA LOSS POSSIBLE AT THIS SCALE & DPI. **

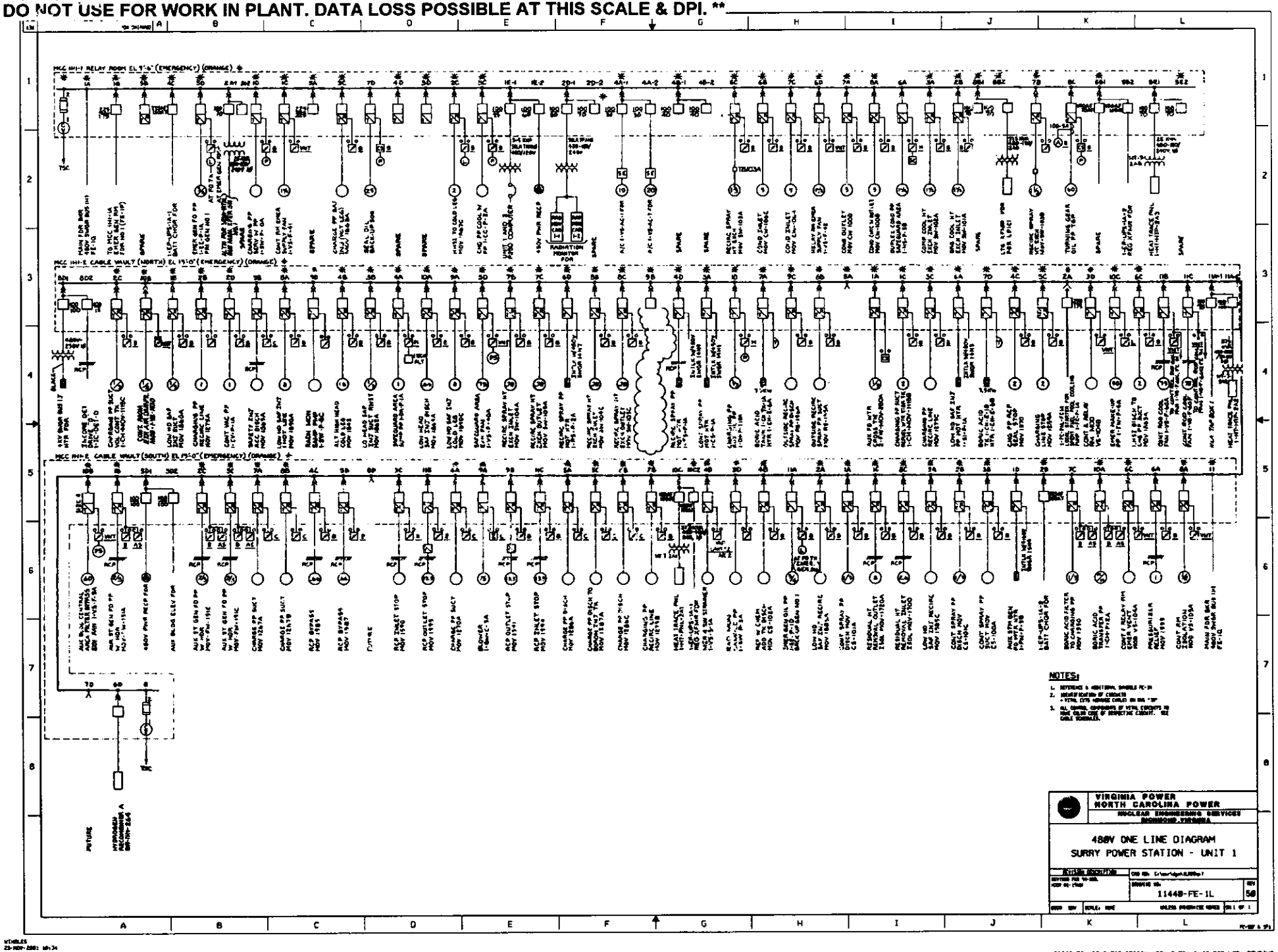


** WARNING: THIS IS ONLY A PARTIAL SECTION OF ENTIRE DRAWING. **



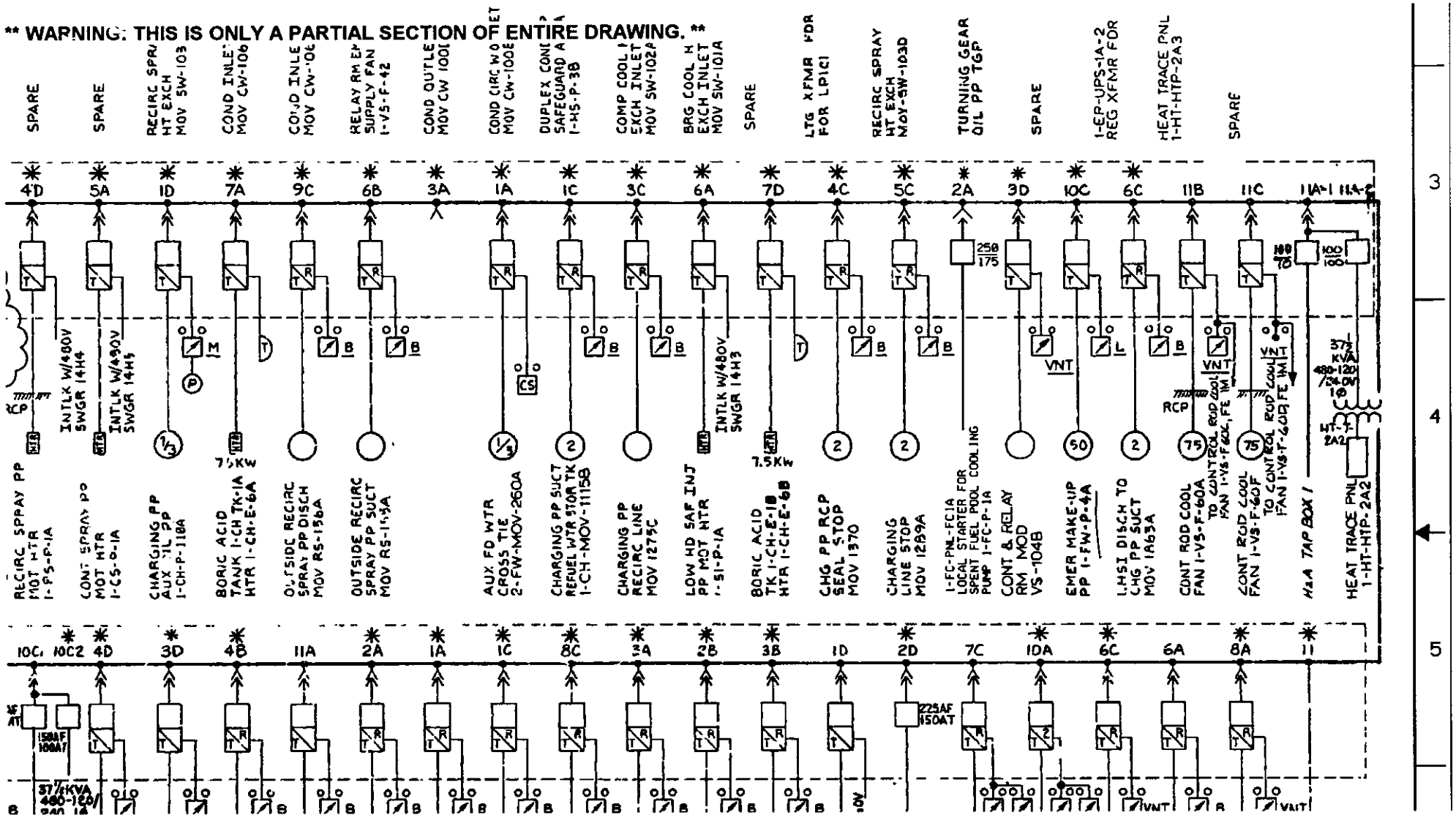
EMERGENCY CONDENSATE MAKE-UP SYSTEM FOR AUXILIARY FEED
UNIT NO. 1

** DO NOT USE FOR WORK IN PLANT. DATA LOSS POSSIBLE AT THIS SCALE & DPI. **



PRIOR TO USING FOR DESIGN WORK CHECK DWG FOR WORK PENDING

** WARNING: THIS IS ONLY A PARTIAL SECTION OF ENTIRE DRAWING. **



VIRGINIA POWER

Engineering Transmittal

[redacted]

To: D L Padula

NES

From: Mike Wilda

January 21, 1999

QA Cat SR

ET No 99-0009, Rev 0
ESWP Diesel Safe Shutdown System Parameters
Surry Units 1&2

Source Document: New Procedure 0-ECM-0706-02, ESW Diesel Shutdown System Checks

Reference: VTM 38-699-00001, Detroit Diesel V-71 Technical Manual

Procedure 0-ECM-0706-02, ESW Diesel Shutdown System Checks, is being developed to periodically check the operation of the ESWP diesel safe shutdown system. When high cooling water temperature or low lubricating oil pressure is sensed the ESW diesel automatically shuts down. There is an interlock with fuel oil pressure to prevent the shutdown system from operating during the diesel startup. Setpoints for the high water temperature, low lube oil pressure, and fuel oil pressure should be added to the DRP to support the procedure.

VTM 38-699-00001, section 7.0, discusses testing of the electrical shutdown system. This section provides setpoint information for all three switches, but does not provide setpoint tolerances. The VTM provides a setpoint of 210 °F for the high water temperature. However, the VTM also directs that during testing the temperature should not exceed 210 °F. Since the normally operating temperature is 165-185 °F [redacted] such that the setpoint range will be 200-210 °F. The setpoint and tolerances were verified [redacted] with Western Branch Diesel as the standard tolerances normally used. Additionally, the required accuracy for the lubricating and fuel oil switches was discussed with Western Branch Diesel. They emphasized the setpoint tolerances for this equipment is not critical. For example, the low pressure lubricating oil switch is set at 10 psig. A loaded diesel with only 10 psig oil pressure will fail. The purpose of the switch is to shut down the diesel on a catastrophic loss of oil. Western Branch Diesel recommended Surry use its experience to determine tolerances for the switches. The setpoints will be as follows:

01-SW-RLY-HWR-1A/B/C	205°F +/-5°F
01-SW-RLY-LO-1A/B/C	10 psi +/-2 psi
01-SW-RLY-FR-1A/B/C	20 psi +/-3 psi

The switch setpoints, 10 psig and 20 psig, are provided by the VTM. The tolerances were chosen by Engineering and are reasonable for the switches functions. Reset for the switches will be deadband. Setpoint data sheets, DRP mark-ups, and an ASC are attached. The PRC and CDS were reviewed. No documents are affected. This ET revises the DRP, which will then be used as input for a new procedure.

Prepared By _____

Reviewed By _____

Approved By _____

CC: J. G. Munford
W. R. Benthall

Attachments
1) Setpoint data sheets
2) DRP mark-up
3) Activity Screening Checklist

VIRGINIA POWER

SURRY POWER STATION

PROCEDURE NO: 1-MOP-FW-007	
REVISION NO: 0	
PROCEDURE TYPE: MAINTENANCE OPERATING PROCEDURE	UNIT NO: 1
PROCEDURE TITLE: REMOVAL FROM AND RETURN TO SERVICE OF AFW BOOSTER PUMPS 1-FW-P-4A AND 1-FW-P-4B	EFFECTIVE DATE: ON FILE
	EXPIRATION DATE: (Temporary Procedures Only) N/A

REVISION SUMMARY:

NEW PROCEDURE

UNIT ONE

PROCEDURE WRITER: *K. Sanderson*	VALIDATOR: *D. Wirsching*
APPROVAL: APPROVAL ON FILE	DATE:

PROCEDURE USED: ❑ Entirely ❑ Partially **Note:** If used partially, note reason in remarks.

PROBLEMS ENCOUNTERED: ❑ Yes ❑ No **Note:** If yes, note problems in remarks.

REMARKS: _____

SHIFT SUPERVISOR OR UNIT SRO (SIGNATURE):	DATE:

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ATTACHMENTS

None

1.0 PURPOSE

1.1 To provide instructions for the removal from and return to service of 1-FW-P-4A and 1-FW-P-4B, AFW Booster Pumps, for maintenance activities.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR, Section 10.3.5, Condensate and Feedwater

2.2 Technical Specifications

2.2.1 Technical Requirements Manual, 3.7, Plant Systems

2.3 Technical References

2.3.1 11448-FM-068A, Feedwater System

2.4 Commitment Documents

2.4.1 CTS-87-1619, Recording the Work Number

2.4.2 PI S-2000-1937, Technical Requirements Change Request (TRCR) 001, Emergency Condensate Makeup Subsystem as a Reliable Source of AFW

Init **Verif**

3.0 INITIAL CONDITIONS

_____ 3.1 IF this procedure is used to prepare equipment for maintenance or to return equipment to service after maintenance, THEN record the Work Order Number and Mark Number below. IF NOT used for maintenance, THEN enter N/A. **(Reference 2.4.1)**

Work Order No.	Mark No.
_____	_____
_____	_____
_____	_____
_____	_____

4.0 PRECAUTIONS AND LIMITATIONS

4.1 This MOP renders 1-FW-P-4A and/or 1-FW-P-4B, AFW Booster Pumps, inoperable. This will require entering the Technical Requirements Manual action for pump operability on Unit 2, if Unit 2 is greater than 350°F/450 psig. **(Reference 2.4.2)**

5.0 INSTRUCTIONS

5.1 Removing 1-FW-P-4A, AFW Booster Pump From Service

NOTE: With Shift Supervisor approval, N/A may be entered for any step or substep in this subsection which does not apply due to plant or equipment conditions. An entry should be made in the Remarks section of the procedure cover page for any step or substep marked N/A.

_____ 5.1.1 Start a Unit 2 clock IAW TRM 3.7.17 for 1-FW-P-4A, AFW Booster Pump, inoperability. **(Reference 2.4.2)**

_____ * 5.1.2 Open and place a Danger Tag on breaker 1-EP-BKR-1H1-2N10C, AFW Booster Pump 1-FW-P-4A.

_____ * 5.1.3 Close and place a Danger Tag on 1-FW-279, AFW Booster Pump 4A Disch.

_____ * 5.1.4 Close and place a Danger Tag on 1-FW-293, AFW Pump 4A Recirc Valve.

_____ 5.1.5 IF 1-FW-P-4A, AFW Booster Pump, will be drained, THEN perform all of the following. Otherwise, enter N/A.

_____ * a. Close and place a Danger Tag on 1-FW-277, AFW Booster Pump 4A Suct.

_____ * b. Remove the pipe cap from 1-FW-296, AFW Pump 4A Suct Str Drain.

_____ c. Attach a drain hose to 1-FW-296 and run to the Floor Drain.

_____ * d. (Open) and place a Danger Tag on 1-FW-296.

_____ * e. Verify open and place a Danger Tag on 1-FW-307, AFW Booster Pump Disch PI-160A isolation.

_____ * f. Remove the pipe cap from 1-FW-600, AFW Booster Pump Disch PI-160A.

_____ g. Attach a hose to 1-FW-600 and run to the Floor Drain.

_____ * h. (Open) and place a Danger Tag on 1-FW-600.

_____ i. Verify that 1-FW-P-4A, AFW Booster Pump, is drained.

_____ 5.1.6 Notify the Shift Supervisor and the Unit 1 RO that 1-FW-P-4A, AFW Booster Pump, is tagged out.

Performed by: _____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

5.2 Returning 1-FW-P-4A, AFW Booster Pump To Service

NOTE: With Shift Supervisor approval, N/A may be entered for any step or substep in this subsection which does not apply due to plant or equipment conditions. An entry should be made in the Remarks section of the procedure cover page for any step or substep marked N/A.

5.2.1 IF 1-FW-P-4A, AFW Booster Pump, has been drained, THEN perform all of the following. Otherwise, enter N/A.

_____ a. Remove Danger Tag and close 1-FW-296, AFW Pump 4A Suct Str Drain.

_____ b. Remove the hose from 1-FW-296.

_____ c. Replace the pipe cap on 1-FW-296.

_____ d. Remove Danger Tag and verify open 1-FW-307, AFW Booster Pump Disch PI-160A isolation.

_____ e. Remove Danger Tag and close 1-FW-600, AFW Booster Pump Disch PI-160A.

_____ f. Remove Danger Tag and open 1-FW-277, AFW Booster Pump 4A Suct.

_____ g. Vent 1-FW-P-4A by opening 1-FW-600. WHEN water is free of air, THEN close 1-FW-600.

_____ h. Remove the hose from 1-FW-600.

_____ i. Replace the pipe cap on 1-FW-600.

5.2.2 IF 1-FW-P-4A, AFW Booster Pump, has been tagged out mechanically, THEN perform all of the following. Otherwise, enter N/A.

_____ a. Remove Danger Tag and open 1-FW-279, AFW Booster Pump 4A Disch

_____ b. Remove Danger Tag from 1-FW-293, AFW Pump 4A Recirc Valve.

_____ 5.2.3 Remove Danger Tag and close 1-EP-BKR-1H1-2N10C, AFW Booster Pump 1-FW-P-4A.

_____ 5.2.4 Notify the Shift Supervisor and the Unit 1 RO that 1-FW-P-4A, AFW Booster Pump tag out has been cleared and the pump is ready to be tested.

_____ 5.2.5 Perform Return to Service testing associated with 1-FW-P-4A.

_____ 5.2.6 WHEN all PMT requirements are completed sat, THEN stop the Unit 2 TRM 3.7.17 clock.

Performed by: _____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

5.3 Removing 1-FW-P-4B, AFW Booster Pump From Service

NOTE: With Shift Supervisor approval, N/A may be entered for any step or substep in this subsection which does not apply due to plant or equipment conditions. An entry should be made in the Remarks section of the procedure cover page for any step or substep marked N/A.

_____ 5.3.1 Start a Unit 2 clock IAW TRM 3.7.17 for 1-FW-P-4B, AFW Booster Pump, inoperability. **(Reference 2.4.2)**

_____ 5.3.2 Open and place a Danger Tag on breaker 1-EP-BKR-1J1-2W6B, AFW Booster Pump 1-FW-P-4B.

_____ 5.3.3 Close and place a Danger Tag on 1-FW-282, AFW Booster Pump 4B Disch.

_____ 5.3.4 Close and place a Danger Tag on 1-FW-294, AFW Pump 4B Recirc Valve.

5.3.5 IF 1-FW-P-4B, AFW Booster Pump, will be drained, THEN perform all of the following. Otherwise, enter N/A.

_____ a. Close and place a Danger Tag on 1-FW-280, AFW Booster Pump 4B Suct

_____ b. Remove the pipe cap from 1-FW-297, AFW Pump 4B Suct Str Drain.

_____ c. Attach a drain hose to 1-FW-297 and run to the Floor Drain.

_____ d. Open and place a Danger Tag on 1-FW-297.

_____ e. Close 1-FW-308, AFW Booster Pump Disch PI-160B

_____ f. Remove 1-FW-PI-160B, AFW Booster Pump 4B Disch Press Indicator, and place in a plastic bag and secure to piping.

_____ g. Attach a hose to 1-FW-308, AFW Booster Pump Disch PI-160B, (with PI removed) and direct to floor drain.

_____ h. Open and place a Danger Tag on 1-FW-308.

_____ i. Verify that 1-FW-P-4B, AFW Booster Pump, is drained.

_____ 5.3.6 Notify the Shift Supervisor and the Unit 1 RO that 1-FW-P-4B, AFW Booster Pump, is tagged out.

Performed by: _____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

5.4 Returning 1-FW-P-4B, AFW Booster Pump To Service

NOTE: With Shift Supervisor approval, N/A may be entered for any step or substep in this subsection which does not apply due to plant or equipment conditions. An entry should be made in the Remarks section of the procedure cover page for any step or substep marked N/A.

5.4.1 IF 1-FW-P-4B, AFW Booster Pump, has been drained, THEN perform all of the following. Otherwise, enter N/A.

_____ a. Remove Danger Tag and close 1-FW-297, AFW Pump 4B Suct Str Drain.

_____ b. Remove the hose from 1-FW-297.

_____ c. Replace the pipe cap on 1-FW-297.

_____ d. Remove Danger Tag and close 1-FW-308, AFW Booster Pump Disch PI-160B isolation.

_____ e. Remove Danger Tag and open 1-FW-280, AFW Booster Pump 4B Suct.

_____ f. Vent 1-FW-P-4B by opening 1-FW-308. WHEN water is free of air, THEN close 1-FW-308.

_____ g. Remove hose from 1-FW-308.

_____ h. Replace 1-FW-PI-160B, AFW Booster Pump 4B Disch Press Indicator.

_____ i. Open 1-FW-308, AFW Booster Pump Disch PI-160B isolation.

5.4.2 IF 1-FW-P-4B, AFW Booster Pump, has been tagged out mechanically, THEN perform all of the following. Otherwise, enter N/A.

_____ a. Remove Danger Tag and open 1-FW-282, AFW Booster Pump 4B Disch

_____ b. Remove Danger Tag from 1-FW-294, AFW Pump 4B Recirc Valve.

_____ 5.4.3 Remove the Danger Tag and close 1-EP-BKR-1J1-2W6B, AFW Booster Pump 1-FW-P-4B.

_____ 5.4.4 Notify the Shift Supervisor and the Unit 1 RO that 1-FW-P-4B, AFW Booster Pump tag out has been cleared and the pump is ready to be tested.

_____ 5.4.5 Perform Return to Service testing associated with 1-FW-P-4B.

_____ 5.4.6 WHEN all PMT requirements are completed sat, THEN stop the Unit 2 TRM 3.7.17 clock.

Performed by:	Signature	Initial	Print	Date
	Signature	Initial	Print	Date
	Signature	Initial	Print	Date
	Signature	Initial	Print	Date
	Signature	Initial	Print	Date

U. S. Nuclear Regulatory Commission

Region II

A.1.2 Administrative Section

NRC-ADMIN-JPM-06

Title:

DETERMINATION OF VCT LEAKRATE

JPM TITLE: DETERMINATION OF VCT LEAKRATE

JPM NUMBER: NRC-ADMIN-JPM-06

JPM REV. DATE: 03/06/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Determine VCT leakrate based on recorder trace

REQUIRED MATERIALS:

1. 1-OPT-RC-10.01, REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED
2. Calculator

REFERENCES:

1. 1-OPT-RC-10.01, REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED
2. 1-DRP-003, CURVE BOOK

VALIDATION TIME: 30 Minutes.

K/A: GEN 2.4.47 (3.4/3.7)

TERMINATING CUES:

The Trainee states that the calculation of VCT leakrate is complete.

SET-UP:

1. None Required

READ TO THE TRAINEE

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. I am the Unit 1 SRO and you are the Third License.

INITIATING CUES:

During a walkdown of the Control Board, the Unit 1 RO noted a change in the VCT level trend as indicated on the Trend Recorder. All other Unit parameters are stable and normal for 100% power operation.

Here is copy of the VCT level trace from the Trend Recorder (Attachment 1). The left-hand trace is VCT level and the right-hand trace is Intake Canal level. The recorder was set-up to record VCT level over a range of 0% to 100% and set at a chart speed of 1 inch per hour.

Here is a copy of 1-OPT-RC-10.01. I need you to calculate the RCS leakrate based on the change in VCT level, as indicated on this recorder trace. Only those portions of the procedure that specifically address the change in VCT level need to be completed. When you have completed your determination of the leakrate, please inform me of the value in gallons per minute.

Step 1: Calculate the percent change in VCT level.

STANDARDS

a. The Operator examines the recorder trace and calculates that the level is decreasing from 34% to 27% over a 15 minute period.

EVALUATOR'S CUES:

- If asked, there has been no change in any other parameter except for VCT level.
- If asked, assume normal 100% power values for all variables.

Step 2: Convert the percent change in VCT level over time to lbm/minute.

STANDARDS:

___ a. Multiplies the percent change in VCT level by the conversion factor listed on Attachment 4.
- 7% x 116.6 lbm/% = 816.2 lbm

___ b. Divides the calculated value by the elapsed time for the change.
- 816.2 lbm / 60 minutes = 13.60 lbm/min

Step 3: Converts the leakrate to gpm by multiplying by the conversion factor listed in Table 5 of Attachment 4.

STANDARDS:

___ a. Identifies the appropriate conversion factor in Table 5 of Attachment 4.

___ b. Multiplies the lbm/min by the conversion factor to obtain gpm
- $\frac{7.48052 \text{ gal/ft3}}{61.856 \text{ lbm/ft3}}$ x 13.60 lbm/min = 1.645 gpm

Step 4: Informs the Unit SRO of the calculated leakrate

STANDARDS:

___ a. Informs the Unit SRO that the calculated RCS leakrate based on the change in VCT level is 1.645 gpm.

EVALUATOR'S NOTES:

- Accept 1.81 gpm to 1.48 gpm as correct based on an acceptable tolerance for reading the recorder trace of ± 10%.

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. I am the Unit 1 SRO and you are the Third License.

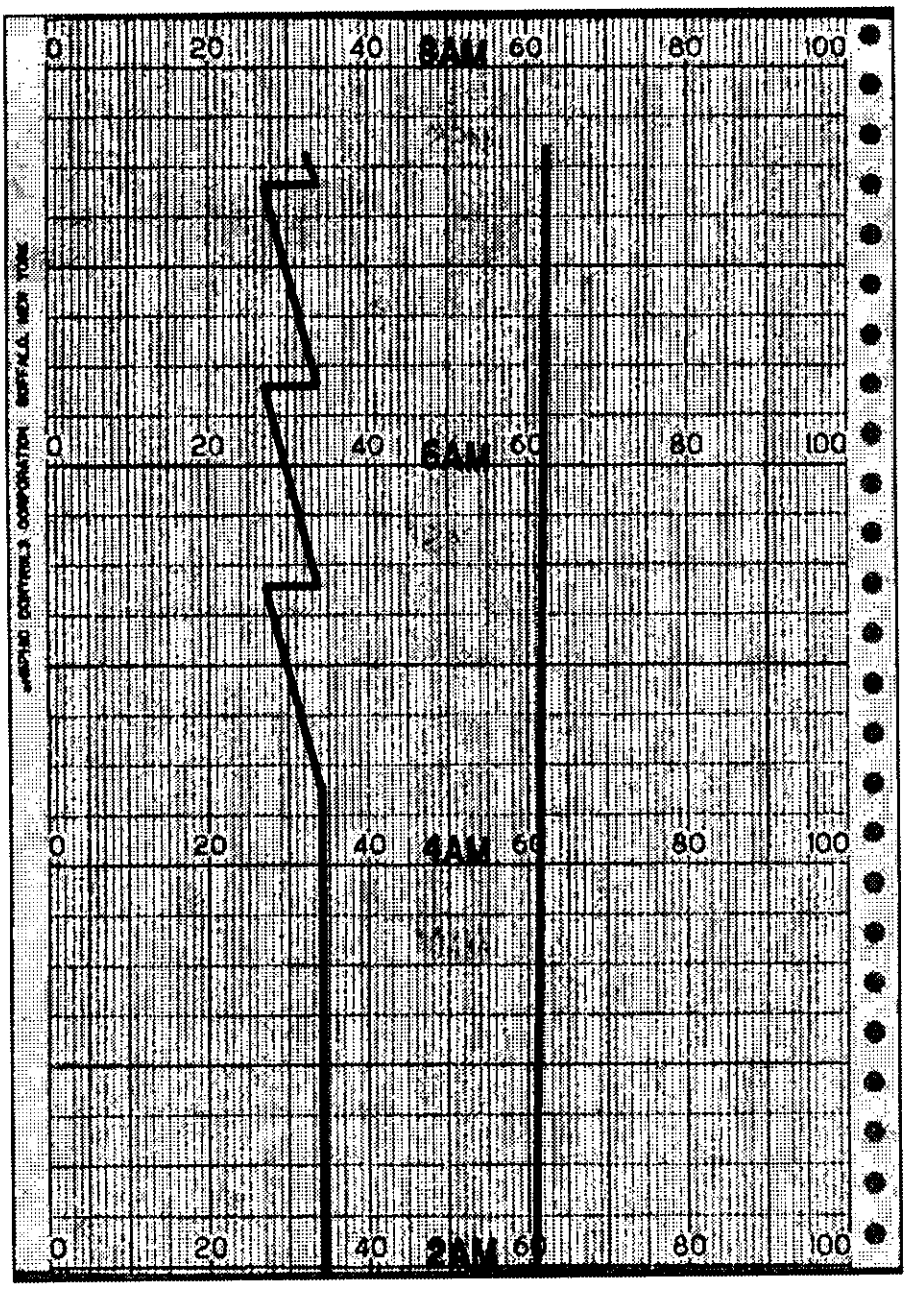
INITIATING CUES:

During a walkdown of the Control Board, the Unit 1 RO noted a change in the VCT level trend as indicated on the Trend Recorder. All other Unit parameters are stable and normal for 100% power operation.

Here is copy of the VCT level trace from the Trend Recorder (Attachment 1). The left-hand trace is VCT level and the right-hand trace is Intake Canal level. The recorder was set-up to record VCT level over a range of 0% to 100% and set at a chart speed of 1 inch per hour.

Here is a copy of 1-OPT-RC-10.01. I need you to calculate the RCS leakrate based on the change in VCT level, as indicated on this recorder trace. Only those portions of the procedure that specifically address the change in VCT level need to be completed. When you have completed your determination of the leakrate, please inform me of the value in gallons per minute.

Attachment 1



mindview

HEWLETT PACKARD

User: mindview,SPS,,

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Rev: ***002*** PAR: ***0***

Title: ***REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED***

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VIRGINIA POWER	PROCEDURE NO: 1-OPT-RC-10.01
SURRY POWER STATION	REVISION NO: 2
PROCEDURE TYPE: OPERATIONS PERIODIC TEST	UNIT NO: 1
PROCEDURE TITLE: REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED	EFFECTIVE DATE: On File
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REVISION SUMMARY:

Revise RCS Leakrate procedures based on Tech Report NE-1270, Rev.0. Mark up provided by Reactor Engineering.

- Added Technical Reference 2.3.5 "Tech Report NE-1270, Rev.0 Evaluation of Surry Power Station RCS Leakrate Calculation".
- Added Supstep 6.2.4.f and modified Supsteps 6.2.4.g, 6.2.5.b, and 6.2.6.b.
- Modified Note in Attachment 6, pages 1 and 2.
- Modified Attachments 3 and 4 Tables.
- Added Attachment 7.

ISI

PROCEDURE WRITER: A. Swander	VALIDATOR: David Dials
APPROVAL: APPROVAL ON FILE	DATE:

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1.0 PURPOSE

1.1 To provide instructions for performing a manual calculation for daily leak rate test of the Reactor Coolant System by using a mass balance method of Reactor Coolant System Inventory analysis. **(Reference 2.4.1)**

1.2 This procedure is applicable for RCS pressures and temperatures at or above Cold Shutdown (200 °F).

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR Section 4.2, RCS Design and Operation

2.1.2 UFSAR Section 5.3.2, Containment Leakage Monitoring System

2.1.3 UFSAR Section 9.1, Chemical Volume and Control System

2.1.4 UFSAR Section 9.3, Residual Heat Removal System

2.1.5 EWR 91-011, RCS Leakage Calculation Revisions / Surry / 1&2

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specification 3.1.C, Reactor Coolant Leakage

2.2.2 Technical Specification Table 4.1-2A Item 10, Primary System Leakage--Minimum Frequency for Determination

2.2.3 Technical Specification 4.3, ASME Code Class 1, 2, 3 Pressure Tests

2.3 Technical References

2.3.1 1-DRP-003, The Curve Book

2.3.2 American Society of Mechanical Engineers Steam Tables

2.3.3 1-AP-16.00, Excessive RCS Leakage

2.3.4 1-OPT-RC-10.0, Reactor Coolant Leakage - Computer Calculated

2.3.5 Tech Report NE-1270, Rev. 0 Evaluation of Surry Power Station RCS Leak Rate Calculation

2.4 Commitment Documents

2.4.1 CTS 50114, Revise RCS leakage calculation procedure to use mass balance method

2.4.2 Section XI Relief Request (Serial #91-269): Inform management of leakage trends which could be indicative of underside reactor vessel and instrumentation weld leakage.

2.4.3 CTS 2406, Safety Injection accumulator leakage to the PDTT

Init Verf

3.0 INITIAL CONDITIONS

NOTE: Reactor Coolant System (RCS) temperature and pressure stability for the purposes of this procedure shall be determined by the Shift Supervisor.

_____ 3.1 The Shift Supervisor has given permission to perform this procedure.

_____ 3.2 The Reactor Coolant System is being maintained at a stable temperature and pressure in order to perform a manual RCS leak rate calculation. Otherwise, if unstable conditions exist or the Shift Supervisor deems it necessary, a walkdown should be performed and N/A should be entered for this step.

_____ 3.3 Reactor Coolant System Tave is greater than or equal to 200°F.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Routine daily leak rate determinations should be performed over a minimum time period of 2 hours, if a manual RCS leak rate calculation is performed.

4.2 Reactor Coolant System sampling should **not** take place during the performance of this procedure.

4.3 RCS temperature and pressure should be maintained as stable as possible when a RCS leak rate calculation is being performed during a pause in a Reactor Coolant System (RCS) heat up or cool down.

4.4 A walkdown of the Reactor Coolant System is required when the RCS is in a condition that a leak rate can **not** be determined.

4.5 If the Operations Computer Calculation Program is used, verify that the procedure and the calculation have the same revision number.

4.6 Appropriate control room indications for RCS temperature and pressure, Volume Control Tank (VCT) Level, Primary Drain Transfer Tank (PDTT) Level, Pressurizer Relief Tank (PRT) Level, and Pressurizer (PRZR) Level should be used when the plant computer is **not** available for data taking.

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

5.0 SPECIAL TOOLS AND EQUIPMENT

None

Init Verif

6.0 INSTRUCTIONS

6.1 General Instructions

NOTE: Summary of all RCS Leakage results will be recorded on Attachment 1.

Densities for RCS temperatures at or above 500 °F at a constant RCS pressure of 2250 psia are provided in Attachment 6. The densities for all other RCS pressures and temperatures at or above Cold Shutdown (200°F) can be obtained from the ASME Steam Tables. (Reference 2.3.2)

If RCS pressure and temperature are too unstable for an accurate manual calculation of RCS Leak Rate, a walkdown of the RCS must be performed.

_____ 6.1.1 Have Shift Supervisor determine if walk down of RCS is required. IF the Shift Supervisor determines that the RCS pressure and temperature are too unstable for an accurate computer or manual calculation of RCS Leak Rate, THEN perform a walk down of the RCS AND enter N/A for Steps 6.1.2 through 6.2.8. IF a walk down of the RCS is NOT required, THEN enter N/A for this step

_____ 6.1.2 Notify Chemistry Department that calculation of RCS leak rate will be in progress and that all sampling operations will be stopped unless authorized by the Shift Supervisor.

_____ 6.1.3 Check VCT controller 1-CH-LCV-1115A, VCT LEVEL DIVERT, and verify that no RCS letdown flow is being diverted to the PDT.

_____ 6.1.4 Stop all makeup to the VCT.

_____ 6.1.5 Record the Total Other Identified Leakage Excluding PRT and PDTT from the last (most recent previously calculated leak rate data) performance of 1-OPT-RC-10.0, Reactor Coolant Leakage - Computer Calculated, or 1-OPT-RC-10.01, Reactor Coolant Leakage - Manually Calculated, as appropriate, on Attachment 1. IF the last leak rate was based upon an RCS walkdown, THEN enter N/A for this step and in appropriate blank in Attachment 1.

_____ 6.1.6 Calculate the current Total Other Identified Leakage (excluding the PRT and the PDTT).

a. Identify and list current Other Identified Leakage (excluding PRT and PDTT) on Attachment 2.

b. Add the other identified leakage (excluding PRT and PDTT) and record the current Total Other Identified Leakage in Attachment 2 and Attachment 1.

_____ 6.1.7 Compare values of Total Other Identified Leakage (excluding PRT and PDTT) for last and present performance of 1-OPT-RC-10.0 or 1-OPT-RC-10.01.

a. IF the amount of Total Other Identified Leakage (excluding PRT and PDTT) recorded in Attachment 1 has changed from the value recorded from last (most recent previously calculated leak rate data) performance of 1-OPT-RC-10.0 or 1-OPT-RC-10.01, THEN notify the Operations Manager on Call before continuing this procedure.

b. IF the values recorded for last and present Total Other Identified Leakage are equal, THEN enter N/A for this step.

_____ 6.1.8 Record the amount of Reactor Coolant System unidentified leakage calculated during the last (most recent previously calculated leak rate data) performance of 1-OPT-RC-10.0 or 1-OPT-RC-10.01 in Attachment 1.

6.2 Manual Reactor Coolant Leakage Calculation

_____ 6.2.1 Record the amount of Total Other Identified Leakage from Attachment 2 in Attachment 3, Column 4 for the determination of the RCS Leak Rate.

_____ 6.2.2 Enter the following initial data required for leak rate determination in Attachment 3, Column 3.

a. Record Start Time of Leak Rate Determination.

b. Record the three narrow range Tave readings. IF RCS Tave is less than 530 °F, THEN use Wide Range Tcold. Enter N/A for any out of service (OOS) temperature channels or for OOS control room board indications when the P-250 Plant Computer is OOS.

c. Calculate the Average RCS Temperature by averaging the temperature readings.

d. Record the three pressurizer level readings. Enter N/A for any out of service pressurizer level channels or for OOS control room board indications when the P-250 Plant Computer is OOS.

e. Calculate the Average Pressurizer Level by averaging the pressurizer level readings.

f. Record the VCT level from the P-250 plant computer addressable point L0112A or from control room board indications when the P-250 Plant Computer is OOS.

g. Record the PDTT Level from the P-250 plant computer addressable point Y4020A or from control room board indications when the P-250 is OOS.

h. Record the RCS Pressure from 1-RC-PI-1444 or 1-RC-PI-1402-1, RCS PRESS WIDE RANGE.

_____ 6.2.3 Repeat Steps 6.2.2.a through 6.2.2.h at the designated final end time for leak rate determination, and record the final data required for leak rate determination in Attachment 3, Column 2.

NOTE: PRT inleakage should be based upon the data collected on the P-250 plant computer addressable point L0485A (PRT Level) trended for at least 24 hours.

NOTE: When plant conditions require a leak rate calculation on short notice, then the PRT inleakage may be based on a shorter time period or the PRT inleakage from a previous performance of this test may be used if it is appropriate and available.

6.2.4 Determine PRT Inleakage.

_____ a. IF a previously calculated PRT inleakage is used, THEN enter N/A for Steps 6.2.4.b through 6.2.4.g, AND record the previously calculated PRT inleakage in the last column of Attachment 4, Table 1.

_____ b. Verify that no makeups to the PRT, draining of the PRT, or pressurizer PORV openings will be performed during the trending of the PRT Level (L0485A) on the P-250 plant computer or during the time the Control Room Operator Logs are recording PRT data required for this procedure.

_____ c. Record the start time and PRT Level at the start of the addressable point L0485A trend in Attachment 3, Column 3.

_____ d. Record the final time and PRT Level at the end of the addressable point L0485A trend in Attachment 3, Column 2.

_____ e. Calculate the Elapsed Time on Attachment 3.

_____ f. Using Attachment 7, convert PRT level (%) to lbm and record in Attachment 3. (Using closest table entry to indicated level is acceptable.)

_____ g. Calculate the change in PRT level (lbm) and record in Attachment 3. IF the PRT inleakage is less than zero, THEN record zero for the PRT level change.

NOTE: Densities for RCS temperatures at or above 500 °F at a constant RCS pressure of 2250 psia are to be obtained in Attachment 6. The densities for all other RCS pressures and temperatures at or above Cold Shutdown (200°F) are to be obtained from the ASME Steam Tables.

6.2.5 Determine the RCS Mass (lb_m) at Initial Leak Rate conditions.

_____ a. From the initial RCS start pressure and average temperature recorded in Attachment 3, Table 1, column 3, determine the RCS density and record in Attachment 3, Column 3.

_____ b. Determine the mass of the RCS at the start of the leak rate calculation by multiplying the density of the RCS by the RCS volume of 8208.8 ft^3 and record the value in Attachment 3, Column 3.

6.2.6 Determine the RCS Mass (lb_m) at Final Leak Rate conditions.

_____ a. From the final RCS pressure and average temperature recorded in Attachment 3, Column 2, determine the RCS density and record in Attachment 3, Column 2.

_____ b. Determine the mass of the RCS at Final Leak Rate conditions by multiplying the density of the RCS by the RCS volume of 8208.8 ft^3 and record the value in Attachment 3, Column 2.

_____ 6.2.7 In Attachment 3, calculate the change in parameter from the initial start conditions to the final end conditions and record in Attachment 3, and Attachment 4, Table 1, Column 1 and Column 3 (elapsed time).

_____ 6.2.8 Perform the calculations of Attachment 4, Tables 1, 2, 3, 4, and 5, to determine the Unidentified RCS Leak Rate (gpm), the Identified RCS Leak Rate (gpm), and the Total RCS Leak Rate (gpm). Record these leak rates in Attachment 1 and in the Control Room Log.

_____ 6.2.9 Record the difference in unidentified RCS Leak Rate from the Last (most recent previously calculated leak rate data) and Present Performance of 1-OPT-RC-10.0 or 1-OPT-RC-10.01 in Attachment 1. Indicate whether present leakage is an increase or decrease from previous unidentified leakage below.

Increase / Decrease (circle)

6.2.10 IF unidentified leakage increases by equal to or greater than 0.2 gpm, THEN perform the following steps. IF unidentified leakage did NOT increase by equal to or greater than 0.2 gpm, THEN enter N/A for the following steps.

_____ a. Have HP sample Containment atmosphere.

_____ b. Have HP compare previous Containment atmosphere to present sample.

_____ c. Review Radiation Monitors for upward trends.

_____ d. Review other Control Room indications to identify leakage.

_____ e. Walk down systems as required to identify leakage.

_____ f. Document the review in the comments section following Step 7.3.1.

_____ g. Inform Operations Manager on Call of increases in unidentified leakage.

6.3 Calculation of the Containment Sump Inleakage Rate

NOTE: The Containment Sump Inleakage Rate is not required by the Surry Technical Specifications and is being determined for information only.

The same Containment sump level instrument should be used to determine both the initial and final Containment sump indicated levels.

CTMT Sump inleakage rate will be calculated using Attachment 5.

_____ 6.3.1 Record the required initial data for calculating the Containment sump inleakage rate. (Attachment 5, Table 1, Column 3)

_____ 6.3.2 Record the required final data for calculating the Containment sump inleakage rate. (Attachment 5, Table 1, Column 2)

_____ 6.3.3 Calculate the change in parameter from the initial start conditions to the final end conditions and record elapsed time in Table 2. (Attachment 5)

_____ 6.3.4 Calculate the total Containment Sump Inleakage Rate in gallons per minute. (Attachment 5, Table 2)

_____ 6.3.5 Transfer the Containment Sump Inleakage Rate from Attachment 5, Table 2, to Attachment 1.

7.0 FOLLOW-ON

7.1 Acceptance Criteria

_____ 7.1.1 Evaluate the test results by reviewing the following Acceptance Criteria. (√)

_____ The Unidentified Leakage Rate is less than or equal to 1.0 gpm.

_____ The Total Identified Leakage Rate is less than or equal to 10.0 gpm.

_____ A walkdown of the Reactor Coolant System, when necessary, disclosed no identified leakage greater than 10.0 GPM.

_____ 7.1.2 Document the test results. (√)

___ Satisfactory ___ Unsatisfactory

7.2 Follow-On Tasks

7.2.1 IF the test was unsatisfactory, THEN perform the following actions. Otherwise, enter N/A.

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

_____ b. Notify System Engineering of unsatisfactory conditions and record the name of the person notified.

System Engineer _____

_____ c. Initiate a Deviation Report and record the number below.

DR No._____

_____ d. Initiate the use of 1-AP-16.00, Excessive RCS Leakage.

_____ 7.2.2 IF a partial operability test was performed, THEN document the reason for the partial test in Operator Comments. Otherwise, enter N/A.

7.3 Notification, Documentation, and Procedure Closeout

_____ 7.3.1 Notify the Shift Supervisor that the test is complete.

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

Initials	Printed Name

Operator Comments:_____

Completed by_____ Date_____

7.4 Review

Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reviewed by: _____ Date: _____

Shift Supervisor

Forward original procedure to Engineering Testing.

Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reviewed by: _____ Date: _____

System Engineer

ATTACHMENT 1

(Page 1 of 1)

SUMMARY OF REACTOR COOLANT LEAK RATE TEST RESULTS AND CONTAINMENT SUMP INLEAKAGE

Summary of Reactor Coolant Leak Rate Test Results			
RCS Leak Rate Data	Values from **Last** (most recent previously calculated leak rate data) Performance of 1-OPT-RC-10.0 or 1-OPT-RC-10.01	**Current** values:	**Difference** in values between Last and Present performance of 1-OPT-RC-10.0 or 1-OPT-RC-10.01
Total OTHER Identified Leakage:	(gpm)	(gpm)	
Total Unidentified RCS Leak Rate:	(gpm)	(gpm)	Difference: (gpm)
Identified RCS Leak Rate:		(gpm)	
Total RCS Leak Rate:		(gpm)	

CTMT Sump Inleakage
CTMT Sump Inleakage Rate: _____ (gpm)

ATTACHMENT 2

(Page 1 of 1)

DETERMINATION OF TOTAL OTHER IDENTIFIED LEAKAGE EXCLUDING PRT AND PDTT

NOTE: The date column corresponds to the date on which the leak was discovered.

NOTE: Leakage from Safety Injection Accumulators to the PDTT may result in a lower than actual unidentified leak rate.

Total Other Identified Leakage (excluding PRT and PDTT)		
Source	Leak Rate (gpm)	Date

Add all the leak rates recorded above in the leak rate column and record the total below as the RCS Total Other Identified Leak Rate.

RCS Total Other Identified Leak Rate = _____GPM

ATTACHMENT 3

(Page 1 of 1)

DATA REQUIRED FOR CALCULATION OF THE RCS LEAK RATE

Required Data for Calculating RCS Leak Rate			
Parameter being analyzed	Final Value of Parameter at End Time	Initial Value of Parameter at Start Time	** Change in Parameter (+ or -) (final value - initial value)
Elapsed Time			(Minutes)
Tave (T0400A)	(°F)	(°F)	
Tave (T0420A)	(°F)	(°F)	
Tave (T0440A)	(°F)	(°F)	
Average of Tave's	(°F)	(°F)	
RCS PRESS 1-RC-PI-1444 or 1-RC-PI-1402-1	(psig)	(psig)	
PRZR Level LO480A	(%)	(%)	
PRZR Level LO481A	(%)	(%)	
PRZR Level LO482A	(%)	(%)	
Average PRZR Level	(%)	(%)	(±%)
VCT Level	(%)	(%)	(±%)
PDTT Level	(%)	(%)	(±%)
PRT Level Elapsed Time			(Hours or Minutes)
PRT Level (L0485A)	(%)	(%)	
PRT Mass (lbm) use Attachment 7	(lbm)	(lbm)	(±lbm)
Total Other Identified Leakage			(from Att. 2, ± gpm)
RCS Density	(lb_m / FT^3)	(lb_m / FT^3)	
RCS Mass (RCS Density x 8208.8 ft^3)	(lb_m)	(lb_m)	(± lb_m)
Performed by: Initial / Date	_____/_____ Initial / Date	_____/_____ Initial / Date	

**A ± value in the change in parameter column indicates an increase or decrease in the respective parameter.

ATTACHMENT 4

(Page 1 of 2)

CALCULATION OF THE RCS LEAK RATES

Table 1, Calculation of the Leak Rates Determined from Attachment 3			
Change in Parameter (±) (final value - initial value)	multiply by Conversion Factors	divide by Elapsed Time (minutes)	Leak Rate (lb_m / minute)
(PRZR Level Change) (±%)	366.96 lb_m / %		
(VCT Level Change) (±%)	116.6 lb_m / %		
(PDTT Level Change) (±%)	71.16 lb_m / %		
(PRT Level Change) (±lbm)	1.0		
(Other Identified Leakage) (± gpm)	8.337 lb_m / gallon		
(RCS Total Mass) (±lb_m)	1.0		

Table 2, Calculation of the **Total** RCS Leakage			
RCS Total Mass Leak Rate (lbm / minute)	plus PRZR Leak Rate (lbm / minute)	plus VCT Leak Rate (lbm / minute)	equals RCS Total Leak Rate (lbm / minute) [To be multiplied by (-1.0)]

Table 3, Calculation of the Total **Identified** Leakage			
PDTT Leak Rate (lbm / minute)	plus PRT Leak Rate (lbm / minute)	plus Other Identified Leak Rate (lbm / minute)	equals Total Identified Leak Rate (lbm / minute)

Calculations Performed by _____/_____

Signature Date

ATTACHMENT 4

(Page 2 of 2)

CALCULATION OF THE RCS LEAK RATES

Table 4, Calculation of the Total **Unidentified** Leakage		
RCS Total Leak Rate (lbm / minute)	minus Total Identified Leak Rate (lbm / minute)	equals RCS Total Unidentified Leak Rate (lb_m / minute)

Table 5, Summary of RCS Leakage in GPM		
Leak Rate (lbm / minute)	Conversion Factor ** (gallons / lb_m)	Leakage (gpm)
RCS Total Leak Rate	7.48052 gallons / ft^3 Divided by 61.856 lb_m / ft^3 (VCT Conditions)	
Total Identified Leak Rate	7.48052 gallons / ft^3 Divided by 61.856 lb_m / ft^3 (VCT Conditions)	
RCS Total Unidentified Leak Rate	7.48052 gallons / ft^3 Divided by 61.856 lb_m / ft^3 (VCT Conditions)	

**VCT conditions for Make-up Water to RCS: Density = 61.856 lb_m / ft^3 at 110°F and 15 psia

NOTE: For RCS walkdown, record estimated leakage based on walkdown. _____gpm

Calculations Performed by _____/_____

Signature Date

ATTACHMENT 5

(Page 1 of 1)

CALCULATION OF THE CONTAINMENT SUMP INLEAKAGE RATE

Table 1			
	Column 2	Column 3	
Parameter being analyzed	Final Value of Parameter at End of Time	Initial Value of Parameter at Start of Time	**Change in Parameter (+ or -) (final value - initial value)
Elapsed Time			(MINUTES)
CTMT Sump Level instrument used: 1-DA-LI-100, 1-DA-LI-110A or 1-DA-LI-110B	Circle instrument used 1-DA-LI-100, 1-DA-LI-110A or 1-DA-LI-110B	Circle instrument used: 1-DA-LI-100, 1-DA-LI-110A or 1-DA-LI-110B	N / A
CTMT Sump Level	(% or IN)	(% or IN)	N / A
CTMT Sump Volume from curve in 1-DRP-003	(gallons)	(gallons)	(gallons)

**A ± value in the change in parameter column indicates an increase or decrease in the respective parameter.

Table 2		
Change in Parameter (±) (final value - initial value)	Divide by Elapsed Time	Sump Inleakage Rate
CTMT Sump Volume Change _____ (gallons)	(Minutes)	(gpm)

Performed by: _____ _____ _____ _____
Signature Initial Print Date

Performed by: _____ _____ _____ _____
Signature Initial Print Date

ATTACHMENT 6

(Page 1 of 2)

RCS DENSITIES AS A FUNCTION OF TEMPERATURE

NOTE: RCS Reference Pressure = 2,250 psia
RCS Reference Volume = 8208.8 ft^3, RHR System isolated.

Temperature (°F)	Density (lb_m / FT^3)	Temperature (°F)	Density (lb_m / FT^3)	Temperature (°F)	Density (lb_m / FT^3)
500.0	49.76	524.0	48.43	547.5	47.02
501.0	49.70	525.0	48.37	548.0	46.99
502.0	49.65	526.0	48.31	548.5	46.95
503.0	49.60	527.0	48.26	549.0	46.92
504.0	49.54	528.0	48.20	549.5	46.89
505.0	49.49	529.0	48.14	550.0	46.86
506.0	49.44	530.0	48.08	550.5	46.83
507.0	49.38	531.0	48.02	551.0	46.79
508.0	49.33	532.0	47.96	551.5	46.76
509.0	49.27	533.0	47.90	552.0	46.73
510.0	49.22	534.0	47.84	552.5	46.70
511.0	49.16	535.0	47.78	553.0	46.67
512.0	49.11	536.0	47.72	553.5	46.63
513.0	49.05	537.0	47.66	554.0	46.60
514.0	49.00	538.0	47.60	554.5	46.57
515.0	48.94	539.0	47.54	555.0	46.54
516.0	48.89	540.0	47.48	555.5	46.50
517.0	48.83	541.0	47.42	556.0	46.47
518.0	48.77	542.0	47.36	556.5	46.44
519.0	48.72	543.0	47.30	557.0	46.41
520.0	48.66	544.0	47.23	557.5	46.38
521.0	48.60	545.0	47.17	558.0	46.34
522.0	48.55	546.0	47.11	558.5	46.31

ATTACHMENT 6

(Page 2 of 2)

RCS DENSITIES AS A FUNCTION OF TEMPERATURE

NOTE: RCS Reference Pressure = 2,250 psia
RCS Reference Volume = 8208.8 ft^3, RHR System isolated

Temperature (°F)	Density (lb_m / FT^3)	Temperature (°F)	Density (lb_m / FT^3)	Temperature (°F)	Density (lb_m / FT^3)
523.0	48.49	547.0	47.05	559.0	46.28
559.5	46.24	565.5	45.84	571.0	45.46
560.0	46.21	566.0	45.81	571.5	45.42
560.5	46.18	566.5	45.77	572.0	45.39
561.0	46.14	577.0	45.74	572.5	45.35
561.5	46.11	567.5	45.71	573.0	45.31
562.0	46.07	568.0	45.67	573.5	45.28
562.5	46.04	568.5	45.63	574.0	45.24
563.0	46.01	569.0	45.60	574.5	45.21
563.5	45.97	569.5	45.56	575.0	45.17
564.0	45.94	570.0	45.53	575.5	45.14
564.5	45.91	570.5	45.49	576.0	45.10
565.0	45.87				

ATTACHMENT 7

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PRT MASS VS INDICATED LEVEL

Indicated Level (Percent)	PRT Water Mass (lbm)	Indicated Level (Percent)	PRT Water Mass (lbm)
59.0	48801.12	61.1	50730.20
59.1	48893.33	61.2	50821.65
59.2	48985.51	61.3	50913.07
59.3	49077.65	61.4	51004.44
59.4	49169.76	61.5	51095.77
59.5	49261.83	61.6	51187.06
59.6	49353.87	61.7	51278.31
59.7	49445.88	61.8	51369.51
59.8	49537.86	61.9	51460.68
59.9	49629.79	62.0	51551.80
60.0	49721.70	62.1	51642.88
60.1	49813.56	62.2	51733.91
60.2	49905.40	62.3	51824.91
60.3	49997.19	62.4	51915.85
60.4	50088.95	62.5	52006.76
60.5	50180.67	62.6	52097.62
60.6	50272.36	62.7	52188.43
60.7	50364.00	62.8	52279.20
60.8	50455.61	62.9	52369.92
60.9	50547.18	63.0	52460.60
61.0	50638.71	63.1	52551.23

ATTACHMENT 7

(Page 2 of 6)

PRT MASS VS INDICATED LEVEL

Indicated Level (Percent)	PRT Water Mass (lbm)	Indicated Level (Percent)	PRT Water Mass (lbm)
63.2	52641.81	65.3	54532.53
63.3	52732.34	65.4	54621.98
63.4	52822.83	65.5	54711.38
63.5	52913.27	65.6	54800.72
63.6	53003.66	65.7	54890.01
63.7	53094.00	65.8	54979.24
63.8	53184.30	65.9	55068.41
63.9	53274.54	66.0	55157.53
64.0	53364.73	66.1	55246.58
64.1	53454.88	66.2	55335.58
64.2	53544.97	66.3	55424.52
64.3	53635.01	66.4	55513.40
64.4	53725.00	66.5	55602.22
64.5	53814.94	66.6	55690.99
64.6	53904.82	66.7	55779.69
64.7	53994.66	66.8	55868.33
64.8	54084.44	66.9	55956.91
64.9	54174.16	67.0	56045.43
65.0	54263.84	67.1	56133.88
65.1	54353.45	67.2	56222.28
65.2	54443.02	67.3	56310.61

ATTACHMENT 7

(Page 3 of 6)

PRT MASS VS INDICATED LEVEL

Indicated Level (Percent)	PRT Water Mass (lbm)	Indicated Level (Percent)	PRT Water Mass (lbm)
67.4	56398.88	69.5	58237.31
67.5	56487.09	69.6	58324.09
67.6	56575.23	69.7	58410.81
67.7	56663.31	69.8	58497.45
67.8	56751.32	69.9	58584.02
67.9	56839.27	70.0	58670.51
68.0	56927.15	70.1	58756.94
68.1	57014.97	70.2	58843.28
68.2	57102.72	70.3	58929.56
68.3	57190.41	70.4	59015.76
68.4	57278.03	70.5	59101.88
68.5	57368.58	70.6	59187.93
68.6	57453.06	70.7	59273.90
68.7	57540.48	70.8	59359.80
68.8	57627.82	70.9	59445.62
68.9	57715.10	71.0	59531.36
69.0	57802.31	71.1	59617.02
69.1	57889.45	71.2	59702.61
69.2	57976.52	71.3	59788.11
69.3	58063.52	71.4	59873.54
69.4	58150.45	71.5	59958.89

ATTACHMENT 7

(Page 4 of 6)

PRT MASS VS INDICATED LEVEL

Indicated Level (Percent)	PRT Water Mass (lbm)	Indicated Level (Percent)	PRT Water Mass (lbm)
71.6	60044.16	73.7	61815.69
71.7	60129.35	73.8	61899.10
71.8	60214.46	73.9	61982.42
71.9	60299.49	74.0	62065.66
72.0	60384.44	74.1	62148.80
72.1	60469.30	74.2	62231.85
72.2	60554.09	74.3	62314.81
72.3	60638.79	74.4	62397.68
72.4	60723.40	74.5	62480.46
72.5	60807.94	74.6	62563.14
72.6	60892.39	74.7	62645.74
72.7	60976.76	74.8	62728.23
72.8	61061.04	74.9	62810.64
72.9	61145.23	75.0	62892.95
73.0	61229.34	75.1	62975.17
73.1	61313.37	75.2	63057.29
73.2	61397.31	75.3	63139.32
73.3	61481.16	75.4	63221.25
73.4	61564.92	75.5	63303.08
73.5	61648.60	75.6	63384.82
73.6	+1732.19	75.7	63466.46

ATTACHMENT 7

(Page 5 of 6)

PRT MASS VS INDICATED LEVEL

Indicated Level (Percent)	PRT Water Mass (lbm)
75.8	63548.00
75.9	63629.44
76.0	63710.79
76.1	63792.04
76.2	63873.19
76.3	63954.23
76.4	64035.18
76.5	64116.03
76.6	64196.77
76.7	64277.42
76.8	64357.96
76.9	64438.40
77.0	64518.73
77.1	64598.97
77.2	64679.09
77.3	64759.12
77.4	64839.04
77.5	64918.85
77.6	64998.56
77.7	65078.16
77.8	65157.66

Indicated Level (Percent)	PRT Water Mass (lbm)
77.9	65237.05
78.0	65316.33
78.1	65395.50
78.2	65474.56
78.3	65553.52
78.4	65632.36
78.5	65711.10
78.6	65789.72
78.7	65868.23
78.8	65946.64
78.9	66024.93
79.0	66103.10
79.1	66181.17
79.2	66259.12
79.3	66336.96
79.4	66414.68
79.5	66492.29
79.6	66569.78
79.7	66647.16
79.8	66724.42
79.9	66801.56

ATTACHMENT 7

(Page 6 of 6)

PRT MASS VS INDICATED LEVEL

Indicated Level (Percent)	PRT Water Mass (lbm)
80.0	66878.59
80.1	66955.50
80.2	67032.29
80.3	67108.96
80.4	67185.51
80.5	67261.95
80.6	67338.26
80.7	67414.45
80.8	67490.52
80.9	67566.47
81.0	67642.30
81.1	67718.00
81.2	67793.58
81.3	67869.04
81.4	67944.37
81.5	68019.58
81.6	68094.66
81.7	68169.61
81.8	68244.44
81.9	68319.15
82.0	68393.72

Indicated Level (Percent(	PRT Water Mass (lbm)
82.1	68468.17
82.2	68542.49
82.3	68616.68
82.4	68690.73
82.5	68764.66
82.6	68838.46
82.7	68912.13
82.8	68985.67
82.9	69059.07
83.0	69132.34

U. S. Nuclear Regulatory Commission

Region II

A-1 Administrative Section (SRO ONLY)

Title:

Valve Out of Position Actions

JPM TITLE: Valve Out of Position Actions

JPM NUMBER: NRC-ADMIN-JPM-A1 (SRO)

JPM REV. DATE: 03/07/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Perform Follow-On tasks of OSP-ZZ-005, and identify applicable TS clock.

REQUIRED MATERIALS:

1. Marked up 1-OSP-ZZ-005, Operational Check of Engineered Safeguards Equipment
2. Tech Specs.

REFERENCES:

1. 1-OSP-ZZ-005, Operational Check of Engineered Safeguards Equipment
2. TS section 3.3, Safety Injection System.

VALIDATION TIME: 30 Minutes.

K/A: GEN2.1.33 4.0

TERMINATING CUES:

The candidate identifies the OSP acceptance criteria not met, applies TS 3.3 to identify the unit in a 72 hour clock.

READ TO THE TRAINEE

If you have any questions, ask them now and I will answer them. During the test, I cannot answer questions. When you complete all the steps correctly, you will pass this Job Performance Measure. I will describe the general conditions for the task you will perform and provide the initiating cues.

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. The Inside Service Building Operator has completed 1-OSP-ZZ-005 through section 6.
3. The Inside Service Building Operator had to leave for an emergent personal issue.

INITIATING CUES:

I need you to perform 1-OSP-ZZ-005, Follow-On actions

Step 1: Performs section 7.1.1, Follow-On

STANDARDS:

___ a. Evaluates Attachment 1 by reviewing the acceptance criteria.
*___ b. Determines 1-SI-48 is closed vs. required open.
___ c. Determines all other attachment 1 criteria is acceptable.

EVALUATOR'S NOTES:

Step 2: Determines Surveillance requirements are Unsatisfactory.

STANDARDS:

___ a. Marks unsatisfactory in step 7.1.2.

EVALUATOR'S NOTES:

Step 3: Performs Follow-On Tasks.

STANDARDS:

___ a. Documents unsat reults in Operator Comments (section 7.3)
___ b. Notifies the SS of the Unsat performance.
___ c. Initiates a PI. (DR).
___ d. Signs and dates the OSP.
___ e. Reports completion of the task.

EVALUATOR'S CUES:

- If asked: the Shift Supervisor (Henry Moore) acknowledges Unsat performance.
- If asked: PI is written and PI number is PI-02-9999.

PART B:

If an inoperability determination was NOT made during the JPM performance read the following statement;

You are now the SS, I need you to perform an operability determination based on the Unsatisfactory OPT performance.

Step 4: Reviews Tech Specs.

STANDARDS:

___ a. Reviews Tech Specs Section 3.3.A.3 and determines if the Spec applies.
___ b. Reviews Tech Specs Section 3.3.B.3 and determines if the Spec applies.
*___ c. Declares 1-SI-P-1B inoperable, starts a 72-hour Tech Spec clock.

EVALUATOR'S NOTES:

Step 5: Notifies SS.

STANDARDS:

___ a. Notifies the SS of the 72-Hour Clock.

EVALUATOR'S NOTES:

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. The Inside Service Building Operator has completed 1-OSP-ZZ-005 through section 6.
3. The Inside Service Building Operator had to leave for an emergent personal issue.

INITIATING CUES:

I need you to perform 1-OSP-ZZ-005, Follow-On actions.

VIRGINIA POWER

SURRY POWER STATION

PROCEDURE NO: 1-OSP-ZZ-005	
REVISION NO: 8	
PROCEDURE TYPE: OPERATIONS SURVEILLANCE PROCEDURE	UNIT NO: 1
PROCEDURE TITLE: OPERATIONAL CHECK OF ENGINEERED SAFEGUARDS EQUIPMENT	EFFECTIVE DATE: ON FILE
	EXPIRATION DATE: (Temporary Procedures Only) N/A

REVISION SUMMARY:

Revised IAW DCP 99-025. Changed required position of 1-SW-896 and 1-SW-897 to OPEN.

UNIT ONE

PROCEDURE WRITER: *Shelby Poole*	VALIDATOR: *N/A*
APPROVAL: APPROVAL ON FILE	DATE:

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1.0 PURPOSE

1.1 To provide instructions for verifying the positions of Engineered Safeguards equipment listed in Attachment 1.

1.2 This procedure shall be performed at least once every 31 days or as required by 1-GOP-1.3.

2.0 REFERENCES

2.1 Source Documents

2.1.1 IE Bulletin 79-06A, Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident

2.2 Technical Specifications Surry Power Station

None

2.3 Technical References

2.3.1 1-GOP-1.3, Unit Startup, RCS Heatup From 345°F to HSD

2.3.2 DCP 95-006, Charging Pump Service Water Pipe Replacement

2.3.3 DCP 93-034, SW Valve Modifications

2.3.4 DCP 99-025, SW Pump Pressure Switch Modification

2.4 Commitment Documents

2.5 NONE

3.0 INITIAL CONDITIONS

3.1 RCS temperature is greater than or equal to 200°F or this procedure is being performed in conjunction with 1-GOP-1.3 for startup.

4.0 PRECAUTIONS AND LIMITATIONS

N/A

4.1 Independent verification is required only when this procedure is performed in conjunction with 1-GOP-1.3 for startup.

5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 INSTRUCTIONS

6.1 Completing Engineered Safeguards Equipment List

6.1.1 Indicate the plant condition applicable to performance of this procedure. (√)

√ RCS temperature is greater than or equal to 200°F

___ Required by 1-GOP-1.3 for Startup (Independent Verification required)

6.1.2 Complete Attachment 1, Engineered Safeguards Equipment List.

7.0 FOLLOW-ON

_____ 7.1 **Acceptance Criteria**

_____ 7.1.1 Evaluate the surveillance by reviewing the Acceptance Criteria for equipment listed in Attachment 1. (√)

___ All equipment checked is in required position or has been properly tagged out.

_____ 7.1.2 Document the surveillance results. (√)

___ Satisfactory ___ Unsatisfactory

7.2 **Follow-On Tasks**

_____ 7.2.1 IF surveillance was satisfactory, THEN enter N/A for following substeps. IF surveillance was unsatisfactory, THEN perform the following:

_____ a. Document the reason for the unsatisfactory surveillance in Comments, Step 7.3.

_____ b. Notify Shift Supervisor of unsatisfactory condition and record name of person notified.

_____

_____ c. Initiate a Deviation Report and record the number.

DR No.: _____

7.3 Notification, Documentation, and Procedure Closeout

_____ 7.3.1 Notify the Shift Supervisor that the test is complete.

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

Initials	Printed Name
KG	Ken Grover

Operator Comments: _____

Completed by: _____ Date: _____

7.4 **Review**

Shift Supervisor Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reviewed by: _____ Date: _____
Shift Supervisor

Forward original procedure to Engineering Testing.

ATTACHMENT 1

(Page 1 of 3)

ENGINEERED SAFEGUARD EQUIPMENT LIST

SYSTEM	VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS PERFORMED	INITIALS VERIF *
SERVICE WATER	1-SW-495	1D WATERBOX MER 4 SW SUP ISOL	OPEN	OPEN		N/A
VENTILATION	1-VS-328	BOTTLED AIR DISCH ROOT VALVE	OPEN	OPEN		
	1-VS-321	CONT RM BOTTLE AIR PCV-322 UPSTR ISOL	OPEN	OPEN		
EP	1-EP-BKR-15H1	EMERGENCY BUS CROSSTIE	RACKED OUT AND TAGGED OUT	RACKED OUT & TAGGED		
	1-EP-BKR-1H1-1 -3C	1-SI-MOV-1869A	TAGGED OFF	TAGGED OFF		
	1-EP-BKR-1J1-1 -9A	1-SI-MOV-1869B	TAGGED OFF	TAGGED OFF		
	1-EP-BKR-1H1 -2N8A	1-SI-MOV-1890A	TAGGED OFF	TAGGED OFF		
	1-EP-BKR-1H1 -2N9A	1-SI-MOV-1890C	TAGGED OFF	TAGGED OFF		
	1-EP-BKR-1J1 -2E8B	1-SI-MOV-1890B	TAGGED OFF	TAGGED OFF		
EDG	EDG #1	FUEL SHUTOFF VALVE	KNOB IN	KNOB IN		
	EDG #3	FUEL SHUTOFF VALVE	KNOB IN	KNOB IN		

* Not required for normal monthly performance.

ATTACHMENT 1

(Page 2 of 3)

ENGINEERED SAFEGUARD EQUIPMENT LIST

SYSTEM	VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS PERFORMED	INITIALS VERIF *
INTERMEDIATE SEAL COOLERS	1-SW-896	CH PUMP INTERMEDIATE SEAL CLR 1A SW OUTLET	OPEN	OPEN	[illegible]	N/A
	1-SW-115	CHG PUMP INTERMEDIATE SEAL CLR 1A SW INLET	OPEN	OPEN	[illegible]	
	1-CC-785	CHG PUMP INTERMEDIATE SEAL CLR 1A CC OUTLET ISOL	OPEN	OPEN	[illegible]	
	1-CC-774	CHG PUMP INTERMEDIATE SEAL CLR 1A CC INLET ISOL	OPEN	OPEN	[illegible]	
	1-SW-897	CHG PUMP INTERMEDIATE SEAL CLR 1B SW OUTLET	OPEN	OPEN	[illegible]	
	1-SW-110	CHG PUMP INTERMEDIATE SEAL CLR 1B SW INLET	OPEN	OPEN	[illegible]	
	1-CC-780	CHG PUMP INTERMEDIATE SEAL CLR 1B CC OUTLET ISOL	OPEN	OPEN	[illegible]	
	1-CC-779	CHG PUMP INTERMEDIATE SEAL CLR 1B CC INLET ISOL	OPEN	OPEN	[illegible]	
SAFETY INJECTION	1-SI-24	RWST ISOL TO HHSI PUMPS	OPEN	OPEN	[illegible]	

* Not required for normal monthly performance.

ATTACHMENT 1

(Page 3 of 3)

ENGINEERED SAFEGUARD EQUIPMENT LIST

SYSTEM	VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS PERFORMED	INITIALS VERIF *
SAFETY INJECTION	1-SI-57	LHSI PUMP 1A SUCT ISOL	OPEN	OPEN	[illegible]	N/A
	1-SI-48	LHSI PUMP 1B SUCT ISOL	OPEN	CLOSED	[illegible]	
RECIRC SPRAY	1-RS-15	RS PUMP 2A RECIRC ISOL	CLOSED	CLOSED	[illegible]	
	1-RS-6	RS PUMP 2B RECIRC ISOL	CLOSED	CLOSED	[illegible]	
CONTAINMENT SPRAY	1-CS-25	LHSI/CHG PUMPS RWST SUCT	LOCKED OPEN	LOCKED OPEN	[illegible]	
	1-CS-1	CTMT SPRAY PUMP 1A SUCT HDR ROOT VALVE	LOCKED OPEN	LOCKED OPEN	[illegible]	
	1-CS-4	CTMT SPRAY PUMP 1B SUCT HDR ROOT VALVE	LOCKED OPEN	LOCKED OPEN	[illegible]	
	1-CS-52	REFUELING WATER CHEM ADD TK OUTLET ISOL	LOCKED OPEN	LOCKED OPEN	[illegible]	
	1-CS-38	REFUELING WATER CHEM ADD TK OUTLET MOV-102A ISOL	OPEN	OPEN	[illegible]	
	1-CS-43	REFUELING WATER CHEM ADD TK OUTLET MOV-102B ISOL	OPEN	OPEN	[illegible]	
	1-CS-118	REFUELING WATER CHEM ADD TK TO CS PUMP 1A ISOL	OPEN	OPEN	[illegible]	
	1-CS-116	REFUELING WATER CHEM ADD TK TO CS PUMP 1B ISOL	OPEN	OPEN	[illegible]	
	1-CS-8	CS PUMP 1A RECIRC ISOL	CLOSED	CLOSED	[illegible]	
	1-CS-15	CS PUMP 1B RECIRC ISOL	CLOSED	CLOSED	[illegible]	

* Not required for normal monthly performance.

U. S. Nuclear Regulatory Commission

Region II

A-2 Administrative Section

NRC-ADMIN-JPM-05 (SRO ONLY)

Title:

Work Order Review And Approval

JPM TITLE: WORK ORDER REVIEW AND APPROVAL

JPM NUMBER: NRC-ADMIN-JPM-05

JPM REV. DATE: 03/06/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X__ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Review and Approve a Work Order for Release to Craft

REQUIRED MATERIALS:

1. None

REFERENCES:

1. VPAP-2002, WORK REQUEST AND WORK ORDER TASKS
2. VPAP-2001, STATION PLANNING AND SCHEDULING
3. 1-OPT-SI-020, CSD TEST OF CHARGING AND SAFETY INJECTION MOVS AND CHECK VALVES
4. System Drawing 11448-FM-089A, SH-003, SAFETY INJECTION SYS DIAGRAM

VALIDATION TIME: 30 Minutes.

K/A: GEN 2.2.17 (2.3/3.5)

TERMINATING CUES:

The Trainee states that the Work Order review is complete and either signs the Work Order for release or states why it can not be released.

READ TO THE TRAINEE

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. You are the Desk SRO handling maintenance for your shift.

INITIATING CUES:

A Planner has just delivered a Work Order to you for adjusting the packing on 1-SI-MOV-1867C, which has a packing leak that has continued to worsen over the past week. The packing leakage was last quantified at approximately 150 mils per hour.

The breaker for 1-SI-MOV-1867C has been Tagged Out (S2-02-SI-017) and verified for this job. The STA has verified that a PRA for this job has been performed.

You are to review the Work Order and either sign it for release to the crafts or identify any issues that would prevent you from releasing the Work Order. When you complete your review, please inform me and provide justification for your decision.

Step 1: Reviews the Work Order Front Page

STANDARDS:

___ a. Verifies that the Work Order is for the correct component.
___ b. Verifies that the Task Problem is accurate.
___ c. Identifies that the Work Order is **MRULE A(4) – Risk Significant** and recalls from the pre-brief that a PRA Assessment has been performed for this emergent work.
___ d. Identifies that the Work Order specifies that a Tagout is required and recalls from the pre-brief that a Tagout has already been hung.

EVALUATOR'S NOTE:

- *If the Candidate states that he does not agree with the Tagout Boundary and will not release the Work Order for this reason, ask that he review the entire Work Order for any additional items that would prevent it's release.*

EVALUATOR'S CUES:

- If asked, a PRA Assessment has been performed for this job.
- If asked, a Tagout has been created hung for this job.

Step 2: Reviews the Work Order Job Steps

STANDARDS:

___ a. Identifies that Step 3 states that the valve can not be cycled at power, which prevents performance of the PMT at power and the release of the Work Order.
___ b. Identifies that Step 14 requires cycling the valve and performing a VOTES Test, which would prevent release of the Work Order.

EVALUATOR'S CUES:

- If asked if the PMT has been waived, report that the PMT is as he sees it.

Step 3: Reviews the PMT Test Data Sheet

STANDARDS:

___ a. Verifies that the PMT is for the correct Work Order and has the correct component Mark Number.

___ b. Identifies under the TEST DATA SHEET APPROVALS section that the PMT requires cycling the valve open and closed, which will prevent performance of the PMT under current Unit conditions.

___ c. Identifies under the MAINTENANCE VERIFICATIONS that the valve must be cycled to perform the verifications, which will prevent the performance of the PMT under current Unit conditions.

___ d. Identifies that the MAINTENANCE VERIFICATIONS have not been WAIVED.

___ e. Identifies under the POST MAINTENANCE TESTING REQUIREMENTS that 1-OPT-SI-020 is required, which requires cycling of the valve and can not be performed under the current Unit conditions.

___ f. Identifies that the POST MAINTENANCE TESTING REQUIREMENTS have not been WAIVED.

EVALUATOR'S CUES:

- If asked for a copy of 1-OPT-SI-020, provide the Candidate with the procedure.
- If asked if any PMT items have been waived, report that the PMT is as he sees it.

Step 4: Reports that the Work Order Review is completed and that the Work Order can not be released for the following reasons:

___ a. The PMT for the job can not be performed with the unit at Power, therefore the Work Order can not be released.

EVALUATOR'S CUES:

- If the Candidate states that the Work Order can not be released without providing justification, ask that he state all issues that he identified during his review.

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. You are the Desk SRO handling maintenance for your shift.

INITIATING CUES:

A Planner has just delivered a Work Order to you for adjusting the packing on 1-SI-MOV-1867C, which has a packing leak that has continued to worsen over the past week. The packing leakage was last quantified at approximately 150 mils per hour.

The breaker for 1-SI-MOV-1867C has been Tagged Out (S2-02-SI-017) and verified for this job. The STA has verified that a PRA for this job has been performed.

You are to review the Work Order and either sign it for release to the crafts or identify any issues that would prevent you from releasing the Work Order. When you complete your review, please inform me and provide justification for your decision.

VIRGINIA POWER **SURRY POWER STATION**	PROCEDURE NO: **1-OPT-SI-020**
	REVISION NO: **3 - P1**
PROCEDURE TYPE: **OPERATIONS PERIODIC TEST**	UNIT NO: **1**
PROCEDURE TITLE: **CSD TEST OF CHARGING AND SAFETY INJECTION MOVS AND CHECK VALVES**	EFFECTIVE DATE: **ON FILE**
	EXPIRATION DATE: (Temporary Procedures Only) **N/A**

REVISION SUMMARY:

- Revised to add Subsections 6.8 and 6.9 to stroke test 1-SI-MOV-1890A and 1-SI-MOV-1890B IAW IST Program Plan (CSV-36).
- Deleted Attachment 1 and incorporated recording of MOV Test Data into the body of the procedure
- Modified Acceptance Criteria to reflect Test Data locations
- Moved stopwatch SQC and Work Order recording data from Attachment 1 to the individual steps throughout the procedure
- Added Step 6.7.13 to return 1-CH-PCV-1145 to auto.
- Modified Steps 1.1 and 1.2 due to removal of Attachment 1

E-PAR {P1} adds Precaution and Limitation 4.7.

Embedded Text

ISI PMT 1.97 Reg Guide

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APPROVAL:

APPROVAL ON FILE _____ DATE: _____

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None	

1.0 PURPOSE

1.1 To provide instructions to exercise and measure the stroke times for the valves in Section 6 each Cold Shutdown. (Reference 2.2.1 and 2.3.4)

1.2 To provide instructions to prove operability of valve(s) in Section 6 following maintenance.

1.3 To provide instructions to verify FAIL-SAFE actuation of 1-CH-TV-1204A, LETDOWN LINE I/S TV, and 1-CH-TV-1204B, LETDOWN LINE O/S TV each Cold Shutdown. (Reference 2.3.4). (Exercising 1-CH-TV-1204A and 1-CH-TV-1204B to the FAIL-SAFE position, using the normal means, simulates a fail safe test.)

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR 6.2, Safety Injection System

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specification Section 4.0.5, Surveillance Requirements for ISI

2.2.2 Technical Specification Section 4.11.C.3, Safety Injection System Tests

2.2.3 Technical Specifications 3.3, Safety Injection System

2.3 Technical References

2.3.1 11448-FM-89A, Safety Injection System

2.3.2 11448-FM-88A,B,C, Chemical and Volume Control System

2.3.3 11448-ESK-6CD1, 11448-ESK-6BM, 11448-ESK-6BU, 11448-FM-6BX, 11448-FM-BX2

2.3.4 Inservice Testing Program Plan for Pumps and Valves

2.3.5 VPAP 0805, Motor Operated Valve Program

2.3.6 EWR 94-015, IST Valves Stroke Time Acceptance Criteria

2.3.7 Regulatory Guide 1.97

2.3.8 Technical Report PE-0014

2.3.9 1-OP-CH-005, Aligning Charging and Seal Injection to the Normal or Alternate Charging Header

2.3.10 ET No. S-95-0329, Stroke Time Acceptance Criteria of 1-SI-MOV-1842

2.4 Commitment Documents

2.4.1 QA Audit 87-01 Finding 2, Recording of WO Numbers

2.4.2 NRC Generic Letter No. 89-04: "Guidance on Developing Acceptable Inservice Testing Programs"

Init Verif

3.0 INITIAL CONDITIONS

_____ 3.1 The Unit is in Cold Shutdown or is in a condition required for post maintenance testing.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Before cycling 1-CH-MOV-1115C, CHG PUMP SUCTION FROM VCT, or 1-CH-MOV-1115E, CHG PUMP SUCTION FROM VCT, with the charging pumps in service, 1-CH-MOV-1115B, CHG PUMP SUCT FROM RWST, or 1-CH-MOV-1115D, CHG PUMP SUCT FROM RWST, must be open to provide continuous suction.

4.2 Minimize the time that valves are out of their normal position.

4.3 Valve testing will **not** be performed on valve(s) undergoing maintenance. If a valve is out of service, exercising is **not** required until just before returning the valve to service.

4.4 RWST boron concentration should be greater than or equal to RCS boron concentration to prevent an inadvertent dilution of the RCS.

4.5 The Shift Supervisor shall be notified immediately if any Acceptance Criteria is not met or if any malfunctions or abnormal conditions occur.

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

4.7 {P1}When stroking MOVs or trip valves, 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. If stroking a trip valve closed, timing should be performed from the time that the close button is depressed until the time that the red push button light extinguishes).

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Stopwatch

5.2 Hoses and fittings

Init Verif

6.0 INSTRUCTIONS

6.1 Work Preparation

NOTE: There may be various valves Tagged Out during the performance of this test. If the Shift Supervisor determines that a Tagged Out valve is not required for the performance of this test, the tag out step may be entered N/A and the problem explained in the Operator Comments section.

NOTE: Valve stroke time is measured from switch actuation to the end of the actuating cycle as determined by the position indicating lights.

_____ 6.1.1 IF this test is used to prove operability of a valve(s), THEN perform only the subsection or steps associated with that valve(s), enter N/A to the remaining subsections or steps of Section 6.0, AND GO TO Section 7.0. IF a full test is to be performed, THEN enter N/A for this step.

6.2 Stroke Test of 1-CH-MOV-1289A and 1-CH-MOV-1289B

_____ 6.2.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No._____For_____

_____ 6.2.2 Reduce Letdown and Charging to a minimum.

_____ 6.2.3 Verify that the VCT level is approximately 30% as indicated on 1-CH-LI-1112, VCT LVL, or 1-CH-LI-1115, VCT LVL, and record the level.

_____ %

6.2.4 Verify open or open the following CHG PUMP MINIFLOW RECIRC VALVES.

______ a. 1-CH-MOV-1275A, PUMP A

______ b. 1-CH-MOV-1275B, PUMP B

______ c. 1-CH-MOV-1275C, PUMP C

______ 6.2.5 Verify open 1-CH-MOV-1373, CHG PP MINIFLOW RECIRC.

* *

CAUTION: Isolating 1-CH-FCV-1122, CHG FLOW CNTRL, may upset the Charging and Letdown balance.

* *

______ 6.2.6 Manually close 1-CH-FCV-1122, CHG FLOW CNTRL.

______ 6.2.7 Verify open or open 1-CH-MOV-1289A, CHG LINE ISOL.

______ 6.2.8 Close 1-CH-MOV-1289A and record stroke time below.

		Stroke Time	Reference	Acceptable Range
______	1-CH-MOV-1289A	Close: _____	9.7 sec	7.3 - 11.5 sec

______ 6.2.9 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: ______________ Cal Due Date: ______________

______ ______ 6.2.10 Open 1-CH-MOV-1289A.

______ 6.2.11 Verify open or open 1-CH-MOV-1289B, CHG LINE ISOL.

______ 6.2.12 Close 1-CH-MOV-1289B and record stroke time below.

		Stroke Time	Reference	Acceptable Range
______	1-CH-MOV-1289B	Close: _____	9.9 sec	7.5 - 11.5 sec

_____ 6.2.13 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.2.14 Open 1-CH-MOV-1289B.

_____ 6.2.15 Open 1-CH-FCV-1122 as required to balance Charging and Letdown.

_____ 6.2.16 WHEN Charging and Letdown are balanced AND pressurizer is at desired level, THEN return 1-CH-FCV-1122 to AUTO. IF 1-CH-FCV-1122 is NOT to be returned to AUTO, THEN enter N/A.

_____ 6.2.17 Re-establish Charging and Letdown as required by Shift Supervisor.

6.3 Stroke Test of 1-CH-MOV-1115C and 1-CH-MOV-1115E

_____ 6.3.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No._____For_____

_____ 6.3.2 Reduce letdown and charging flow to a minimum.

_____ 6.3.3 Verify that the VCT level is greater than 30% as indicated on 1-CH-LI-1112, VCT LVL, or 1-CH-LI-1115, VCT LVL, and record the level.

_____ %

_____ _____ 6.3.4 Open 1-CH-MOV-1115B, CHG PUMP SUCT FROM RWST.

_____ _____ 6.3.5 Open 1-CH-MOV-1115D, CHG PUMP SUCT FROM RWST.

_____ 6.3.6 Verify open or open 1-CH-MOV-1115C, CHG PUMP SUCTION FROM VCT.

_____ 6.3.7 Close 1-CH-MOV-1115C and record the stroke time below.

		Stroke Time	Reference	Acceptable Range
_____	1-CH-MOV-1115C	Close: _____	10.1 sec	8.6 - 11.6 sec

_____ 6.3.8 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.3.9 Open 1-CH-MOV-1115C.

_____ 6.3.10 Verify open or open 1-CH-MOV-1115E, CHG PUMP SUCTION FROM VCT.

_____ 6.3.11 Close 1-CH-MOV-1115E and record stroke time below.

	Stroke Time	Reference	Acceptable Range
1-CH-MOV-1115E	Close: _____	10.4 sec	8.9 - 11.9 sec

_____ 6.3.12 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.3.13 Open 1-CH-MOV-1115E.

_____ _____ 6.3.14 Close 1-CH-MOV-1115B and 1-CH-MOV-1115D.

_____ 6.3.15 Re-establish charging and letdown as required by Shift Supervisor.

6.4 Stroke Test of 1-SI-MOV-1867C, 1-SI-MOV-1867D, and 1-SI-MOV-1869B

_____ 6.4.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No._____For_____

_____ 6.4.2 Reduce letdown and charging flow to a minimum.

6.4.3 Verify open or open the following CHG PUMP MINIFLOW RECIRC VALVES.

_____ a. 1-CH-MOV-1275A, PUMP A

_____ b. 1-CH-MOV-1275B, PUMP B

_____ c. 1-CH-MOV-1275C, PUMP C

_____ 6.4.4 Verify open or open 1-CH-MOV-1373, CHG PP MINIFLOW RECIRC.

_____ 6.4.5 Place Alternate Charging and Seal Injection in service IAW 1-OP-CH-005, Aligning Charging and Seal Injection to the Normal or Alternate Charging Header.

_____ 6.4.6 Verify closed or close 1-SI-MOV-1867C, HHSI TO COLD LEGS.

_____ 6.4.7 Cycle 1-SI-MOV-1867C and verify full stroke. Record the time required to open and to close the MOV below.

	Stroke Time	Reference	Acceptable Range
_____ 1-SI-MOV-1867C	Open: _____	9.6 sec	7.2 - 10.5 sec
_____ 1-SI-MOV-1867C	Close: _____	9.2 sec	6.9 - 10.5 sec

_____ 6.4.8 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ 6.4.9 Verify closed or close 1-SI-MOV-1867C.

6.4.10 Verify closed or close 1-SI-MOV-1867D, HHSI TO COLD LEGS.

_____ 6.4.11 Cycle 1-SI-MOV-1867D and verify full stroke. Record the time required to open and to close the MOV below.

	Stroke Time	Reference	Acceptable Range
_____ 1-SI-MOV-1867D	Open: _____	9.9 sec	7.5 - 10.5 sec
_____ 1-SI-MOV-1867D	Close: _____	9.9 sec	7.5 - 10.5 sec

_____ 6.4.12 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

6.4.13 Verify closed or close 1-SI-MOV-1867D.

_____ 6.4.14 Verify closed or close breaker 1J1-1-9A for 1-SI-MOV-1869B, HHSI TO HOT LEGS.

_____ 6.4.15 Verify closed or close 1-SI-MOV-1869B, HHSI TO HOT LEGS.

_____ 6.4.16 Cycle 1-SI-MOV-1869B and verify full stroke. Record the time required to open and to close the MOV below.

	Stroke Time	Reference	Acceptable Range
_____ 1-SI-MOV-1869B	Open: _____	8.6 sec	6.5 - 10.7 sec
_____ 1-SI-MOV-1869B	Close: _____	8.8 sec	6.6 - 11.0 sec

_____ 6.4.17 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

6.4.18 Verify closed or close 1-SI-MOV-1869B.

_____ 6.4.19 Open breaker 1J1-1-9A for 1-SI-MOV-1869B.

_____ 6.4.20 Place Normal Charging and Seal Injection in service IAW 1-OP-CH-005, Aligning Charging and Seal Injection to the Normal or Alternate Charging Header.

_____ 6.4.21 Re-establish charging and letdown as required by Shift Supervisor.

6.5 Stroke Test of 1-SI-MOV-1842 and 1-SI-MOV-1869A

_____ 6.5.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No._____For_____

_____ 6.5.2 Verify that normal charging is in service.

6.5.3 Close the charging pump alternate discharge valves.

_____ _____ a. 1-CH-MOV-1287A, CHG PUMP A DISCH ALT

_____ _____ b. 1-CH-MOV-1287B, CHG PUMP B DISCH ALT

_____ _____ c. 1-CH-MOV-1287C, CHG PUMP C DISCH ALT

_____ 6.5.4 Verify closed or close 1-SI-MOV-1842, ALT HHSI TO COLD LEGS

_____ 6.5.5 Cycle 1-SI-MOV-1842 and verify full stroke. Record the time required to open and to close the MOV below.

	Stroke Time	Reference	Acceptable Range
_____ 1-SI-MOV-1842	Open: _____	15.3 sec	13.1 - 17.5 sec
_____ 1-SI-MOV-1842	Close: _____	15.5 sec	13.2 - 17.8 sec

_____ 6.5.6 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.5.7 Verify closed or close 1-SI-MOV-1842.

_____ 6.5.8 Verify closed or close breaker 1H1-1-3C for 1-SI-MOV-1869A, HHSI TO HOT LEGS.

_____ 6.5.9 Verify closed or close 1-SI-MOV-1869A, HHSI TO HOT LEGS.

_____ 6.5.10 Cycle 1-SI-MOV-1869A and verify full stroke. Record the time required to open and to close the MOV below.

		Stroke Time	Reference	Acceptable Range
_____	1-SI-MOV-1869A	Open: _____	9.5 sec	7.2 - 11.5 sec
_____	1-SI-MOV-1869A	Close: _____	10.1 sec	8.6 - 11.5 sec

_____ 6.5.11 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.5.12 Verify closed or close 1-SI-MOV-1869A.

_____ _____ 6.5.13 Open breaker 1H1-1-3C for 1-SI-MOV-1869A.

6.5.14 Open the charging pump alternate discharge valves. IF charging pump alternate discharge valves will NOT be opened, THEN enter N/A for the following substeps.

_____ _____ a. 1-CH-MOV-1287A, CHG PUMP A DISCH ALT

_____ _____ b. 1-CH-MOV-1287B, CHG PUMP B DISCH ALT

_____ _____ c. 1-CH-MOV-1287C, CHG PUMP C DISCH ALT

6.6 Stroke Test of 1-SI-MOV-1890C

_____ 6.6.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No._____For_____

_____ _____ 6.6.2 Verify closed or close 1-SI-MOV-1864A, LHSI PUMP A TO COLD LEGS.

_____ _____ 6.6.3 Verify closed or close 1-SI-MOV-1864B, LHSI PUMP B TO COLD LEGS.

_____ 6.6.4 Verify closed or close breaker 1H1-2N-9A for 1-SI-MOV-1890C, LHSI TO COLD LEGS.

_____ 6.6.5 Verify open or open 1-SI-MOV-1890C.

_____ 6.6.6 Cycle 1-SI-MOV-1890C and verify full stroke. Record the time required to close and to open the MOV below.

	Stroke Time	Reference	Acceptable Range
_____ 1-SI-MOV-1890C	Close: _____	12.1 sec	10.3 - 13.9 sec
_____ 1-SI-MOV-1890C	Open _____	11.7 sec	10.0 - 13.4 sec

_____ 6.6.7 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.6.8 Position 1-SI-MOV-1890C as required by the Shift Supervisor. (√)

___ Open ___ Closed

_____ _____ 6.6.9 Position the breaker 1H1-2N-9A for 1-SI-MOV-1890C as directed by the Shift Supervisor. (√)

___ Open ___ Closed

_____ _____ 6.6.10 Position 1-SI-MOV-1864A as directed by the Shift Supervisor. (√)

___ Open ___ Closed

_____ _____ 6.6.11 Position 1-SI-MOV-1864B as directed by the Shift Supervisor. (√)

___ Open ___ Closed

6.7 Stroke Test of 1-CH-TV-1204A and 1-CH-TV-1204B

****

CAUTION: The RCS must **not** be solid during this test.

****

_____ 6.7.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No._____For_____

_____ 6.7.2 Verify that the RHR System is operating normally.

6.7.3 Reduce charging and letdown flows in accordance with the following substeps.

_____ a. Close 1-RH-HCV-1142, RHR LETDOWN FLOW.

b. Verify closed all LETDOWN ORIFICE ISOLS.

_____ 1. 1-CH-HCV-1200A

_____ 2. 1-CH-HCV-1200B

_____ 3. 1-CH-HCV-1200C

_____ c. Reduce charging flow using 1-CH-FCV-1122, CHG FLOW CNTRL.

_____ 6.7.4 Close 1-CH-TV-1204A, LETDOWN LINE I/S TV, and record the stroke time below.

	Stroke Time	Reference	Acceptable Range
_____ 1-CH-TV-1204A	Close/Fail: _____	3.5 sec	1.8 - 5.2 sec

_____ 6.7.5 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ 6.7.6 Close 1-CH-TV-1204B, LETDOWN LINE O/S TV, and record the stroke time below.

	Stroke Time	Reference	Acceptable Range
_____ 1-CH-TV-1204B	Close/Fail: _____	1.1 sec	≤ 2 sec

_____ 6.7.7 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ 6.7.8 Place 1-CH-PCV-1145, LTDN LINE PRESS CNTRL, in MANUAL.

_____ 6.7.9 Open 1-CH-PCV-1145.

_____ _____ 6.7.10 Open 1-CH-TV-1204A.

_____ _____ 6.7.11 Open 1-CH-TV-1204B.

_____ 6.7.12 Adjust 1-CH-FCV-1122 to achieve required charging flow.

_____ 6.7.13 Place 1-CH-PCV-1145 in auto and adjust as required.

_____ 6.7.14 Open 1-RH-HCV-1142, RHR LETDOWN FLOW.

_____ 6.7.15 Adjust 1-RH-HCV-1142 and 1-CH-PCV-1145 to achieve required letdown flow.

6.7.16 Position the LETDOWN ORIFICE ISOLS as directed by the Shift Supervisor. (√)

_____ a. 1-CH-HCV-1200A ___ Open ___ Closed

_____ b. 1-CH-HCV-1200B ___ Open ___ Closed

_____ c. 1-CH-HCV-1200C ___ Open ___ Closed

6.8 Stroke Test of 1-SI-MOV-1890A

______ 6.8.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No.__________________For____________________

* *

CAUTION: If the RCS is depressurized, flow paths to the RCS may possibly be established while performing valve strokes. Flow paths to the RCS must be isolated before performing valve strokes to prevent gravity drain of the RWST to the RCS at reduced inventory.

* *

______ 6.8.2 Verify closed or close 1-SI-MOV-1862A, LHSI PUMP A SUCT FROM RWST. Enter N/A if RCS pressure is greater than 50 psig.

______ 6.8.3 Verify closed or close 1-SI-MOV-1864A, LHSI PUMP A DISC TO COLD LEGS. Enter N/A if RCS pressure is greater than 50 psig.

______ 6.8.4 Using 1-SI-178, vent the line section IAW 1-OSP-SI-001. IF 1-SI-MOV-1890A is to be cycled to prove operability after maintenance, THEN enter N/A. **(Ref. 2.4.2)**

______ 6.8.5 Verify closed or close breaker 1H1-2N-8A, 1-SI-MOV-1890A.

______ 6.8.6 Verify closed or close 1-SI-MOV-1890A, LHSI TO HOT LEGS.

_____ 6.8.7 Cycle 1-SI-MOV-1890A and verify full stroke. Record the time required to open and to close the MOV below.

		Stroke Time	Reference	Acceptable Range
_____	1-SI-MOV-1890A	Open: _____	11.3 sec	9.7 - 12.9 sec
_____	1-SI-MOV-1890A	Close: _____	12.1 sec	10.3 - 13.9 sec

_____ 6.8.8 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.8.9 Verify closed 1-SI-MOV-1890A.

_____ _____ 6.8.10 Open breaker 1H1-2N-8A, 1-SI-MOV-1890A. (Reference 2.2.3)

_____ 6.8.11 Position 1-SI-MOV-1862A and 1-SI-MOV-1864A as required for plant conditions.

_____ a. 1-SI-MOV-1862A ___ Open ___ Closed

_____ b. 1-SI-MOV-1864A ___ Open ___ Closed

6.9 Stroke Test of 1-SI-MOV-1890B

______ 6.9.1 Record the Work Order number and the Mark Number of the valve to be returned to service below. IF this procedure is NOT used to prove operability after maintenance or return of equipment to service, THEN enter N/A. **(Reference 2.4.1)**

Work Order No.__________________For____________________

* *

CAUTION: If the RCS is depressurized, flow paths to the RCS may possibly be established while performing valve strokes. Flow paths to the RCS must be isolated before performing valve strokes to prevent gravity drain of the RWST to the RCS at reduced inventory.

* *

______ 6.9.2 Verify closed or close 1-SI-MOV-1862B, LHSI PUMP B SUCT FROM RWST. Enter N/A if RCS pressure is greater than 50 psig.

______ 6.9.3 Verify closed or close 1-SI-MOV-1864B, LHSI PUMP B DISC TO COLD LEGS. Enter N/A if RCS pressure is greater than 50 psig.

______ 6.9.4 Using 1-SI-177, vent the line section IAW 1-OSP-SI-001. IF 1-SI-MOV-1890B is to be cycled to prove operability after maintenance, THEN enter N/A. **(Ref. 2.4.2)**

______ 6.9.5 Verify closed or close breaker 1J1-2E-8B, 1-SI-MOV-1890B.

______ 6.9.6 Verify closed or close 1-SI-MOV-1890B, LHSI TO HOT LEGS.

____ 6.9.7 Cycle 1-SI-MOV-1890B and verify full stroke. Record the time required to open and to close the MOV below.

		Stroke Time	Reference	Acceptable Range
_____	1-SI-MOV-1890B	Open: _____	12.1 sec	10.3 - 13.9 sec
_____	1-SI-MOV-1890B	Close: _____	12.1 sec	10.3 - 13.9 sec

_____ 6.9.8 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: _____ Cal Due Date: _____

_____ _____ 6.9.9 Verify closed 1-SI-MOV-1890B.

_____ _____ 6.9.10 Open breaker 1J1-2E-8B, 1-SI-MOV-1890B. (Reference 2.2.3)

_____ 6.9.11 Position 1-SI-MOV-1862B and 1-SI-MOV-1864B as required for plant conditions.

_____ a. 1-SI-MOV-1862B ___ Open ___ Closed

_____ b. 1-SI-MOV-1864B ___ Open ___ Closed

7.0 FOLLOW-ON

7.1 Acceptance Criteria

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

____ The valve(s) tested traveled full stroke within the specified acceptable range listed in the procedure. (This also constitutes acceptable fail safe testing.)

____ Each MOV and trip valve tested cycled through its full travel.

_____ 7.1.2 Document the test results. (√)

___ SATISFACTORY ___ UNSATISFACTORY

7.2 Follow-On Tasks

7.2.1 IF the test was satisfactory, THEN enter N/A for the following substeps. IF the test was unsatisfactory, THEN perform the following:

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

_____ b. Notify ISI Engineer and System Engineer, and record the name of the person notified.

ISI Engineer: _____

System Engineer: _____

_____ c. Initiate a Deviation Report and record the number.

DR Number: _____

_____ d. Initiate a Work Request and record the number.

WR Number: _____

_____ 7.2.2 IF a partial operability test was done, THEN document the reason for the partial test in Operator Comments. IF a full test was done, THEN enter N/A.

_____ 7.2.3 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

_____ 7.3.1 Notify the Shift Supervisor that the test is complete.

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

Initials	Printed Name

Operator Comments: _____

Completed by: _____ Date: _____

7.4 **Review**

Shift Supervisor Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reviewed by: _____ Date: _____
Shift Supervisor

Forward original procedure to Engineering Testing.

Engineering Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reviewed by: _____ Date: _____
ISI Engineer

```
* VA POWER  NCNWB036                                  SURRY                    W/O TASK  : 00466270 01          *
* O R I G I N A L        PRINTED 02/27/2002        PAGE 01 OF 06    WR TAG: *          WR TAG LOC: *
```

```
*   MARK NUMBER: 38-01-SI-MOV-1867C-VALVE-                                  DUAL CLASS: S                    *
*   MN DESC: HHSI TO COLD LEGS                                              UTC NUMBER: *                    *
*   BOM ITEM NO: *          MFR: A101  MODEL NO.: S350W DD, 3 IN, 94-1      SERIAL NO : *          ITEM QCL: *  *
*   TASK TITLE : ADJUST OR REPACK                                           TYPE: PLANNED MAINTENANCE   SR TASK: Y  *
```

```
*   LOC GRID X/Y : 7.3  G       ELEV: 2      VINS FR: *                                                          *
*   LOCATION CODE: AB   - AUXILIARY BUILDING                                                                     *
*   LOCATION DESC: 2 FT SOUTH UNIT 1 CONTAINMENT PEN AREA, BESIDE                                                *
*                  1-SI-MOV-1867D, 1 FT OFF FLOOR                                                                *
```

```
*   TASK PROBLEM   PACKING LEAK, ADJUST OR REPACK                                          TASK PRIORITY: 3  *
*   DESCRIPTION:   *** THIS WORK ORDER CREATED FOR TRAINING PURPOSES ONLY ***                                *
*                                                                                                            *
*                  RETAIN   FAILED   EQUIPMENT   FOR   CAUSE   DETERMINATION   EVALUATION                    *
*                                                                                                            *
*                   **MRULE A(4) - RISK SIGNIFICANT**                                                        *
```

```
*   EQ REL      : Y       EQML        : N       HUMAN FACTORS: N       ENVIRONMENTAL ZONE: AB-2B              *
*   REG 1.97    : N       APPEND R    : Y       APPEND R AREA: 17                FRA FLAG: R                   *
*   SEISMIC     : Y       NPRDS ITEM  : Y       INSUL COMP   : *                 LIC. RIN: *                   *
```

```
*                                    T A S K   I N F O R M A T I O N                                         *
*                                                                                                            *
*   TAGOUT REQD  : Y       WELD/FL REQD : N       ASME PROM    : N       DEV RPT IND  : N                    *
*   PMT REQD     : Y       SCAF REQD    : N       INS REM REQD : N       DEV RPT #'S  : *          *         *
*   RWP REQD     : Y       CONF ENTRY   : N       IND SR       : N       ENG REVIEW   : N                    *
*                          SECURE REL   : N       COATING REQD : N       ENG DES DOC  : *                    *
*   RWP NUMBERS  : *_______ *_______ *_______ *_______                                                         *
```

```
*   PLANNER: PWRGCUR    CURTIS              G                                   LEVEL: 3 LMD  M   TASK TYPE: PL  *
*   W/R SUBMITTED BY:   *                   * *     DEPT: *                  TROUBLE/BREAKDOWN: N                *
*   W/R APPROVED BY :   *                   * *     DATE: *                     WINDOW _________   FEG: _________ *
```

```
*                                    T A S K   S I G N A T U R E S                                           *
*                                                                                                            *
*   OPERATIONS          : _____________________________________ ___ ___   DATE/TIME: _____ /_____            *
*                                                                          LCO      : _____                  *
*                                                                                                            *
*   QC NOTIFIED         : _____________________________________ ___ ___   DATE/TIME: _____ /_____            *
*                                                                                                            *
*   TAGGING VERIFIED BY: _____________________________________ ___ ___   DATE/TIME: _____ /_____            *
```

```
*                                                                                                            *
*   TAGGING REPORT NBRS: _____________ _____________ _____________                                           *
*                                                                                                            *
```

```
*   SPECIAL NOTES       : WORK SAFE!!!!                                                                      *
*                         ***********************************************                                    *
*                         ** NOTE ** DENATURED ALCOHOL TO BE CARRIED INTO THE                                *
*                         (RCA) ON SATURATED RAGS,IN PLASTIC BAGS ONLY.!!!!                                  *
*                                        PACKING CONTROL FORM                                                *
*                                     (1) VALVE INFORMATION                                                  *
*                         MARK NO.: 38 - 01 - SI - MOV - 1867C,D - VALVE,MODEL:                              *
*                          GATE    MFG.DWG.NO.: 93-12393 & 93-13026    SIZE:3"                           *
*                         MFG:ANCHOR-DARLING   PRESSURE: 2750 PSIG TEMPERATURE:                              *
*                          100 DEGREES                                                                       *
*                                   (2) PACKING SPECIFICATIONS                                               *
*                         STUFFING BOX: STEM O.D.: 1.25  BOX I.D.: 2.00                                      *
*                         BOX DEPTH:4.313 LANTERN RING: YES HEIGHT: ***                                      *
*                         LEAK OFF LINE TO BOTTOM OF STUFFING BOX: ***                                       *
*                         PACKING DATA: PACKING SET: FNP-004  SET(S): 2                                      *
*                         SEQUENCE: WSSUW-L-WSW        VA.PWR.STK.NO.: 02124900                              *
*                         BUSHING SET: NB4 142  SET(S):1                                                     *
*                         INSTALLED HEIGHT: ***    VA. PWR. STK. NO.: 063/7090                               *
*                         GLAND STUDS: QTY: 2  DIA:0.625  TORQUE:  45 FT.LBS.                                *
```

TASK TITLE: ADJUST OR REPACK TYPE : PLANNED MAINTENANCE

SPECIAL NOTES : COMMENTS: (1) MEASURE LANTERN RING THICKNESS AND BOTT
OM OF STUFFING BOX TO CENTERLINE OF LEAK-OFF LINE.
(2) VERIFY STUFFING BOX DEPTH.
(3) INSTALL LOWER PACKING SET AND TORQUE TO 41 FT-LBS
INSTALL UPPER PACKING SET AND TORQUE TO 45 FT-LBS.
(4) MAX RETORQUE IS 53 FT-LBS.
(5) APPLY CHESTERTON PACKING LUBE ON PACKING, STEM,
AND STUFFING BOX. APPLY FEL-PRO N-5000 TO THE PACKING
GLAND STUDS.
(6) DO NOT APPLY PACKING LUBE TO THREADED PART OF
VALVE STEM.
(7) TORQUE VALUE IS FROM THE OLD CHESTERTON SHEETS.
(8) AFTER REPACK CENG REVIEW IS REQUIRED.

REPAIR REPLACEMENT

ANCHOR DARLING 3" GATE VALVE,1500 LBS.,WELDED ENDS.
NUTS AND BOLTS B-7 MATERIAL.
B/B BOLTS 10 EA.,1-3/8" - 8THRD,
NUTS 20 EA.

TORQUE INFORMATION

1. ACTUATOR TO YOKE, 5/8"-11,4EA.,90 FT. LBS.LUBED
2. YOKE TO BONNET, 5/8"-11 4 EA.,90 FT. LBS, LUBED
3. BODY TO BONNET,1-3/8",16 EA.,715 FT. LBS. LUBED
USING FLEX GASKET.
PER DEO SED 1299 AND TORQUE MANUAL
ALL TORQUE VALUES ONLY APPLY WITH THE VALVE IN THE
MID OR OPEN POSITION

TASK JOB STEPS

STEP NO	STEP DESCRIPTION	CRAFT	REQUIRED	HOURS	TOT HOURS
01	SURVEY,SET-UP AND RECLAMATION	HP	1	1.0	1.0
02	REVIEW WORK PACKAGE,(PMT) REQUIRMENTS AND (RWP)	MECH	2	0.3	0.6
03	***OUTAGE***THIS VALVE CAN ONLY BE CYCLED IN A SHUTDOWN CONDITION. THIS MAINTENANCE CAN NOT BE PERFORMED AT POWER DUE TO PMT REQUIREMENTS	OPS	1	0.1	0.1
04	CONTACT(MOV) COORDINATOR PRIOR TO STARTING WORK	MECH	1	0.1	0.1
05	VERIFY PROPER MARK # AND I.D. TAG	MECH	1	0.1	0.1
06	SET UP WORK AREA	MECH	1	1.0	1.0
07	**(NOTE)** NOTIFY SHIFT SUPV'R AND CENG.	MECH	1	0.1	0.1
08	VERIFY COMPONENT IS PROPERLY TAGGED	MECH	1	0.1	0.1
09	FME,IAW VPAP-1302	MECH	1	0.1	0.1
10	ADJUST OR REPACK VALVE IAW	MECH	2	5.0	10.0
11	CLEAN WORK AREA AND RELEASE TAGS	MECH	1	1.0	1.0
12	NOTIFY ELECT.'S VALVE IS READY TO VOTES TEST	MECH	1	0.1	0.1
13	VERIFY WITH OPS SHIFT SUPV'R THAT CLEAR CAP IS OVER MOV SWITCH IN MAIN CONTROL ROOM	ELEC	1	0.1	0.1
14	HAVE OPS CYCLE VALVE AND PERFORM VOTES TEST.	ELEC	2	5.0	10.0
15	CLOSE OUT (PMT)	MECH	1	1.0	1.0
16	DOCUMENT WORK PERFORMED AND MATERIALS USED	MECH	1	1.0	1.0
17	COMPLETE ALL PAPER WORK AND REVIEW WORK PACKAGE	MECH	1	1.0	1.0
				TOTAL EST HOURS:	27.4

TASK REFERENCE DOCUMENTS

DOC TYPE	SUB TYPE	DOCUMENT NUMBER	SHEET	REV	TITLE/DESCRIPTION	USED(Y/N)
DWG	000	11448-FAR-200				
DWG	000	11448-FM-898				
PROC	000	OC-28			ASSESSMENT OF MAI	
PROC	000	0-ECM-1509-01			VOTES MOV TESTING	
PROC	000	0-MCM-0412-02			CHESTERTON REPACK WITH LANTERN RING	

TASK TOOLS

QC TOOL #	QTY PLANNED	TOOL NAME	TOOL RANGE
____	1	AMMETER, CLAMP-ON, DIGITAL	ACA/ACV/OHMS - 0.1 - 999
____	1	CRIMPER, MECHANICAL	# 4, 6, 8, 2 AWG
____	1	MEGOHMMETER	REFER TO MANUAL
____	__		
____	__		
____	__		
____	__		

OTHER TOOLS

_____ _____ _____

_____ _____ _____

_____ _____ _____

TROUBLE FOUND/WORK PERFORMED

ACTUAL START DATE: _____ ACTUAL START TIME: _____

MAJOR FAILURE: _____ MAJOR ACTION: _____
CONTINUED ON ADDITIONAL SHEETS: ___ (Y/N) NUMBER OF SHEETS ADDED: ____ ACTUAL COMPLETION DATE: _____
ROOT CAUSE COMPONENT (IF APPLICABLE): _____ ACTUAL COMPLETION TIME: _____

WORK ACCEPTED AS PERFORMED

CRAFTSMAN: _____ DATE: _____ MANHOURS : ____ W/R TAG REMOVED: __ BY: _____

FOREMAN/GR. TECH : _____ DATE/TIME: _____ / _____

ENGINEERING REVIEW: _____ DATE/TIME: _____ / _____

QRR/TEST ENG : _____ DATE/TIME: _____ / _____

OPERATIONS : _____ DATE/TIME: _____ / _____

QA REVIEW : _____ DATE/TIME: _____ / _____

TASK UTC DATA

(FOR CHANGEOUTS)

CHANGEOUT?: __ (Y/N) IF 'Y', PLEASE ENTER THE UTC CHANGEOUT DATA BELOW:

NEW UTC NUMBER: _____ OLD UTC STATUS: _____

TASK MATERIALS

QTY PLANNED	QTY ALLOC	UI	ITEM NO.	ITEM DESCRIPTION	PRIMARY LOC	SECONDRY LOC	PO NUMBER	QTY USED
1	0	EA	02124790	BUSHING, PACKING, 2.750" I.D., 3.750"	W2611M0301			
2	0	ST	02124930	PACKING, RING TYPE, 2.750" I.D. X 3.750"	W2611P0306			
1	0	EA	06148850	LUBRICANT, ANTI-SEIZE, 1 OZ. TUBE,	SRLLCA510502			
1	0	EA	06499218	BRUSH, SCRUB, 11/16" X 8 1/2", NYLON,	W1P41L030401			
1	0	EA	06505871	SPONGE, HAND, 1" X 3 3/8" X 6 1/4",	W2611U030101			
1	0	GL	37757910	CHEMICAL, DENATURED ALCOHOL, LIQUID, 1		SR[illegible]04		

VA POWER NCMW8036 SURRY W/I TASK : 00466270 01

O R I G I N A L PRINTED 02/27/2002 PAGE 06 OF 06 WR TAG: * WR TAG LOC: *

TASK TITLE: ADJUST OR REPACK TYPE : PLANNED MAINTENANCE

V A R I A N C E R E A S O N (O P T I O N A L)				SUPERVISOR'S INPUT ON REWORK (OPTIONAL)			
POOR ESTIMATE:	____	MANLOADING	____	PERSONNEL -		OTHER -	
DELAYS :	____	REWORK	____	PLANNED :	____	MATERIAL :	____
SCOPE CHANGE :	____	OTHER	____	TECHNIQUE :	____	TOOL/EQUIP:	____
COMMENTS :	_____			INADVERTENT:	____	DESIGN :	____
_____				CONTRACTOR :	____	PROCEDURES:	____
_____				COMMENTS :	_____		
DELAY REASON :	_____	MANHRS:	_____	_____			
_____			_____	_____			
_____			_____	_____			

SURRY PMT Test Data Sheet

HEADER INFORMATION

WO/TASK:00466270-1 TDS: 1 OUTAGE: Y PLANNER: Joe Chandler CRAFT: MECH

MARK NO: 01-SI-MOV-1867C-VALVE- REV NO: 0

DESCRIPTION: HHSI TO COLD LEGS

TEST DATA SHEET APPROVALS

ENGINEERING: N/R
ISI: N/R
OPERATIONS: D SHEPHEARD 02/27/2002
PMT REQUIRES CYCLING OPEN AND CLOSED

ADDITIONAL INSTRUCTIONS TO CRAFT

** OUTAGE RELATED ** VALVE WILL HAVE TO BE CYCLED FOR PMT.

MAINTENANCE ACTIONS

NOTE: If a PIT tag is attached to issued material, the Planner shall be notified so that either a Supplemental Test Data Sheet or a revised Test Data Sheet which includes the Post Installation Test requirements can be issued

I. The specified testing is based on the following maintenance actions:

1. PERFORM VALVE PACKING ADJUSTMENT OR VALVE REPACK : : (MECH)

The Maintenance Actions were completed on: ____/____/____
Date

NOTE: If Maintenance Actions in addition to those listed above are performed, a revised Test Data Sheet must be issued. If fewer Maintenance Actions are performed than listed above, a revised Test Data Sheet should be issued to avoid having to perform unnecessary testing.

MAINTENANCE VERIFICATIONS

I. Perform the following verifications:

1. (MOV) PERFORM VOTES/QUICK LOOK BRIDGE, MEGGER, AND LOAD CHECKS: : 0-ECM-1509-01/03/05/0
1.0 IAW procedure have Operations operate valve in both directions and verify Full Load Amps

1.1 Verify that indicating lights work in relation to valve position
1.2 Check operation of valve, operator, and limit switches
1.3 Listen for abnormal sounds

1.4 Verify current reading acceptability IAW procedure

2.0 Acceptance Criteria

2.1 Results have been evaluated as Acceptable IAW Procedure

SAT / UNSAT / WAIVED / DEFERRED _____/_____
(ELEC) **Date**

II. If a Verification is to be waived or there is a question concerning the acceptance of a Verification, request Engineering review.

Resolution: _____
_____
_____
(Attach additional pages if needed)

_____ / _____
Engineer Date

III. List the verifications which are to be DEFERRED, along with the corresponding Test Data Sheet (Work Order No. and Task No.) to which the verificaiton is being deferred:

DEFERRED VERIFICATION	TEST DATA SHEET (WO/Task No)

(Attach additional pages if needed)

Approval to defer these verifications is granted provided that they are performed prior to declaring the equipment / component operable.

_____ / _____
Operations Date

IV. If any verification is statused as FAILED, indicate below how it will be dispositioned (i.e. rework, retest, accept as is, etc.). This information shall also be entered electronically into the PMT database via an entry in the Explanation field.

UNSAT VERIFICATION	MEANS OF DISPOSITIONING

Basis: _____
_____
_____
_____
(continue on back if needed)

By: _____ / _____
Engineering Date

POST MAINTENANCE TESTING REQUIREMENTS

I. Perform the following Post-Maintenance Tests:

1. PERFORM VALVE EXERCISE TEST : 1-OPT-SI-020

SAT / UNSAT / WAIVED / DEFERRED _____/_____
(OPER) **Date**

2. (X) COMPONENT IN-SERVICE VISUAL LEAK TEST PMT-CMP-OP-01
POST MAINTENANCE LEAKAGE TEST:
1) Confirm the component is in service and at operating pressure and temperature.

2) Visually examine the component s pressure retaining surfaces (or outermost surface of the component s insulation) and record below the results of the examination (SAT=SATISFACTORY, meets criteria; UNSAT=UNSATISFACTORY, does not meet criteria; and INC=INCOPLETE, test incomplete) in accordance with the following criteria:

BORATED FLUID SYSTEM: Slightly wet packing, no leakage at mechanical joints, component surfaces or outermost insulation surfaces.

HAZARDOUS FLUID SYSTEMS: No leakage

RADIOACTIVE CONTAMINATED FLUID SYSTEM: Slightly wet packing, no leakage at mechanical joints, component surfaces or outermost insulation surfaces.

FLUID SYSTEMS NOT LISTED ABOVE: Slightly wet packing, wet but not dripping mechanical joints, component surfaces or outermost insulation surfaces.

GAS/AIR SYSTEMS: No leakage per bubble testing.

NOTES:

The Post Maintenance Leakage Test should be performed when equipment is returned to service; however, it may be waived by the Shift Supervisor or Operations Coordinator for maintenance performed during major outage or for equipment that would require a special entrance into a radiation area, hazardous area, or containment under vacuum.

SAT / UNSAT / WAIVED / DEFERRED _____/_____
(OPER) **Date**

NOTE: If any of the following tests are not completed as specified (i.e. any required section is not performed), then a review of the test results shall be performed by Engineering/ISI, the applicable test results shall be marked WAIVED, and Section II below shall be completed. Tests which are to be performed later (when plant conditions permit) OR are to be satisfied by performing the same test on another Test Data Sheet shall be marked DEFERRED, and section III below shall be completed.

II. *If a Post-Maintenance Test is to be waived (i.e. not completed as specified or not performed at all), the basis shall be provided by Engineering and/or IST. IF THE TEST BEING WAVED IS AN IST PERIODIC TEST, IST ENG./DESIGNEE SHALL PROVIDE THE BASIS. IF THE TEST BEING WAIVED is a TYPE "C" TEST, TYPE "C" ENG./DESIGNEE SHALL PROVIDE THE BASIS (NOTE: If the test being awaived affects both IST and Type "C", justification for the Waiver shall address both program requirements.)* The determination of whether SNSOC approval is required for a waived Post-Maintenance Test shall be made by Engineering and/or IST.

Basis:

_____

_____

_____

_____

(continue on back if needed)

By: _____ / _____
Engineering/ISI Date

Approval (as required): _____ / _____
SNSOC Date

III. List the Tests which are to be DEFERRED, along with the corresponding Test Data Sheet (Work Order No. and Task No.) to which the test is being deferred:

DEFERRED TEST	TEST DATA SHEET (WO/Task No)

(Attach additional pages if needed)

Approval to defer these tests is granted provided that the deferred testing is performed prior to declaring the equipment/component operable.

_____ / _____
Operations Date

IV. *If any Test is statused as FAILED, indicate below how it will be dispositioned (i.e. rework, retest, accept as is, etc.).* This information shall also be entered electronically into the PMT database via an entry in the Explanation field.

UNSAT TEST	MEANS OF DISPOSITIONING

Explanation:

_____

_____

_____

_____

(continue on back if needed)

By: _____ / _____
Engineering/ISI Date

Approval (as required): _____ / _____
SNSOC Date

Developed for the Surry, September 2002, Initial Examination

U. S. Nuclear Regulatory Commission

Region II

A-3 Administrative Section (SRO ONLY)

Title:

CALCULATE RADIATION EXPOSURE WHEN PLACING UNIT 1 RESIDUAL HEAT REMOVAL SYSTEM IN SERVICE

JPM TITLE: CALCULATE RADIATION EXPOSURE WHEN PLACING UNIT 1 RESIDUAL HEAT REMOVAL SYSTEM IN SERVICE

JPM NUMBER: NRC-ADMIN-JPM-03

JPM REV. DATE: 03/07/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Determines the success path for opening 1-RH-MOV-1701 is one operator traveling via the spiral staircase.

REQUIRED MATERIALS:

1. Unit 1 Containment survey maps with estimated transit times
2. Calculator

REFERENCES:

None

VALIDATION TIME: 30 Minutes.

K/A: 2.3.4 (2.5/3.1)
2.3.10 (2.9/3.3)

TERMINATING CUES:

Determines the success path for opening 1-RH-MOV-1701 is one operator traveling via the spiral staircase.

READ TO THE TRAINEE

If you have any questions, ask them now and I will answer them. During the test, I cannot answer questions. When you complete all the steps correctly, you will pass this Job Performance Measure. I will describe the general conditions for the task you will perform and provide the initiating cues.

INITIAL CONDITIONS:

1. Unit 1 has experienced a small break LOCA with a safety injection.

2. The Operating Team is attempting to place the Residual Heat Removal System in service, but they are unable to open 1-RH-MOV-1701 from the Main Control Room.

3. You have been tasked with entering Containment and locally opening 1-RH-MOV-1701.

4. Your allowable dose limit for this job is 1850 mr. Another Operator is available to assist with the same allowable dose limit.

5. General area radiation levels have been manually estimated based on installed radiation monitor readings.

6. Survey maps of the Unit 1 Containment are available, showing dose rates and one way travel time to reach the valve for each of 3 possible routes.

7. If either set of stairs is used, the estimated time in the "A" room to open the valve is 8 minutes. If the elevator is used the estimated time in the "A" room to open the valve is 6 minutes.

8. If a second operator is sent, the time to open the valve will be halved (4 minutes if the stairs are used, 3 minutes if the elevator is used).

9. Health Physics personnel are currently unavailable to provide assistance for dose determination.

INITIATING CUES:

You have been directed to determine:

1) The dose that will be received for each roundtrip path and which roundtrip path would result in the lowest radiation exposure.

2) If 1-RH-MOV-1701 can be opened locally by you without exceeding your dose margin limit.

3) How many Operators are required to accomplish the job with the minimum total job dose.

( ) ELEMENT: 1

Calculate exposure at valve.

STANDARDS:

___ 1. For stairway travel (6 R/HR)(1000 MR/R)(1 HR/60 MIN)(8 MIN)= 800 MR

___ 2. For elevator travel (6 R/HR)(1000 MR/R)(1 HR/60 MIN)(6 MIN)= 600 MR

EVALUATOR'S NOTES:

NOTE: The operator may perform the calculations in any order.

( ) ELEMENT: 2

Calculate exposure from using elevator.

STANDARDS:

___ 1. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(3 MIN)(2 TRIPS) = 300 MR. (Personnel Hatch to Elevator Door)

___ 2. (2 R/HR)(1000 MR/R)(1 HR/60 MIN)(1 MIN)(2 TRIPS) = 67 MR. (Elevator ride)

___ 3. (12 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 800 MR. (Elevator door to valve)

___ 4. (300 MR)+(66 MR)+(800 MR) + (600 MR) = 1766 MR TOTAL DOSE.

EVALUATOR'S NOTES:

NOTE: Total exposure via this path including time at the valve: 1766 mr (.2 points).

( ) ELEMENT: 3

Calculate exposure from using stairway.

STANDARDS:

___ 1. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(1 MIN)(2 TRIPS) = 100 MR. (Personnel Hatch to Stairway)

___ 2. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(3 MIN)(2 TRIPS) = 300 MR. (Stairway)

___ 3. (12 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 800 MR. (Stairway on –3'6" to valve)

___ 4. (100 MR)+(300 MR)+(800 MR)+(800MR) = 2000 MR TOTAL DOSE.

EVALUATOR'S NOTES:

NOTE: Total exposure via this path including time at the valve: 2000 mr (.2 points)

( ) ELEMENT: 4

Calculate exposure from using spiral staircase.

STANDARDS:

___ 1. (1 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 67 MR. (Personnel Hatch to Spiral Staircase)

___ 2. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(3 MIN)(2 TRIPS) = 300 MR. (Spiral Staircase)

___ 3. (4 R/HR)(1000 MR/R)(1 HR/60 MIN)(4 MIN)(2 TRIPS) = 533 MR. (Spiral Staircase on –3'6" to valve)

___ 4. (67 MR)+(300 MR)+(533 MR)+(800) = 1700 MR.

EVALUATOR'S NOTES:

NOTE: Total exposure via this path including time at the valve: 1700 mr. (.4 points)

( ) ELEMENT: 5

Determine lowest exposure path and compare to allowable dose.

STANDARDS:

___ 1. Compared results of three calculations and determines the path using the spiral staircase to be the lowest exposure.

EVALUATOR'S NOTES:

Determines only Elevator and spiral staircase are acceptable paths.
Spiral staircase is lowest dose travel path.

( ) ELEMENT: 6

STANDARDS:

___ 2. Determines the task can be performed within the given exposure limits.

EVALUATOR'S NOTES:

Determines the task can be performed within the given exposure limits (.1 Points)

( ) ELEMENT: 7

Determine if extra Operator is beneficial.

STANDARDS:

___ 1. Determines two Operator dose using spiral staircase.

___ 2. (6 R/HR)(1000 MR/R)(1 HR/60 MIN)(4 MIN)(2 Operators) = 800 MR.

___ 3. ((67 MR)+(300 MR)+(533 MR))*2 Operators +(800MR) = 2600 MR.

Operator may apply logic that the same dose will be expended at the valve, and from an ALARA standpoint, the dose to travel to and from the valve is unwarranted.

EVALUATOR'S NOTES:

Determines no extra Operator is beneficial. (.1 points)

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 has experienced a small break LOCA with a safety injection.

2. The Operating Team is attempting to place the Residual Heat Removal System in service, but they are unable to open 1-RH-MOV-1701 from the Main Control Room.

3. You have been tasked with entering Containment and locally opening 1-RH-MOV-1701.

4. Your allowable dose limit for this job is 1850 mr. Another Operator is available to assist with the same allowable dose limit.

5. General area radiation levels have been manually estimated based on installed radiation monitor readings.

6. Survey maps of the Unit 1 Containment are available, showing dose rates and one way travel time to reach the valve for each of 3 possible routes.

7. If either set of stairs is used, the estimated time in the "A" room to open the valve is 8 minutes. If the elevator is used the estimated time in the "A" room to open the valve is 6 minutes.

8. If a second operator is sent, the time to open the valve will be halved (4 minutes if the stairs are used, 3 minutes if the elevator is used).

9. Health Physics personnel are currently unavailable to provide assistance for dose determination.

INITIATING CUES:

You have been directed to determine:

1) Which roundtrip path would result in the lowest radiation exposure.

2) If 1-RH-MOV-1701 can be opened locally by you without exceeding your dose margin limit.

3) How many Operators are required for the job with the minimal total job dose.

RESULTS:

Dose received for each travel path:

ELEVATOR: _____

STAIRWAY: _____

SPIRAL STAIRCASE: _____

Recommended path:

_____

Can the Alignment be completed within your Dose Limit?

_____ YES _____ NO

Is an extra Operator recommended to lower the total dose for the task?

_____ YES _____ NO

Spiral Staircase Pathway

ATTACHMENT 1
(Page 1 of 2)

RADIOLOGICAL SURVEY MAP RECORD

Map Number	Location	Date	Time
100	Unit #1 Containment 47' Elevation	TODAY	Now

PURPOSE: ☐ Routine ☒ Non-Routine ☐ RWP Prep., for RWP No.#

TYPE: ☒ Gamma ☐ Beta ☐ Neutron ☐ Smear, GA ☐ Smear, LA ☐ Smear, HP ☐ Air Sample

REACTOR POWER	
Unit 1	Unit 2
150	100

Instrument	Serial #
Installed Rad Monitors	
throughout	CTMT

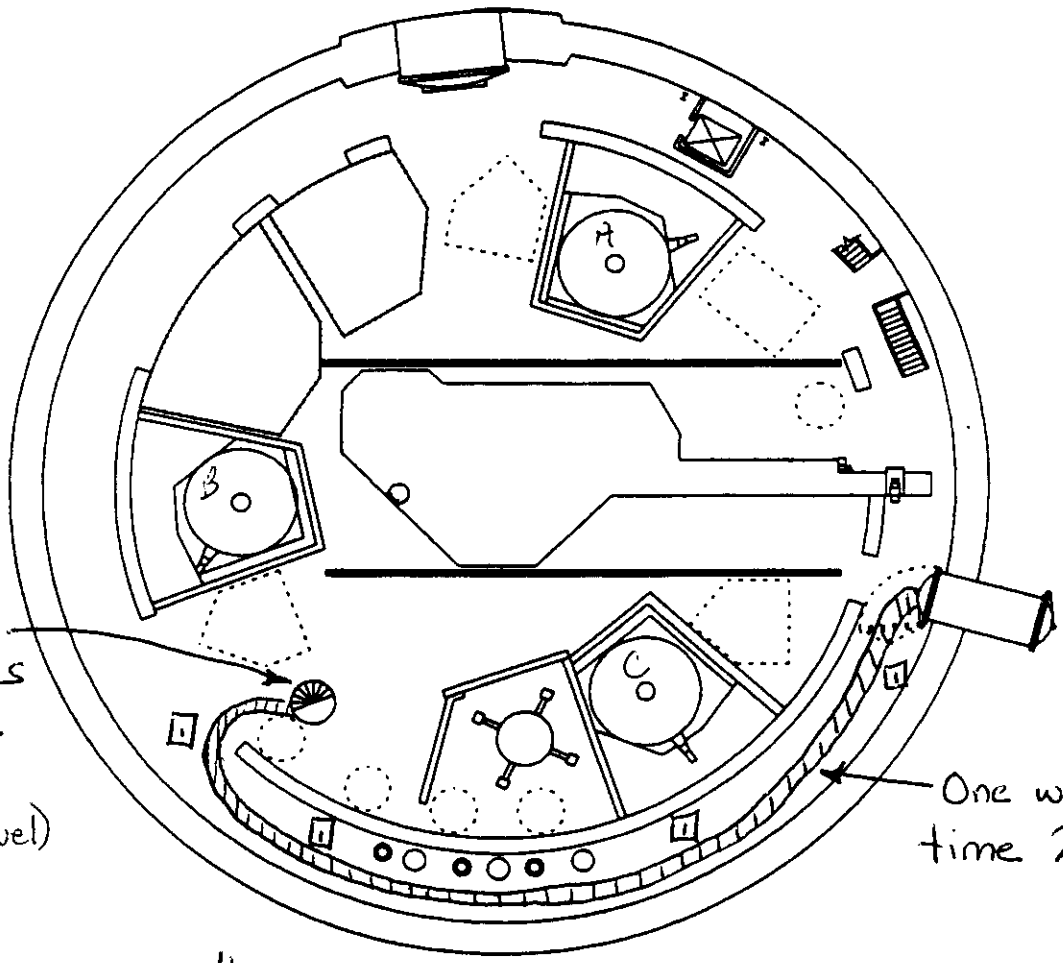
- ☒ All GA Smears <1000 DPM/100cm² Except as noted on map or smear worksheet.
- ☐ All GA Smears <1000 DPM/100cm²
- ☐ All LA smears <1000 DPM/ft²
- ☐ All HP smears <1 HP/smear
- ☒ Air particulate + I_2 <0.1 DAC
- ☐
- ☐
- ☒ All GA smears in DPM/100cm²
- ☒ All HP smears in HPs/smear
- ☑ All Gamma readings in mrem/hr as denoted on Survey map
- ☒ All Neutron readings in mrem/hr.
- ☒ All Beta readings in mrad/hr.
- ☐

Comments: General area estimates based on CTMT radiation monitors

1000 mr = 1 R ▨ Denotes travel path

Survey RWP: Special

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date



*All measurements in R/hr

LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA- Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
(F) - Frisking Station
RCAB - Radiological Control Area Boundary
NDCR - Neutron Dose Calculation Required

☐ Gen. Area; ◯ Contact; △ GA Smear; ◇ LA Area; △* HP Smear; AS Air Sample Location; LCK Locked Gate; X-X-X Barrier

Spiral Staircase Pathway

ATTACHMENT 1
(Page 1 of 2)

RADIOLOGICAL SURVEY MAP RECORD

Map Number	Location	Date	Time
150	Unit #1 Containment -3'6" Elevation	Today	Now

PURPOSE: ☐ Routine ☒ Non-Routine ☐ RWP Prep., for RWP No.#

TYPE: ☒ Gamma ☐ Beta ☐ Neutron ☐ Smear, GA ☐ Smear, LA ☐ Smear, HP ☐ Air Sample

REACTOR POWER	
Unit 1	Unit 2
TSD	100

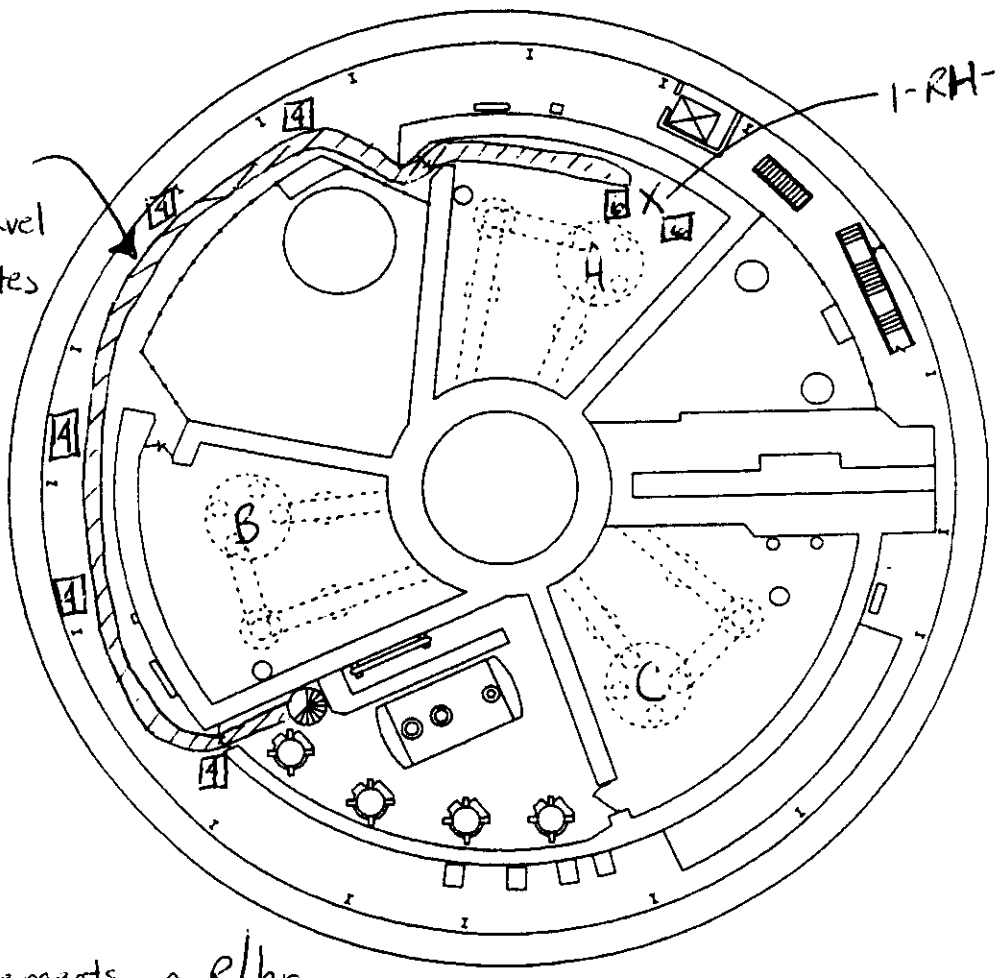
Instrument	Serial #
Installed Rad Monitors	
throughout	CMT

- ☒ (N/A) All GA Smears <1000 DPM/100cm^2 Except as noted on map or smear worksheet.
- ☐ All GA Smears <1000 DPM/100cm^2
- ☐ All LA smears <1000 DPM/ft^2
- ☐ All HP smears <1 HP/smear
- ☒ Air particulate + I_2 <0.1 DAC
- ☐
- ☐
- ☒ (N/A) All GA smears in DPM/100cm^2
- ☒ (N/A) All HP smears in HPs/smear
- ☒ All Gamma readings in mrem/hr. as denoted on Survey map
- ☒ (N/A) All Neutron readings in mrem/hr.
- ☒ (N/A) All Beta readings in mrad/hr.
- ☐

Comments: General area based on Containment radiation monitors
1000 mr = 1R
▨ Denotes travel path

Survey RWP: Special

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date



*All measurements in R/hr

LDWA - Low Dose Waiting Areas	HPA - Hot Particle Area	CAM - Continuous Air Monitor
LHRA - Locked High Radiation Area	CA - Contaminated Area	(F) - Frisking Station
HRA - High Radiation Area	ARA - Airborne Radioactivity Area	RCAB - Radiological Control Area Boundary
RA- Radiation Area	RM - Radioactive Material (s)	NDCR - Neutron Dose Calculation Required

☐ Gen. Area; ◯ Contact; △ GA Smear; ◇ LA Area; △* HP Smear; **AS** Air Sample Location; **LCK** Locked Gate; ~~X X X~~ Barrier

Stairway Pathway

ATTACHMENT 1
(Page 1 of 2)

RADIOLOGICAL SURVEY MAP RECORD

Map Number	Location	Date	Time
100	Unit #1 Containment 47' Elevation	Today	Now

PURPOSE: ☐ Routine ☒ Non-Routine ☐ RWP Prep., for RWP No.#

TYPE: ☒ Gamma ☐ Beta ☐ Neutron ☐ Smear, GA ☐ Smear, LA ☐ Smear, HP ☐ Air Sample

REACTOR POWER Unit 1	Unit 2
15D	100

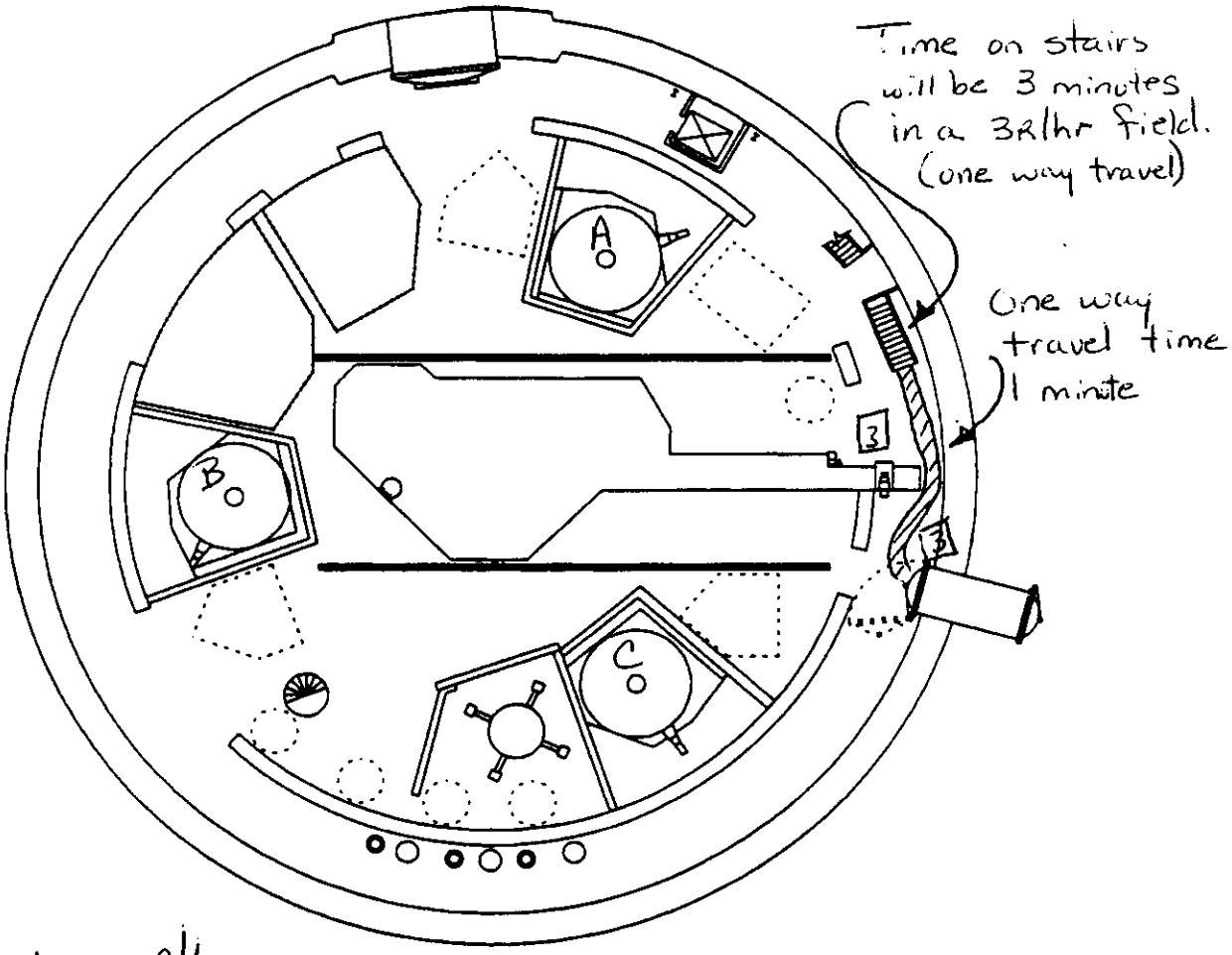
Instrument	Serial #
Installed Rad monitors	
throughout	CTMT

- ☒ All GA Smears <1000 DPM/100cm^2 Except as noted on map or smear worksheet.
- ☐ All GA Smears <1000 DPM/100cm^2
- ☐ All LA smears <1000 DPM/ft^2
- ☐ All HP smears <1 HP/smear
- ☑ Air particulate + I_2 <0.1 DAC
- ☐
- ☐
- ☒ All GA smears in DPM/100cm^2
- ☒ All HP smears in HPs/smear
- ☒ All Gamma readings in mrem/hr. as denoted on survey map
- ☒ All Neutron readings in mrem/hr.
- ☒ All Beta readings in mrad/hr.
- ☐

Comments General area estimates based on CTMT radiation monitors
1000 mr = 1 R ▥▥▥▥▥ Denotes travel path

Survey RWP: Special

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date



*All measurements in R/hr

LDWA - Low Dose Waiting Areas	HPA - Hot Particle Area	CAM - Continuous Air Monitor
LHRA - Locked High Radiation Area	CA - Contaminated Area	(F) - Frisking Station
HRA - High Radiation Area	ARA - Airborne Radioactivity Area	RCAB - Radiological Control Area Boundary
RA- Radiation Area	RM - Radioactive Material (s)	NDCR - Neutron Dose Calculation Required

☐ Gen. Area; ◯ Contact; △ GA Smear; ◇ LA Area; △* HP Smear; **AS** Air Sample Location; **LCK** Locked Gate; X X X Barrier

Stairway pathway

ATTACHMENT 1
(Page 1 of 2)

RADIOLOGICAL SURVEY MAP RECORD

Map Number	Location	Date	Time
150	Unit #1 Containment -3'6" Elevation	Today	Now

PURPOSE: ☐ Routine ☒ Non-Routine ☐ RWP Prep., for RWP No.#

TYPE: ☒ Gamma ☐ Beta ☐ Neutron ☐ Smear, GA ☐ Smear, LA ☐ Smear, HP ☐ Air Sample

REACTOR POWER	
Unit 1	Unit 2
ISD	100

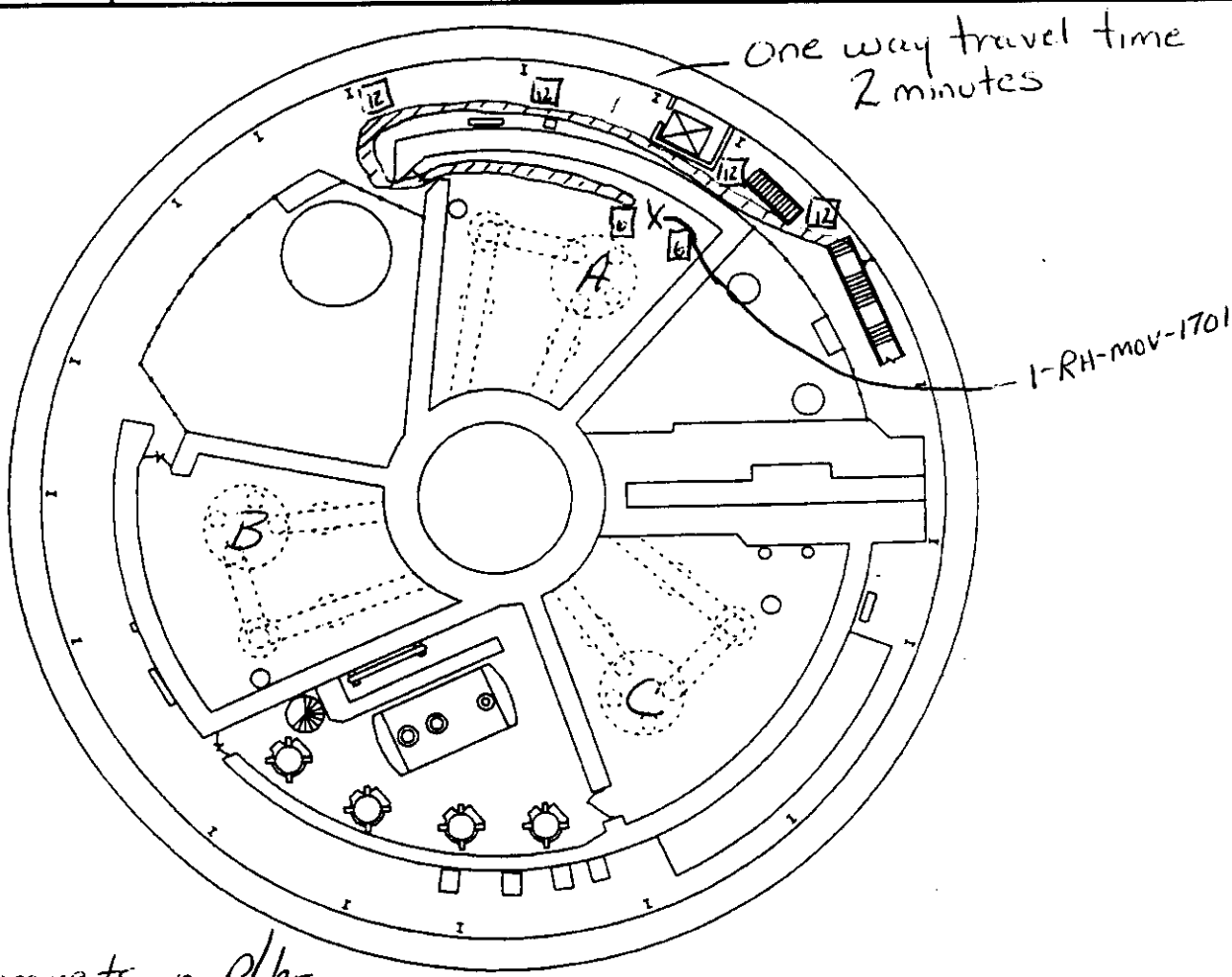
Instrument	Serial #
Installed	Rad monitors
throughout	CTMT

- N/A All GA Smears <1000 DPM/100cm^2 Except as noted on map or smear worksheet.
- ☐ All GA Smears <1000 DPM/100cm^2
- ☐ All LA smears <1000 DPM/ft^2
- ☐ All HP smears <1 HP/smear
- ☑ Air particulate + I_2 <0.1 DAC
- ☐
- ☐
- N/A All GA smears in DPM/100cm^2
- N/A All HP smears in HPs/smear
- ☒ All Gamma readings in mrem/hr. denoted on survey map
- N/A All Neutron readings in mrem/hr.
- N/A All Beta readings in mrad/hr.
- ☐

Comments: General area estimates based on CTMT radiation monitors
1000 mr = 1R ▨ Denotes travel path

Survey RWP: Special

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date



* All measurements in R/hr

LDWA - Low Dose Waiting Areas	HPA - Hot Particle Area	CAM - Continuous Air Monitor
LHRA - Locked High Radiation Area	CA - Contaminated Area	(F) - Frisking Station
HRA - High Radiation Area	ARA - Airborne Radioactivity Area	RCAB - Radiological Control Area Boundary
RA- Radiation Area	RM - Radioactive Material (s)	NDCR - Neutron Dose Calculation Required

☐ Gen. Area; ◯ Contact; △ GA Smear; ◇ LA Area; △* HP Smear; **AS** Air Sample Location; **LCK** Locked Gate; X-X-X Barrier

Elevator Pathway

ATTACHMENT 1
(Page 1 of 2)

RADIOLOGICAL SURVEY MAP RECORD

Map Number	Location	Date	Time
100	Unit #1 Containment 47' Elevation	Today	Now

PURPOSE: ☐ Routine ☒ Non-Routine ☐ RWP Prep., for RWP No.#

TYPE: ☒ Gamma ☐ Beta ☐ Neutron ☐ Smear, GA ☐ Smear, LA ☐ Smear, HP ☐ Air Sample

REACTOR POWER	
Unit 1	Unit 2
ISD	100

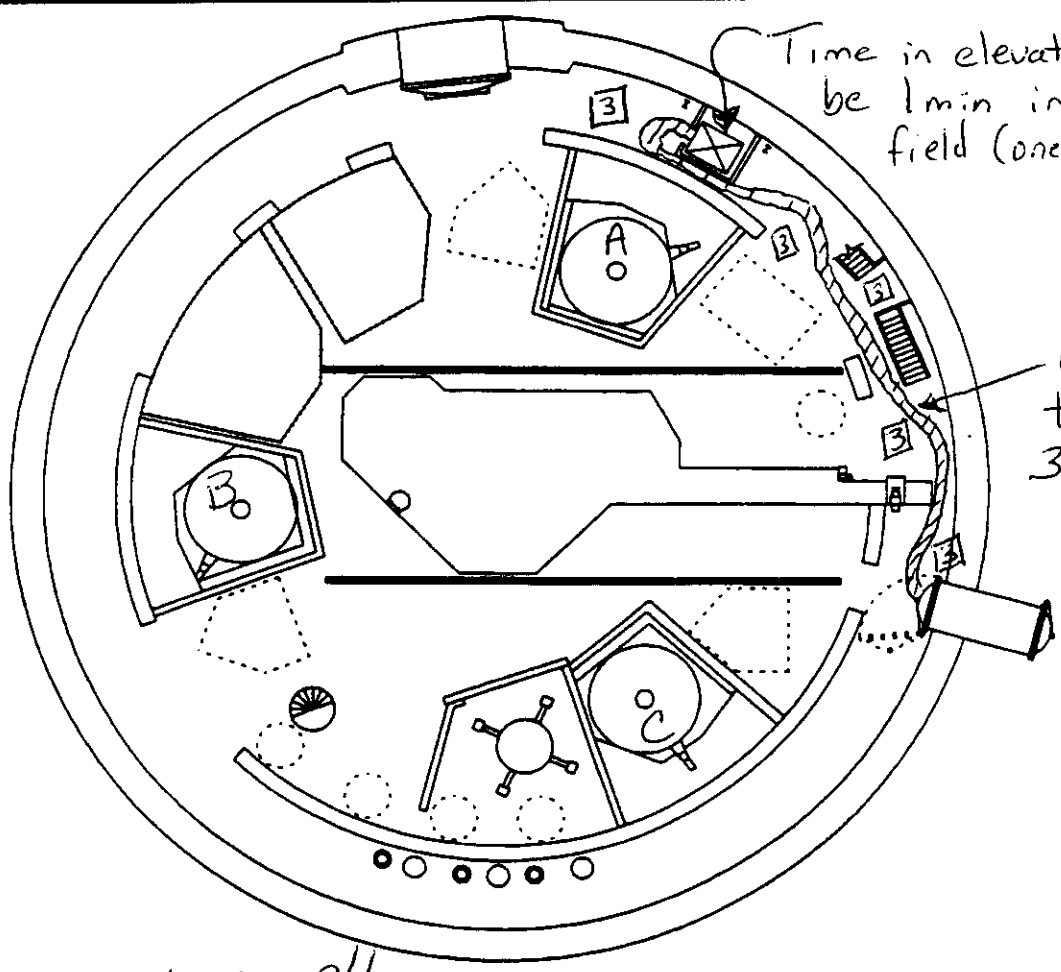
Instrument	Serial #
Installed Rad monitors	
throughout	CTMT

- ☒ All GA Smears <1000 DPM/100cm² Except as noted on map or smear worksheet.
- ☐ All GA Smears <1000 DPM/100cm²
- ☐ All LA smears <1000 DPM/ft²
- ☐ All HP smears <1 HP/smear
- ☒ Air particulate + I_2 <0.1 DAC
- ☐
- ☐
- N/A All GA smears in DPM/100cm²
- N/A All HP smears in HPs/smear
- ☒ All Gamma readings in mrem/hr. or as denoted on survey map
- N/A All Neutron readings in mrem/hr.
- N/A All Beta readings in mrad/hr.
- ☐

Comments: General area estimates based on CTMT radiation monitors
1000 mr = 1R ||||||||||| Denotes travel path

Survey RWP: Special

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date



*All measurements in R/hr

LDWA - Low Dose Waiting Areas	HPA - Hot Particle Area	CAM - Continuous Air Monitor
LHRA - Locked High Radiation Area	CA - Contaminated Area	(F) - Frisking Station
HRA - High Radiation Area	ARA - Airborne Radioactivity Area	RCAB - Radiological Control Area Boundary
RA- Radiation Area	RM - Radioactive Material (s)	NDCR - Neutron Dose Calculation Required

☐ Gen. Area; ◯ Contact; △ GA Smear; ◇ LA Area; △* HP Smear; **AS** Air Sample Location; **LCK** Locked Gate; X X X Barrier

Elevator Pathway

ATTACHMENT 1
(Page 1 of 2)

RADIOLOGICAL SURVEY MAP RECORD

Map Number	Location	Date	Time
150	Unit #1 Containment -3'6" Elevation	Today	Now

PURPOSE: ☐ Routine ☒ Non-Routine ☐ RWP Prep., for RWP No.#

TYPE: ☒ Gamma ☐ Beta ☐ Neutron ☐ Smear, GA ☐ Smear, LA ☐ Smear, HP ☐ Air Sample

REACTOR POWER	
Unit 1	Unit 2
150	100

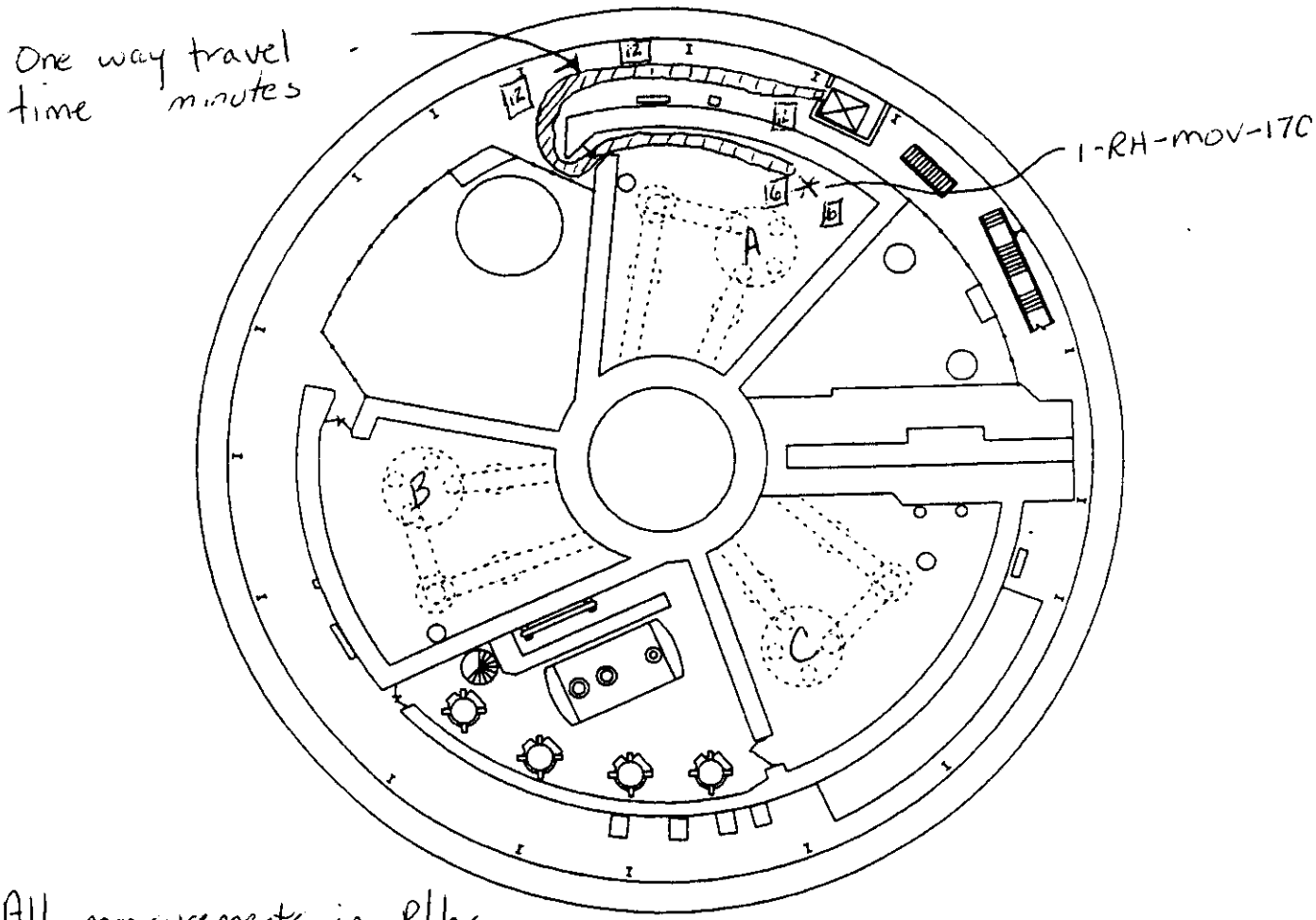
Instrument	Serial #
Installed Rad Monitors	
throughout CIMT	

- N/A All GA Smears <1000 DPM/100cm² Except as noted on map or smear worksheet.
- ☐ All GA Smears <1000 DPM/100cm²
- ☐ All LA smears <1000 DPM/ft²
- ☐ All HP smears <1 HP/smear
- ☒ Air particulate + I_2 <0.1 DAC
- N/A All GA smears in DPM/100cm²
- N/A All HP smears in HPs/smear
- ■ All Gamma readings in mrem/hr. as denoted on survey maps
- N/A All Neutron readings in mrem/hr.
- N/A All Beta readings in mrad/hr.

Comments: General area estimates based on Containment radiation monitors
1000 mr = 1R ▨ Denotes travel path

Survey RWP: Special

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date



* All measurements in R/hr

LDWA - Low Dose Waiting Areas	HPA - Hot Particle Area	CAM - Continuous Air Monitor
LHRA - Locked High Radiation Area	CA - Contaminated Area	(F) - Frisking Station
HRA - High Radiation Area	ARA - Airborne Radioactivity Area	RCAB - Radiological Control Area Boundary
RA- Radiation Area	RM - Radioactive Material (s)	NDCR - Neutron Dose Calculation Required

☐ Gen. Area; ◯ Contact; △ GA Smear; ◇ LA Area; △* HP Smear; **AS** Air Sample Location; **LCK** Locked Gate; X X X Barrier

Developed for the Surry, 2002, Initial Examination

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

A-4 ADMINISTRATIVE SECTION SRO

NRC-ADMIN-JPM-04

Title:

Determination of event reportability/classification

* - indicates a critical step.

JPM TITLE: Determination of event reportability/classification

JPM NUMBER: NRC-ADMIN-JPM-04

JPM REV. DATE: 03/12/02

TIME VALIDATION: 20 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Based on given event, determine appropriate emergency classification/notification

REQUIRED MATERIALS:

1. EPIP-1.01, EMERGENCY MANAGER CONTROLLING PROCEDURE
2. VPAP 2802, NOTIFICATIONS AND REPORTS

REFERENCES:

3. EPIP-1.01, EMERGENCY MANAGER CONTROLLING PROCEDURE
4. VPAP 2802, NOTIFICATIONS AND REPORTS

VALIDATION TIME: 20 Minutes.

K/A: GENERIC 2.4.41 (2.3/4.1)

* - indicates a critical step.

Read to the Operator

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed/simulated for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- You are the Shift Supervisor. At 0300, with Unit 1 at 100% power, the 1C Charging pump was in service and tripped. The 1B charging pump is tagged for maintenance and the 1A Charging pump failed to automatically start, but was immediately started from the Main Control Board.
- At 0302, personnel in the area noted light smoke coming from the 1C Charging Pump motor and an acrid odor.
- At 0305, the Fire Brigade reported to the scene and sprayed the smoking motor with CO_2, as a precaution, verified the supply breaker open and reported that no open flames were observed.
- At 0430, a Unit ramp has commenced due to Management determination of 3 inoperable charging pumps.

INITIATING CUES:

- Make all necessary classifications and notifications.
- When you finish the actions necessary to accomplish this, please inform me of your findings and action, as applicable.

* - indicates a critical step.

Determine event reportability/classification	
STEP 1: OBTAIN EPIP-1.01, EMERGENCY MANAGER CONTROLLING PROCEDURE. Standards (a) Proceeds to SS console bookrack. (b) Obtains SEM emergency package (or STA classification package). (c) Gets copy of EPIP-1.01, EAL Tabs. Evaluator's Comments Applicant may go to VPAP 2802 first and skip steps 1 and 2.	_____SAT _____UNSAT
STEP 2: *DETERMINE EVENT CATEGORY. Standards Determines event to be NON-Emergency. Evaluator's Comments: Applicant should verbalize that there is no emergency classification if he goes directly to VPAP 2802.	_____SAT _____UNSAT
STEP 3: OBTAIN VPAP 2802, NOTIFICATIONS AND REPORTS. Standards Obtains copy of VPAP 2802. Evaluator's Comments:	_____SAT _____UNSAT

* - indicates a critical step.

STEP 4: DETERMINES TYPE OF NOTIFICATION Standards *(a) Determines that event is a 4 hour notification, per section 6.3.4.1, initiation of plant shutdown required by Tech Specs. ***OR*** *(b) Determines that event is a 1 hour notification, per section 6.3.3.b, an automatic safety system that does not function as required during operation. Evaluator's Comments Either a or b is acceptable, but only if the correct reason is given. **END OF TASK**	_____SAT _____UNSAT

* - indicates a critical step.

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed/simulated for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- You are the Shift Supervisor. At 0300, with Unit 1 at 100% power, the 1C Charging pump was in service and tripped. The 1B charging pump is tagged for maintenance and the 1A Charging pump failed to automatically start, but was immediately started from the Main Control Board.
- At 0302, personnel in the area noted light smoke coming from the 1C Charging Pump motor and an acrid odor.
- At 0305, the Fire Brigade reported to the scene and sprayed the smoking motor with CO_2, as a precaution, verified the supply breaker open and reported that no open flames were observed.
- At 0430, a Unit ramp has commenced due to Management determination of 3 inoperable charging pumps.

INITIATING CUES:

- Make all necessary classifications and notifications.
- When you finish the actions necessary to accomplish this, please inform me of your findings and action, as applicable.

* - indicates a critical step.

U. S. Nuclear Regulatory Commission

Region II

A-1.1 Administrative Section (RO ONLY)

NRC-ADMIN-JPM-01

Title:

Verification of Valve Position

JPM TITLE: Verification of Valve Position

JPM NUMBER: NRC-ADMIN-JPM-02

JPM REV. DATE: 03/06/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Perform a Verification of Valve Position

REQUIRED MATERIALS:

1. Valve Lineup Attachment
2. Safety Equipment (Hardhat, Safety Glasses, Gloves)
3. 4 chains and 4 locks
4. A key for the locks.

REFERENCES:

1. OPAP-0008, ADMINISTRATIVE CONTROL OF KEYS AND LOCKED VALVES AND SWITCHES

2. OPAP-0012, VALVE OPERATIONS

VALIDATION TIME: 30 Minutes.

K/A: GEN 2.1.29 (3.4/3.3)

TERMINATING CUES:

The Trainee states that all valve positions have been verified.

SET-UP:

1. Startup the mock-up area air compressor and pressurize the IA System.
2. Verify 1-TLO-MOV-100A is CLOSED.
3. Verify 1-TLO-MOV-100B is OPEN.
4. Verify 1-TLO-08 LOCKED OPEN.
5. Verify 1-TLO-11 LOCKED OPEN.
6. Verify 1-TLO-16 LOCKED CLOSED.
7. Verify 1-TLO-21 LOCKED THROTTLED 3 TURNS.
8. Verify 1-TCW-LCV-100A OPEN with IA valved in (1-TIA-13 OPEN).

READ TO THE TRAINEE

INITIAL CONDITIONS:

1. Unit 1 is in a Refueling Outage.

2. The TLO System had been Tagged Out for various maintenance activities. All work has been completed and the Tag Out has been cleared.

3. A System Valve Lineup must be completed prior to filling the System in preparation for returning it to service.

4. The Valve Lineup has been initiated but has not been completed.

5. I am the Project SRO and you are an On-Shift Operator qualified on the System.

INITIATING CUES:

I need you to perform a local verification of valve position on all the valves listed on Attachment 1.

- You are to perform the Initial Check of valve position for the valves that have not been checked
- You are to Independently Verify the valve position of any valves for which the Initial Check has already been performed.

Here is an Admin Key for the Watchstation that the valves are located in. If you determine that any valve is not in the proper position, please inform me first and then take whatever local actions are appropriate in order to place the valve in the required position. Attachment 2 may be used as a reference and provides the general location of each valve.

Step 1: The Operator may elect to obtain a copy of OPAP-0008 and/or OPAP- 0012.

EVALUATOR'S CUES:

- If the Operator asks for a copy of either of the above procedures, then provide him with a copy.

Step 2: Verify 1-TLO-MOV-100A Closed

STANDARDS:

___ a. Verifies that the correct valve has been located by comparing the Valve Identification Tag to Attachment 1.
___ b. Determines by referring to Attachment 1 that the valve should be in the closed position.
___ c. Inspects valve and determines that that it does not have a local position indication.
___ d. Inspects 1-TLO-MOV-100A for valve stem thread indication.
___ e. Compares the valve stem thread indication with 1-TLO-MOV-100B and determines that they are different (no valve stem threads showing on 1-TLO-MOV-100B).
___ f. Initials and dates the IC Block on Attachment 1 for 1-TLO-MOV-100A.

EVALUATOR'S CUES:

- If asked, 1-TLO-MOV-100A does not have remote position indication.
- If asked, 1-TLO-MOV-100A is energized and must remain energized.
- If asked, 1-TLO-MOV-100A can not be electrically cycled.
- If asked, 1-TLO-MOV-100B has been previously verified in the OPEN position.
- If asked, 1-TLO-MOV-100A and 1-TLO-MOV-100B are identical valves.

Step 3: Verify 1-TLO-08 Locked Open

STANDARDS:

___ a. Verifies the correct valve has been located by comparing the Valve Identification Tag to Attachment 1.
___ b. Determines that 1-TLO-08 should be LOCKED OPEN by referring to Attachment 1.
___ c. Unlocks and removes the chain around 1-TLO-08.
___ d. Moves the valve in the CLOSED direction until there is a small amount of stem movement and then returns the valve to the fully open position.
___ e. Checks the position of the valve stem for 1-TLO-08.
___ f. Reinstalls and locks the chain in a manner that limits valve travel.
___ g. Initials and Dates the IC block on Attachment 1 for 1-TLO-8.

EVALUATOR'S NOTES:

- The Operator should wear gloves when manipulating valves, however, this is not a failure criteria.

Step 4: Independently Verify 1-TLO-11 Locked Open

STANDARDS:

___ a. Verifies the correct valve has been located by comparing the Valve Identification Tag to Attachment 1.
___ b. Determines that the Initial Check of 1-TLO-11 has already been performed but that an Independent Verification of the valve position is still required by referring to Attachment 1.
___ c. Checks that the chain is installed so that it restricts valve movement and that the lock properly installed.
___ d. Initials and Dates the IV block on Attachment 1 for 1-TLO-11.

EVALUATOR'S NOTES:

- The Operator should wear gloves when manipulating valves, however, this is not failure criteria.

Step 5: Verify 1-TLO-16 Locked Closed

STANDARDS:

___ a. Verifies the correct valve has been located by comparing the Valve Identification Tag to Attachment 1.
___ b. Determines that 1-TLO-16 should be LOCKED CLOSED by referring to Attachment 1.
___ c. Unlocks and removes the chain around 1-TLO-16.
___ d. Attempts to move the valve in the CLOSED direction using normal closing torque.
___ e. Checks the position of the valve stem for 1-TLO-16.
___ f. Reinstalls and locks the chain in a manner that limits valve travel.
___ g. Initials and Dates the IC block on Attachment 1 for 1-TLO-16.

EVALUATOR'S NOTES:

- The Operator should wear gloves when manipulating valves, however, this is not failure criteria.

Step 6: Verify 1-TLO-21 Locked Throttled 3 Turns Open

STANDARDS:

___ a. Verifies the correct valve has been located by comparing the Valve Identification Tag to Attachment 1.
___ b. Determines that 1-TLO-21 should be LOCKED THROTTLED 3 TURNS OPEN by referring to Attachment 1.
___ c. Unlocks and removes the chain around 1-TLO-21.
___ d. Moves the valve in the CLOSED direction until there is no additional movement and then reopens the valve 3 turns.
___ e. Reinstalls and locks the chain in a manner that limits valve travel.
___ f. Initials and Dates the IC block on Attachment 1 for 1-TLO-21.

EVALUATOR'S NOTES:

- The Operator should wear gloves when manipulating valves, however, this is not failure criteria.

EVALUATOR CUES:

- If the Operator asks if the valve may be manipulated to determine valve position since the System is secured and drained, reply that he has permission to perform the appropriate actions needed to verify the valve position.

- If the Operator asks for someone to Simultaneously Verify the valve position, reply that you will be the Simultaneous Verifier.

Step 7: Verify 1-TCW-LCV-100A is Closed

STANDARDS:

___ a. Verifies the correct valve has been located by comparing the Valve Identification Tag to Attachment 1.
___ b. Determines that 1-TCW-LCV-100A should be CLOSED by referring to Attachment 1.
___ c. Checks the local position indicator on the valve and determines that the valve is actually open.
___ d. Notifies the Project SRO that 1-TCW-LCV-100A indicates OPEN.
___ e. Traces the IA supply tubing back and identifies that 1-TIA-13 is the Instrument Air Isolation Valve for 1-TCW-LCV-100A.
___ f. Closes 1-TIA-13.
___ g. Opens the Petcock on the downstream IA supply regulator and bleeds off the residual air pressure.
___ h. Checks the local position indicator for 1-TCW-LCV-100A and determines that the valve is now closed.
___ i. Initials and Dates the IC block on Attachment 1 for 1-TCW-LCV-100A.

EVALUATOR'S NOTES:

- The Operator should wear gloves when manipulating valves, however, this is not failure criteria.

EVALUATOR CUES:

- If the Operator reports that the valve is not in the proper position and asks what he should do, reply that he is to take whatever local actions are appropriate to place the valve in the required position.
- If the Operator asks what the remote position indication of the valve is, report that the valve does not have a remote position indicator.

- If asked what position the control switch for the valve is, report that it is in the CLOSED position.

Step 8: Reports to the Project SRO that the IC portion of the valve lineup has been completed.

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is in a Refueling Outage.

2. The TLO System had been Tagged Out for various maintenance activities. All work has been completed and the Tag Out has been cleared.

3. A System Valve Lineup must be completed prior to filling the System in preparation for returning it to service.

4. The Valve Lineup has been initiated but has not been completed.

5. I am the Project SRO and you are an On-Shift Operator qualified on the System.

INITIATING CUES:

I need you to perform a local verification of valve position on all the valves listed on Attachment 1.

- You are to perform the Initial Check of valve position for the valves that have not been checked
- You are to Independently Verify the valve position of any valves for which the Initial Check has already been performed.

Here is an Admin Key for the Watchstation that the valves are located in. If you determine that any valve is not in the proper position, please inform me first and then take whatever local actions are appropriate in order to place the valve in the required position. Attachment 2 may be used as a reference and provides the general location of each valve.

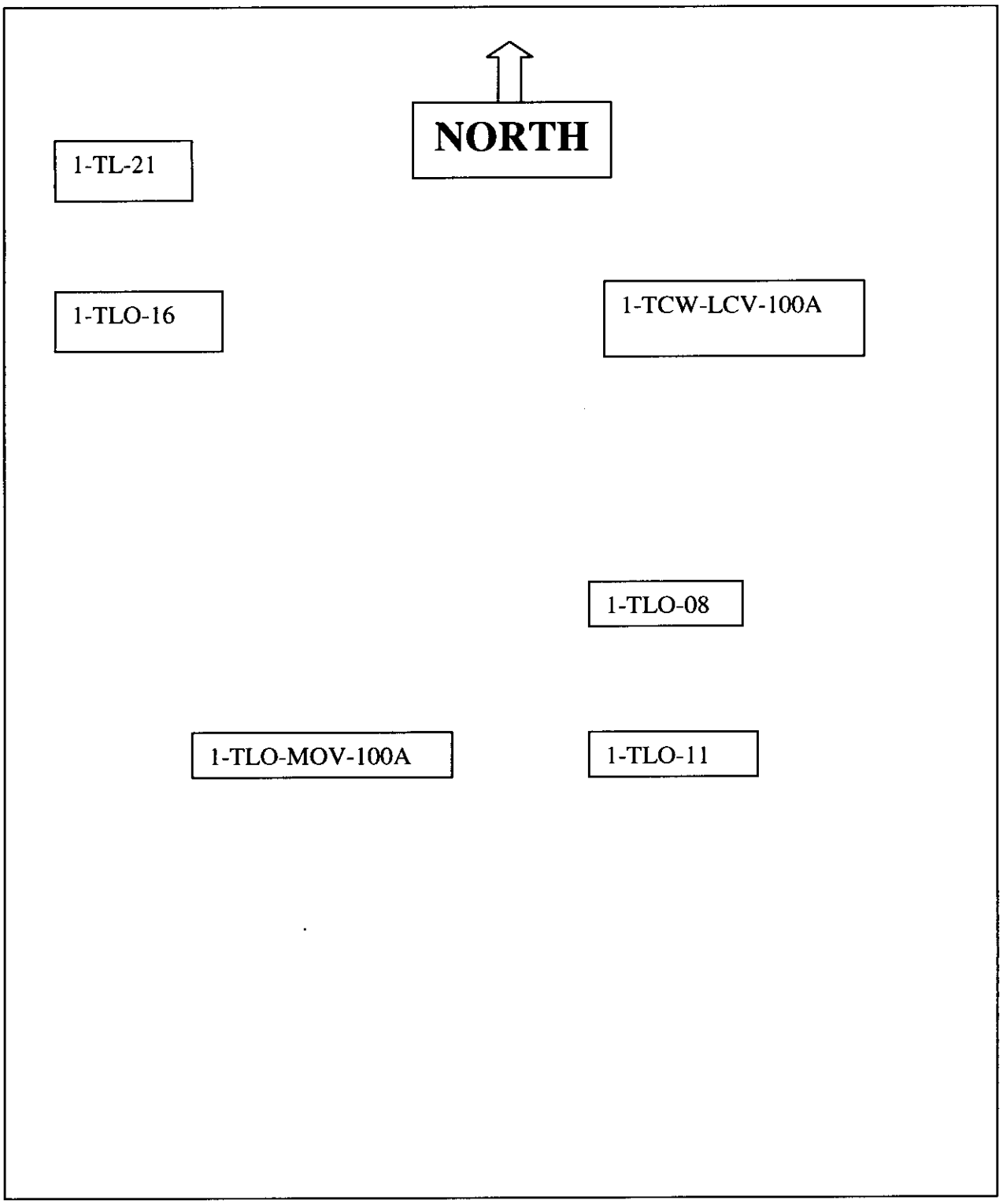
(Page 13 of 15)

Attachment 1

TURBINE LUBE OIL VALVE ALIGNMENT

COMPONENT NUMBER	COMPONENT DESCRIPTION	NORMAL POSITION	CHKD Init / Date		IV Init / Date	
	OUTSIDE – UNIT 1 ALLEYWAY					
1-TLO-MOV-100A	LO PUMP 1A SUCT MOV	CLOSED				
1-TLO-08	LO PUMP 1B DISCH ISOL	LOCKED OPEN				
1-TLO-11	LO PUMP 1A DISCH ISOL	LOCKED OPEN	JFK	Today		
1-TLO-16	LO HX SUP HDR DNSTR ISOL	LOCKED CLOSED				
1-TLO-21	LO HX OUTLET ISOL	LOCKED THROTTLED 3 TURNS OPEN				
1-TCW-LCV-100A	CW TK LEVEL CONTROL VALVE TO CW PUMP 1A	CLOSED				

ATTACHMENT 2



mindview

User: mindview,INNS,,

Request: SU_TRNG_OPS_AD-2027 from inncux14

Date Printed: Mon Apr 16 10:15:24 EDT 2001

Procedure: ***OPAP-0008***

Rev: ***004*** PAR: ***0***

Title: ***ADMINISTRATIVE CONTROL OF KEYS AND LOCKED VALVES AND SWITCHES***

Effective Date: ***12/31/1996***

Station: ***Innsbrook*** Docbase: ***INMIND***

If this procedure is initiated OR re-initiated after the print date shown, then the current revision\PAR numbers must be verified.

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VIRGINIA POWER

Department Administrative Procedure

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Title: Administative Control of Keys and Locked Valves and Switches

Process / Program Owner: Superintendent - Nuclear Operations

Procedure Number	Revision Number	Effective Date
OPAP-0008	4	

Revision Summary

- Incorporates PS-1
  - -Added **North Anna** only to 5.3.3
  - -Revised 6.1.8 - deleted **Surry** only Vital Area Key Locker
- Deleted **Surry** only in 4.1
- Deleted 5.1.3 - **Surry** only key locker reference
- Revised 6.1.1 - changed shall to may and Station to watchstation
- Deleted 6.1.2 - **Surry** only key locker reference
- Deleted 6.1.6 - reference to additional keys in the Technical Support Center
- Revised 6.4.2 - reworded for clarification
- Added 6.4.3 - considerations to preclude locking
- Revised 6.6.2 - added Operations Department personnel when requesting a change to locking requirements
- Revised 6.6.3 - added removal of approved locking devices
- Revised 6.7 - All keys will be inventoried at least 3 times per week
- Miscellaneous editorial changes and corrections (no change bars)

Approvals on File

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1.0 PURPOSE

This procedure establishes the administrative control program for control of valves, locks, and switches as necessary to prevent hazards to personnel and to ensure that limiting conditions for operation are met.

2.0 SCOPE

This procedure applies to Operations Department personnel.

3.0 REFERENCES/COMMITMENT DOCUMENTS

3.1 References

3.1.1 INPO 85-017, Guidelines for the Conduct of Operations at Nuclear Power Station

3.1.2 INPO Good Practice, OP-203, Tagging Procedures for the Protection of Personnel, Components, and Systems

3.1.3 INPO Good Practice, OP-208, System and Component Labeling

3.1.4 INPO Good Practice, OP-214, Independent Verification

3.1.5 INPO Good Practice, OP-216, Valve Operations

3.1.6 INPO SOER 83-9, Valve Inoperability Caused by Motor-Operated Failures

3.1.7 INPO SOER 85-2, Valve Mispositioning Event Involving Human Error

3.1.8 INPO Document 83-037, Assessment of Motor-Operated Valve Failures

3.1.9 INPO Document 85-007, Human Error in Valve Mispositioning

3.1.10 INPO Document Plant Valve Manual

3.1.11 OPNS-1401, Shift Operations

3.1.12 OPNS-1403, Inspection, Test, and Operating Status

3.1.13 VPAP-1401, Conduct of Operations

3.1.14 VPAP-1402, Control of Equipment, Tag-Outs, and Tags

3.1.15 VPAP-1405, Independent and Simultaneous Verification

3.1.16 VPAP-2002, Work Requests and Work Order Tasks

3.1.17 OPAP-0009, Control of System Status (North Anna)

3.1.18 OPAP-0010, Tag-Outs

3.1.19 Administrative Lock List (VPMCD) (North Anna)

3.1.20 OC-20, Admin Lock Log (Surry)

3.1.21 0-GOP-4.33, Quarterly Administrative Lock Inspection (North Anna)

3.2 Commitment Documents

None

4.0 DEFINITIONS

4.1 Administrative Locks

Locking devices used for control of safety-related equipment, containment integrity equipment, or other equipment as designated by the Operations Department. Administrative Locks may be used on:

- Locked areas of the Station
- Locked cabinets
- After-hours keys (e.g., warehouse, offices)
- Specific breakers, valves, and switches

4.2 Locking Device

A mechanical device used to secure components in a desired status. The following are considered locking devices:

- Locks (including breakaway)
- Chains secured by locks
- Lead-sealed wires
- Wires without lead seals
- Other Superintendent Operations approved locking and sealing devices

5.0 RESPONSIBILITIES

5.1 Superintendent Operations

The Superintendent Operations is responsible for:

5.1.1 Approving changes to Operation Department controlled locking requirements.

5.1.2 Approving locking devices to be used at the Station.

5.2 Supervisor Operations Support

The Supervisor Operations Support is responsible for:

5.2.1 Reviewing Locking Requirements Change Requests.

5.2.2 Notifying the Procedures Group and Design Engineering of changes to locking requirements.

5.2.3 Implementing changes to locking requirements.

5.3 Shift Supervisor

The Shift Supervisor is responsible for:

5.3.1 Control of the manipulation of valves, locks, and switches which are maintained under administrative control.

5.3.2 Maintenance of and authorization of the issuance of keys to valves, locks, and switches contained in the Administrative Key Locker.

5.3.3 Maintenance of Emergency Access Keys to Vital Areas **(North Anna)**.

5.3.4 Periodic verification of the status of valves, locks, and switches.

5.4 Station Operators

Station Operators are responsible for:

5.4.1 Maintaining the proper controls over repositioning of locked components.

5.4.2 Maintaining the proper controls over the watchstation Administrative Key.

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6.0 INSTRUCTIONS

6.1 Key Control

NOTE: Keys to Locked High Radiation Areas and Locked Extreme High Radiation Areas are controlled by the Radiological Control Department and keys to Security-related areas, devices, and equipment are controlled by Security.

6.1.1 One Administrative Key may be controlled by the Operations Shift Team Members at each watchstation. The Administrative Key shall lock and unlock locking devices under Operations Department control throughout the watchstation.

6.1.2 The Shift Supervisor shall control the Operations Key Locker. The Operations Key Locker is located in the Operations Annex.

6.1.3 The Emergency Key Locker (**North Anna**) and the Appendix R Key Ring (**Surry**) shall be maintained by the Unit SRO in the Control Room for use in the event of a Control Room fire.

6.1.4 **Key Issue Logs and Indices**

a. Key Issue Logs shall be maintained with each key locker.

b. Key indices shall be maintained for all key lockers and key rings.

c. Cognizant management personnel shall enter key status changes in the Key Issue Logs.

d. During an emergency, Key Issue Logs should not be maintained.

6.1.5 Vital area keys are controlled by the Security Department.

6.1.6 The Unit SRO has vital area keys which shall be used for emergency use only. They are maintained in the Emergency Key Locker (**North Anna**).

6.2 Administrative Controls and Operational Restrictions

6.2.1 The position of a valve or switch under administrative control may be changed only by authorization from the Unit SRO or Shift Supervisor.

6.2.2 Locked valves and switches shall not be manipulated except in accordance with an approved Station procedure, Tag-Out, or Temporary Modification. The procedure that aligns the valve or switch does not have to be the same procedure that re-aligns the valve or switch.

6.2.3 When a locked valve or switch manipulation is complete and the component is in its required position, it should be locked in that position.

6.2.4 When performing a Tag-Out on locked equipment:

a. If the component does not require a change of position, the lock shall remain in place.

b. If a change of component position is required, the lock shall be removed and:

1. If the component is in a contaminated area, the lock shall be locked to the valve body without locking the component.

2. If the component is in a non-contaminated area, the lock shall be taken to the Shift Supervisor.

6.2.5 When a lock, locked valve, or locked switch that has been re-positioned is restored to its preferred position, Independent Verification shall be performed in accordance with VPAP-1405, Independent and Simultaneous Verification.

6.2.6 Components that have metallic seals attached shall be controlled as follows:

a. Qualified Operations Department personnel shall independently verify that any Component to which a metallic seal is to be attached is properly positioned before the seal is applied.

b. The metallic seal shall be applied to the component in the presence of or by a Qualified Operations Department person.

6.2.7 Motor operated valves that are maintained under administrative control shall be tagged or locked at the circuit breaker.

6.3 Administrative Controlled Valve, Lock, and Switch List

6.3.1 Administratively controlled valves, locks, and switches are delineated in:

a. Administrative Lock List (VPMCD) **(North Anna)**

b. OC-20, Admin Lock Log **(Surry)**

c. Periodic Test (PT) Procedures

d. Operating Procedures

6.3.2 Changes to the list shall be reviewed and approved in accordance with 6.6.

6.4 Determination of Locking Requirements

NOTE: Except for ANSI standards requirements governing containment isolation valves and certain Technical Specification requirements, the decision to add locks on Station components has generally been a prerogative of the Station design and regulatory commitments. Locking of doors and components should be as required by regulations or to ensure Station safety and security.

6.4.1 The Superintendent Operations shall be the final authority for determining Operation Department controlled locking requirements.

6.4.2 The following criteria should be considered to determine if a valve or switch should be locked:

a. Safety system valve or switch whose mis-positioning could disable the system (i.e., prohibit, restrict, or divert flow).

b. Valve in flowpath or switch controls flowpath of system required by a Technical Specification.

c. Valve or switch is boundary to uncontrolled radioactive release.

d. Containment isolation valve or control switch.

e. Valve or switch provides flowpath for protective function of safety system or Technical Specification required system (i.e., relief valve isolation, pump recirc).

f. Valve or switch provides flowpath for post accident system requiring pre-alignment due to inaccessibility following an accident.

g. Valve or switch is required to be locked due to commitment to external organization.

6.4.3 The following criteria should be considered to preclude locking:

a. Locking a valve or switch may hinder a component's operation

b. Locking a door to an area may prevent emergency access.

c. Locking a valve or switch may adversely affect seismic loading.

d. Locks minimize the probability of unauthorized operation of certain components.

6.4.4 Station drawings should normally reflect a valve locking device only if the locking device is based on a design or a regulatory requirement.

6.5 Determination of Locking Device Type

6.5.1 The Superintendent Operations shall be the final authority for the determination of Operation Department controlled locking device type.

6.5.2 The following guidelines should be considered to determine the type of locking device that is appropriate for a given application:

a. Physical configuration of the valve or switch and the nearby components.

b. Type of locking device already in use on similar components in the same or similar systems.

c. Type of locking device specified by design or regulatory requirement.

d. Break-away locks should be used on emergency fire equipment and first aid equipment.

6.6 Changes to Locking Requirements

6.6.1 The Superintendent Operations shall approve all changes to the locking requirements.

6.6.2 Operations Department personnel (Shift Team members or Operations Support personnel) may request a change to the locking requirements of a Station component. Requests by personnel outside the Operations Department to change the locking requirements for Station components are initiated in accordance with VPAP-1402, Control of Equipment, Tag-Outs, and Tags.

a. The Supervisor Operations Support shall evaluate the request to change locking requirements as follows:

1. Determine if the request is valid.
2. Concur with or specify the type of locking device to be used.
3. If unacceptable, provide a brief reason and inform the originator.
4. If approved, obtain Superintendent Operations concurrence.

b. Upon approval of the locking requirements change request, the Supervisor Operations Support shall change required Operations Department documents and send copies of the locking requirements change request to:

- Procedures Group (to update any required procedures)
- Design Engineering (to update any required drawings)

6.6.3 The Supervisor Operations Support shall direct cognizant personnel to install or remove approved locking devices.

6.6.4 The Shift Supervisor may approve a change after obtaining Superintendent Operations concurrence and notifying the Supervisor Operations Support.

1. The Supervisor Operations Support shall notify the Procedures Group to update any required procedures and Design Engineering to update any required drawings.
2. The Shift Supervisor shall make a log entry describing the change of locking requirements.

6.7 Periodic Checks

6.7.1 Key Inventory

All keys shall be inventoried at least 3 times per week by the Senior Office Associate. Any discrepancies shall be immediately reported to the Shift Supervisor for resolution.

6.7.2 Administratively Controlled Valves, Locks, and Switches

a. The Shift Supervisor shall verify the status of administratively controlled valves, locks, and switches periodically in accordance with Technical Specification and approved procedure requirements. Administratively controlled valves in containment shall not be verified except before Unit start-up.

   1. Periodic verification shall confirm that each administratively controlled valve, lock, or switch is in its required position or that each administratively controlled valve, lock, or switch not in its required position has been evaluated and appropriately documented.

   2. If an administratively controlled valve, lock, or switch is not in its required position and its existing position has not been properly evaluated and documented, the Shift Supervisor shall be notified. The Shift Supervisor shall determine:
      - If a Station Deviation should be initiated
      - If a system required by Technical Specifications is out of service
      - The reason for the system misalignment
      - If notifications are necessary
      - If the administratively controlled valve, lock, or switch should be returned to its required position

b. The status of administratively controlled valves, locks, and switches shall be verified and documented in accordance with:

   1. Administrative Lock List (VPMCD) **(North Anna)**
   2. 0-GOP-4.33, Quarterly Administrative Lock Inspection **(North Anna)**
   3. OC-20, Admin Lock Log **(Surry)**
   4. PT Procedures
   5. Operations Valve Line-ups

7.0 RECORDS

7.1 The following individual and packaged documents and copies of any related correspondence completed as a result of the performance or implementation of this procedure are records. They shall be submitted to Records Management in accordance with VPAP-1701, Records Management. Prior to transmittal to Records Management, the sender shall assure that:

- Each record is packaged when applicable,
- QA program requirements have been fulfilled for Quality Assurance records,
- Each record is legible, completely filled out, and adequately identifiable to the item or activity involved,
- Each record is stamped, initialed, signed, or otherwise authenticated and dated, as required by this procedure.

7.1.1 **Individual Records**

None

7.1.2 **Record Packages**

- Administrative Lock List (VPMCD) **(North Anna)**
- 0-GOP-4.33, Quarterly Administrative Lock Inspection **(North Anna)**
- OC-20, Admin Lock Log **(Surry)**
- PT Procedures
- Operations Procedures

7.2 The following documents completed as a result of the implementation of this procedure are not records and are not required to be transmitted to Records Management.

None

HEWLETT PACKARD

mindview

User: mindview,INNS,,

Request: SU_TRN_HUSKEY-5128 from inncux14

Date Printed: Wed Dec 12 09:44:20 EST 2001

Procedure: ***OPAP-0012***

Rev: ***006*** PAR: ***0***

Title: ***VALVE OPERATIONS***

Effective Date: ***04/18/2000***

Station: ***Innsbrook*** Docbase: ***INMIND***

If this procedure is initiated OR re-initiated 24 hours following the print time & date shown, then the revision and PAR must be verified. This leader page is part of the controlled document and must remain with the procedure as a permanent record.
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VIRGINIA POWER

Department Administrative Procedure

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Title: Valve Operations

Process / Program Owner: Superintendent Operations

Procedure Number	Revision Number	Effective Date
OPAP-0012	6	On File

Revision Summary

The following changes were made to add methods for verification of valve position:

- Revised 6.8.1, Valves to be Checked Open as follows:
  - Added 6.8.1.b (fourth bullet) - "Observation of the valve mark number label and the installed tamper seal. Visual position of the valve stem should also be checked if the valve is readily accessible."
  - Added 6.8.1.c - "For inaccessible IA valves, IA valves with installed tamper seals, and IA valves in high dose areas, observation of expected valve response (e.g., remote or local cycling the associated FCV, HCV, LCV, TV valve, or verification of downstream air flow via a convenient bleed point) can be used to determine that an IA valve is open."
- Added 6.8.5.c (under 6.8.5, Valves to be Checked Throttled) - "Observation of the valve mark number label and the installed tamper seal. Visual position of the valve stem should also be checked if the valve is readily accessible."

Approvals on File

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1.0 PURPOSE

This procedure establishes administrative controls for valve operation.

2.0 SCOPE

This procedure applies to Operations Department personnel.

3.0 REFERENCES/COMMITMENT DOCUMENTS

3.1 References

3.1.1 INPO Good Practice OP-203, Tagging Procedures for the Protection of Personnel, Components, and Systems

3.1.2 INPO Good Practice OP-208, System and Component Labeling

3.1.3 INPO Good Practice OP-214, Independent Verification

3.1.4 INPO Good Practice OP-216, Valve Operations

3.1.5 INPO Significant Operating Report (SOER) 83-9, Valve Inoperability Caused by Motor-Operated Failures

3.1.6 INPO Significant Operating Report (SOER) 85-2, Valve Mispositioning Event Involving Human Error

3.1.7 INPO 85-017, Guidelines for the Conduct of Operations at Nuclear Power Stations

3.1.8 INPO 83-037, Assessment of Motor-Operated Valve Failures

3.1.9 INPO 85-007, Human Error in Valve Mispositioning

3.1.10 INPO Plant Valve Manual

3.1.11 VPAP-1401, Conduct of Operations

3.1.12 VPAP-1405, Independent and Simultaneous Verification

3.1.13 VPAP-2002, Work Requests and Work Orders

3.1.14 OPAP-0010, Tag-Outs

3.1.15 Memo from D. Critchfield to Operations Personnel dated June 3, 1992

3.2 Commitment Documents

3.2.1 Kansler, M. R. to Station personnel, letter #89-370, 06/08/89

3.2.2 DR N-99-0669, Relief Valve Gagging

4.0 DEFINITIONS

None

5.0 RESPONSIBILITIES

5.1 Shift Supervisor

The Shift Supervisor is responsible for supervising and coordinating required valve alignment tasks.

5.2 Station Operators

Station Operators are responsible for performing valve manipulations in accordance with approved Station procedures.

6.0 INSTRUCTIONS

****

WARNING: Packing blowout can cause personnel injury. If possible, avoid standing directly in front of the stem of a valve being opened or closed.

Valve failure in confined or difficult access spaces presents an additional hazard. A means of escape should be considered before operating valves in confined space.

****

6.1 General Valve Operation

6.1.1 Any valve found to be positioned so its operation creates a safety hazard should be reported to the Shift Supervisor.

6.1.2 All Station piping system valves may be operated by Operations Department personnel, as directed by the Shift Supervisor, in accordance with approved procedures, skill of the craft, or as required to protect Station equipment or personnel. **[Commitment 3.2.1]**

6.1.3 The Instrument and Control Maintenance Department should be requested to align or manipulate valves downstream of instrument root isolation valves (e.g., local isolation valves, equalizing valves, and vents and drains). **[Commitment 3.2.1]**

6.1.4 The Chemistry Department should be requested to align or operate valves that are normally used for sampling operations. **[Commitment 3.2.1]**

6.1.5 Test personnel may manipulate valves in systems that are being tested following installation or major modification. **[Commitment 3.2.1]**

6.1.6 Valves should be considered precision equipment and handled carefully during each operation. Every valve operating deficiency should be reported to the Shift Supervisor.

6.2 Valve Operating Equipment Cautions

6.2.1 Leverage devices (e.g., valve wrenches, pry bars) shall not be used on handwheels of motor-operated valves (MOVs), air-operated valves (AOVs), hydraulically-operated valves, or diaphragm valves.

6.2.2 Valve wrenches may be used to open or close manual valves. Excessive leverage shall not be used on the wrench. If excessive leverage is required to open or close a valve, notify the Shift Supervisor. Oversized valve wrenches can apply excessive torque and shall not be used.

6.2.3 Excessive force shall not be used to close a valve. Excessive force may break valve parts and damage the valve seat, making it impossible to seat the valve until the valve is repaired or replaced.

6.2.4 Any valve that does not operate freely shall be reported to the Shift Supervisor.

6.2.5 Do not backseat a valve unless specifically authorized.

6.2.6 To attempt to seat a leaking valve, the disk should be seated gently, then backed off slightly until any foreign matter is flushed out from under the seat before fully seating the valve.

6.2.7 If a valve is closed while it is hot, the valve disc may become bound in the seat as it cools. To prevent binding, the valve should be opened slightly and seated lightly during cooldown. The valve should be checked frequently during cooldown of hot systems to ensure it is properly seated.

6.2.8 Prior to operation, valves should be checked for boric acid crystal buildup or other foreign material on the stems that can cause stem or packing damage. If there is boric acid buildup or foreign material, notify the Shift Supervisor or Unit SRO.

6.2.9 When turning a valve handwheel, verify that the wheel is only raising or lowering the stem. Turning the stem may loosen or remove screwed bonnets.

6.2.10 The threads of rising stem valves should be kept clean and lubricated. If the stem of a large valve is not already lubricated, the threads should be cleaned and lubricated before operating the valve.

6.2.11 If a valve is equipped with a bypass, the bypass should be opened before operating the valve.

6.2.12 Gate valves should not be used to throttle flows. Except as directed by the Shift Supervisor, gate valves should be fully opened or fully closed.

6.3 Manual Operation of Globe, Gate, Butterfly, and Diaphragm Valves

6.3.1 A valve shall be positioned with its handwheel or reach rod.

6.3.2 To close a valve, rotate the handwheel clockwise (reverse seated valves - counterclockwise) until:

a. Normal force applied to the handwheel does not move the valve.

b. The attached position indicator or other position verification technique shows the valve to be closed.

c. System parameters such as flow or pressure indicate the valve is closed.

6.3.3 To open a valve, rotate the handwheel counterclockwise (reverse seated valves - clockwise) until:

a. Normal force applied to the handwheel does not move the valve.

b. The attached position indicator or other position verification technique shows the valve is open.

c. System parameters such as flow or pressure indicate the valve is open.

6.3.4 Once a valve has been verified open, the handwheel should be rotated slightly closed from the full open position.

6.4 Manual Operation of Ball or Plug Valves

6.4.1 The valve shall be positioned using the handle or reach rod.

6.4.2 To close a valve, rotate the handle 90 degrees until:

- The handle is perpendicular to the piping
- System parameters such as flow or pressure indicate the valve is closed

6.4.3 To the open a valve, rotate the handle 90 degrees until:

- The handle lines up with the piping
- System parameters such as flow or pressure indicate the valve is open

6.5 Manual Operation of MOVs

MOVs should normally be operated electrically. Manual MOV operation should not be a routine operation.

6.5.1 Before operating an MOV manually, observe the following precautions, except when directed by a procedure:

a. Superintendent Operations or Operations Manager on Call should be contacted.

b. The MOV Coordinator should be contacted.

c. If the MOV is a containment isolation valve, it shall not be manually operated without SNSOC authorization in Modes 1 through 4 **(North Anna)** or Power Operation through Cold Shutdown **(Surry)**. Manual isolation may change the leakage characteristics of the valve.

NOTE: The following step does not apply to valves 1-CW-MOV-101A through D or 2-CW-MOV-201A through D. **(North Anna)**

d. Open and Tag-Out the MOV power supply and control switch in accordance with OPAP-0010, Tag-Outs, to prevent automatic operation. The Tagging Record shall be notated that the MOV is manually tightened.

e. Avoid overtravel of the MOV. Some MOVs are adjusted to stop traveling open at far less than 100 percent stroke due to pump or system flow restriction requirements.

f. Seating and backseating an MOV may prevent subsequent electric motor valve operation and cause valve damage.

6.5.2 The handwheel must be engaged to operate the valve manually. If necessary to engage the handwheel, turn the handwheel slightly while depressing the de-clutch lever.

6.5.3 The valve may be opened or closed with the handwheel. The valve position indicator should be observed.

6.5.4 After repositioning a valve, the de-clutch lever will remain in the engaged position until electrically operated. The de-clutch lever should not be forced into the motor operation position as MOV damage may result.

NOTE: If the MOV cannot be electrically stroked following manual operation and a SNSOC approved formal Engineering Evaluation has been performed to ensure operability of the MOV, Steps 6.5.5 through 6.5.7 may be waived (Reference 3.1.5).

6.5.5 After handwheel operation, an MOV shall be declared inoperable and the appropriate action entered until electrically operated.

6.5.6 An MOV that has been seated or backseated by hand should have:

- Its power supply breaker opened
- Danger Tags or magnetic markers placed in accordance with OPAP-0010, Tag-Outs, on the power supply breaker and the control switch to warn against remote operation until the valve has been unseated by hand

6.5.7 Proper re-engagement of the clutch mechanism should be demonstrated after manual actuation by:

- Stroking the valve with the motor drive to assure proper clutch engagement
- Verifying proper engagement from both indicating light change in the Control Room and local observation of stem movement

6.6 Returning MOVs to Service after Maintenance

If maintenance that could affect phase rotation (i.e., direction of travel) is performed on an MOV, then the valve should be tested as follows before returning it to service:

6.6.1 Remove any Danger Tags from the MOV and the breaker in accordance with OPAP-0010, Tag-Outs.

6.6.2 Use the handwheel to position the MOV at midstroke.

6.6.3 Station personnel at the circuit breaker and the MOV and establish communications between them.

6.6.4 Close the circuit breaker for the MOV.

6.6.5 Close the MOV by operating its control switch and verify that it is moving in the closed direction.

a. If the MOV does not move in the close direction, immediately open the power supply breaker and notify the Shift Supervisor.

b. If the valve motions stops but the motor continues to run, immediately open the power supply breaker and notify the Shift Supervisor.

6.6.6 If the MOV is part of the Inservice Inspection (ISI) program, then perform the ISI required testing. If is not part of the ISI testing:

a. Stroke the MOV fully open and closed.

b. Verify the valve has the required stroke time, if applicable.

c. Verify the valve has smooth operation.

6.7 Manual Operation of Air Operated Valves (AOV)

6.7.1 AOVs should be operated manually only after removing the AOV solenoid from automatic operation by:

- Closing the air supply
- Bleeding the air from the valve diaphragm
- Opening the control power circuit breaker, if required

6.7.2 AOVs should be returned to automatic operation by:

- Closing or verifying closed the control power circuit breaker
- Opening the air supply

6.8 Verification of Valve Position

NOTE: Independent Verification guidelines for valves are specified in VPAP-1405, Independent and Simultaneous Verification.

6.8.1 Valves to be Checked Open

a. For manual valves, the valve operator should be moved in the closed direction until there is a small amount of stem movement and then moved in the open direction until the valve is in its fully open position.

b. Valve position should be verified by, but is not limited to, one or more of the following:

- Visual position of the valve stem (e.g., grease markings, indicator on rising stem valves, or other mechanical position indication)
- Remote position indication
- Observation of the expected system response in regard to valve position (e.g., indication of flow downstream of valve, proper instrument response if the valve is an instrument root, indication that the section of piping downstream of the valve is pressurized
- Observation of the valve mark number label and the installed tamper seal. Visual position of the valve stem should also be checked if the valve is readily accessible

c. For inaccessible IA valves, IA valves with installed tamper seals, and IA valves in high dose areas, observation of expected valve response (e.g., remote or local cycling the associated FCV, HCV, LCV, TV valve, or verification of downstream air flow via a convenient bleed point) can be used to determine that an IA valve is open.

6.8.2 Valves to be Checked Closed

a. For manual valves, the valve handwheel should be turned only in the closed direction using normal closing torque.

b. Valve position should be verified by, but is not limited to, one or more of the following:
   - Visual position of the valve stem (e.g., grease markings, indicator on rising stem valves, or other mechanical position indication)
   - Remote position indication
   - Observation of the expected system response to valve position (e.g., indication of flow downstream of valve, proper instrument response if the valve is an instrument root, indication that the section of piping downstream of the valve is pressurized

6.8.3 **Valves to be Checked Locked Open**

Valves that should be locked open should be checked by:

a. Unlocking the valve.

b. Checking the manual valve open in accordance with 6.8.1.

c. Locking the valve so valve operator travel is limited as much as possible.

d. Verifying the locking mechanism is properly restored and secured.

e. Having a second qualified individual Independently Verify that the lock is installed on the correct valve and properly locked. **(Surry)**

f. **IF** Independent Verification is required, **THEN** have a second qualified individual Independently Verify the valve position by verifying the following: **(North Anna)**

   1. The lock is installed on the correct valve and properly locked.

   2. Visually verifying valve position or process parameters, **IF** unsure of valve position, **THEN** do the following:
      - Use simultaneous verification and check the valve position by unlocking the valve, checking correct position and relocking the valve
      - Both parties will initial check space
      - A third person will independently verify the lock is installed on the correct valve and properly locked

6.8.4 **Valves to be Checked Locked Closed**

Valves that should be locked closed should be checked by:

a. Unlocking the valve.

b. Checking the manual valve closed in accordance with 6.8.2.

c. Locking the valve such that the valve operator travel is limited as much as possible.

d. Verifying the locking mechanism is properly restored and secured.

e. Having a second qualified individual Independently Verify that the lock is installed on the correct valve and properly locked. **(Surry)**

f. **IF** Independent Verification is required, **THEN** have a second qualified individual Independently Verify the valve position by verifying the following: **(North Anna)**

   1. The lock is installed on the correct valve and properly locked.

   2. Visually verifying valve position or process parameters, **IF** unsure of valve position, **THEN** do the following:

      - Use simultaneous verification and check the valve position by unlocking the valve, checking correct position and relocking the valve
      - Both parties will initial check space
      - A third person will independently verify the lock is installed on the correct valve and properly locked

6.8.5 **Valves to be Checked Throttled**

Valve position should be verified by, but is not limited to, one or more of the following:

a. Visual verification using the valve stem position, local indicators, or any other valve component suitable for verification.

b. Observation of the expected system response in regard to valve position (i.e., indication of proper flow rate or pressure as applicable).

c. Observation of the valve mark number label and the installed tamper seal. Visual position of the valve stem should also be checked if the valve is readily accessible.

d. Shut and re-open the valve a prescribed number of turns. This practice should be avoided because the valve may be mispositioned.

e. **IF** unsure of valve position, **THEN** do the following: **(North Anna)**

1. Use simultaneous verification and check the valve position by unlocking the valve, checking correct position and relocking the valve.
2. Both parties will initial check space.
3. **IF** Independent Verification is required, **THEN** a third person will independently verify the lock is installed on the correct valve and properly locked.

6.8.6 **Control Valves**

a. Control valves should be checked to:

- Verify that power and air, if applicable, are available
- Verify that they are free to operate (i.e., no physical obstructions)

b. Actual valve position should be verified using either local or remote indication.

6.9 Gagging of Relief and Safety Valves

6.9.1 Alternate means of overpressure protection shall be provided when relief and safety valves are gagged.

6.9.2 Relief and safety valves shall not be gagged without Shift Supervisor permission.

6.9.3 The following actions shall be taken to install a gag on a relief or safety valve:

a. Prior to gagging the valve, request Engineering to perform a technical evaluation to determine if continued operation of the affected system is acceptable.

b. Evaluate the affected system or component for operability.

c. Document the valve is gagged in accordance with VPAP-1402, Control of Equipment, Tag-Outs, and Tags. and declare the valve inoperable. **[Commitment 3.2.2]**

d. If the gag is installed due to valve failure, then generate a Work Order in accordance with VPAP-2002, Work Requests and Work Orders.

e. Install the gagging device in accordance with approved procedures and vendor manuals.

7.0 RECORDS

None

Developed for the Surry, March 2002, Initial Examination
Examination Report Number 2002-301

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

ADMINISTRATION

NRC-ADMIN-A.2-RO

CLASS ROOM/CONTROL ROOM

TITLE:

TAGGING ELEMENTS/BOUNDARY DETERMINATION

APPLICANT: _____

EXAMINER: _____

REV. 0

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Determine Tagging Elements/Boundary Determination

Alternate Path:

NO

Facility JPM #:

NEW

K/A Ratings:

G 2.1.24 (2.8/3.1) Ability to obtain and interpret station electrical and mechanical drawings.
G 2.2.13 (3.6/3.8) Knowledge of tagging and clearance procedures.

Task Standard:

Preferred Evaluation Location:

Simulator _____ In-plant _____

Preferred Evaluation Method:

Perform _____ Simulate ____

References:
USFAR, Section 10.3.5, Condensate and Feedwater, TRM, 3.7, Plant Systems, 11448-FM-068A, Feed water system.
Validation Time: Critical Time: NO

Applicant: _____ Start _____
Name Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____
Name

COMMENTS

READ TO THE OPERATOR

DIRECTION TO THE APPLICANT:

TASK TO BE PERFORMED ANYWHERE

I will explain the initial conditions and state the task to be performed. I will provide any initiating cues and reports on other actions when directred by you. Ensure you indicate to me when you understand your assigned task. To indicate you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the third license. 1-FW-P-4A, "AFW Booster Pump," requires a seal package replacement. This will require the pump casing to be drained.

INITIATING CUES:

You are requested to determine ALL requirements/elements necessary to prepare this system for the required maintenance (Tag out elements, valve positions, etc/Boundaries). Use the attached table to identify all components.

NOTE: (RESTRICT MIND access to plant drawings and administrative procedures. MOP'S are NOT authorized.)

NOTE: The order in which tags should be placed is not necessary.

NOTE: The number of blanks on the attached table is not indicative of the number of item necessary to complete the JPM

	COMPONENT ID NUMBER/ NAME	POSITION	DANGER TAG REQUIREMENT (YES/NO)
1	1-EP-BKR-1H1-2N10C, AFW Booster Pump 1-FW-P-4A	OPEN	YES (Critical Step)
2	1-FW-279 AFW Booster Pump 4 A discharge	CLOSE	YES (Critical Step)
3	1-FW-293 AFW Pump 4 A Recirc Valve	CLOSE	YES (Critical Step)
4	1-FW-277 AFW Booster Pump 4 A suction.	CLOSE	YES (Critical Step)
5	1-FW-296	Pipe Cap Removed	NO (Critical Step)
6	Attach Drain Hose to 1-FW -296 And Run to Floor Drain.	NA	NA
7	1-FW-296	OPEN	YES (Only Part That Is Critical, Is to Have it Opened)
8	1-FW-307 AFW Booster Pump Disch PI-160A isolation.	Open	Yes (Critical Step)
9	1-FW-600, AFW Booster Pump Disch PI-160A	Pipe Cap Removed	NO (Critical Step)
10	Attach Drain Hose to 1-FW-600 and Run to Floor Drain	NA	NA
11	1-FW-600	OPEN	YES (Only Part That Is Critical, Is to Have it Opened)

	COMPONENT ID NUMBER/ NAME	POSITION	DANGER TAG REQUIREMENT (YES/NO)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			

APPLICANT CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

I will explain the initial conditions and state the task to be performed. I will provide any initiating cues and reports on other actions when directred by you. Ensure you indicate to me when you understand your assigned task. To indicate you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the third license. 1-FW-P-4A, "AFW Booster Pump," requires a seal package replacement. This will require the pump casing to be drained.

INITIATING CUES:

You are requested to determine ALL requirements/elements necessary to prepare this system for maintenance (Tag out elements, valve positions, etc/Boundaries). Use the attached table to identify all components.

NOTE: (RESTRICT MIND access to plant drawings and administrative procedures. MOP'S are NOT authorized.)

NOTE: The order in which tags should be placed is not necessary.

NOTE: The number of blanks on the attached table is not indicative of the number of item necessary to complete the JPM

Developed for the Surry, September 2002, Initial Examination

U. S. Nuclear Regulatory Commission

Region II

A-3 Administrative Section (RO ONLY)

Title:

HAND CALCULATION OF PRIMARY-TO- SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

JPM TITLE: HAND CALCULATION OF PRIMARY TO SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

JPM NUMBER: NRC-ADMIN-JPM-03 (RO ONLY)

JPM REV. DATE: 03/11/02

TIME VALIDATION: 15 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

Task

Determine Steam Generator Primary to Secondary Leakage Rate using 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring.

Applicability	Est Completion Time	Actual Time
RO ONLY	15 Minutes	

NUREG-1122 Importance Ratings

GEN2.3.11 (RO 2.7/SRO 3.2)

Conditions

- Task is to be PERFORMED in area which has adequate reference material.

Standards

- Complete calculation of Primary to Secondary Leakage. Value XXX +/- 10% gpd

Initiating Cues

- Shift Supervisor Direction

Terminating Cues

- Completion of Attachment 1 of 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring.

Procedures

- 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring.

Tools and Equipment

- Calculator

Safety Considerations

- None

READ TO THE TRAINEE

I will explain the initial conditions, and state the task to be performed. All steps shall be performed/simulated for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Primary to secondary leakage is suspected. The Shift Supervisor has directed you to perform attachment 1 of 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring. The most recent Unit 1 RCS isotopic activities are attached. Calculate the Primary to Secondary leakage rate and report gallon-per-day leakage rate to the Shift Supervisor.

INITIATING CUES:

You have been directed to: Calculate the Primary to Secondary leakage rate and report gallon-per-day leakage rate to the Shift Supervisor.

- **START TIME: _____**

---

1. Record the current time and date. _____ / _____

   Standards
   Records current time and date

   Evaluator's Comments

---

2. Obtain flow rates from both Air Ejectors and record total flow rate below:

   - Air Ejector A flow _____ scfm +
   - Air Ejector B flow _____ scfm =
   - Total Flow _____ scfm

   Standards

   Obtains readings from Turbine Building Operator

   CUE: Air Ejector A flow 2.2 SCFM.
   Air Ejector B flow 1.8 SCFM.

   Evaluator's Comments

Performance Checklist
(continued)

---

3. Record the current reading from 1-SV-RI-111. _____ cpm

   Standards
   Obtains readings from 1-SV-RI-111 (Digital Readout)

   CUE: 1-SV-RI-111 indicates 210 cpm.

   Evaluator's Comments

---

4. Obtain the most recent Unit 1 RCS activity for the isotopes listed in the table below from Chemistry and record in the Table. (This data is normally kept in the Radiation Monitor setpoint book and is updated weekly)

   Standards
   Uses provided attachment

   Evaluator's Comments

---

5. Multiply the isotopic concentrations (C) times the AE Rad Monitor Isotopic Efficiency (k)and record in the Table in column 4.

   Standards
   Completes column 4 correctly.

   Evaluator's Comments

Performance Checklist
(continued)

---

6. Add the products obtained in Step 5, column 4, and record below. This sum is R_c, Total AE RM response factor)
   R_c _____ (total AE RM response factor)

   Standards

   Calculates R_c R_c =3.97E7

   Evaluator's Comments

---

7. Determine primary-to-secondary leak rate in gallons per day (Q L) IAW the following formula.
   •Q_L = 1.084E4 x (R - 130) x F AE / R c = _____ gpd

   Standards

   Calculates Q_L Q_L = .0873 gpd. ± 10% (.07857-.096)

   Evaluator's Comments

****** TERMINATE JPM AT THIS POINT ******

ATTACHMENT 1

(Page 1 of 3)

HAND CALCULATION OF PRIMARY-TO-SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

NOTE: Multiple copies of this Attachment should be made as necessary.

_____ 1. Record the current time and date. _____ / _____

_____ 2. Obtain flow rates from both Air Ejectors and record total flow rate below:

- Air Ejector A flow ___2.2_____ scfm +
- Air Ejector B flow___1.8_____ scfm =
- Total Flow _____4.0_____scfm

_____ 3. Record the current reading from 1-SV-RI-111. _____210_____cpm.

ATTACHMENT 1
(Page 2 of 3)
HAND CALCULATION OF PRIMARY-TO-SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

_____ 4. Obtain the most recent Unit 1 RCS activity for the isotopes listed in the table below from Chemistry and record in the Table. (This data is normally kept in the Radiation Monitor setpoint book and is updated weekly)

Isotope in RCS	Concentration in RCS (uCi/gram) (C)	AE Rad Mon Isotopic Efficiency (CPM/uCi/cc) (k)	C x k
Ar-41	3.5E-3	5.97 E+07	2.09E5
Kr-85	-	3.22 E+06	-
Kr-85m	3.93E-4	1.29 E+10	5.07E6
Kr-87	1.06E-3	7.28 E+08	7.72E5
Kr-88	9.81E-4	2.99 E+09	2.93E6
Xe-131m	-	2.86 E+08	-
Xe-133	2.29E-3	2.32 E+07	5.31E4
Xe-133m	-	6.19 E+08	-
Xe-135	3.89E-3	4.58 E+09	1.78E7
Xe-135m	1.29E-3	5.65 E+08	7.29 E5
Xe-138	4.08E-3	2.97 E+09	1.21E7

_____ 5. Multiply the isotopic concentrations (C) times the AE Rad Monitor Isotopic Efficiency (k) and record in the Table in column 4.

_____ 6. Add the products obtained in Step 5, column 4, and record below. (This sum is R c, Total AE RM response factor)

R c 3.97E7 (total AE RM response factor)

KEY

ATTACHMENT 1
(Page 3 of 3)
HAND CALCULATION OF PRIMARY-TO-SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

NOTE: • The terms in the formula below are as follows:

• R = Current AE RM reading from Step 3

• 130 = Background AE RM reading

•F AE = Total AE flow from Step 2

•R c = Total AE RM response factor from Step 6

_____ 7. Determine primary-to-secondary leak rate in gallons per day (Q L) IAW the following formula.

- Q L = 1.084E4 x (R - 130) x F AE / R c =_____.0873_____ gpd

_____ 8. Initiate Attachment 3 through 6 as appropriate for existing leak rate.

_____ 9. Log leak-rate in Unit 1 Narrative Log.

_____ 10. Reperform Steps 1 through 8 of this Attachment as necessary based on any of the following:

- Plant management direction
- Adverse trend in AE reading
- Step change in AE reading
- AE alert or high alarm received

INITIAL CONDITIONS:

Primary to secondary leakage is suspected. The Shift Supervisor has directed you to perform attachment 1 of 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring. The most recent Unit 1 RCS isotopic activities are attached. Calculate the Primary to Secondary leakage rate and report gallon-per-day leakage rate to the Shift Supervisor.

INITIATING CUES:

You have been directed to: Calculate the Primary to Secondary leakage rate and report gallon-per-day leakage rate to the Shift Supervisor.

CHEMISTRY DESKTOP – DATASHEET

Pri 1 Hot Leg Gas Batch ID: 70134

Print Date: Today.

			Unit	%	Ar-41	Kr-85	Kr-85m	Kr-87	Kr-88	Xe-133	Xe-133m	Xe-135	Xe-135m	Xe-138
			Mode	Power										
Date	Time	Sample	Reading	Reading	Gamma isotopic	Gamma isotopic	Gamma isotopic	Gamma isotopic	Gamma isotopic	Gamma isotopic	Gamma isotopic	Gamma isotopic	Gamma isotopic	Gamma isotopic
			Mode #	%	uc/ml	uc/ml	uc/ml	uc/ml	uc/ml	uc/ml	uc/ml	uc/ml	uc/ml	uc/ml
	10:45	Rx Info	Mode 1	100										
	10:45	RCS sample location			3.50E-3		3.93E-4	1.06E-3	9.81E-4	2.29E-3		3.89E-3	1.29e-3	4.08e-3

VIRGINIA POWER **SURRY POWER STATION**	PROCEDURE NO: **0-OSP-RC-002** REVISION NO: **3**
PROCEDURE TYPE: **OPERATIONS SURVEILLANCE PROCEDURE**	UNIT NO: **1 & 2**
PROCEDURE TITLE: **STEAM GENERATOR PRIMARY TO SECONDARY LEAKAGE MONITORING**	EFFECTIVE DATE: **On File** EXPIRATION DATE: (Temporary Procedures Only) **N/A**

REVISION SUMMARY:

Revised in response to Operations feedback.
1. Deleted note prior to Step 6.1.1 from previous revision. This note implied that grab sample data should be obtained before required actions are performed.
2. Revised Step 6.1.3 and added Step 6.1.4 to direct that hand-calculated be used on Unit 1, and data from 0-HSP-LKRATE-001 be used on Unit 2.
3. Changed background count rate from 90 to 130 on Attachment 1, page 3.

PROCEDURE WRITER: *Ron Mushenheim*	VALIDATOR: *Butch Gross*
APPROVAL: **Approval on File**	DATE:

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1.0 PURPOSE

1.1 To provide appropriate actions to preclude through-wall SG tube defects from propagating to tube rupture.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR, Section 3.3, Reactor Coolant System

2.1.2 UFSAR 4.2.7, Leakage

2.1.3 UFSAR 4.3.5, System Accident Potential

2.1.4 UFSAR 9.1.2.2, Reactor Coolant Activity Concentration, Monitoring, and Control

2.1.5 UFSAR 14.3.1, Steam Generator Tube Rupture

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specifications 3.1.C, RCS Leakage

2.3 Technical References

2.3.1 EPRI TR-104788-R2, PWR Primary - To - Secondary Leak Guidelines, Rev. 2

2.3.2 0-HSP-LKRATE-001, Primary To Secondary Leakrate Assessment Using Condenser Air Ejector Sample Data

2.3.3 CH-87.201, Primary to Secondary Leak Rate Monitoring

2.3.4 1-RMA-A2, Unit 1 Mn Stm ABC Rad Mon Alert / HI

2.3.5 2-RMA-A7, Unit 2 Mn Stm ABC Rad Mon Alert / HI

2.3.6 1-RMA-A3, Unit 1 Aux Stm Rad Alert / HI

2.3.7 2-RMA-A6, Unit 2 Aux Stm Rad Alert / HI

2.3.8 1-RM-G8, Cndsr Air Ejctr Alert/Failure

2.3.9 1-RM-H8, 1-SV-RI-111 High

2.3.10 1-RM-N7, Stm Gen BD Alert / Failure

2.3.11 1-RM-N8, Stm Gen BD Alert / Failure

2.3.12 1-RM-P7, 1-SS-RI-112 High

2.3.13 1-RM-P8, 1-SS-RI-113 High

2.3.14 2-RM-G2, Cndsr Air Ejctr Alert/Failure

2.3.15 2-RM-H2, 2-SV-RI-211 High

2.3.16 2-RM-N1, Stm Gen BD Alert / Failure

2.3.17 2-RM-N2, Stm Gen BD Alert / Failure

2.3.18 2-RM-P1, 2-SS-RI-212 High

2.3.19 2-RM-P2, 2-SS-RI-213 High

2.3.20 1/2-E-3, Steam Generator Tube Rupture

2.3.21 1/2-ES-3.1, Post-SGTR Cooldown Using Backfill

2.3.22 1/2-ES-3.2, Post-SGTR Cooldown Using Blowdown

2.3.23 1/2-ES-3.3, Post-SGTR Cooldown Using Steam Dump

2.3.24 1/2-AP-16.00, Excessive RCS Leakage

2.3.25 0-AP-23.00, Rapid Load Reduction

2.3.26 0-AP-23.01, Rapid RCS Cooldown

2.3.27 1/2-AP-24.00, Minor SG Tube Leak

2.3.28 1/2-AP-24.01, Large Steam Generator Tube Leak

2.3.29 DCP 01-039, Condenser Air Ejector Rad Monitor Replacement

2.4 **Commitment Documents**

None

Init Verif

3.0 INITIAL CONDITIONS

3.1 The Unit is in Hot Standby or in Power Operations.

3.2 Any of the following indications of increased primary to secondary leakage has occurred.

- Procedure 0-HSP-LKRATE-001, Primary To Secondary Leakrate Assessment Using Condenser Air Ejector Sample Data, has detected total primary to secondary leakage greater than or equal to five gallons per day (gpd).
- Procedure CH-87.201, Steam Generator Primary to Secondary Leakrate Calculation, has detected total primary to secondary leakage greater than or equal to five gallons per day (gpd).
- A valid Alert or High alarm has been received on any Radiation Monitor used to monitor primary to secondary leakage.
- A significantly increased indication has been observed on any Radiation Monitor used to monitor primary to secondary leakage.

4.0 PRECAUTIONS AND LIMITATIONS

None

5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 INSTRUCTIONS

6.1 Increased Steam Generator Primary to Secondary Leakage Requirements

_____ 6.1.1 Verify initiated or initiate 0-HSP-LKRATE-001, Primary To Secondary Leakrate Assessment Using Condenser Air Ejector Sample Data. (This calculation can be performed in between 60 to 90 minutes.)

_____ 6.1.2 Verify initiated or initiate CH-87.201, Primary to Secondary Leak Rate Monitoring.

_____ 6.1.3 IF Unit 1 affected, THEN initiate Attachment 1 to perform hand calculated leak rate AND use this data to determine required actions. Otherwise, enter N/A.

_____ 6.1.4 IF Unit 2 affected, THEN use the results from 0-HSP-LKRATE-001 to determine required actions. Otherwise, enter N/A.

_____ 6.1.5 Refer to Tech Spec 3.6 (E) and 3.1.C.6 for secondary side activity limits.

_____ 6.1.6 IF primary to secondary leakage is greater than or equal to five gpd and less than 30 gpd, THEN initiate Attachment 2, Increased Monitoring. Otherwise, enter N/A.

_____ 6.1.7 IF primary to secondary leakage is greater than or equal to 30 gpd and less than 75 gpd, THEN initiate Attachment 3, Action Level 1. Otherwise, enter N/A.

_____ 6.1.8 IF primary to secondary leakage is greater than or equal to 75 gpd for greater than one hour, THEN initiate Attachment 4, Action Level 2. Otherwise, enter N/A.

_____ 6.1.9 IF primary to secondary leakage is increasing by greater than 30 gpd/hr and is greater than 75 gpd, THEN initiate Attachment 5, Action Level 3. Otherwise, enter N/A.

_____ 6.1.10 IF primary to secondary leakage is greater than or equal to 150 gpd, THEN initiate Attachment 6, Action Level 3. Otherwise, enter N/A.

_____ 6.1.11 Notify the System Engineer and record the name of the person notified.

_____

System Engineer

_____ 6.1.12 Submit a Plant Issue and record the number. Enter N/A if a Plant Issue has already been initiated.

_____

PI Number

7.0 FOLLOW-ON

7.1 Acceptance Criteria

None

7.2 Follow-On Tasks

None

7.3 Notification, Documentation, and Procedure Closeout

_____ 7.3.1 Notify the Shift Supervisor that the OSP is complete.

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

Initials	Printed Name

Operator Comments: _____

_____

_____

_____

_____

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Completed by: _____ Date: _____

7.4 Review

Shift Supervisor Comments: _____

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Reviewed by: _____ Date: _____
Shift Supervisor

ATTACHMENT 1

(Page 1 of 3)

HAND CALCULATION OF PRIMARY-TO-SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

NOTE: Multiple copies of this Attachment should be made as necessary.

_____ 1. Record the current time and date. _____ / _____

_____ 2. Obtain flow rates from both Air Ejectors and record total flow rate below:

- Air Ejector A flow _____ scfm +
- Air Ejector B flow _____ scfm =
- Total Flow _____ scfm

_____ 3. Record the current reading from 1-SV-RI-111. _____ cpm

ATTACHMENT 1

(Page 2 of 3)

HAND CALCULATION OF PRIMARY-TO-SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

_____ 4. Obtain the most recent Unit 1 RCS activity for the isotopes listed in the table below from Chemistry and record in the Table. (This data is normally kept in the Radiation Monitor setpoint book and is updated weekly)

Isotope in RCS	Concentration in RCS (*u*Ci/gram) (C)	AE Rad Mon Isotopic Efficiency (CPM/*u*Ci/cc) (k)	C x k
Ar-41		5.97 E+07	
Kr-85		3.22 E+06	
Kr-85m		1.29 E+10	
Kr-87		7.28 E+08	
Kr-88		2.99 E+09	
Xe-131m		2.86 E+08	
Xe-133		2.32 E+07	
Xe-133m		6.19 E+08	
Xe-135		4.58 E+09	
Xe-135m		5.65 E+08	
Xe-138		2.97 E+09	

_____ 5. Multiply the isotopic concentrations (C) times the AE Rad Monitor Isotopic Efficiency (k) and record in the Table in column 4.

_____ 6. Add the products obtained in Step 5, column 4, and record below. (This sum is R_C, Total AE RM response factor)

R_C _____(total AE RM response factor)

ATTACHMENT 1

(Page 3 of 3)

HAND CALCULATION OF PRIMARY-TO-SECONDARY LEAKAGE USING THE CONDENSER AIR EJECTOR RADIATION MONITOR

NOTE:
- The terms in the formula below are as follows:
  - R = Current AE RM reading from Step 3
  - 130 = Background AE RM reading
  - F_{AE} = Total AE flow from Step 2
  - R_C = Total AE RM response factor from Step 6

_____ 7. Determine primary-to-secondary leak rate in gallons per day (Q_L) IAW the following formula.

- $Q_L = 1.084E4 \times (R - 130) \times F_{AE} / R_C =$ _____ gpd

_____ 8. Initiate Attachment 3 through 6 as appropriate for existing leak rate.

_____ 9. Log leakrate in Unit 1 Narrative Log.

_____ 10. Reperform Steps 1 throught 8 of this Attachment as necessary based on any of the following:

- Plant management direction
- Adverse trend in AE reading
- Step change in AE reading
- AE alert or high alarm received

ATTACHMENT 2

(Page 1 of 2)

INCREASED MONITORING

NOTE: The level describes the condition in which leakage has been detected and quantified but is not in a range that can be accurately monitored.

_____ 1. Identify the leaking Steam Generator and requantify leakage if possible.

_____ 2. Return any Radiation Monitors used for monitoring primary to secondary leakage to service as necessary.

_____ 3. Direct HP and Chemistry to increase grab sampling frequency to once per four hours.

_____ 4. Increase monitoring of the Air Ejector Radiation Monitor to once every 15 minutes. Use Attachment 7 to log monitor readings.

_____ 5. IF leak rate stabilizes for one hour based on Air Ejector Rad Monitor reading, (less than or equal to 10% increase during a one hour period) THEN reduce monitoring of Radiation Monitors to once every two hours and reduce HP and Chemistry sampling to once per eight hours.

_____ 6. IF leak rate stabilizes for 24 hours based on Air Ejector Rad Monitor reading, (less than or equal to 10% increase during a 24 hour period) THEN reduce monitoring of Radiation Monitors to once every eight hours and reduce HP and Chemistry sampling to once per 12 hours.

_____ 7. IF Unit 1 affected, THEN reperform Attachment 1 as necessary based on any of the following:

- Plant management direction
- Adverse trend in AE reading
- Step change in AE reading
- AE alert or high alarm received

ATTACHMENT 2

(Page 2 of 2)

INCREASED MONITORING

_____ 8. Consult with the OMOC on performing the following actions.

- Bypassing the Condensate Polishing Building
- Shifting Auxiliary Steam supply to the unaffected unit or the Auxiliary Boilers
- Reducing or terminating the affected SG Blowdown rate
- Isolating MS supply from the affected SG to the TD AFW pump

_____ 9. IF Unit 1 affected, THEN direct HP to increase the Air Ejector Radiation Monitor alert setpoint to indicate a 30 gpd SG tube leak.

_____ 10. IF Unit 2 affected, THEN direct HP to evaluate increasing the Air Ejector Radiation Monitor alert and high setpoints.

ATTACHMENT 3

(Page 1 of 3)

ACTION LEVEL 1

NOTE: Action Level 1 defines a plant condition in which leakage has increased and should be frequently monitored.

_____ 1. Direct HP and Chemistry to increase grab sample frequency to once per four hours to identify the leaking Steam Generator and to requantify primary to secondary leak rates.

_____ 2. Increase monitoring of the Air Ejector Radiation Monitor to once every 15 minutes. Use Attachment 7 to log monitor readings.

_____ 3. IF leak rate stabilizes for one hour based on Air Ejector Rad Monitor reading, (less than or equal to 10% increase during a one hour period) THEN reduce monitoring of Radiation Monitors to once every two hours and reduce HP and Chemistry sampling to once per eight hours.

_____ 4. IF leak rate stabilizes for 24 hours based on Air Ejector Rad Monitor reading, (less than or equal to 10% increase during a 24 hour period) THEN reduce monitoring of Radiation Monitors to once every eight hours and reduce HP and Chemistry sampling to once per 12 hours.

_____ 5. Request that Engineering evaluate the leak rate data.

_____ 6. IF Unit 1 affected, THEN reperform Attachment 1 as necessary based on any of the following:

- Plant management direction
- Adverse trend in AE reading
- Step change in AE reading
- AE alert or high alarm received

ATTACHMENT 3

(Page 2 of 3)

ACTION LEVEL 1

_____ 7. Initiate review of the following procedures:

- ( )-E-3, Steam Generator Tube Rupture
- ( )-ES-3.1, Post-SGTR Cooldown Using Backfill
- ( )-ES-3.2, Post-SGTR Cooldown Using Blowdown
- ( )-ES-3.3, Post-SGTR Cooldown Using Steam Dump
- ( )-AP-16.00, Excessive RCS Leakage
- 0-AP-23.00, Rapid Load Reduction
- 0-AP-23.01, Rapid RCS Cooldown
- ( )-AP-24.00, Minor SG Tube Leak
- ( )-AP-24.01, Large Steam Generator Tube Leak

_____ 8. Direct HP to review procedures / requirements for posting radiological hazard signs in areas not normally required (Turbine Building).

_____ 9. IF leak rates are stable (less than or equal to 10% increase during a one hour period) THEN evaluate resetting Radiation Monitor alert/alarm setpoints to above their existing baseline reading to permit detection of rapidly increasing leak rate.

_____ 10. Evaluate secondary contamination potential and contain as required.

ATTACHMENT 3

(Page 3 of 3)

ACTION LEVEL 1

_____ 11. Consult with the OMOC on performing the following actions.

- Bypassing the Condensate Polishing Building
- Shifting Auxiliary Steam supply to the unaffected unit or the Auxiliary Boilers
- Reducing or terminating the affected SG Blowdown rate
- Isolating MS supply from the affected SG to the TD AFW pump

_____ 12. IF Unit 1 affected, THEN direct HP to increase the Air Ejector Radiation Monitor alert setpoint to indicate a 75 gpd SG tube leak.

_____ 13. IF Unit 2 affected, THEN direct HP to evaluate increasing the Air Ejector Radiation Monitor alert and high setpoints.

ATTACHMENT 4

(Page 1 of 3)

ACTION LEVEL 2

CONTINGENCY ACTIONS FOR LEAKAGE GREATER THAN OR EQUAL TO 75 GPD FOR GREATER THAN ONE HOUR

NOTE:

- This Attachment should be implemented when primary to secondary leakage is greater than or equal to 75 gpd in any SG and sustained for greater than or equal to one hour, and the rate of increase in leakage is less than 30 gpd/hr in any SG. The leak rate can be verified as sustained for greater than one hour based on Air Ejector Radiation Monitor readings remaining elevated, or on two Air Ejector samples taken approximately one hour apart.

- To avoid an unnecessary plant shutdown, this Attachment should not be implemented unless leakage is qualitatively confirmed prior to declaration. For Unit 1, leakage is qualitatively confirmed when two independent radiation monitors trend in the same direction with the same order of magnitude. For Unit 2, leakage is qualitatively confirmed when radiation monitors trend in the same direction with the same order of magnitude and grab sampling has verified the leak rate.

- Confirmation time must be kept to a minimum.

_____ 1. Direct HP and Chemistry to increase grab sample frequency to once per four hours to identify the leaking Steam Generator and to requantify primary to secondary leak rates.

_____ 2. Commence controlled plant shutdown and be in Hot Shutdown within 24 hours from the time of leak rate determination.

_____ 3. Attempt to identify the leaking SG and quantify leakage.

_____ 4. Increase monitoring of the Air Ejector Radiation Monitor to once every 15 minutes. Use Attachment 7 to log monitor readings.

ATTACHMENT 4

(Page 2 of 3)

ACTION LEVEL 2

CONTINGENCY ACTIONS FOR LEAKAGE GREATER THAN OR EQUAL TO 75 GPD FOR GREATER THAN ONE HOUR

_____ 5. Monitor primary to secondary leakage to verify that leakage rate of increase does not exceed 30 gpd/hr or 100 gpd total (this would require initiating Attachment 5).

_____ 6. IF Unit 1 affected, THEN reperform Attachment 1 as necessary based on any of the following:

- Plant management direction
- Adverse trend in AE reading
- Step change in AE reading
- AE alert or high alarm received

_____ 7. Notify HP to monitor the secondary plant for contamination and to post as required.

_____ 8. Initiate Attachment 8 or 9 as necessary to minimize secondary contamination.

_____ 9. Initiate review of the following procedures:

- ( )-E-3, Steam Generator Tube Rupture
- ( )-ES-3.1, Post-SGTR Cooldown Using Backfill
- ( )-ES-3.2, Post-SGTR Cooldown Using Blowdown
- ( )-ES-3.3, Post-SGTR Cooldown Using Steam Dump
- ( )-AP-16.00, Excessive RCS Leakage
- 0-AP-23.00, Rapid Load Reduction
- 0-AP-23.01, Rapid RCS Cooldown
- ( )-AP-24.00, Minor SG Tube Leak
- ( )-AP-24.01, Large Steam Generator Tube Leak

ATTACHMENT 4

(Page 3 of 3)

ACTION LEVEL 2

CONTINGENCY ACTIONS FOR LEAKAGE GREATER THAN OR EQUAL TO 75 GPD FOR GREATER THAN ONE HOUR

_____ 10. Consult with the OMOC on performing the following actions.

- Bypassing the Condensate Polishing Building
- Shifting Auxiliary Steam supply to the unaffected unit or the Auxiliary Boilers
- Reducing or terminating the affected SG Blowdown rate
- Isolating MS supply from the affected SG to the TD AFW pump

_____ 11. IF Unit 1 affected, THEN direct HP to increase the Air Ejector Radiation Monitor alert setpoint to indicate a 150 gpd SG tube leak.

_____ 12. IF Unit 2 affected, THEN direct HP to evaluate increasing the Air Ejector Radiation Monitor alert and high setpoints.

ATTACHMENT 5

(Page 1 of 3)

ACTION LEVEL 3

CONTINGENCY ACTIONS FOR LEAKAGE INCREASING BY GREATER THAN 30 GPD/HR AND GREATER THAN 75 GPD

NOTE:

- Action Level 3 describes a condition that suggests the leak is increasing rapidly and the unit should be promptly shutdown.

- The rate of change limit specified by this Attachment is provided to identify the potential need for a rapid power reduction to 50% power, and applies to progressively increasing leak rates and not to leak rate spikes followed by leak rate decreases. If leak rate increases to 100 gpd while in Action Level 2, Action Level 3 must be entered.

- To avoid an unnecessary plant shutdown, this Attachment should not be implemented unless leakage is qualitatively confirmed prior to declaration. For Unit 1, leakage is qualitatively confirmed when two independent radiation monitors trend in the same direction with the same order of magnitude. For Unit 2, leakage is qualitatively confirmed when radiation monitors trend in the same direction with the same order of magnitude and grab sampling has verified the leak rate.

- Confirmation time must be kept to a minimum. Precise duplication of leak rates, as indicated by the monitors, is not important.

_____ 1. Commence controlled plant shutdown to less than or equal to 50% within one hour IAW 0-AP-23.00, Rapid Load Reduction.

_____ 2. Continue plant shutdown and be in Hot Shutdown within the next two hours (three hours total).

_____ 3. Attempt to identify the leaking SG and quantify leakage.

ATTACHMENT 5

(Page 2 of 3)

ACTION LEVEL 3

CONTINGENCY ACTIONS FOR LEAKAGE INCREASING BY GREATER THAN 30 GPD/HR AND GREATER THAN 75 GPD

_____ 4. Increase monitoring of the Air Ejector Radiation Monitor to once every 15 minutes. Use Attachment 7 to log monitor readings.

_____ 5. IF Unit 1 affected, THEN reperform Attachment 1 as necessary based on any of the following:

- Plant management direction
- Adverse trend in AE reading
- Step change in AE reading
- AE alert or high alarm received

_____ 6. Notify HP to monitor the secondary plant for contamination and to post as required.

_____ 7. Initiate Attachment 8 or 9 as necessary to minimize secondary contamination.

_____ 8. Initiate review of the following procedures:

- ( )-E-3, Steam Generator Tube Rupture
- ( )-ES-3.1, Post-SGTR Cooldown Using Backfill
- ( )-ES-3.2, Post-SGTR Cooldown Using Blowdown
- ( )-ES-3.3, Post-SGTR Cooldown Using Steam Dump
- ( )-AP-16.00, Excessive RCS Leakage
- 0-AP-23.00, Rapid Load Reduction
- 0-AP-23.01, Rapid RCS Cooldown
- ( )-AP-24.00, Minor SG Tube Leak
- ( )-AP-24.01, Large Steam Generator Tube Leak

ATTACHMENT 5

(Page 3 of 3)

ACTION LEVEL 3

CONTINGENCY ACTIONS FOR LEAKAGE INCREASING BY GREATER THAN 30 GPD/HR AND GREATER THAN 75 GPD

_____ 9. Consult with the OMOC on performing the following actions.

- Bypassing the Condensate Polishing Building
- Shifting Auxiliary Steam supply to the unaffected unit or the Auxiliary Boilers
- Reducing or terminating the affected SG Blowdown rate
- Isolating MS supply from the affected SG to the TD AFW pump

ATTACHMENT 6

(Page 1 of 3)

ACTION LEVEL 3

CONTINGENCY ACTIONS FOR LEAKAGE GREATER THAN 150 GPD

NOTE:
- Action Level 3 describes a condition that suggests the leak is increasing rapidly and the unit should be promptly shutdown.
- To avoid an unnecessary plant shutdown, this Attachment should not be implemented unless leakage is qualitatively confirmed prior to declaration. For Unit 1, leakage is qualitatively confirmed when two independent radiation monitors trend in the same direction with the same order of magnitude. For Unit 2, leakage is qualitatively confirmed when radiation monitors trend in the same direction with the same order of magnitude and grab sampling has verified the leak rate.
- Confirmation time must be kept to a minimum. Precise duplication of leak rates, as indicated by the monitors, is not important.

_____ 1. Commence plant shutdown and be in Hot Shutdown within six hours.

_____ 2. Attempt to identify the leaking SG and quantify leakage.

_____ 3. Increase monitoring of the Air Ejector Radiation Monitor to once every 15 minutes. Use Attachment 7 to log monitor readings.

_____ 4. Notify HP to monitor the secondary plant for contamination and to post as required.

_____ 5. Initiate Attachment 8 or 9 as necessary to minimize secondary contamination.

ATTACHMENT 6

(Page 2 of 3)

ACTION LEVEL 3

CONTINGENCY ACTIONS FOR LEAKAGE GREATER THAN 150 GPD

_____ 6. IF Unit 1 affected, THEN reperform Attachment 1 as necessary based on any of the following:

- Plant management direction
- Adverse trend in AE reading
- Step change in AE reading
- AE alert or high alarm received

_____ 7. Initiate review of the following procedures:

- ( )-E-3, Steam Generator Tube Rupture
- ( )-ES-3.1, Post-SGTR Cooldown Using Backfill
- ( )-ES-3.2, Post-SGTR Cooldown Using Blowdown
- ( )-ES-3.3, Post-SGTR Cooldown Using Steam Dump
- ( )-AP-16.00, Excessive RCS Leakage
- 0-AP-23.00, Rapid Load Reduction
- 0-AP-23.01, Rapid RCS Cooldown
- ( )-AP-24.00, Minor SG Tube Leak
- ( )-AP-24.01, Large Steam Generator Tube Leak

ATTACHMENT 6

(Page 3 of 3)

ACTION LEVEL 3

CONTINGENCY ACTIONS FOR LEAKAGE GREATER THAN 150 GPD

_____ 8. Consult with the OMOC on performing the following actions.

- Bypassing the Condensate Polishing Building
- Shifting Auxiliary Steam supply to the unaffected unit or the Auxiliary Boilers
- Reducing or terminating the affected SG Blowdown rate
- Isolating MS supply from the affected SG to the TD AFW pump

ATTACHMENT 7

(Page 1 of 1)

TRENDING AIR EJECTOR RADIATION MONITOR READINGS

NOTE: Copies of this Attachment should be made to allow trending the Air Ejector Monitor readings for as long as necessary. Initiate a new Attachment daily.

DATE _____

INITIAL READING _____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME
_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME	_____ CPM _____ TIME

ATTACHMENT 8

(Page 1 of 3)

MINIMIZING TURBINE BUILDING AND SECONDARY CONTAMINATION, UNIT 1

NOTE: Actions should be taken to lower Hotwell level if annunciator 1J-A4 is received due to high level.

_____ 1. Monitor Hotwell level.

_____ 2. Verify or place all Turbine Building sump pumps in Sump Numbers 1 and 2 in OFF.

_____ 3. Initiate OC-47, Turbine Building Sump Pumps Status Verification.

_____ 4. IF Hotwell increasing uncontrollably, THEN verify isolated OR isolate Hotwell High and Low volume makeup valves:

- 1-CN-160
- 1-CN-162

_____ 5. Direct HP and Chemistry to sample the Turbine Building sumps for activity. IF activity levels in the sump(s) will NOT allow pumping to the river, THEN perform applicable Step(s) 6 through 9 for the affected sump(s). IF activity levels in the sumps are acceptable, THEN discharge the sumps through the normal flow path AND GO TO Step 10.

_____ 6. Place a portable sump pump in Number 1 Turbine Building sump.

_____ 7. Run the hose from the portable sump pump to the CC HX trough.

_____ 8. Place a portable sump pump in Number 2 Turbine Building sump.

ATTACHMENT 8

(Page 2 of 3)

MINIMIZING TURBINE BUILDING AND SECONDARY CONTAMINATION, UNIT 1

NOTE: A Fire Watch must be posted while the Fire Door beween the Turbine Buildings is open.

_____ 9. Run the hose from the portable sump pump in Number 2 Turbine Building sump to the CC HX trough.

_____ 10. Connect a minimum 3/4 inch hose (minimum 250 lb rating) from 1-CN-241, Seal Water Supply Hdr, to the CC HX trough.

_____ 11. Station an Operator at the CC HX trough.

_____ 12. Direct HP and Chemistry to sample the Hotwell for activity.

NOTE: The capacity of the sump pump in the CC HX trough is 25 gpm

13. Control Hotwell level at less than 75% by performing Substep a. (Hotwell can not go to the river) OR Substep b. (Hotwell can go to the river) below based on the results of the samples.

_____ a. Slowly open 1-CN-241 to transfer water to the CC HX trough, not to exceed the capacity of the CC HX trough sump pump.

_____ b. Pump the Hotwell to the river IAW the following:

_____ 1. Verify closed or close 1-CN-70, Telltale Between Overboard Isol Valves.

_____ 2. Open 1-CN-69, CN to Disch Tunnel Hdr Upstr Isol.

_____ 3. Throttle open 1-CN-71, CN to Disch Tunnel Hdr Dnstr Isol, to control Hotwell pump down rate.

ATTACHMENT 8

(Page 3 of 3)

MINIMIZING TURBINE BUILDING AND SECONDARY CONTAMINATION, UNIT 1

4. WHEN Hotwell is at the desired level, THEN do the following:

_____ a. Close 1-CN-69, CN to Disch Tunnel Hdr Upstr Isol.

_____ b. Close 1-CN-71, CN to Disch Tunnel Hdr Dnstr Isol.

_____ 14. Pump the Number 1 and 2 Turbine Building sumps to the CC HX trough or to the river as directed by HP.

_____ 15. IF Hotwell or sump drains directed to LW, THEN notify the Radwaste Facility to expect a large volume of Liquid Waste contaminated with blowdown from the leaking Steam Generator.

_____ 16. Pump down the CC HX trough as necessary.

ATTACHMENT 9

(Page 1 of 3)

MINIMIZING TURBINE BUILDING AND SECONDARY CONTAMINATION, UNIT 2

NOTE: Actions should be taken to lower Hotwell level if annunciator 2J-A4 is received due to high level.

_____ 1. Monitor Hotwell level.

_____ 2. Verify or place all Turbine Building sump pumps in Sump Numbers 2 and 3 in OFF.

_____ 3. Initiate OC-47, Turbine Building Sump Pumps Status Verification.

_____ 4. IF Hotwell increasing uncontrollably, THEN verify isolated OR isolate Hotwell High and Low volume makeup valves:

- 2-CN-160
- 2-CN-162

_____ 5. Direct HP and Chemistry to sample the Turbine Building sumps for activity. IF activity levels in the sump(s) will NOT allow pumping to the river, THEN perform applicable Step(s) 6 through 9 for the affected sump(s). IF activity levels in the sumps are acceptable, THEN discharge the sumps through the normal flow path AND GO TO Step 10.

_____ 6. Place a portable sump pump in Number 3 Turbine Building sump.

_____ 7. Run the hose from the portable sump pump to Number 2 Turbine Building sump.

NOTE: A Fire Watch must be posted while the Fire Door beween the Turbine Buildings is open.

_____ 8. Place a portable sump pump in Number 2 Turbine Building sump.

_____ 9. Run the hose from the portable sump pump in Number 2 Turbine Building sump to the CC HX trough.

ATTACHMENT 9

(Page 2 of 3)

MINIMIZING TURBINE BUILDING AND SECONDARY CONTAMINATION, UNIT 2

_____ 10. Connect a minimum 3/4 inch hose (minimum 250 lb rating) from 2-CN-241, Seal Water Supply Hdr, to the CC HX trough.

_____ 11. Station an Operator at the CC HX trough.

_____ 12. Direct HP and Chemistry to sample the Hotwell for activity.

NOTE: The capacity of the sump pump in the CC HX trough is 25 gpm

13. Control Hotwell level at less than 75% by performing Substep a. (Hotwell can not go to the river) OR Substep b. (Hotwell can go to the river) below based on the results of the samples.

_____ a. Slowly open 2-CN-241 to transfer water to the CC HX trough, not to exceed the capacity of the CC HX trough sump pump.

_____ b. Pump the Hotwell to the river IAW the following:

_____ 1. Verify closed or close 2-CN-70, Telltale Between Ovbd Isol Valves.

_____ 2. Open 2-CN-69, CN to Disch Tunnel Hdr Upstr Isol.

_____ 3. Throttle open 2-CN-71, CN to Disch Tunnel Hdr Dnstr Isol, to control Hotwell pump down rate.

_____ 4. WHEN Hotwell is at the desired level, THEN do the following:

_____ a. Close 2-CN-69, CN to Disch Tunnel Hdr Upstr Isol.

_____ b. Close 2-CN-71, CN to Disch Tunnel Hdr Dnstr Isol.

ATTACHMENT 9

(Page 3 of 3)

MINIMIZING TURBINE BUILDING AND SECONDARY CONTAMINATION, UNIT 2

_____ 14. Pump the Number 2 and 3 Turbine Building sumps to the CC HX trough or to the river as directed by HP.

_____ 15. IF Hotwell or sump drains directed to LW, THEN notify the Radwaste Facility to expect a large volume of Liquid Waste contaminated with blowdown from the leaking Steam Generator.

_____ 16. Pump down the CC HX trough as necessary.

Developed for the Surry, 2002, Initial Examination

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

A-4 ADMINISTRATIVE SECTION RO

NRC-ADMIN-JPM-04 (RO ONLY)

Title:

Meteorological and Stability Class Determination

IAW

EPIP-2.01 Notification of State and Local Governments

Read to the Operator

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed/simulated for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

A Site Area Emergency was declared 35 minutes ago due to RCS leakage.

An Initial Report of Emergency to State and Local Governments was completed 25 minutes ago with an update schedule of 60 minutes.

A breach in the containment has caused a release of radioactive material that is presently occurring.

A follow-up message to the State and Local Governments is being prepared using Attachment 2 of EPIP-2.01.

The Backup MET Tower recorders are out of service due to supply breaker (VB II-IV breaker 33) replacement. Backup MET tower input to the ERFCS remains operable.

INITIATING CUES:

The Unit 1 SRO has requested that you assist the State and Local Emergency Communicator by performing steps 19-25 of EPIP 2.01, "Notification of State and Local Governments," to obtain Meteorological Data from the Met Panel.

* - indicates a critical step.

Meteorological and Stability Class Determination	
STEP 1: Observes Step 19. STANDARD: _____ Observes NOTE identifying sources to obtain data (Charts, EMCOMM, AP-10.13). _____ Observes NOTE stating EMCOMM and ERFCS Group Review #39 contain MET data. _____ Identifies On-Site Meteorological Information is available. COMMENTS:	_____SAT _____UNSAT
STEP 2: GET METEOROLOGICAL INFORMATION: (Step 20) STANDARD: _____ Determines Temperature, Wind Speed, Wind Direction, Affected Sectors, and Stability class are needed COMMENTS:	_____SAT _____UNSAT
STEP 3: Determines temperature. (Step 21) STANDARD: *_____ On the MET panel locates and observes the Main Tower temperature (23°C/73°F). _____ Multiplies 23°C by 1.8 and adds 32 to obtain 73°F (if needed) **Evaluator's Cue:** *** Provide indication that digital readout is 23°C.** *** If candidate uses ERFCS, data point M3MM001C indicates 0.0 bd (highlighted in yellow)** COMMENTS:	_____SAT _____UNSAT

* - indicates a critical step.

STEP 4: Observes NOTE prior to step 22. STANDARD: _____ Observes NOTE identifying source of wind indication is Main tower lower. Alternate indication is (1) Backup tower (2) Main tower Upper. COMMENTS:	_____SAT _____UNSAT
STEP 5: Gets Wind Speed (Step 22) STANDARD: _____ Determines the Main Tower Lower Level Wind Speed recorder is invalid and uses an alternate: *_____ Obtains wind speed (12 mph) from the Main Tower upper level recorder. **Evaluator's Cue:** **Provide indications that the Main Tower Lower recorder indicates EEEEEE.** **Provide indications that the Backup Tower Wind Speed recorder is blank (powered off).** **Provide indications that the Main Tower Upper wind speed is 12 mph.** *** If candidate uses ERFCS, data points M3MM001C (Main Lower) and M3MM007C (B/U) indicate 0.0 bd (highlighted in yellow)** COMMENTS:	_____SAT ____UNSAT

* - indicates a critical step.

STEP 6: Observes NOTES prior to step 23 STANDARD: _____ The approximate wind direction for the previous 15 minutes should be determined. ____ The primary source of wind direction is the Main Tower Lower. Alternate indications are: (1) Backup tower, (2) Main Tower Upper. ____ Wind direction is always given as the direction the wind blows from. COMMENTS:	_____SAT _____UNSAT
STEP 7: Gets Wind direction in terms of compass point wind blowing from. STANDARD: *_____ Determines the Main Tower Lower Level Wind Direction recorder indicates 288 degrees (+/-4) for the last 15 minutes *_____ Selects WNW as direction wind is blowing from. Evaluator's Cue: **Provide wind bouncing between 284 and 292 on the Main Tower Lower recorder.** **If candidate looks at ERFCS point M3MM004C provide cue of 288 degrees.** **If candidate looks at the upper recorder indications are bouncing between 305 and 310.** **Backup wind direction recorder is blank (no power).** **Other ERFCS wind direction points (M3MM005C and M3MM003C) indicate 306.** COMMENTS:	_____SAT _____UNSAT

* - indicates a critical step.

STEP 8: Observes NOTE prior to step 24. STANDARD: _____ Affected sectors are recorded using alphabetic designations. COMMENTS:	_____SAT _____UNSAT
STEP 9: Determine Downwind Sectors: (Step 24) STANDARD: *_____ Uses table in step 24 to determine E-F-G as the downwind sectors. COMMENTS:	_____SAT _____UNSAT
STEP 10: Observes Notes Prior to step 25. STANDARD: _____ Main tower Delta T is preferred source of stability, sigma theta is secondary. _____ The value closer to "G" should be used if unable to distinguish Delta T or sigma theta. _____ Numerical ranges presented on the chart for Delta T and Sigma Theta are less than the range of the chart recorder and indicator in the Control Room. Indications are not expected to read outside the ranges found on these tables. COMMENTS:	_____SAT _____UNSAT

* - indicates a critical step.

STEP 11: Determines Stability Class: (Step 25) STANDARD: _____ Identifies Main Tower Delta T recorder and Backup recorder are OOS *_____ Identifies sigma theta ERFCS point indicates 10.2 degrees *_____ Identifies stability class is "D" **Evaluator's Cue:** **Main Tower Delta T recorder has - - - - - - - indication.** **Sigma Theta recorder is blank (no power).** **Delta T ERFCS point M3MM008C is 9.99 bd (highlighted in yellow)** **Sigma Theta ERFCS point M3MM006C is 10.2 degrees.** COMMENTS:	_____SAT _____UNSAT
STEP 12: Give Meteorological information to the requestor. STANDARD: _____ Provides Temperature, wind speed, Affected sectors, and stability class to the evaluator. COMMENTS: **END OF TASK**	_____SAT _____UNSAT

* - indicates a critical step.

Read to the Operator

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed/simulated for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

A Site Area Emergency was declared 35 minutes ago due to RCS leakage.

An Initial Report of Emergency to State and Local Governments was completed 25 minutes ago with an update schedule of 60 minutes.

A breach in the containment has caused a release of radioactive material that is presently occurring.

A follow-up message to the State and Local Governments is being prepared using Attachment 2 of EPIP-2.01.

The Backup MET Tower recorders are out of service due to supply breaker (VB II-IV breaker 33) replacement. Backup MET tower input to the ERFCS remains operable.

INITIATING CUES:

The Unit 1 SRO has requested that you assist the State and Local Emergency Communicator by performing steps 19-25 of EPIP 2.01, "Notification of State and Local Governments," to obtain Meteorological Data from the Met Panel.

* - indicates a critical step.

LEVEL 2 DISTRIBUTION
This Document Must Be Verified
And Maintained In Accordance With Source
EMERGENCY Approved Procedure Control Process PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
EPIP-2.01	NOTIFICATION OF STATE AND LOCAL GOVERNMENTS (With 3 Attachments)	29
		PAGE 1 of 18

PURPOSE

To initially notify State and local governments of the declaration of an emergency and to provide status updates related to the event.

ENTRY CONDITIONS

Any of the following:

1. An emergency has been declared.

2. Entry directed by Station Emergency Manager.

SIMULATOR

Approvals on File

Effective Date 02/21/02

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 1	INITIATE PROCEDURE: • By: _____ Date: _____ Time: _____ Location: _____	
_____ 2	CHECK FIRST REPORT OF EMERGENCY FOR EVENT - REQUIRED	IF procedure previously initiated, THEN continue from step in effect identified during relief/turnover.

NOTE:
- The initial notification of any emergency classification must be completed within 15 minutes of declaring the emergency class.
- Items 4 through 8 on Attachment 2 may be excluded from the first report of any emergency classification, (including termination).
- Attachment 1, Instructions for Completing Report of Emergency to State and Local Governments, may be referenced as needed.

_____ 3	RECORD INFORMATION ON ATTACHMENT 2 (REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS)	
_____ 4	CHECK EMERGENCY - REMAINS IN EFFECT	IF emergency terminated before message sent, THEN do the following: a) Record reason event terminated in Item 3. b) Record "State EOC portion of message not applicable" on bottom of Attachment 2 Page 2.
_____ 5	HAVE SEM/RM APPROVE REPORT (initial at top of Attachment 2)	

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 6	RECORD TIME NOTIFICATION STARTED	
	NOTE: • Multiple items excluded from a message may be read as a single statement, e.g., "Items 4 through 8 excluded from this message." • Outbound calls through the PBX system are made by dialing 8-1-(area code)-###-####. Using unrestricted PBX telephones, outbound calls may be made by dialing 9-1-(area code)-###-#### (area code not required for outbound calls within local calling area). No prefix (8-, 9-) is needed when using a direct outside line.	
_____ 7	SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS (i.e., Initial or Follow-up Report, as required):	
	a) Check Instaphone - CLEAR OF CONFLICTING MESSAGE TRAFFIC	a) IF Instaphone NOT available, THEN do the following: 1) Call State EOC on DEM ARD (Alternate: (804) 674-2400). 2) Notify State EOC Duty Officer of need to transmit message. 3) WHEN Instaphone available for message transmittal, THEN GO TO Step 7.b.
	b) Use Instaphone to contact State and local Emergency Operations Centers (EOCs)	b) IF Instaphone NOT operable, THEN GO TO Step 11.
	c) Perform initial roll-call (check boxes as EOC(s) answer)	
	d) Read Items 1 through 9	

(STEP 7 CONTINUED ON NEXT PAGE)

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS (i.e., Initial or Follow-up Report, as required): (Continued)	
	e) Check each EOC answers acknowledgement roll-call (check associated box as EOC(s) answer)	e) IF any EOC does NOT respond, THEN circle locality name on Attachment 2.
	f) Repeat any items upon request	
	g) Record date and time transmittal of Items 1 through 9 completed	
	h) Check message reports emergency - REMAINS IN EFFECT	h) IF State EOC acknowledged message, THEN GO TO Step 9. IF State EOC did NOT acknowledge message, THEN do the following: 1) Use DEM ARD phone to contact State EOC (Alternate: (804) 674-2400 (ask for Duty Officer)). IF all means of communications with State EOC are inoperable, THEN do the following: a) Notify SEM/RM. b) GO TO Step 9. 2) Read Items 1 through 9. 3) GO TO Step 9.

(STEP 7 CONTINUED ON NEXT PAGE)

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS (i.e., Initial or Follow-up Report, as required): (Continued)	
	i) Use DEM ARD phone to contact State EOC (Alternate: (804) 674-2400 (ask for Duty Officer))	i) IF all means of communications with State EOC are inoperable, THEN do the following: 1) Use Instaphone to transmit Item 10 to local EOCs. 2) Record the following on second page of Attachment 2: • "Transmitted Item 10 to local EOCs." • Date and time transmitted to each local EOC. 3) GO TO Step 9.
	j) Check State EOC acknowledged message	j) Read Items 1 through 9.
	k) Read Items 10 and 11	
	l) Consult with State EOC Duty Officer to determine desired update message schedule	
	m) Record following at Item 12: • Update message schedule • State EOC Duty Officer's name	
_____ 8	RECORD DATE AND TIME TRANSMITTAL OF ITEMS TO STATE EOC COMPLETE	

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 9	VERIFY ALL LOCAL EOCs ANSWERED ACKNOWLEDGEMENT ROLL CALL	IF any EOC(s) did NOT answer roll call, THEN do the following: a) Use telephone to call EOC(s) that did not answer. b) Refer to the table below for order of priority and list of local EOC phone numbers: Surry (757) 294-5264 James City (757) 566-0112 Isle of Wight (757) 357-2151 (local) (757) 357-3191 (local) Williamsburg (757) 220-2331 Newport News (757) 247-2578 York (757) 890-3603 c) IF State EOC notified, THEN read Items 1 through 9. IF NO communications with State EOC, THEN read Items 1 through 10. d) Record the following on Attachment 2: • Method of contact. • Reason Instaphone failed (if known). • Date and time of contact.
_____ 10	GO TO STEP 12	

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Other personnel may assist by making notifications simultaneously using other telephones.

_____ 11 SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS USING ALTERNATIVE MEANS:

a) Call State EOC:

1) Use DEM ARD (Alternate: (804) 674-2400, ask for EOC Duty Officer)

2) Read entire Attachment 2

3) Record date/time transmittal to State EOC complete

b) Call each local EOC and read Items 1 through 9:

Surry	(757) 294-5264
James City	(757) 566-0112
Isle of Wight	(757) 357-2151 (local) (757) 357-3191 (local)
Williamsburg	(757) 220-2331
Newport News	(757) 247-2578
York	(757) 890-3603

c) Record date/time transmittal of Items 1 through 9 complete

_____ 12 NOTIFY SEM/RM TRANSMITTAL WAS SENT

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 13	KEEP ATTACHMENT 2 WITH THIS PROCEDURE	
_____ 14	CHECK IF ITEM 11 ON REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS INDICATES REPORT OF RADIOLOGICAL CONDITIONS - REQUIRED	GO TO Step 17.

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- The initial Report of Radiological Conditions must be transmitted to the State EOC (or State representatives in the LEOF/CEOF) as soon as possible following the release of radioactive material.
- Follow-up reports should be issued approximately every 60 minutes or when there are changes in radiological conditions. Time should be measured from time of delivery, time facsimile sent, or time verbal transmittal completed.

_____ 15	GET REPORT OF RADIOLOGICAL CONDITIONS FOR THE STATE:	
	a) Check if either of the following Radiological Status reports available: • MIDAS Radiological Status report OR • EPIP-4.03, DOSE ASSESSMENT TEAM CONTROLLING PROCEDURE, Attachment 1, Radiological Status	a) IF NO Radiological Status report available, THEN do the following: 1) Determine from radiological assessment organization when report will be available. 2) Notify SEM/RM about delay. 3) WHEN Radiological Status report becomes available, THEN continue in this procedure.
	b) Get Radiological Status report from radiological assessment organization	
	c) Check report - COMPLETE	c) IF blank items remain on Radiological Status report, THEN return report to radiological assessment organization for completion.

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 16	SEND REPORT OF RADIOLOGICAL CONDITIONS TO THE STATE:	
	a) Attach Radiological Status report to Attachment 3	
	b) Follow Attachment 3 Part I, Instructions for Virginia Power/Surry Emergency Communicator	
	c) Check Report of Radiological Conditions to the State - SENT VIA FACSIMILE MACHINE	c) IF Radiological Status report communicated verbally or delivered, THEN GO TO Step 16.g.
	d) Allow 5 minutes for State EOC Duty Officer to verify receipt of message	
	e) Check receipt of message - VERIFIED BY STATE EOC DUTY OFFICER	e) IF receipt of message NOT verified, THEN do the following: 1) Call State EOC on DEM ARD (Alternate: (804) 674-2400). 2) Ask State EOC Duty Officer if message received. 3) IF receipt of message verified, THEN GO TO Step 16.f. IF message NOT received, THEN do the following: a) Follow Attachment 3 Part I Item 6 instructions. b) GO TO Step 16.g.
	f) Record Date/Time verified on Attachment 3 Part III Item 1	
	g) Notify SEM/RM transmittal - SENT	
	h) Keep Attachment 3 with this procedure	

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Follow-up reports of emergency conditions must be provided to State and local governments approximately every 60 minutes (from previous message notification start time) or when there are changes in emergency conditions, unless otherwise agreed upon with the State.

_____ 17	CHECK ANY OF THE FOLLOWING MESSAGE UPDATE CONDITIONS - EXISTS: • Status of any of the following Report of Emergency items - CHANGED: • Emergency class (including event termination) • Offsite Assistance Required • Site Evacuation • Prognosis Worsening • Radioactive Release • Protective Action Recommendation OR • Updated Radiological Status report provided by radiological assessment organization OR • Follow-up report due IAW schedule established with State EOC Duty Officer	WHEN Report of Emergency message update conditions satisfied, THEN RETURN TO Step 3. WHEN Report of Radiological Conditions message update conditions satisfied, THEN RETURN TO Step 15. IF termination message has been sent, THEN GO TO Step 27.
_____ 18	RETURN TO APPLICABLE STEP AS INDICATED BELOW:	

Report of Emergency to State and Local Governments	RETURN TO Step 3
Report of Radiological Conditions to the State	RETURN TO Step 15

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

   1) Complete transmittal of current message.

   2) RETURN TO Step 3 to prepare new emergency message.

b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

   - Update current message to include changed condition(s).

   - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- Data may be obtained from meteorological panel charts (via TSC staff communicating with Control Room when ERFCS not available), ERFCS (group reviews or EMCOMM, activated by typing EMCOMM and pressing the gray button labeled LAST), the computer modem or local data logger (described in O-AP-20.03, LOSS OF METEOROLOGICAL MONITORING INSTRUMENTATION).
- Both the ERFCS EMCOMM feature and ERFCS Group Review #39, COMERDS-1, Common ERDS Points, contain meteorological information averaged over the previous 15 minutes. ERFCS Group Review #39 presents averaged ambient temperature in degrees Fahrenheit (°F).

_____ 19	CHECK ON-SITE METEOROLOGICAL INFORMATION - AVAILABLE	IF on-site data NOT available, THEN do the following: a) Get regional information from one of the following: • Company Weather Center: (804) 273-3025. • National Weather Service (NWS): (800) 737-8624. • Have HP initiate EPIP-4.10, DETERMINATION OF X/Q. b) Give meteorological information to requestor. c) RETURN TO procedure step in effect.

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 20 GET ON-SITE METEOROLOGICAL INFORMATION AS REQUESTED:

a) Refer to specified step(s) to acquire requested information:

Temperature	Step 21
Wind Speed	Step 22
Wind Direction	Step 23
Affected Sectors	Steps 23 and 24
Stability Class	Step 25

b) Give meteorological information to requestor

c) RETURN TO procedure step in effect

_____ 21 DETERMINE TEMPERATURE:

a) Get temperature from Main Tower Temperature indicator

b) Use formula below to convert temperature to °F (if needed):
°F = (°C x 1.8) + 32

NOTE: Primary source of wind speed is the Main Tower Lower Level indicator. Alternate sources are (1) Backup Tower, and (2) Main Tower Upper Level.

_____ 22 GET WIND SPEED

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- An approximate average wind direction for the previous 15 minutes should be determined.
- Primary source of wind direction is the Main Tower Lower Level indicator. Alternate sources are (1) Backup Tower, and (2) Main Tower Upper Level.
- Wind direction is always given as the compass point the wind blows from. Example: Wind direction is from East North East (ENE).

_____ 23 GET WIND DIRECTION IN TERMS OF COMPASS POINT WIND BLOWING FROM:

DEGREES	COMPASS POINT	DEGREES	COMPASS POINT	DEGREES	COMPASS POINT
0-11	N	192-214	SSW	350-371	N
12-34	NNE	215-236	SW	372-394	NNE
35-56	NE	237-259	WSW	395-416	NE
57-79	ENE	260-281	W	417-439	ENE
80-101	E	282-304	WNW	440-461	E
102-124	ESE	305-326	NW	461-484	ESE
125-146	SE	327-349	NNW	485-506	SE
147-169	SSE			507-529	SSE
170-191	S			530-540	S

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Affected sectors are recorded using alphabetic designations.

_____ 24 DETERMINE DOWNWIND SECTORS:

COMPASS POINT	DOWNWIND SECTORS	COMPASS POINT	DOWNWIND SECTORS
N	H - J - K	S	R - A - B
NNE	J - K - L	SSW	A - B - C
NE	K - L - M	SW	B - C - D
ENE	L - M - N	WSW	C - D - E
E	M - N - P	W	D - E - F
ESE	N - P - Q	WNW	E - F - G
SE	P - Q - R	NW	F - G - H
SSE	Q - R - A	NNW	G - H - J

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- Main Tower Delta T is the preferred source of stability class. Sigma Theta (Backup Tower) is the secondary source.
- The value closer to "G" should be used if unable to distinguish Delta T or Sigma Theta value.
- Numerical ranges presented below for Delta T and Sigma Theta are less than the range of the chart recorder and indicator in the Control Room. Indications are not expected to read outside the ranges found on these tables.

_____ 25 DETERMINE STABILITY CLASS:

MAIN TOWER DELTA T			BACKUP TOWER SIGMA THETA		
DELTA T (°C)	STABILITY CLASS		SIGMA THETA (°)	STABILITY CLASS	
≤ -0.67	=	A	≥ 22.5	=	A
-0.66 to -0.60	=	B	22.4 to 17.5	=	B
-0.59 to -0.53	=	C	17.4 to 12.5	=	C
-0.52 to -0.18	=	D	12.4 to 7.5	=	D
-0.17 to +0.53	=	E	7.4 to 3.8	=	E
+0.54 to +1.41	=	F	3.7 to 2.1	=	F
> +1.41	=	G	< 2.1	=	G

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE: Responsibilities may be transferred to relief within a facility or to another facility, e.g., Control Room to TSC, Control Room to LEOF or CEOF, or TSC to LEOF or CEOF.	
_____ 26	TRANSFER RESPONSIBILITY FOR STATE/LOCAL NOTIFICATIONS:	
	a) Notify SEM (or RM if in LEOF/CEOF)	
	b) Tell relief Emergency Communicator about current event status	
	c) Review most recently completed Attachments 2 and 3 with relief	
	d) Tell relief Emergency Communicator when next notification is due	
	e) Provide this procedure and all attachments or send copies of attachments to relief	
	f) Have relief/turnover recorded in event log	
	g) Check - INTERFACILITY TURNOVER HAS BEEN COMPLETED	g) RETURN TO step in effect prior to relief.

CONTINUOUS ACTION PAGE FOR EPIP-2.01

1. REPORT OF EMERGENCY CONDITION CHANGE CRITERIA

   WHEN emergency conditions change (e.g., classification, event termination, offsite assistance, site evacuation, worsening prognosis, release of radioactive material, Protective Action Recommendation), THEN do one of the following:

   a. IF preparation of a new/revised message will prevent timely transmittal of an initial message reporting an emergency class (i.e., within 15 minutes of classification), THEN do the following:

      1) Complete transmittal of current message.

      2) RETURN TO Step 3 to prepare new emergency message.

   b. IF new/revised message can be prepared without delaying timely transmittal of an initial message reporting an emergency class, THEN do one the following:

      - Update current message to include changed condition(s).

      - RETURN TO Step 3 to prepare new emergency message.

2. REPORT OF EMERGENCY UPDATE CRITERIA

   WHEN scheduled Report of Emergency to State and Local Governments - DUE, THEN RETURN TO Step 3 to prepare new emergency message.

NOTE: Transmittal of a Report of Emergency to State and Local Governments takes precedence over preparing a new radiological status message, responding to requests for meteorological information and turning-over duties to relief.

3. REPORT OF RADIOLOGICAL STATUS CONDITION CHANGE CRITERIA

   WHEN updated Radiological Status report provided by radiological assessment organization, THEN RETURN TO Step 15 to prepare new radiological status message.

4. METEOROLOGICAL INFORMATION REQUEST CRITERIA

   IF requested to acquire on-site meteorological information, THEN GO TO Step 19.

5. SHIFT RELIEF OR INTERFACILITY TURNOVER CRITERIA

   WHEN shift relief or interfacility turnover occurs, THEN GO TO Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 27	TERMINATE PROCEDURE: • Give EPIP-2.01, forms and other applicable records to the Control Room STA (TSC Emergency Procedures Coordinator or EOF Services Coordinator) • Completed by: _____ Date: _____ Time: _____ -END-	

Form Field	Instructions for Preparing Form:
Approval (SEM or RM)	Leave blank. (The Station Emergency Manager (SEM) or Recovery Manager (RM) signs/initials this space after message is drafted.)
Message #	Record sequential message number on pages 1 and 2. A single numbering sequence is used for Reports of Emergency to State and Local Governments (Attachment 2) from the initial classification until the Emergency Plan is exited. The numbering sequence for Reports of Radiological Conditions to the State (Attachment 3) is separate.
Notification Start Time	Leave blank. (Enter notification start time when beginning transmittal of the approved message.)
Location	Check off facility from which notification will be made.
Roll Call	Leave blank. (Check off recipients of the emergency message when they answer the roll call.)

NOTE:
- **Information to complete Items 1-2 and 4-7 obtained from SEM/RM.**
- **Items 4, 5, 6, 7 and/or 8 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.'**
- **Inclusion of optional items, e.g., Item 6, Evacuation of onsite personnel, should be condsidered when it can result in avoiding an immediate follow-up message.**

Item 1 **Emergency Class.**

IF message initial or follow-up report, THEN do the following:

a. Check block for highest applicable emergency class.

b. Enter time (0001-2400) and date of declaration.

IF initial message is also a termination report, THEN record time of termination in Item 3.

IF message emergency termination report, THEN do the following:

a. Check Emergency Terminated block.

b. Complete Items 2, 3 and 9.

Form Field	Instructions for Preparing Form:
Item 2	**Release of radioactive material.** The SEM/RM determines whether a release of radioactive material is occurring, has occurred, has occurred and has been terminated, or is projected to occur based on plant indications and/or consultation with the RAD/RAC. For the purposes of emergency messages, release refers to a radiological release attributable to the emergency event.
Item 3	**Remarks / Description of event.** Write Remarks / Description of event in plain language. Avoid technical jargon, abbreviations and acronyms. Explain any change in the prognosis of situation (Item 7) reported in the previous message. IF Item 2 indicated a radiological release is occurring or has occurred, THEN remarks should be entered placing the release in context, e.g., release is estimated to be confined to the site, release estimated to be within normal plant limits, site boundary dose rates are below offsite protective action levels. Avoid repeating Remarks / Description of event from the previous message. The description should describe current conditions at the time the report approved by the SEM/RM.
Item 4	**Assistance requested.** [ ] Excluded from this message may be checked for the initial report of an emergency class and termination reports only. This item documents requests that have been made for on-site assistance from off-site organizations such as from fire departments, rescue squads or law enforcement agencies, including local law enforcement, Virginia State Police, Federal Bureau of Investigation, etc.). This item is NOT for requesting assistance. A check block for other off-site organizations and space to record a description of the off-site organization is provided, e.g., U.S. Department of Energy. Continue to record requests for assistance until the request has been canceled or off-site assistance has been released. For an ambulance, continue to record request for assistance until the ambulance has been released from the hospital.

Form Field	Instructions for Preparing Form:
Item 5	**Emergency Response Actions Underway.** [ ] Excluded from this message may be checked for the initial report of an emergency class and termination reports only. Check blocks are provided for the following: [ ] Station monitoring teams dispatched offsite (teams may be dispatched for any emergency classification, but dispatch is generally required at the Site Area Emergency and General Emergency classifications) [ ] Station emergency personnel called in (unless special circumstances are involved, station emergency personnel are called-in at an Alert or higher emergency class, but may be called-in for a Notification of Unusual Event) [ ] Other (examples of other emergency response actions include dispatch of damage control teams, relocation of personnel from selected areas, etc.)
Item 6	**Evacuation of onsite personnel.** [ ] Excluded from this message may be checked for the initial report of an emergency class and termination reports only. The Remote Assembly Area is selected in accordance with EPIP-5.05, SITE EVACUATION. An "Other" check block is provided in case personnel are evacuated to different location, e.g., local evacuation assembly center. Early release of personnel, i.e., non-essential personnel are sent home early, is reported in Item 3, Remarks / Description of event. Continue to record evacuation of onsite personnel until evacuated personnel released from the applicable Remote Assembly Area.

Form Field	Instructions for Preparing Form:

NOTE: Changes in the prognosis of situation should be explained in Item 3, Remarks / Description of event.

Item 7 **Prognosis of situation.**

[ ] Excluded from this message may be checked for the initial report of an emergency class and termination reports only.

The "Other" check block can be used to provide an indication of anticipated event termination, e.g., emergency will be terminated when unit reaches cold shutdown at or about 1700 hours.

Item 8 **Meteorological data.**

[ ] Excluded from this message may be checked for the initial report of an emergency class and termination reports only.

[ ] Not available may be checked when waiting for meteorological information will delay transmission of a message. Efforts to obtain meteorological data from alternative sources should not delay sending emergency messages.

Check [ ] Based on onsite measurements when meteorological information is acquired from onsite instruments.

Onsite measurements may be acquired from any of the following:

- ERFCS EMCOMM feature (15-minute average) (activated by typing EMCOMM and pressing the gray button labeled LAST)
- ERFCS Group Review #39, COMERDS-1, Common ERDS Points (15-minute average)
- Control Room meteorological panel charts (approximate average for previous 15 minutes) (communicate with Control Room staff when ERFCS not available in other facilities)
- 0-AP-20.03, LOSS OF METEOROLOGICAL MONITORING INFORMATION.

[Instructions for Item 8, Meteorological data, continued on following page.]

Form Field	Instructions for Preparing Form:
Item 8 [continued]	**Meteorological data.**

Multiple indications of wind direction and wind speed are available. The priority for using these indications is:

1 Main Tower Lower Level

2 Backup Tower

3 Main Tower Upper Level

Check [ ] Based on offsite regional data when onsite measurements are NOT available. Regional wind speed and wind direction data may be obtained from the following in the order indicated:

1 Company Weather Center, (804) 273-3025

2 National Weather Service (NWS), (800) 737-8624

Use the following table to convert indicated degree reading to compass point wind blowing from.

DEGREES	COMPASS POINT
0-11 or 350-371	N (NORTH)
12-34 or 372-394	NNE (NORTH NORTHEAST)
35-56 or 395-416	NE (NORTHEAST)
57-79 or 417-439	ENE (EAST NORTHEAST)
80-101 or 440-461	E (EAST)
102-124 or 462-484	ESE (EAST SOUTHEAST)
125-146 or 485-506	SE (SOUTHEAST)
147-169 or 507-529	SSE (SOUTH SOUTHEAST)
170-191 or 530-540	S (SOUTH)
192-214	SSW (SOUTH SOUTHWEST)
215-236	SW (SOUTHWEST)
237-259	WSW (WEST SOUTHWEST)
260-281	W (WEST)
282-304	WNW (WEST NORTHWEST)
305-326	NW (NORTHWEST)
327-349	NNW (NORTH NORTHWEST)

Record wind direction in compass point wind is blowing from.

Record wind speed.

Form Field	Instructions for Preparing Form:
Item 9	**Emergency Communicator identification.** Enter name of Emergency Communicator.
Roll Call	Leave blank. (Check off recipients of the emergency message when they answer the roll call.)
Message Close-Out	Leave blank. (Check off facility from which notification was made and enter date/time after transmitting Items 1-9.)
Item 10	**Recommended offsite protective actions.** IF Item 1 indicates the emergency class is a Notification of Unusual Event, Alert or Site Area Emergency, THEN check [ ] None. IF Item 1 indicates the emergency class is a General Emergency, THEN copy recommended offsite protective action from EPIP-1.06, PROTECTIVE ACTION RECOMMENDATION, Attachment 3, in Item 10.
Item 11	**Report of Radiological Conditions.** IF Item 2 indicates a release of radioactive material has NOT occurred and is NOT projected, THEN check [ ] We will not issue a Report of Radiological Conditions. IF a Report of Radiological Conditions is required AND all the following conditions are met: • LEOF (or CEOF) - RESPONSIBLE FOR STATE NOTIFICATIONS • Department of Emergency Management - PRESENT • Department of Health (Radiological Health Programs) representative - PRESENT THEN check [ ] We will provide the Report of Radiological Conditions to the State representatives in the LEOF (CEOF). IF a Report of Radiological Conditions is required AND has to be transmitted to the State EOC, THEN check [ ] We will transmit a Report of Radiological Conditions to the State EOC.

Form Field	Instructions for Preparing Form:
Item 12	**Update schedule and name of State EOC Duty Officer.** Leave blank. (Update schedule and identification of State EOC Duty Officer is determined in consultation with the State EOC Duty Officer after message is transmitted.)
Message Close-Out	Leave blank. (Check off facility from which notification was made and enter date/time after transmitting Items 10-12.)

APPROVAL: (SEM or RM): _____: MESSAGE # _____: TIME NOTIFICATION STARTED: _____

This is Surry Power Station [] 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
[] Alert [] General Emergency

Declared at _____ on _____
(24-hr time) (date)

[] Emergency Terminated

Item 2: Release of radioactive material:
[] Has NOT occurred and is NOT projected [] Is presently occurring
[] Has occurred and is now terminated [] Is projected to occur

Item 3: Remarks / Description of event: _____

NOTE: Items 4 - 8 may be excluded from initial message reporting any emergency class (including termination).

Item 4: Assistance requested: [] Excluded from this message
[] None
____ (#) Fire Units from _____
____ (#) Police Units from _____
____ (#) Rescue Units from _____
[] Other _____

Item 5: Emergency response actions underway: [] Excluded from this message
[] None
[] Station monitoring teams dispatched offsite
[] Station emergency personnel called in
[] Other _____

Item 6: Evacuation of onsite personnel: [] Excluded from this message
[] No
[] Yes, evacuated to: [] Primary Remote Assembly Area
[] Secondary Remote Assembly Area
[] Other _____

(ATTACHMENT 2 CONTINUED ON NEXT PAGE)

MESSAGE # _____

Item 7: Prognosis of situation: [] Excluded from this message
[] Improving [] Stable
[] Worsening [] Other _____

Item 8: Meteorological data is: [] Excluded from this message
[] Based on onsite measurements; [] Based on offsite regional data;
[] Wind direction is from the _____; [] Wind speed is _____ mph
[] Not available

Item 9: 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 [] Control Room [] TSC [] LEOF [] CEOF out at _____ on _____.
(24-hr time) (date)

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

This is Surry Power Station [] Control Room [] TSC [] LEOF [] CEOF. Continuing the emergency message:

Item 10: Recommended offsite protective actions are:

[] None

[] Standard: Evacuate 360° from 0 miles to 5 miles.

[] Expanded:
[] Evacuate 360° from 0 miles to 5 miles.
[] Evacuate 360° from 5 miles to ____ miles.
[] Evacuate sectors ____ ____ ____ from ____ miles to ____ miles.
[] Shelter 360° from ____ miles to ____ miles.
[] Shelter sectors ____ ____ ____ from ____ miles to ____ miles.
[] Shelter unaffected sectors from ____ miles to ____ miles.

Item 11: [] We will transmit a Report of Radiological Conditions to the State EOC.
[] We will provide the Report of Radiological Conditions to the State representatives in the LEOF (CEOF).
[] We will not issue a Report of Radiological Conditions.

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

Name of State EOC Duty Officer: _____.

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

PART I. Instructions for Surry Emergency Communicator:

1. Check name of facility: [ ] Control Room [ ] TSC [ ] Local EOF [ ] Central EOF

2. Record Message #: ___ Communicator's name: _____ Call-back #: (___) ___-_____

3. Check which report is attached and record the report number and run time (as appropriate):

   _____ MIDAS Radiological Status computer printout (2 pages) Report # _____ Run Time _____
   _____ Radiological Status attachment from EPIP-4.03 (1 page) Report # _____

4. Have Station Emergency Manager (SEM) / Recovery Manager (RM) approve transmittal:

   APPROVED FOR TRANSMITTAL: _____ (SEM / RM initials) DATE: ___/___/___ TIME: ___:___

5. IF report can be delivered to both VDES AND VDH staff in EOF, THEN GO TO PART I, ITEM 6.
   IF report will be sent by facsimile, THEN notify State EOC Report of Radiological Conditions will be sent by facsimile (Use DEM ARD or (804) 674-2400) and request receipt confirmation.

6. Deliver report to both VDEM AND VDH staff in EOF:
   a. Date/Time Message Delivered to VDEM Representative in Local/Central EOF: ___/___/___ ___:___
   b. Date/Time Message Delivered to VDH Representative in Local/Central EOF: ___/___/___ ___:___
   c. Record N/A by Part II and Part III below.

   IF report will be sent by facsimile, THEN ask facsimile machine operator to transmit this message.

   IF transmittal of report by facsimile NOT achieveable, THEN do the following:
   a. Notify State EOC using DEM ARD or call (804) 674-2400
   b. Identify yourself and your location
   c. Ask EOC Duty Officer to use a Report of Radiological Conditions form to copy message
   d. Read the attached report
   e. Record when message transmittal completed: Date/Time Message Completed: ___/___/___ ___:___
   f. Record N/A by Part II and Part III below.

PART II. Instructions for Facsimile Machine Operator:

1. Record Facsimile Operator's name : _____ Date/Time Sent: ___/___/___ ___:___

2. Transmit this message to State EOC facsimile machine (804) 674-2419.
   IF facsimile transmission NOT successful, THEN RETURN message to Emergency Communicator.

3. Return original report to State and Local Emergency Communicator.

PART III. Instructions for State EOC Duty Officer:

1. Notify Surry Emergency Communicator report received. Date/Time Verified: ___/___/___ ___:___
   (Use DEM ARD or see PART I, Item 2 above for call-back number). Receipt Verification

2. Forward message to EOC Operations Officer for distribution to State Radiological Health Programs and Information & Planning representatives.

CROSSTIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2)
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	09/23/90		
02	1	09/17/91	Procedure revision. Enhanced cues and clarification of step 6 that both 1J1-2E & 2W must both be stripped.	
03	2	07/27/92	Editorial/formatting changes.	
04	3	05/28/93	Emergency Procedure revision. Corrected cues for attempts at local closure.	S93-0598
05	4	09/08/93	Rev. 7 formatting changes.	
06	5	09/21/93	Reflect ECA-0.1, Attachment 1 Rev. 7 changes to cue.	S93-0850
07	6	08/22/94	Reflect local pistol grip out of closing circuit when 15H1/25H1 racked to connect.	S94-0808
08	7	11/15/94	Current revision of ECA-0.1 and FCA-12.00.	S94-1052
09	8	08/09/96	KA number and procedure changes; component label verification.	S96-0207
10	9	03/23/98	Delete JPM # from trainee handouts.	S98-0286
11	10	12/09/98	Convert to Word.	S98-0936
12	11	01/11/99	Update for Rev. 10 of ECA-0.1.	S98-0975
13	12	09/14/99	1999 Op Eval.	S99-0555
14	13	01/11/00	Rev 11, ECA-0.1	S99-0875

CROSSTIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2)
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
15	14	03/01/02		S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 35.03 (Rev 14)

Operator _____ Evaluator _____

Observer _____ Evaluation Date _____

Task

CROSSTIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2).

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	15 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
APE056.AA1.02 (RO 3.8/SRO 4.1)	NLO

Conditions

- Task is to be SIMULATED in the plant.
- A simulated loss of all on- and off-site power (blackout) has previously occurred on Unit 1. The #1 EDG has been restored and bus 1H is energized (1J & 2J buses are dead). ECA-0.1 is in progress at step 3 to establish IA.

Standards

- 1-ECA-0.1, Attachment 2.

Initiating Cues

- 1-ECA-0.1, Attachment 1, step 3.
- Shift Supervisor direction.

Terminating Cues

- Completion of Attachment 2, part 2, step 6.

Procedures

- 1-ECA-0.1, Loss of All AC Power Recovery Without SI Required, Attachment 2.

Tools and Equipment

- Breaker racking tool

Safety Considerations

- Standard Personal Safety Equipment

Performance Checklist

Directions to the Operator.

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are recovering from a loss of all AC power. Currently, both 1H and 2H emergency buses are energized, however, both unit J buses are deenergized.
- Here is 1-ECA-0.1, Attachment 2. I need you to crosstie Unit 1 emergency buses by performing all of Part 1 and Part 2 through step 6.
- When you finish the actions necessary to accomplish this, please inform me so that the Turbine Building Operator can line up fire water cooling and start the IA compressor.

Notes to the Evaluator.

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 1, 4, 7, 8, and 11 before 13.
- **START TIME:** _____

---

* 1. LOCKOUT THE 1J BUS EQUIPMENT POSSIBLE FROM THE MAIN CONTROL ROOM. ***(Step 1 and 2)***

Standards

Places the following controls in the PTL (or lockout) position:

*(a) 1-VS-F-58B
*(b) 1-FW-P-3B
(c) 1-CH-P-1C (Alternate supply)
*(d) 1-CH-P-1B
*(e) Unit 1 PRZR heater group "A" (lockout)
*(f) 1-CS-P-1B
*(g) 1-RS-P-2B
*(h) 1-RS-P-1B
*(i) 1-SI-P-1B
*(j) 15J3 (#3 EDG supply to Unit 1)
*(k) 1-VS-F-1B
(l) 15H1 (Bus Tie)

CUES

- When each switch is placed in PTL, all lights extinguish.
- **If asked:** The power supply indicator for 1-VS-F-58B indicates it is powered from the 2H bus.

Evaluator's Note

- 1-VS-F-58B normal power supply is from 2H - this substep is only critical if 1-VS-F-58B is powered from its alternate power supply.
- 1-CH-P-1C (ALT) and breaker 15H1 are normally maintained in PTL.

Evaluator's Comments

---

2. LOCALLY VERIFY THE "B" CONTAINMENT SPRAY PUMP BREAKER (1-CS-P-1B) OPEN. ***(Step 3)***

Standards

(a) Proceeds to 480v breaker 14J-5.
(b) Verifies breaker indicates OPEN by observing the breaker mechanical indicating flag.

CUES

- **If asked:** 14J-5 breaker mechanical indicator flag shows OPEN.

Evaluator's Comments

---

3. LOCALLY VERIFY THE "B" RECIRC SPRAY PUMP BREAKER (1-RS-P-1B) OPEN. ***(Step 3)***

Standards

(a) Proceeds to 480v breaker 14J-4.
(b) Verifies breaker indicates OPEN by observing the breaker mechanical indicating flag.

CUES

- **If asked:** 14J-4 breaker mechanical indicator flag shows OPEN.

Evaluator's Comments

---

* 4. LOCALLY OPEN THE SUPPLY BREAKER FOR MCC 1J1-1. ***(Step 3)***

Standards

Proceeds to 480v breaker 14J1-6 (MCC 1J1-1 FDR BKR) and opens the breaker by depressing the breaker TRIP pushbutton.

CUES

- **If asked:** Breaker mechanical indicator flag shows CLOSED before trip.
- **Tell operator:** (When breaker trip button pressed), a "bang" breaker operating noise is heard.
- **If asked:** Breaker mechanical indicator flag shows green flag following trip.

Evaluator's Comments

---

5. LOCALLY VERIFY 1-FW-P-3B BREAKER OPEN. ***(Step 3)***

Standards

(a) Proceeds to 4160V breaker 15J4.
(b) Verifies breaker 15J4 indicates open by observing breaker indicating lights and/or breaker mechanical indicator flag.

Evaluator's Cues

- **If asked**: Bkr mechanical indicator flag shows OPEN.
- **If asked**: Bkr mechanical indicating lights show green and amber lights lit and red light off.

Evaluator's Comments

---

6. LOCALLY VERIFY 1J BUS STUB BUS SEPARATED. ***(Step 3)***

Standards

(a) Proceeds to Unit 1 Emergency Switchgear Room 4160v breaker 15J9.
(b) Verifies breaker 15J9 indicates OPEN by observing breaker indicating lights and/or breaker mechanical indicator flag.

CUES

- **If asked**: 15J9 breaker mechanical indicator flag shows OPEN.
- **If asked**: 15J9 breaker indicating lights show green and amber lights lit and red light off.

Evaluator's Comments

---

* 7. LOCALLY OPEN ALL BREAKERS ON MCC 1J1-2.

Standards

(a) Proceeds to MCC 1J1-2 (Unit 1 Cable Vault).
(b) Records on attachment 1, all breakers found open or tagged-open on MCCs 1J1-2E & 1J1-2W. ***(Step 4)***
*(c) Opens all other breakers on MCCs 1J1-2E & 1J1-2W by rotating handles to the OFF position. ***(Step 5)***

Evaluator's Comments

Do first 2 rows of breaker cabinets; say the rest is done.
If trainee having trouble, let applicant continue.

---

* 8. LOCALLY CLOSE SUPPLY BREAKER FOR 1-IA-C-1 (IA COMPRESSOR). ***(Part 2, Step 1)***

Standards

At MCC 1J1-2, closes breaker 1J1-2E 2A by rotating handle to the ON position.

CUES

- **If asked:** Hear clunk and stays in closed position.

Evaluator's Comments

---

9. LOCALLY VERIFY FUSES INSTALLED IN CROSSTIE BREAKER (15H1). ***(Part 2, Step 2)***

Standards

(a) Proceed to 4160V breaker 15H1.
(b) Verifies the breaker control power fuses are installed.
(c) Verifies breaker trip fuses are installed in fuse socket.

CUES

- **If asked:** Trip and control fuses are already installed properly in fuse sockets.

Evaluator's Comments

Allow applicant to open cabinet to see fuses.

---

10. LOCALLY VERIFY CHARGING SPRING TOGGLE SWITCH FOR 15H1 IS ON. ***(Part 2, Step 3)***

Standards

Observes bottom area of breaker to verify the breaker charging spring toggle switch is in the ON position.

CUES

- **If asked:** Breaker charging spring toggle switch is in the up position.

Evaluator's Comments

10A. TAKE ACTION TO REMOVE RED TAG ON EMERGENCY BUS CROSSTIE BREAKER 15H1.

Standards

Contact Shift Supervisor to have red tag removed.

Evaluator's Comments

---

* 11. LOCALLY RACK-IN THE EMERGENCY BUS CROSSTIE BREAKER (15H1). ***(Part 2, Step 4)***

Standards

Performs the following:
(a) Checks breaker racked to the DISCONNECT position by opening breaker door and observing mechanical position indicator inside cubicle.
(b) Closes breaker door.
(c) Obtains breaker racking tool from storage hanger.
(d) Inserts breaker racking tool into racking mechanism.
(e) Rotates racking screw interlock mechanism clockwise until racking interlock is released.
*(f) Racks breaker to the test and then CONNECT position by turning racking tool in the clockwise direction.
(g) Removes breaker racking tool from racking mechanism.

CUES

- **If asked**: Breaker initially racked to DISCONNECT position.
- **If asked**: No green tags seen; no ground straps installed.
- **If asked**: SS approval for RED tag removal granted.
- **If asked**: When breaker correctly racked, it is in CONNECT position.

Evaluator's Note

0-OCP-EP-200 and/or 0-MOP-EP-200 may be utilized by operator to rack in breaker 15H1.

Evaluator's Comments

---

* 12. LOCALLY PLACE 1-IA-C-1 IN OFF. ***(Part 2, Step 5)***

Standards

Proceeds to Unit 2 Turbine Building Basement and locates 1-IA-C-1 control panel.

*(a) Places 1-IA-C-1 Control Switch in OFF.

CUES

- When switch placed in OFF a click is sensed.

Evaluator's Comments

---

13. INFORM UNIT 1 OPERATOR OF CROSS-CONNECT OF 1H & 1J EMERGENCY BUSES.

Standards

Informs Unit 1 operator of action that will cross-connect the 1H and 1J emergency buses.

Evaluator's Comments

---

* 14. CLOSE EMERGENCY BUS CROSSTIE BREAKER, 15H1. ***(Part 2, Step 6)***

Standards

Proceeds to Emergency Generator No. 1 control panel on MCR and performs the following:

(a) Removes breaker control for 15H1 from PTL.
*(b) Places breaker control for 15H1 to the CLOSED position.
(c) Verifies breaker closes (red light lit).
(d) Checks voltage indicated on 1J bus voltmeter.

CUES

- **If asked**: 15H1 initial indication is green light on & red off.
- **If asked**: After proper closure, 15H1 red light is on and green off.
- **If asked**: 1H & 1J bus voltage indicates 4200 volts.
- **If local closure attempted using the breaker close lever TELL operator: Breaker operating noise heard; it initially indicated red light lit; then breaker operating noise heard again and breaker indication shows green light lit.**
- If local closure attempted using the local control switch, TELL operator that the green light is on and the local indicator indicates open.

Evaluator's Comments

15. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that 1H & 1J emergency buses cross-tied.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary
Job Performance Measure 35.03 (Rev 14)
CROSSTIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2)

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 35.03 (Rev 14)
CROSSTIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2)

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **15 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be SIMULATED in the plant.
- A simulated loss of all on- and off-site power (blackout) has previously occurred on Unit 1. The #1 EDG has been restored and bus 1H is energized (1J & 2J buses are dead). ECA-0.1 is in progress at step 3 to establish IA.

Initiating Cues

- 1-ECA-0.1, Attachment 1, step 3.
- Shift Supervisor direction.

Directions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are recovering from a loss of all AC power. Currently, both 1H and 2H emergency buses are energized, however, both unit J buses are deenergized.
- Here is 1-ECA-0.1, Attachment 2. I need you to crosstie Unit 1 emergency buses by performing all of Part 1 and Part 2 through step 6.
- When you finish the actions necessary to accomplish this, please inform me so that the Turbine Building Operator can line up fire water cooling and start the IA compressor.

VIRGINIA POWER
SURRY POWER STATION

EMERGENCY CONTINGENCY ACTION

NUMBER	PROCEDURE TITLE	REVISION
1-ECA-0.1	LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED (With 3 Attachments)	12
		PAGE 1 of 13

PURPOSE

To provide guidance to use normal operational systems to stabilize plant conditions following restoration of AC emergency power.

ENTRY CONDITIONS

Transition from 1-ECA-0.0, LOSS OF ALL AC POWER.

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: If an SI signal is actuated prior to performing Step 11 of this procedure, it should be reset to permit manual loading of equipment on an AC Emergency Bus.

* *

NOTE: CSF Status Trees should be monitored for information only. FRs should NOT be implemented before completion of Step 11.

1. __CHECK RCP SEAL ISOLATION STATUS:

a) Close RCP seal injection isolation valve: • 1-CH-MOV-1370	a) Locally close needle valves before starting CHG pump: • 1-CH-294 • 1-CH-297 • 1-CH-300
b) Close RCP thermal barrier CC trip valves: • 1-CC-TV-140A • 1-CC-TV-140B	b) Locally close thermal barrier CC isolation valve before starting CC pump: • 1-CC-96

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: The load placed on any EDG should NOT exceed 2750 KW.

* *

2. __MANUALLY LOAD THE FOLLOWING EQUIPMENT ON ENERGIZED AC EMERGENCY BUS:

a) Align and start CHG pump:

1) Check valve alignment: — 1) Manually align valves.

- CHG pump miniflow RECIRC valve(s) - OPEN
- CHG pump suction from RWST MOVs - OPEN
  - 1-CH-MOV-1115B
  - 1-CH-MOV-1115D
- CHG line isolation valves - CLOSED
  - 1-CH-MOV-1289A
  - 1-CH-MOV-1289B
- CHG line isolation valves - CLOSED
  - 1-SI-MOV-1867C
  - 1-SI-MOV-1867D

2) Start one CHG pump

b) Start Safeguards exhaust fan

c) Start at least two CRDM fans

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	__VERIFY INSTRUMENT AIR AVAILABLE BY CHECKING ANNUNCIATOR B-E-6 - NOT LIT	Do the following: a) Initiate Attachment 1. b) GO TO Step 5.
4.	__CROSSTIE TURBINE BLDG IA TO CTMT IAW 1-OP-IA-005 (ZONE 5 KEY REQUIRED)	
5.	__ESTABLISH CHARGING FLOW:	
	a) Close CHG flow control • 1-CH-FCV-1122	
	b) Verify CHG line isolation - OPEN • 1-CH-HCV-1310A	b) Manually open valve.
	c) Open CHG line isolation MOVs • 1-CH-MOV-1289A • 1-CH-MOV-1289B	c) Locally open valve(s).
	d) Verify CHG pump miniflow RECIRC valves - OPEN	d) Manually open valves. <u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> maintain at least 60 gpm CHG line flow <u>AND</u> GO TO Step 6.
	e) Establish at least 40 gpm charging flow using CHG flow control	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6.	__VERIFY SI FLOW NOT REQUIRED:	
	a) RCS subcooling based on CETCs - GREATER THAN 30°F [85°F]	a) GO TO 1-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED.
	b) PRZR level - GREATER THAN 22% [43%]	b) Control CHG flow to maintain PRZR level. <u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> GO TO 1-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED.
7.	__CHECK IF CHG CROSSTIE CAN BE ISOLATED:	
	a) Check Unit 1 CHG pump - RUNNING	a) GO TO Step 8. <u>WHEN</u> Unit 1 CHG pump running, <u>THEN</u> do Steps 7b through 7d.
	b) CHG crosstie - IN SERVICE	b) GO TO Step 8.
	c) Locally close CHG crosstie valves: • 1-CH-728 • 2-CH-447	
	d) Locally open CHG line valve: • 1-CH-304	
8.	__CHECK PRZR LEVEL - GREATER THAN 35% [55%]	Control charging flow to maintain PRZR level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION:
- Alternate water sources for AFW pumps will be necessary if ECST level decreases to less than 20%. (Refer to Attachment 3)
- If SG narrow range level decreases to less than 11% [22%] and AFW flow is less than 350 gpm [450 gpm], the MD AFW pumps should be manually loaded on AC Emergency Bus to supply water to the SGs.

* *

NOTE: If MD AFW pump operation is not required, pump control switches should be maintained in PULL-TO-LOCK to prevent automatic start.

9. __CHECK INTACT SG LEVELS:

a) Any narrow range SG level - GREATER THAN 11% [22%]	a) Maintain AFW greater than 350 gpm [450 gpm] until narrow range level in at least one SG greater than 11% [22%]. IF AFW flow less than 350 gpm [450 gpm], THEN do the following: 1) Establish AFW valve alignment. 2) Start MD AFW pumps.
b) Check emergency buses - BOTH ENERGIZED	b) Locally isolate AFW header on deenergized bus if necessary to control level: • 1-FW-141 for H bus • 1-FW-156 for H bus • 1-FW-171 for H bus OR • 1-FW-140 for J bus • 1-FW-155 for J bus • 1-FW-170 for J bus
c) Control AFW flow to maintain SG narrow range level between 22% and 50%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	__ESTABLISH SG PRESSURE CONTROL:	
	a) Adjust SG PORVs to maintain SG pressure	a) GO TO Step 11.
	b) Locally close steam dump valve(s)	
	c) Locally close MSTV bypass valve(s)	

* *

CAUTION: If an SI signal is actuated during the remainder of this procedure, 1-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, should be performed.

* *

11. __PUT THE FOLLOWING PUMPS IN AUTO ON THE ENERGIZED AC EMERGENCY BUS(ES):

- All but one CHG pump
- LHSI pumps
- CS pumps
- ISRS pumps
- OSRS pumps

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: FRs may now be implemented as necessary.

12. __CHECK CC SYSTEM STATUS:

a) Restore SW to CC HXs IAW 0-AP-12.01, LOSS OF INTAKE CANAL LEVEL, Steps 16 to 23.

b) Establish CC:

1) Locally throttle CC pump discharge valve to approximately 25% open:

- 1-CC-558 for 1-CC-P-1A
- 1-CC-564 for 1-CC-P-1B

2) Locally close stub bus tie breaker

3) Start one CC pump

4) Locally open discharge valve

b) IF a CC pump can NOT be started, THEN attempt to crosstie CC systems.

13. __CHECK PRZR LEVEL - GREATER THAN 35% [55%]

Do the following:

a) Control CHG flow to restore PRZR level.

b) WHEN PRZR level greater than 35% [55%], THEN perform Step 14.

c) GO TO Step 15.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	__ESTABLISH LETDOWN: a) Adjust CHG line flow to establish greater than 40 gpm b) Open letdown line pressure control valve • 1-CH-PCV-1145 c) Verify closed or close letdown orifice isolation valves • 1-CH-HCV-1200A • 1-CH-HCV-1200B • 1-CH-HCV-1200C d) Open letdown isolation valves • 1-CH-TV-1204A • 1-CH-TV-1204B • 1-CH-LCV-1460A • 1-CH-LCV-1460B e) Open letdown orifice isolation valve(s) f) Adjust letdown line pressure control valve to maintain letdown pressure • 1-CH-PCV-1145 g) Adjust NRHX outlet temperature control valve to control letdown temperature, if necessary • 1-CC-TCV-103	Establish excess letdown IAW 1-OP-CH-006, SHIFTING LETDOWN.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15.	__CHECK VCT MAKEUP CONTROLS:	
	a) Verify one BATP operating and aligned to Unit 1	a) Align one BATP IAW 1-OP-CH-010, BAST ALIGNMENTS.
	b) Verify at least one PG pump operating	b) Start PG pump.
	c) Verify Boric Acid and PG flow controls set for one of the following: • Greater than RCS boron concentration OR • 2300 ppm	c) Adjust controls.
	d) Verify makeup set for AUTO control	d) Put in AUTO.
16.	__ALIGN CHG PUMP SUCTION TO VCT:	
	a) Verify VCT level - GREATER THAN 27%	a) GO TO Step 17. WHEN VCT level greater than 34%, THEN do Steps 16b and 16c.
	b) Open CHG pump suction from VCT MOVs: • 1-CH-MOV-1115C • 1-CH-MOV-1115E	b) Locally open valve(s).
	c) Close CHG pump suction from RWST MOVs: • 1-CH-MOV-1115B • 1-CH-MOV-1115D	c) Locally close valve(s).
17.	__CONTROL CHARGING AND LETDOWN FLOW TO MAINTAIN PRZR LEVEL BETWEEN 35% [55%] AND 60%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18.	__ESTABLISH PRZR PRESSURE CONTROL:	
	a) Check letdown - IN SERVICE	a) Use PRZR heaters and one PRZR PORV to maintain RCS pressure. GO TO Step 19.
	b) Use PRZR heaters and auxiliary spray to maintain RCS pressure	
*19.	__VERIFY NATURAL CIRCULATION: • RCS subcooling based on CETCs - GREATER THAN 30°F [85°F] • CETC temperatures - STABLE OR DECREASING • SG Pressures - STABLE OR DECREASING • RCS hot leg wide range temperatures - STABLE OR DECREASING • RCS cold leg wide range temperatures - AT SATURATION TEMPERATURE FOR SG PRESSURE IAW SATURATION CURVE IN CURVE BOOK	Dump more steam from intact SGs.
20.	__CHECK IF SOURCE RANGE DETECTORS SHOULD BE ENERGIZED:	
	a) Check intermediate range flux - LESS THAN $5x10^{-11}$ AMPS	a) GO TO Step 21. <u>WHEN</u> flux less than $5x10^{-11}$ amps, <u>THEN</u> do Steps 20b and 20c.
	b) Verify source range detectors - ENERGIZED	b) Manually energize source range detectors.
	c) Transfer NR-1-45 to source range scale	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21.	__VERIFY ADEQUATE SHUTDOWN MARGIN:	
	a) Determine RCS CSD boron concentration IAW 1-OP-RX-002, SHUTDOWN MARGIN (CALCULATED AT ZERO POWER)	
	b) Have chemists obtain samples: • RCS hot legs • Pressurizer	
	c) Verify shutdown margin - ADEQUATE	c) Borate.
22.	__MAINTAIN STABLE PLANT CONDITIONS: • RCS pressure • PRZR level • RCS temperatures • Intact SG levels	
*23.	__VERIFY SI FLOW NOT REQUIRED:	
	a) RCS subcooling based on CETCs - GREATER THAN 30°F [85°F]	a) GO TO 1-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED.
	b) PRZR level - GREATER THAN 22% [43%]	b) Control CHG flow to maintain PRZR level. <u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> GO TO 1-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED.
24.	__TRY TO RESTORE OFFSITE POWER TO ALL AC EMERGENCY BUSES	Initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25.	__GO TO 1-ES-0.2, NATURAL CIRCULATION COOLDOWN	

- END -

___ 1. IF Unit 2 IA available, THEN crosstie IA from Unit 2 by opening 1-IA-44 and 2-IA-44.

2. IF Unit 2 IA NOT available, THEN do the following:

___ a. Verify or place BC system in service. IF BC NOT available, THEN locally establish fire water cooling to IA compressor IAW the following:

- To align 1-IA-C-1 do the following:

  ___ 1. Open 1-BC-170.

  ___ 2. Open 1-BC-3.

  ___ 3. Close 1-BC-231.

  ___ 4. Close 1-BC-232.

- To align 2-IA-C-1 do the following:

  ___ 1. Open 2-BC-170.

  ___ 2. Open 2-BC-3.

  ___ 3. Close 2-BC-168.

  ___ 4. Close 2-BC-2.

  ___ 5. Open 1-IA-44 and 2-IA-44.

___ b. Cool down IA compressor(s), if necessary.

___ c. Reset the IA compressor(s) high temperature switches, if necessary.

___ d. Locally start at least one IA compressor.

___ 3. IF Unit 2 IA NOT available AND 1J Bus deenergized, THEN initiate Attachment 2 to crosstie Unit 1 Emergency Buses for IA restoration.

PART 1: 1J BUS STRIPPING

__ 1. Put the following control switches in PTL:

__ 1-VS-F-58B
__ 1-FW-P-3B
__ 1-CH-P-1C ALT
__ 1-CH-P-1B
__ PRZR heater group A

__ 1-CS-P-1B
__ 1-RS-P-2B
__ 1-RS-P-1B
__ 1-SI-P-1B

__ 2. Put or verify the following control switches in PTL:

__ EDG 3 Emergency supply to Unit 1 (15J3)
__ 1-VS-F-1B
__ Bus Tie (15H1)

__ 3. Locally open or verify open the following breakers:

__ 1-CS-P-1B (14J-5)
__ 1-RS-P-1B (14J-4)
__ MCC 1J1-1 Supply breaker (14J1-6)
__ 1-FW-P-3B (15J4)
__ Stub bus tie breaker (15J9)

__ 4. List ALL breakers found open or tagged-open on MCC 1J1-2.

_____ _____ _____

_____ _____ _____

_____ _____ _____

__ 5. Locally open ALL other breakers on MCC 1J1-2.

PART 2: POWERING OF IA COMPRESSOR

__ 1. Locally close breaker for 1-IA-C-1 (1J1-2E2A).

__ 2. Locally install or verify installed control power and trip fuses in 15H1.

__ 3. Locally verify charging spring toggle switch for 15H1 is ON.

__ 4. Locally rack emergency bus crosstie breaker 15H1 to CONNECT.

__ 5. Locally place 1-IA-C-1 in OFF.

__ 6. Close 15H1 from the MCR.

__ 7. Locally verify fire water cooling established to 1-IA-C-1.

__ 8. Locally start 1-IA-C-1.

PART 3: RETURN OF 1J BUS TO NORMAL

__ 1. WHEN at least one station service air compressor is restored, THEN put 15H1 in PTL.

__ 2. Locally rack 15H1 to DISCONNECT.

__ 3. Locally close ALL breakers on MCC 1J1-2 opened in Part 1, Step 4. (Breakers listed in Part 1, Step 3 should remain open or tagged-open.)

__ 4. Locally close MCC 1J1-1 supply breaker (14J1-6).

__ 5. Put EDG 3 emergency supply to Unit 1 breaker 15J3 in AFTER TRIP.

__ 6. WHEN power is restored to 1J bus, THEN return components placed in PTL in Parts 1 and 2 Step 1, to service IAW Shift Supervisor direction.

Select one of the following methods to supply suction to AFW pumps.

1. Makeup to 1-CN-TK-1 from 1-CN-TK-2

   To fill the ECST from the 300,000 gallon tank, locally open 1-CN-150.

2. Alignment of AFW Booster Pump(s)

   __ a. Verify 1-CN-TK-3 level greater than 20%.

   __ b. Locally open booster pump discharge to available AFW pump(s):

1-FW-P-2	1-FW-P-3A	1-FW-P-3B
1-FW-283	1-FW-284	1-FW-285

   __ c. Locally verify selected booster pump suction valve open:

1-FW-P-4A	1-FW-P-4B
1-FW-277	1-FW-280

   __ d. Locally open selected booster pump discharge valve:

1-FW-P-4A	1-FW-P-4B
1-FW-279	1-FW-282

   __ e. Locally start aligned booster pump(s).

   __ f. Locally verify AFW pump suction pressure.

   __ g. Locally close AFW pump normal suction valve(s):

1-FW-P-2	1-FW-P-3A	1-FW-P-3B
1-FW-153	1-FW-168	1-FW-183

3. Fire Water Alignment to AFW pumps

__ a. Locally close telltale drain valve, 1-FW-119.

__ b. Locally open fire main isolation valves:

- 1-FW-120
- 1-FW-185

__ c. Locally start diesel driven fire pump.

__ d. Locally open fire water suction valves to available AFW pump(s):

1-FW-P-2	1-FW-P-3A	1-FW-P-3B
1-FW-154	1-FW-169	1-FW-184

__ e. Locally verify AFW pump suction pressure.

__ f. Locally close normal AFW pump suction valves:

1-FW-P-2	1-FW-P-3A	1-FW-P-3B
1-FW-153	1-FW-168	1-FW-183
1-FW-283	1-FW-284	1-FW-285

4. Crosstie from Unit 2

__ a. Consult with Unit 2 SRO.

__ b. Have Unit 2 Operator close AFW MOVs.

- 2-FW-MOV-251A
- 2-FW-MOV-251B
- 2-FW-MOV-251C
- 2-FW-MOV-251D
- 2-FW-MOV-251E
- 2-FW-MOV-251F

__ c. Have Unit 2 Operator open AFW Crosstie MOVs.

- 1-FW-MOV-160A
- 1-FW-MOV-160B

__ d. Have Unit 2 Operator start Unit 2 AFW pump(s).

__ e. Throttle AFW flow to maintain SG level.

Developed for the Surry, March 2002, Initial Examination
Examination Report # 2002-

U.S. Nuclear Regulatory Commission

Region II

In Plant Systems

NRC-IP-JPM-B-2-B

Title:

LOCALLY START THE EMERGENCY SERVICE WATER PUMPS

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 13.02 (Rev 07)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

LOCALLY START THE EMERGENCY SERVICE WATER PUMPS w/ strainer swap required to prevent overtemperature condition on the diesel.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	20 min	

NUREG-1122 Importance Ratings	**Surry Importance Rating**
SYS076.A2.01 (RO 3.5/SRO 3.7)	NLO 3.17

Conditions

- Task is to be SIMULATED in the plant at the Low Level Intake Structure.
- Any plant mode/condition.

Standards

- 1-SW-P-1C running IAW 0-OP-SW-002, delivering flow with engine parameters stable.

Initiating Cues

- AP-12.01, Loss of Intake Canal Level, step 10.
- Shift Supervisor direction to start an Emergency Service Water Pump.

Terminating Cues

- Completion of 0-OP-SW-002, Diesel Driven ESW Pump Operation, step 6.11.17.

Procedures

- 0-OP-SW-002, Diesel Driven ESW Pump Operation.

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Performance Checklist

Directions to the Operator.

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. The plant is currently losing intake canal level.
- You are to locally start the "C" Emergency Service Water pump in accordance with 0-OP-SW-002 and supply Service Water to the Intake Canal.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 15 before 18.
- **START TIME:**

---

1. READ PRECAUTIONS AND LIMITATIONS. ***(Section 4.0)***

   Standards

   Notes all applicable precautions & limitations.

   Evaluator's Comments

---

2. CHECK ESW PUMP 1-SW-P-1C IS NOT STOP LOGGED. ***(step 6.9.1)***

   Standards

   (a) Proceeds to 2B CW pump trash rack.
   (b) Checks 2B CWP intake bay for the presence of stop logs.

   CUES

   - **If asked**: As is.

   Evaluator's Comments

---

3. OPEN THE ESW PUMP HOUSE AIR LOUVERS. ***(step 6.9.2)***

   Standards

   (a) Opens the chain-operated damper located between the "A" & "B" ESW pumps in overhead (1-VS-DMP-102).
   (b) Proceeds to west wall of ESW pump house and opens the 4 dampers by turning the damper handwheels (1-VS-DMP-103, -104, -105 & -106).

   CUES

   - **If asked**: as each is found & properly operated, it opens.

   Evaluator's Comments

---

4. VERIFY DIESEL FUEL OIL TANK (1-SW-TK-1) LEVEL. ***(step 6.9.3)***

Standards

Verifies diesel fuel oil tank level greater than administrative limit of 4350 gallons by pumping up indicator.

CUES

- **If asked**: after pumping up indicator point to a value of 4600 gallons.

Evaluator's Comments
Note: Lever on level indicator must be pumped for accurate reading.

---

5. VERIFY POSITION OF DIESEL SPEED CONTROL LEVER. ***(step 6.9.4)***

Standards

(a) Observes note on Diesel Speed Control Lever location/position.
(b) Proceeds to diesel mounted local control panel (southside on pump).
(c) Checks the speed control lever set at approximately 1/2 to 2/3 full throttle position.

CUES

- **If asked**: speed control lever at the 2/3 (down) full throttle position.

Evaluator's Comments

---

6. VERIFY CLUTCH HANDLE ENGAGED. ***(step 6.9.5)***

Standards

(a) Observes note concerning clutch handle engage position.
(b) Proceeds to clutch housing (on same side of diesel as controls).
(c) Checks clutch handle engaged (lever positioned toward diesel).

CUES

- **If asked**: lever positioned toward diesel.

Evaluator's Comments

---

7. VERIFY ENGINE OIL LEVEL. ***(step 6.9.6)***

Standards

(a) Proceeds to north side of ESW pump diesel.
(b) Checks engine oil level between the full (F) and low (L) marks on the dipstick.

CUES

- **If asked**: oil between full & low marks on dipstick.

Evaluator's Comments

---

8. VERIFY PUMP ANGLE DRIVE OIL LEVEL. ***(step 6.9.7)***

Standards

(a) Proceeds to north side of ESW pump right angle gear drive.
(b) Simulates removing oil fill plug (turns to left to loosen).
(c) Checks pump oil level is between the bottom and 1/4 inch below the bottom of fill hole.
(d) Simulates replacing oil fill plug (turns to right to tighten).

CUES

- **If asked**: oil nearly level with the bottom of fill hole.

Evaluator's Comments
Note: Plug should be hand tight

---

9. VERIFY VENT TRAP VALVE IS OPEN. ***(step 6.9.8)***

Standards

(a) Locates pump vent trap valve, 1-SW-296 (located below right angle gear drive oil fill plug near floor).
(b) Checks 1-SW-296 open.

CUES

- **If asked**: 1-SW-296 as is.

Evaluator's Comments

---

10. VERIFY ESW PUMP AUTOMATIC AIR SHUTOFF IS RESET. ***(step 6.9.9)***

Standards

(a) Refers to Attachment 1.
(b) Proceeds to south side of ESW pp on top of diesel.
(c) Checks cam from SOV side to ensure trip latch engaged in cam tooth.

CUES

- **If asked**: trip latch is as is.

Evaluator's Comments

---

11. VERIFY THE ESW PUMP FUEL OIL VALVES OPEN. ***(step 6.9.10)***

Standards

(a) Verifies 1-SW-288, ESW Pump 1C Fuel Oil Inlet is open.
(b) Verifies 1-SW-289, ESW Pump 1C Fuel Oil Outlet is open.
(c) Verifies 1-SW-290, Fuel Oil Supply Isolation is open.
(d) Verifies 1-SW-292, Fuel Oil Return Isolation is open.

Evaluator's Comments

---

12. VERIFY BREAKER 2G1-1B-1D2 CLOSED. ***(step 6.9.11)***

Standards

Verifies breaker 2G1-1B-1D2 for 1-SW-P-1C Battery Charger Feeder closed. (Located on West wall switchgear)

CUES

- **If asked**: Breaker 2-G1-1B-1D2 indicates as is.

Note: This startup is for emergency conditions. If asked about performance date, refer applicant to initial conditions.
Skip steps 6.9.12 through 6.9.13

Evaluator's Comments

---

13. Verifies Pre-Start Checks Complete ***(step 6.10.1)***

Standards

Verify caution about starting 2-CS-P-1B while 1-SW-P-1C is running. Verify Subsection 5.9, Pre-Start checks for SW-P-1C is complete.

Evaluator's Comments

---

* 14. START ENGINE. ***(step 6.10.2 through 6.10.4)***

Standards

(a) Acknowledges CAUTION about verifying engine oil pressure to prevent engine damage.
*(b) Within 10 to 15 seconds of engine start, verify engine oil pressure is at least 5 psig.
(c) Within 30 to 45 seconds of engine start, verify engine oil pressure is at least 25 psig.
(d) Acknowledges CAUTION that start attempts are limited to four 30 second attempts with a 3 minute wait between attempts.
*(e) At local wall mounted control station, pushes START button and records time pump was started. (West wall start station)
(f) Verifies engine start.

CUES

- If start pushbutton is depressed only momentarily, then tell operator: the engine turns over, but stops.
- If the start pushbutton is maintained in the depressed position for a reasonable but short (< 15 sec.) period of time, then tell operator: engine start noise is heard. Simulate with pen movement engine parameters coming toward normal. Allow rpm to stabilize at 1200.

Evaluator's Comments

---

15. VERIFY THE PUMP VENT TRAP STOPS VENTING. ***(step 6.10.5)***

Standards

(a) Locates pump vent trap valve (1-SW-296, located below right angle gear drive oil fill plug).
(b) Checks pump vent trap stops venting air.

CUES

- **If asked**: no air vent noise heard.

Note: Steps 6.10.6 N/A (no performance data required)

Evaluator's Comments

---

* 16. ADJUST ENGINE SPEED. ***(step 6.10.7)***

Standards

(a) Proceeds to diesel mounted local control panel (southside on pump).
*(b) Slowly moves throttle to full speed position (down).

CUES

- **If asked**: point to 1800 rpm after throttle adjustment. (simulate with pen)

Evaluator's Comments

---

17. VERIFY THAT THER ARE NO FUEL OR LUBE OIL LEAKS. ***(step 6.10.8)***

Standards

Inspects equipment for leakage.

CUES

- **If asked**: no visible leaks exist.

Evaluator's Comments

* 18. MANUALLY CONTROL ENGINE TEMPERATURE ***(step 6.10.9)***

Standards

Throttle 1-SW-5, ESW Pump 1C Engine Clg Outlet, as required to control the engine water temperature between 165°F and 185°F. IF at any time while the engine is running, the cooling water valve is fully open AND the engine water temperature continues to rise, THEN swap the 1-SW-STR-4C, ESW Pump 1C Clg Wtr Str, AND clean the strainer that was in service.

CUES

- **If asked**: Temperature is 180°F and rising.

Evaluator's Comments

Cue that temperature drops as valve is opened, but that it begins to rise again. Continue until valve is fully open or the 1-SW-STR-4C strainer is swapped. If strainer is swapped, allow temperature to be controlled and go to element 20 of JPM. If the strainer is not swapped, then proceed to element 19 of JPM.

* 19. Manually trips Diesel on prior to exceeding 210°F ***(step 6.10.10)***

Standards

IF the engine water temperature can NOT be maintained less than 210°F, THEN immediately trip the ESW Pump Diesel from the 1-SW-PNL-1C, Diesel Control Panel, AND notify the Shift Supervisor.

CUES

If strainer has not been swapped, indicate that temperature is 210°F and rising.
After diesel tripped, indicate that the engine has stopped.

- **If asked**: As Shift Supervisor, indicate that pump is required for current plant conditions and ask what the operator recommends.

Evaluator's Comments
The correct recommendation is to swap strainers and restart the engine.

Allow applicant to restart engine if he swaps strainers prior to start. Successful completion requires either strainer swap before or after high temperature condition. EDG must be running stable with temperature between 165°F and 185°F and pump delivering flow.

NOTE: Engine alarms on High Temp at 205°F. Illuminates light on startup panel. (WEST wall)

---

20. REPORT TO SHIFT SUPERVISOR (EVALUATOR)

Standards

Verbal status report made of task completion.

Evaluator's Comments

Stop Time:

Directions to the Operator.

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. The plant is currently losing intake canal level.
- You are to locally start the "C" Emergency Service Water pump in accordance with 0-OP-SW-002 and supply Service Water to the Intake Canal.
- When you finish the actions necessary to accomplish this, please inform me.

NOTE: The Diesel Speed Control Lever is the rod with the black knob located in the slot on the left side of the Engine Panel.

The full throttle position of the Diesel Speed Control Lever is down.

The minimum throttle position of the Diesel Speed Control Lever is up.

✓ 6.9.4 Verify or place the Diesel Speed Control Lever between 1/2 and 2/3 of full throttle position.

ITS OK

NOTE: The engaged position for the clutch handle is toward the engine.

✓ 6.9.5 Verify the clutch handle is in the engaged position.

If full towards pump will disengage Diesel

✓ 6.9.6 Verify the engine oil level is between the Full (F) and Low (L) marks.

6.9.7 Check the pump angle drive oil level.

Need wrench

Labeled oil Sample point Gear box.

a. Remove the fill plug.

b. Verify the oil level is between the bottom and 1/4 inch below the bottom of the fill hole.

c. Replace the fill plug and hand tighten.

6.9.8 Verify open 1-SW-296, ESW Pump 1C Vent Trap Isol.

6.9.9 Verify the ESW Pump Automatic Air Shutoff is reset IAW Attachment 1. **(Reference 2.4.5)**

6.9.10 Verify open the following ESW Pump Fuel Oil valves.

a. 1-SW-288, ESW Pump 1C Fuel Oil Inlet

b. 1-SW-289, ESW Pump 1C Fuel Oil Outlet

c. 1-SW-290, Fuel Oil Sup Isol

d. 1-SW-292, Fuel Oil Ret Isol

As indicated

6.9.11 Verify closed breaker 2G1-1B-1D2 for 1-SW-P-1C Battery Charger Fdr.

N/A

NOTE: Steps 6.9.12 through 6.9.13 may be marked as N/A if performance data is not required.

Attachment 4 contains a graphic which may be referred to for identification of the Whitey valves associated with 1-SW-FI-121C.

6.9.12 Isolate 1-SW-FI-121C, ESW Pump 1C Disch Flow Ind, by verifying closed or closing the following valves. **(Reference 2.4.2)**

•1-SW-ICV-3116, ESW Pump 1C Disch FI-121C (H) Isol

•1-SW-ICV-3117, ESW Pump 1C Disch FI-121C (L) Isol

•1-SW-ICV-3118, ESW Pump 1C Disch FI-121C (H) Vent

•1-SW-ICV-3119, ESW Pump 1C Disch FI-121C (L) Vent

•1-SW-ICV-3120, ESW Pump 1C Disch FI-121C Equalizing Valve

•1-SW-ICV-3121, ESW Pump 1C Disch FI-121C (H) Test Conn

•1-SW-ICV-3122, ESW Pump 1C Disch FI-121C (L) Test Conn

_____ NA 6.9.13 Verify closed or close 1-SW-933, 1-SW-FE-121C Drain Isol.

Performed by: _____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

6.10 Starting 1-SW-P-1C

* *

CAUTION: To prevent possible fouling of the ESW suction bowl, 2-CW-P-1B must not be started without prior management approval when 1-SW-P-1C is running.

* *

__✓__ 6.10.1 Verify Subsection 6.9, Pre-Start Checks for 1-SW-P-1C, is complete.

* *

CAUTION: To prevent damage to the starter motor, start attempts are limited to four 30 second attempts with a 3 minute wait between attempts.

* *

* *

CAUTION: To prevent engine damage, adequate oil pressure must be verified
- at 5 psig within 10 to 15 seconds after the engine is started
- at 25 psig within 30 to 45 seconds after the engine is started

* *

______ 6.10.2 At the 1-SW-PNL-1C, Diesel Control Panel, start 1-SW-P-1C AND record the time the pump was started below.

Time __________

__✓__ 6.10.3 Within 10 to 15 seconds of engine start, verify the engine oil pressure is at least 5 psig. Otherwise, immediately trip the ESW Pump Diesel from the 1-SW-PNL-1C, Diesel Control Panel AND notify the Shift Supervisor.

✓ ____ 6.10.4 Within 30 to 45 seconds of engine start, verify the engine oil pressure is at least 25 psig. Otherwise, immediately trip the ESW Pump Diesel from the 1-SW-PNL-1C, Diesel Control Panel AND notify the Shift Supervisor.

✓ ____ 6.10.5 Verify that the pump vent trap stops venting. IF water continues to flow, THEN close 1-SW-296, ESW Pump 1C Vent Trap Isol, AND notify the Shift Supervisor, AND submit a Work Request.

* *

CAUTION: To prevent possible damage to the annubar or SW piping, power insertion of the annubar must be stopped when the stop nuts on the annubar insertion indicating rods approach the annubar housing. Final insertion travel must be performed manually.

* *

NOTE: A ladder may be required for 1-SW-FE-121C access and a 1/8 inch Allen wrench is required if the hand crank will be removed (set screw).

- Full stroke of 1-SW-FE-121C requires approx. 700 turns on the handwheel.
- Attachment 8 contains a graphic showing the 1-SW-FE-121C arrangement.

6.10.6 Insert 1-SW-FE-121C, ESWP 1C Annubar Flow Element, by performing the following steps. IF Performance data is not required; THEN enter N/A for this step and Step 6.10.15 through Step 6.10.19.

N/A ____ a. Open 1-SW-919, ESW Pump 1C Disch FE-121C Retractable Annubar Isol.

____ b. Remove or verify removed the drive mechanism locking pin.

____ c. Using the hand crank, insert 1-SW-FE-121C approximately 10 turns by rotating the hand crank clockwise.

_____ N/A d. IF a drill will be used, THEN loosen the hand crank set screw AND remove the annubar hand crank. Enter N/A if the hand crank was found removed or a drill will not be used.

_____ e. Continue inserting the annubar by rotating the drive mechanism clockwise, using a drill or the hand crank.

* *

CAUTION: Drilling the annubar fully to the stop nuts can damage the annubar actuator assembly.

* *

_____ f. WHEN the stop nuts on the annubar insertion indicating rods approach the annubar housing, THEN stop drill insertion of the annubar AND attach the annubar hand crank AND hand tighten the hand crank set screw. Enter N/A if inserting the annubar manually.

_____ g. Using the hand crank, insert 1-SW-FE-121C until the stop nuts on the annubar insertion indicating rods touch the annubar housing.

_____ h. Insert the drive mechanism locking pin.

NOTE: The target engine speed is the optimum speed at which the pump vibrations are acceptable and the pump flow is satisfactory. This speed differs and is unique for each emergency service water pump.

(what does it idle at?)

_____ 6.10.7 Slowly move the engine throttle down toward the full speed position. (Target engine speed is 1800 rpm.) max 1760

_____ 6.10.8 Verify that there are no fuel or lube oil leaks. IF there are leaks, THEN notify the Shift Supervisor, AND submit a Work Request. **(Reference 2.4.3)**

* *

CAUTION: To prevent leakage of Service Water from the duplex strainers after strainer cleaning is completed, the O-Ring must be verified installed and properly aligned before the strainer is closed.

* *

_____ 6.10.9 Throttle 1-SW-5, ESW Pump 1C Engine Clg Outlet, as required to control the engine water temperature between 165°F and 185°F. IF at any time while the engine is running, the cooling water valve is fully open AND the engine water temperature continues to rise, THEN swap the 1-SW-STR-4C, ESW Pump 1C Clg Wtr Str, AND clean the strainer that was in service.

_____ 6.10.10 IF the engine water temperature can NOT be maintained less than 210°F, THEN immediately trip the ESW Pump Diesel from the 1-SW-PNL-1C, Diesel Control Panel, AND notify the Shift Supervisor.

6.10.11 Vent 1-SW-PI-107C, ESW Pump 1C SW Disch Press Ind, as follows.

_____ a. Remove the cap from the 1-SW-PI-107C vent line.

_____ b. Slowly open 1-SW-808, Emerg SW Diesel 1C Clg Inlet PI-107C Vent, until all air is vented and water issues from the vent. Close 1-SW-808.

_____ c. Replace the cap on the 1-SW-PI-107C vent line.

NOTE: Steps 6.10.12 through 6.10.19 may be marked as N/A if performance data is not required.

_____ 6.10.12 Record discharge pressure as indicated on 1-SW-PI-107C, ESW Pump 1C SW Disch Press Ind.

Discharge Pressure ____________________ psig.

MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	08/03/92		
02	1	07/13/93	Step number change in ECA-1.1.	S93-0857
03	2	08/22/94	Reflect latest revision of OP-CS-004.	S94-0887
04	3	09/16/96	KA number and procedure changes; component label verification.	S96-0252
05	4	03/25/98	Delete JPM # from trainee handouts.	S98-0286
06	5	12/09/98	Convert to Word.	S98-0936
07	6	03/01/02		S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 53.01B (Rev 06)

Operator _____ Evaluator _____

Observer _____ Evaluation Date _____

Task

MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	20 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
SYS006.A2.02 (RO 3.9/SRO 4.3) GEN2.1.20 (RO 4.3/SRO 4.2)	NLO 4.70/RO 4.57/SRO 4.67

Conditions

- Task is to be SIMULATED in the plant.
- A Loss of Emergency Coolant Recirculation has occurred on Unit 2. The RWST level is extremely low and in need of being replenished.

Standards

- 2-OP-CS-004, Refueling Water Storage Tank Makeup.

Initiating Cues

- 2-ECA-1.1, Loss of Emergency Coolant Recirculation, step 4.
- Shift Supervisor direction.

Terminating Cues

- 2-OP-CS-004, Refueling Water Storage Tank Makeup, step 5.2.8 completed.

Procedures

- 2-OP-CS-004, Refueling Water Storage Tank Makeup.

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment
- **ALARA**
- DO NOT enter contaminated areas.

Performance Checklist

Directions to the Operator.

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are currently experiencing a Loss of Emergency Coolant Recirculation on Unit 2. Unit 2's RWST level is extremely low and in need of being replenished.
- Here is a copy of 2-OP-CS-004. I need you to initiate makeup to Unit 2's RWST from the Spent Fuel Pit.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 9 before 10.
- **START TIME:** _____

---

1. REVIEW INITIAL CONDITIONS AND PRECAUTIONS & LIMITATIONS. ***(Section 3 and 4)***

Standards

(a) Checks Initial Conditions satisfied.
(b) Reviews Precautions and Limitations.

CUES

- **If asked:** MCR personnel will track RWST level & inform when desired level is reached.
- **If asked:** An operator has been dispatched to safeguards to control access to the valve pit area.
- **If asked:** Valve pit has been verified free of personnel and HP has been notified to restrict personnel to safeguards until further notice.
- **If asked:** Unit 2 safeguards is in unfiltered mode.

Evaluator's Comments

---

2. NOTIFY STA UNIT 2 RWST WILL BE FILLED. ***(Step 5.2.1)***

Standards

Inform operator that STA has been contacted.

Evaluator's Comments

---

3. VERIFY SFP BORON CONCENTRATION. ***(Step 5.2.2)***

Standards

Verifies that the SFP boron concentration is adequate for RWST addition.

CUES

- **If asked:** SFP boron concentration is 2410 ppm.

Evaluator's Comments

4. VERIFY SFP PURIFICATION SYSTEM IN SERVICE. ***(Step 5.2.3)***

Standards

(a) Proceeds to Fuel Building Basement.
(b) Checks that at least one SFP Cooling Pump (1-FC-P-1A or 1B) is in operation by:
   - checking adequate pump discharge pressure, and
   - local pump control switch indicating lights.
(c) Checks that at least one SFP Purification Pump (1-FC-P-3A or 3B) is operating by:
   - checking adequate pump discharge pressure, and
   - local pump control switch indicating lights.

CUES

- **If asked:** 1-FC-P-1A local control indicating lights indicate RED on & GREEN off. Pump & shaft are rotating. 1-FC-PI-101A reads 34#.
- **If asked:** 1-FC-P-1B local control indicating lights indicate GREEN on & RED off. Pump & shaft are NOT rotating. 1-FC-PI-101B reads 0#.
- **If asked:** 1-FC-P-3A local control indicating lights indicate RED on & GREEN off. Pump & shaft are rotating.
- **If asked:** 1-FC-P-3B local control indicating lights indicate GREEN on & RED off. Pump & shaft are NOT rotating.

Evaluator's Comments

5. STOP SFP SKIMMER PUMP ***(Step 5.2.4)***.

Standards

(a) Determines that the "A" SFP Skimmer pump is in operation by observing local pump indicating lights and pump discharge pressure.
(b) Secures the "A" Skimmer pump by placing the control switch to the OFF position.

CUES

- **If asked:** 1-FC-P-2A local control indicating lights indicate RED on & GREEN off. Pump & shaft are rotating.
- **If asked:** 1-FC-PI-102A reads 22# prior to securing 1-FC-P-2A.
- **If asked:** 1-FC-PI-102A reads 0# after securing 1-FC-P-2A.
- **If asked:** 1-FC-P-2B local control indicating light indicates GREEN on & RED off. Pump & shaft are NOT rotating. 1-FC-PI-102B reads 0#.

Evaluator's Comments

---

6. REQUEST MCR TO STOP OPERATING RWST RECIRC PUMP ***(Step 5.2.5)***.

Standards

(a) Contacts Unit 2 MCR via gai-tronics or telephone.
(b) Requests that the operating RWST recirc pump be secured.

CUES

- **If asked:** RWST recirc pumps are already secured due to low RWST level.

Evaluator's Comments

---

7. VERIFY CLOSED 1-FC-73, UNIT 1 RWST RECIRC PUMPS DISCHARGE ROOT VALVE ***(Step 5.2.6)***.

Standards

(a) Proceeds to 13' Aux Building "IX Alley" area.
(b) Locates 1-FC-73 (on IX Alley on deck).
(c) Verifies 1-FC-73 closed by attempting to turn the handwheel in the clockwise direction.

Evaluator's Comments

Rising stem valve.

---

8. OPEN OR VERIFY OPEN 2-FC-74, UNIT 1 RWST TO FC SUP HDR ISOL ***(Step 5.2.7)***.

Standards

(a) Proceeds to Unit 2 Safeguards basement.
(b) Locates 2-FC-74 above the RS rad monitor house approximately 10' off floor.
(c) Verifies 2-FC-74 open by turning handwheel clockwise to move valve off open seat then counter-clockwise to fully open valve.

Evaluator's Comments

---

* 9. OPEN 2-FC-73 (MANUAL ISOLATION TO/FROM UNIT 2 RWST)(***Step 5.2.8***).

Standards

(a) Proceeds to 13' Aux Bldg "IX Alley" area.
(b) Locates 2-FC-73 (approx mid way down alley on deck).
*(c) Opens 2-FC-73 (by turning handwheel counter-clockwise).

Evaluator's Comments

Rising stem valve.

---

* 10. CLOSE 1-FC-16 (INLET TO THE SPENT FUEL PIT IX) ***(Step 5.2.9)***.

Standards

(a) Locates 1-FC-16 (approx mid way down alley on wall).
*(b) Closes 1-FC-16 (by turning handwheel clockwise).

CUES

- **If asked:** 1-FC-FI-102 indicates 114 gpm prior to closing 1-FC-16.
- **If asked:** 1-FC-FI-102 indicates 0 gpm after closing 1-FC-16.

Evaluator's Comments

---

11. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that RWST makeup initiated.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary
Job Performance Measure 53.01B (Rev 06)
MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT

Surry Power Station
Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 53.01B (Rev 06)
MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **20 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be SIMULATED in the plant.
- A Loss of Emergency Coolant Recirculation has occurred on Unit 2. The RWST level is extremely low and in need of being replenished.

Initiating Cues

- 2-ECA-1.1, Loss of Emergency Coolant Recirculation, step 4.
- Shift Supervisor direction.

Directions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are currently experiencing a Loss of Emergency Coolant Recirculation on Unit 2. Unit 2's RWST level is extremely low and in need of being replenished.
- Here is a copy of 2-OP-CS-004. I need you to initiate makeup to Unit 2's RWST from the Spent Fuel Pit.
- When you finish the actions necessary to accomplish this, please inform me.

VIRGINIA POWER

SURRY POWER STATION

PROCEDURE NO: 2-OP-CS-004	
REVISION NO: 6	
PROCEDURE TYPE: OPERATING PROCEDURE	UNIT NO: 2
PROCEDURE TITLE: REFUELING WATER STORAGE TANK MAKEUP	EFFECTIVE DATE: ON FILE
	EXPIRATION DATE: (Temporary Procedures Only) N/A

REVISION SUMMARY:

Made the following changes in response to DCP 93-040 Rev. 21.

- Added Technical References 2.3.1 and 2.3.6 on Page 4.
- Added new Initial Conditions 3.3 on Page 5.
- Added new Precautions and Limitations 4.3 on Page 5.

Embedded Text

PROCEDURE WRITER: *James P. Winfree*	VALIDATOR: *Ryan Phillips*
APPROVAL: **APPROVAL ON FILE**	DATE:

PROCEDURE USED: ☐ Entirely ☐ Partially **Note:** If used partially, note reason in remarks.

PROBLEMS ENCOUNTERED: ☐ Yes ☐ No **Note:** If yes, note problems in remarks.

REMARKS: _____

SHIFT SUPERVISOR (SIGNATURE):	DATE:

TABLE OF CONTENTS

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1.0 PURPOSE	**3**
2.0 REFERENCES	**3**
3.0 INITIAL CONDITIONS	**5**
4.0 PRECAUTIONS AND LIMITATIONS	**5**
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5.1 Makeup to RWST from the Blender	**6**
5.2 Makeup to RWST from the Spent Fuel Pit	**11**

1.0 PURPOSE

1.1 To provide instructions for makeup to the RWST using the blender or the SFP.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR Section 6.3, Consequence-Limiting Safeguards

2.1.2 UFSAR Section 6.2, Safety Injection System

2.1.3 UFSAR Section 5.2.3, Spray Systems

2.1.4 SDBD-SPS-CS, System Design Basis Document-Surry Power Station Containment Spray System

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specifications Section 3.4.A.3, Spray Systems

2.2.2 Technical Specifications Section 3.3.A.1, Safety Injection System

2.2.3 Technical Specifications Section 3.2.B.1, Chemical Volume and Control System

2.2.4 Technical Specifications Section 3.2.E, Chemical Volume and Control System

2.3 Technical References

2.3.1 0-OP-VS-005, Unit 1 & 2 Safeguard Building Ventilation Systems

2.3.2 11548-FM-084A, Containment Spray System

2.3.3 11548-FM-088B, Chemical Volume and Control System

2.3.4 11448-FM-081A, Fuel Pit Systems

2.3.5 2-CPT-CS-001, Refueling Water Storage Tank Chemistry

2.3.6 DCP 93-040 Rev. 21, BS Water Intrusion and Control/Surry/Units 1 & 2 (Relocation of the RWST overflow/vent header.)

2.4 Commitment Documents

2.4.1 CTS 1126, Technical Specification Change 204, which increased SI Accumulator boron concentration to 2250 ppm

2.4.2 CTS 3523, LER S2 94-003 - Secure and control closure of dilution valves and tracking of the LCO clock following completion of makeup activities while the plant is in CSD/RSD conditions

Init **Verif**

3.0 INITIAL CONDITIONS

_____ 3.1 Verify that there are no personnel at the bottom of the Safeguards Valve Pit.

_____ 3.2 Verify that the Health Physics Supervisor has been notified to restrict all work at the bottom of the Safeguards Valve Pit.

_____ 3.3 Verify in service or put in service Unit 2 Safeguard Building Ventilation System in either the FILTER or UNFILTER mode IAW 0-OP-VS-005, Unit 1 & 2 Safeguard Building Ventilation Systems.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 The RWST temperature is to be maintained less than or equal to 45°F when required by Technical Specifications.

4.2 The RWST overflows to the bottom of the Safeguards Valve Pit. Precaution should be taken not to overflow the RWST.

4.3 During the RWST fill process, the Unit 2 Safeguard Building Ventilation System must be in service.

4.4 The Refueling Water Storage Tank shall contain not less than 387,100 gallons of borated water at a maximum temperature of 45°F with a boron concentration of at least 2300 ppm and not greater than 2500 ppm when required by Technical Specifications.

4.5 During Refueling or Cold Shutdown conditions, the PG to blender isolation valve(s) shall be locked, sealed, or otherwise secured in the closed position or must be locked, sealed, or otherwise secured in the closed position within 15 minutes following planned dilution or makeup activities. **(Ref. 2.4.2)**

4.6 Boron injection flowpaths should be reviewed before Section 5.1 is performed.

5.0 INSTRUCTIONS

5.1 Makeup to RWST from the Blender

_____ 5.1.1 Notify the STA that Unit 2 RWST will be filled.

_____ 5.1.2 Verify that the VCT is at desired level and that the blender is not needed for normal makeup to the VCT.

_____ 5.1.3 Verify emergency borate flowpath is available. IF NOT available, THEN review Tech. Spec. 3.2.C.1.

_____ 5.1.4 Verify that the blender is not needed for normal boric acid control of the Reactor Coolant System.

_____ 5.1.5 Record the following blender setpoints for a return to service reference.
BA FLOW CONTR _____ PRI WTR FLOW CONTR _____

_____ 5.1.6 Place the MAKE-UP MODE CONTR switch to STOP to prevent automatic actuation of blender.

5.1.7 Place or verify the control switch for the following valves in CLOSE.

_____ a. 2-CH-FCV-2113A, BORIC ACID TO BLENDER

_____ b. 2-CH-FCV-2113B, BLENDER TO CHG PUMP

_____ c. 2-CH-FCV-2114B, BLENDER TO VCT

_____ 5.1.8 Open or verify open 2-CH-208, Boric Acid Blender 2 Outlet Isol.

_____ 5.1.9 Open or verify open 2-CH-210, Boric Acid Blender 2 Outlet Hdr Isol.

_____ 5.1.10 Open or verify open 2-CH-378, Boric Acid Blender 2 Outlet Hdr Isol.

_____ 5.1.11 Close or verify closed 2-FC-71, No 2 Refueling Water Storage Tk Ret Isol.

_____ 5.1.12 Set the BA SUP BATCH INTEGRATOR and the PRI WTR BATCH INTEGRATOR for the required amount of makeup. IF the integrators will NOT be used, THEN enter N/A.

_____ 5.1.13 Set the BA FLOW CONTR and the PRI WTR FLOW CONTR for the required concentration of makeup.

_____ 5.1.14 Place the MAKE-UP MODE SEL switch to the MANUAL position.

NOTE: During CSD or RSD conditions, the PG to Makeup system isolation valves shall be locked, sealed, or otherwise secured in the closed position except for planned boron dilution or makeup activities. **(Ref. 2.4.2)**

_____ 5.1.15 IF the unit is in CSD or RSD conditions, THEN line up the PG to Makeup system isolation valves in accordance with the following substeps. IF [redacted]it is NOT in CSD or RSD conditions, THEN enter N/A to the following substeps.

_____ a. Notify the Shift Supervisor that the PG to Makeup system isolation valves will be opened for a planned boron dilution or makeup activity.

_____ b. Brief the operator who will be operating the PG to Makeup system isolation valves, that the valves must be closed within 15 minutes of completing the boron dilution or makeup activity.

_____ c. Verify communications are established between the operator locally at the PG to Makeup system isolation valves and the MCR.

d. Verify open or open the following PG to Makeup system isolation valves, and record the time the valves are opened in the Unit 2 Narrative Log.

_____ • 2-CH-212, Boric Acid Blender FCV-2114A Inlet

_____ • 2-CH-223, Boric Acid Blender Inlet FIT-2114 Inlet

_____ 5.1.16 Place the control switch for 2-CH-FCV-2113A, BORIC ACID TO BLENDER, to AUTO.

_____ 5.1.17 Start the makeup by placing the MAKE-UP MODE CONTR switch to the START position.

NOTE: During CSD or RSD conditions, the PG to Makeup system isolation valves shall be locked, sealed, or otherwise secured in the closed position within 15 minutes of completion of a planned boron dilution or a makeup activity. **(Ref. 2.4.2)**

5.1.18 WHEN the required makeup is complete, THEN perform all of the following.

_____ a. Place the MAKE-UP MODE CONTR switch to the STOP position.

_____ b. Set the BA FLOW CONTR and the PRI WTR FLOW CONTR to the setpoints that were recorded in Step 5.1.5.

_____ c. Place the MAKE-UP MODE CONTR switch to the START position and makeup approximately 200 gallons to verify removal of high concentration borated water from the makeup line.

_____ d. Place the MAKE-UP MODE CONTR switch to the STOP position.

_____ e. Place the control switch for 2-CH-FCV-2113A, BORIC ACID TO BLENDER, to CLOSE.

5.1.19 IF the unit is in CSD or RSD conditions, THEN close the PG to Makeup system isolation valves in accordance with the following substeps. IF the unit is NOT in CSD or RSD conditions, THEN enter N/A to the following substeps. **(Ref. 2.4.2)**

_____ a. Start a 15 minute clock IAW Technical Specification 3.2.E.

_____ b. Record the time in the Unit 2 Narrative Log.

c. Close the following PG to Makeup system isolation valve(s) opened in Step 5.1.15.d. IF one valve is NOT required to be closed, THEN enter N/A for that valve.

_____ _____ • 2-CH-212, Boric Acid Blender FCV-2114A Inlet

_____ _____ • 2-CH-223, Boric Acid Blender Inlet FIT-2114 Inlet

_____ d. Stop the 15 minute Technical Specification clock that was started in Step 5.1.19.a AND record the time in the Unit 2 Narrative Log.

_____ _____ 5.1.20 Close 2-CH-210, Boric Acid Blender 2 Outlet Hdr Isol.

_____ _____ 5.1.21 Close 2-CH-378, Boric Acid Blender 2 Outlet Hdr Isol.

_____ _____ 5.1.22 Close 2-CH-208, Boric Acid Blender Outlet Hdr Isol.

_____ 5.1.23 Place the MAKE-UP MODE SEL switch to the AUTO position.

5.1.24 Place the control switch for the following valves to the AUTO position.

_____ a. 2-CH-FCV-2113B, BLENDER TO CHG PUMP

_____ b. 2-CH-FCV-2114B, BLENDER TO VCT

_____ c. 2-CH-FCV-2113A, BORIC ACID TO BLENDER

_____ 5.1.25 Set the BA SUP BATCH INTEGRATOR and the PRI WTR BATCH INTEGRATOR for normal makeup. IF the integrators will NOT be set, THEN enter N/A.

_____ 5.1.26 Perform a MANUAL blended flow to Charging Pump suction to verify makeup capability. IF the flow path is NOT required, THEN enter N/A.

_____ 5.1.27 Set the blender for AUTO makeup by placing the MAKE-UP MODE CONTR switch to the START position and verifying the red light is LIT. IF the blender is NOT to be set for AUTO control, THEN enter N/A.

_____ 5.1.28 Notify Health Physics that access to the bottom of the Safeguards Valve Pit is no longer restricted.

_____ 5.1.29 Sample the RWST IAW 2-CPT-CS-001, Refueling Water Storage Tank Chemistry. IF a RWST sample is NOT required, THEN enter N/A.

Performed by:			
Signature	Initial	Print	Date
Signature	Initial	Print	Date
Signature	Initial	Print	Date
Signature	Initial	Print	Date

5.2 Makeup to RWST from the Spent Fuel Pit

_____ 5.2.1 Notify the STA that Unit 2 RWST will be filled.

_____ 5.2.2 Verify that the Spent Fuel Pit Boron Concentration is adequate for RWST addition.

_____ 5.2.3 Verify in service or place in service the Spent Fuel Pit Purification system.

_____ 5.2.4 Stop the running Spent Fuel Pit Skimmer Pump. (√)
IF a Spent Fuel Pit Skimmer Pump is NOT in service, THEN enter N/A.

_____ 1-FC-P-2A, Spent Fuel Pit Skimmer Pump 2A

_____ 1-FC-P-2B, Spent Fuel Pit Skimmer Pump 2B

_____ 5.2.5 Verify or place the control switch for each RWST Recirc Pump in OFF. (√).

_____ 2-CS-P-2A, REFUELING WATER RECIRC PUMP

_____ 2-CS-P-2B, REFUELING WATER RECIRC PUMP

_____ 5.2.6 Close or verify closed 1-FC-73, RWST Recirc Pumps Disch Root Valve.

_____ 5.2.7 Open or verify open 2-FC-74, RWST Recirc Pumps Disch Hdr Isol.

_____ 5.2.8 Start the RWST makeup by opening 2-FC 73, No 2 Refueling Water Storage Tk Sup.

_____ 5.2.9 Close 1-FC-16, Fuel Pit Ion Exchanger Inlet Isol.

_____ 5.2.10 WHEN the required makeup is complete, THEN open 1-FC-16.

_____ _____ 5.2.11 Close 2-FC-73.

_____ 5.2.12 Start one of the RWST Recirc Pumps in SLOW. (√)
IF an RWST Recirc Pump is NOT to be started, THEN enter N/A.

_____ 2-CS-P-2A, Refueling Water Recirc Pump

_____ 2-CS-P-2B, Refueling Water Recirc Pump

_____ 5.2.13 Adjust the Spent Fuel Pit Skimmer suction height to actual Spent Fuel Pit level for both Skimmers.

_____ 5.2.14 Start the Spent Fuel Pit Skimmer Pump that was secured in Step 5.2.4. (√)
IF a Spent Fuel Pit Skimmer Pump is NOT to be started, THEN enter N/A.

_____ 1-FC-P-2A, Spent Fuel Pit Skimmer Pump 2A

_____ 1-FC-P-2B, Spent Fuel Pit Skimmer Pump 2B

_____ 5.2.15 Notify Health Physics that access to the bottom of the Safeguards Valve Pit is no longer restricted.

_____ 5.2.16 Sample the RWST IAW 2-CPT-CS-001, Refueling Water Storage Tank Chemistry. IF a RWST sample is NOT required, THEN enter N/A.

Performed by:	Signature	Initial	Print	Date
	Signature	Initial	Print	Date
	Signature	Initial	Print	Date
	Signature	Initial	Print	Date

Facility: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Exam Level (circle one): **RO / SRO-I** Operating Test No.: 1

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. Perform the Immediate Operator actions for Loss of Main Feedwater flow (Facility # LO26.08)	S, D	4s (KA054AA2.02)
b. Recover dropped control rod (Facility # LO65.03)	S, D	1 (KA001K4.09)
c. Verify Natural Circulation Flow w/ flow not occurring and Steam Dump failure (Facility #LO38.03)	S, A, M (Significant Modification)	2 (KA002A4.02)
d. Transfer to cold leg recirc w/ RMT functional and MOV1860B failing to open (Facility #LO52.01)	S,A,M (Significant Modification)	3 (KA011EA1.11)
e. Loss of Operating RHR pump (Facility #LO40.01)	S, D, L	4p (KA025AA1.03)
f. Respond to #3 EDG failure to load (Facility #LO55.06)	S,D	6 (KA064A4.06)
g. Perform CLS Component Verification (E-0, attachment 1), w/ A CTMT air recirc fan failing to trip (Facility #LO67.01)	S,A,M	5 (KA022A3.01, A4.01)

B.2 Facility Walk-Through

a. Cross-tie Unit 1 emergency busses to restore Instrument Air (Facility #LO35.03)	D	6 (KA056AA1.37)
b. Locally start the Emergency SW Pumps and mitigate over-temperature condition. (Facility #13.02)	D,M,A	4s (KA076A2.01)
c. Makeup to the Unit 2 RWST from the Spent Fuel Pit (Facility #53.01B)	D, R	2 (KA006A2.02)

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Exam Level (circle one): **SRO(U)** Operating Test No.: 2-U

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a.		
b. Recover dropped control rod (Facility # LO65.03)	S, D	1 (KA001K4.09)
c. Verify Natural Circulation Flow w/ flow not occurring and Steam Dump failure (Facility #LO38.03)	S, A, M (Significant Modification)	2 (KA002A4.02)
d. Transfer to cold leg recirc w/ RMT functional and MOV1860B failing to open (Facility #LO52.01)	S,A,M (Significant Modification)	3 (KA011EA1.11)
e.		
f.		
g.		

B.2 Facility Walk-Through

a. Cross-tie Unit 1 emergency busses to restore Instrument Air (Facility #LO35.03)	D	6 (KA056AA1.37)
b. Locally start the Emergency SW Pumps and mitigate over temperature condition. (Facility #13.02)	D,M,A	4s (KA076A2.01)
c.		

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

PERFORM THE IMMEDIATE OPERATOR ACTIONS FOR A LOSS OF MAIN FEEDWATER FLOW
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	01/31/01	Create new JPM	S01-0047
02	1	03/01/02		S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 26.08 (Rev 01)

Operator _____ Evaluator _____

Observer _____ Evaluation Date _____

Task

PERFORM THE IMMEDIATE OPERATOR ACTIONS FOR A LOSS OF MAIN FEEDWATER FLOW.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	8 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
APE/054/AA2.02 (RO 4.1/SRO 4.4)	RO 3.93/SRO 3.78

Conditions

- Task is to be PERFORMED in the simulator.
- Unit is at 75% power with all systems normal and in automatic.

Standards

- Steps 1 through 5 of AP-21.00 performed without reference to the AP.

Initiating Cues

- Shift Supervisor direction

Terminating Cues

- Completion of immediate action steps (1-AP-21.00, step 5 completed).

Procedures

- 1-AP-21.00, Loss of Main Feedwater Flow.

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Simulator Setup

- Call up 75% IC and initialize.
- Place Rod Control in Auto.
- Lamp Override MOVFW150(B)_GREEN, 0 Sec TD, O/R OFF.
- Lamp Override MOVFW150(B)_RED, 0 Sec TD, O/R ON.
- Enter malfunction MFW1701/1702 20% deg ON pump, trigger 1.
- Enter MOV Override for MOVFW150(B), 100% to 0% 10 sec ramp trigger 1.
- Using Remote function: FWMOV150(B)on screen (Set value = .1 on evaluator cue "Place Simulator in Run"; Simulator should be in run when trainee enters).
- Recall SimCert.Mon to monitor FW/SIM flow mismatch.

PERFORMANCE CHECKLIST

Directions to the Operator.

- I am the Shift Supervisor. Unit 1 is at 75% power with all systems in normal and automatic.
- A unit transient is about to occur. You are to perform any immediate operator actions necessary to respond to this transient.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- This task is to be PERFORMED.
- When trainee ready to perform this task, state "Place the Simulator in Run" to cue the booth operator to set the selected MFP Discharge MOV position = 0.1.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None.
- **START TIME:** _____

---

1. VERIFY AT LEAST ONE MFP RUNNING. ***(Step 1)***

Standards

(a) Identifies SG NR level deviation alarms.
(b) Identifies both MFPs running by observing amps, red breaker indicating lights lit.
(c) Identified affected MFP amps ~200, unaffected MFP amps ~420.
(d) Identifies SF/FF mismatch

CUES

- **If asked**: Affected MFP amps ~200, unaffected MFP amps ~420
- **If Asked**: SF/FF mismatch of ~.5 x 10^6 lbm/hr on all three SGs

Evaluator's Note
If trainee opts to trip the reactor based on indications associated with this event prior to attempting AP-21.00 actions, this would constitute failure criteria.

Evaluator's Comments

---

* 2. START A THIRD CN PUMP. ***(Step 4)***

Standards

*(a) Places the control switch for "A" Condensate pump, 1-CN-P-1A, to the START position.
(b) Checks "A" CN pump starts (red light on & green light off) and amps indicated.
(c) Identifies SF/FF mismatch still evident and SG NR levels still decreasing.
(d) Identifies FRV demand >100% (FRVs full open, red light on, green off).

CUES

- **If asked:** After starting "A" CN pump, SF/FF mismatch has decreased but a mismatch still exists, and SG NR levels still decreasing.

Evaluator's Comments

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* 3. REDUCE TURBINE LOAD TO MATCH STEAM FLOW WITH FEED FLOW. ***(Step 5)***

Standards

*(a) Decreases turbine load using valve position limiter to match SF and FF.
(b) Further adjusts turbine load using limiter, as necessary, until SF>FF and SG NR levels begin recovering.

CUES

- **If asked:** Rod control will function if placed in auto.

Evaluator Note

Limiter should be used to reduce turbine load to ~575 - 600 MW.

If trainee action or lack of action leads to a condition where a manual reactor trip is required or if an automatic reactor trip is actuated, this would constitute failure criteria.

Evaluator's Comments

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4. REPORT TO SHIFT SUPERVISOR.

Standards

Verbal status report made of task completion.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary
Job Performance Measure 26.08 (Rev 01)
PERFORM THE IMMEDIATE OPERATOR ACTIONS FOR A LOSS OF MAIN FEEDWATER FLOW

Licensed Operator Programs

TASK PERFORMANCE SUMMARY

Job Performance Measure 26.08 (Rev 01)

PERFORM THE IMMEDIATE OPERATOR ACTIONS FOR A LOSS OF MAIN FEEDWATER FLOW

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **8 Min** Actual Time: ___ **Min** Time Critical? Yes ☒ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☒

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

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Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be PERFORMED in the simulator.
- Unit is at 75% power with all systems normal and in automatic.

Initiating Cues

- Shift Supervisor direction

Directions

- I am the Shift Supervisor. Unit 1 is at 75% power with all systems in normal and automatic.
- A unit transient is about to occur. You are to perform any immediate operator actions necessary to respond to this transient.
- When you finish the actions necessary to accomplish this, please inform me.

VIRGINIA POWER
SURRY POWER STATION

ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-AP-21.00	LOSS OF MAIN FEEDWATER FLOW (With 1 Attachment)	5
		PAGE 1 of 4

PURPOSE

To provide guidance for the total or partial loss of Main Feedwater flow with the Reactor at power.

ENTRY CONDITIONS

The Reactor is in the Power Range and a reduction in Main FW flow occurs as indicated by one or more of the following:

1. Loss of one or both Main FW Pumps as indicated by breaker position or loss of amperage.

2. Loss of Main Feed Pumps or a reduction in Main Feed flow as indicated by any of the following annunciators:

   - 1H-G8, FW PP DISCH HDR LO PRESS
   - 1H-H8, FW PP OVERCURRENT TRIP
   - 1H-E5, 6, 7, STM GEN 1A, 1B, or 1C FW ≥ ≤ STM FLOW
   - 1H-G5, 6, 7, STM GEN 1A, 1B, or 1C LVL ERROR
   - 1H-D8, FW PP 1A LUBE OIL LOW PRESS
   - 1H-E8, FW PP 1B LUBE OIL LOW PRESS
   - 1H-F8, FW PP SUCT HDR LO PRESS

3. Decreasing indication on Chart Recorder 1-FW-PR-153, FW HDR PRESS.

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[1]	__CHECK MAIN FEED PUMPS - ONLY ONE RUNNING	IF no Main Feed Pumps running, THEN manually trip the Reactor AND GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION. IF two Main Feed Pumps running, THEN GO TO Step 4.
[2]	__CHECK REACTOR POWER - GREATER THAN 85%	IF Reactor power less than or equal to 65%, THEN do the following: a) Adjust turbine load to equalize steam flow and feed flow as necessary. b) GO TO Step 17. IF Reactor power greater than 65%, THEN GO TO Step 4.
[3]	__MANUALLY TRIP THE REACTOR AND GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION	
[4]	__START A THIRD CONDENSATE PUMP	
[5]	__REDUCE TURBINE LOAD TO MATCH STEAM FLOW WITH FEED FLOW • Use Valve Position Limiter	Reduce Turbine load using Turbine Manual.
6.	__CHECK CONDENSATE POLISHING BLDG - BYPASSED • MOV-CP-100 - Open	Open MOV-CP-100.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	__VERIFY STEAM DUMP OPERATION - REDUCING TAVE/TREF MISMATCH BASED ON DEMAND SIGNAL	Manually operate Steam Dumps in the Steam Pressure Mode. IF Steam Dumps inoperable, THEN dump steam using SG PORVS.

NOTE: Depending on initial plant conditions, rod insertion or boration may be used to stabilize RCS temperature and maintain ΔFlux in band.

8.	__CHECK CONTROL RODS - INSERTING IF NECESSARY	Manually insert control rods.
9.	__VERIFY ANNUNCIATOR 1E-E3, ΔFLUX DEVIATION - NOT LIT	Perform Annunciator Response Procedure.
10.	__VERIFY ALL SG FLOWs - STEAM FLOW IS LESS THAN OR EQUAL TO FEED FLOW	Do the following: a) Continue to reduce Turbine load. b) RETURN TO Step 7.
11.	__VERIFY ALL SG LEVELS - AT OR TRENDING TO PROGRAMMED LEVEL	Manually control Main Feed Water Regulating Valves.
12.	__VERIFY TAVE - MATCHED WITH TREF	Do the following: a) Adjust control rods. b) Dilute or borate the RCS as necessary.
13.	__VERIFY FEED HEADER TO STEAM HEADER ΔP - AT LEAST 50 PSID	Reduce turbine load.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	__VERIFY AMPs ON EACH MOTOR OF THE RUNNING MAIN FEED PUMP(s) - LESS THAN 420 AMPS	Reduce turbine load.
15.	__CHECK OPERATION OF MAIN FEED PUMP(s) • Recirc valve position • Discharge MOV position • Pump amps	
16.	__VERIFY REACTOR POWER CHANGE - LESS THAN 15% IN ONE HOUR	Notify Chemistry.
17.	__NOTIFY THE FOLLOWING: • OMOC • Maintenance Foreman	

- END -

I. PROBABLE CAUSES:

1. Loss of Main Feed Pump(s) due to any of the following:

   - Low lube oil pressure
   - Electrical fault
   - Low suction pressure
   - Inadequate flow with recirculation valve closed

2. Loss of Condensate Pumps

3. High Polishing BLDG differential pressure

4. Main FW pipe rupture

II. REFERENCES:

1. DC 78-10
2. 11448-FM-68A, Feedwater System
3. UFSAR Section 10.3.5
4. 1-E-0, Reactor Trip or Safety Injection
5. 1E-E3, Δ FLUX DEVIATION
6. CTS 2753, Surry Core Uprate TSCR
7. DCP 95-010, Main Feed Water Pump Motor replacement
8. Engineering Transmittal No. S96-0169, Rev. 0, 5-30-96
9. Engineering Transmittal No. S96-0169, Rev. 1, 5-7-97 (Step 14)

RECOVER A DROPPED CONTROL ROD
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	08/29/91		
02	1	09/18/91	Enhance setup directions/clarify question 1 stem by modifying to a "D" bank rod.	
03	2	05/14/92	Revision of AP-1.01.	
04	3	05/21/92	Ensure HO-1 wording matched Q-1 wording/editorial changes.	
05	4	09/03/93	Rev. 7 formatting changes.	
06	5	09/23/93	Update IAW AP-1.01 and JPM standards.	S93-1130
07	6	08/18/95	Reflect O-AP-1.01 (Rev. 9) changes; labeling errors; add question references.	S95-0785
08	7	08/20/96	KA #/procedure changes; component label verification.	S96-0267
09	8	07/31/97	Reflect current procedure and JPM templates; enhance guidance & cues.	S97-0604
10	9	03/20/98	Delete JPM # from trainee handouts.	S98-0286
11	10	12/09/98	Convert to Word.	S98-0936
12	11	03/01/02		S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 65.03 (Rev 11)

Operator _____ Evaluator _____

Observer _____ Evaluation Date _____

Task

RECOVER A DROPPED CONTROL ROD.

Applicability

RO/SRO

Est Completion Time

15 Minutes

Actual Time

_____

NUREG-1122 Importance Ratings

APE003.AA1.02 (RO 3.6/SRO 3.4)
APE003.AA1.03 (RO 3.6/SRO 3.3)
APE003.AA2.01 (RO 3.7/SRO 3.9)

Surry Importance Rating

RO 3.38/SRO 3.44

Conditions

- Task is to be PERFORMED in the simulator.
- A single dropped RCCA (P-10) has occurred. Reactor power has been reduced to 60% power and stabilized. AP-1.00 has been performed through step 11 and transition made to AP-1.01, step 4 where it has been performed through step 11.

Standards

- Rod P-10 fully withdrawn IAW 0-AP-1.01, Control Rod Misalignment.

Initiating Cues

- 0-AP-1.01, Control Rod Misalignment, step 12.
- Shift Supervisor direction.

Terminating Cues

- 0-AP-1.01, Control Rod Misalignment, step 25 completed.

Procedures

- 0-AP-1.01, Control Rod Misalignment.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 60% power IC, enable group step counters & initialize. Verify all group step counters reading correctly.
- Call up extreme view RD2. Be prepared to set CBA's P-to-A converter equal to zero.
- Enter malf for dropped RCCA P-10 (MRD1224). Perform 0-AP-1.00 through step 11 and transition to 0-AP-1.01 step 4, perform through step 10 and stabilize plant.
- Sign off copy of 0-AP-1.01, Control Rod Misalignment, from step 4 through step 11.
- Set up analog trend recorders for Tave and Tref 555-565°F.
- **REMOVE MALFUNCTION** (MRD1224) & freeze simulator until ready to perform JPM.

Performance Checklist

Directions to the Operator.

- I am the Shift Supervisor. Control rod P-10 dropped about 1 hour ago due to a blown fuse. The unit has been stabilized and the Instrument Techs have repaired the fuse. A pre-job brief and ICCE brief have been held and we are now ready to withdraw the rod.
- Here's a copy of AP-1.01, I want you to recover the dropped control rod starting at step 12.
- When you finish the actions necessary to accomplish this and return the rods to MANUAL, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 2-4,9 & 10 (any order) before 11; 11-12-13-14.
- **START TIME:** _____

---

1. REVIEW CAUTIONS PRIOR TO STEP 12.

   Standards

   (a) Notes that this procedure is NOT valid for realignment of a control rod if Reactor is subcritical.
   (b) Notes that realignment SHALL be performed with power held constant at less than or equal to 75%.

   Evaluator's Comments

---

2. RESET NIS ROD DROP SIGNAL. ***(Step 12 and 13)***

   Standards

   (a) Examines NIS PR channels (N-41,42,43,44) for actuated DROPPED ROD ROD STOP BISTABLE.
   (b) Takes POWER RANGE TEST Switch for all affected NIS channels from NORMAL to RESET and return to NORMAL.
   (c) Checks annunciator G-H-1 (NIS DROPPED ROD FLUX DECREASE >5% PER 2 SEC) cleared.

   Evaluator's Comments

---

* 3. TRANSFER ROD CONT MODE SEL SWITCH TO AFFECTED BANK. ***(Step 14)***

Standards

*(a) Rotates ROD CONT MODE SEL SWITCH from the MANUAL to the CBA position.
(b) Verifies rod speed indication of 48 spm on ROD SPEED SI-1-408.

Evaluator's Comments

---

* 4. ALIGN LIFT COIL DISCONNECT SWITCHES FOR AFFECTED BANK. ***(Step 15)***

Standards

(a) Proceeds behind Vertical Board 1-2 to Lift Coil Disconnect Switch Panel and opens panel door.
*(b) Places all disconnect switches for affected bank to OPEN position.
- *. F-2
- *. B-10
- *. K-14
- *. P-6
- *. K-2
- *. B-6
- *. F-14
- . P-10

*(c) Places or verifies switch for P-10 in CLOSE position.
(d) Requests alignment of Lift Coil Disconnect Switches to be independently verified.

CUES

- **If asked:** Lift Coil Disconnect Switches have been independently verified.

Evaluator's Comments

---

5. RECORD AFFECTED BANK POSITION. ***(Step 16)***

Standards

Records Group 1 and 2 step counter readings for Bank A.

Evaluator's Comments

---

6. REVIEWS CAUTIONS PRIOR TO STEP 17.

Standards

Notes that the affected speed during realignment is limited to 2/P (P=fraction of Core Power where 100% power is equal to 1.0) steps per hour if affected rod remains misaligned for more than 12 hours or the duration of misalignment can NOT be determined. This limit may be relaxed with authorization from the Reactor Engineer or Nuclear Analysis and Fuels.

CUES

- **If asked:** Reactor Engineering has authorized that the 2/P rod speed limit be relaxed. No limit on rod speed is required.

Evaluator's Comments

---

7. RECORDS REACTOR POWER AND ROD WITHDRAWAL RATE. ***(Step 17)***

Standards

(a) Checks reactor power by monitoring Benchboard power range meters, meters on the NIS power range drawers, loop delta T meters etc... and records value in the appropriate blank.
(b) Determines rod withdrawal rate at 48 spm and records value in the appropriate blank.

CUES

- **If asked:** Do not exceed 70% power, a 1 dpm SUR or temperature >565°F during dropped rod recovery.

Evaluator's Comments

---

8. CHECKS AFFECTED ROD ON BOTTOM. ***(Step 18)***

Standards

(a) Reads NOTE prior to step 18 explaining reason for ROD CONT SYS URGENT FAILURE alarm.
(b) Checks rod P-10 on bottom.

CUES

- **If asked:** Rod P-10 is on the bottom.

Evaluator's Comments

---

* 9. RESET AFFECTED GROUP STEP COUNTER.

Standards

Pulses Group Step Counter for CONT BANK A GP 2 from fully withdrawn height to a reading of 000 steps.

Evaluator's Notes

If both group step counters are reset to zero, then trainee must address resetting Group 1 step counters prior to stating JPM is completed.

Evaluator's Comments

---

* 10. RESET AFFECTED BANK'S P/A CONVERTER. ***(Step 20)***

Standards

(a) Contacts an auxiliary operator.
(b) Directs AO to go to Unit 1's P/A converter in relay room.
*(c) Directs AO to reset "A" bank P/A converter (pulse P/A cnvtr for CBA from fully withdrawn down to 000 steps).
(d) Acknowledges the following annunciators:
- G-G-5 (ROD BANK A LO LIMIT)
- G-H-5 (ROD BANK A EXTRA LO LIMIT).

(e) Identifies trend recorder TR-1409A pen 2 tracks to 0.

CUES

- After directed, the simulator instructor should perform TIME COMPRESSION, reset CBA P/A converter to 000 using extreme view screen RD2 and then notify the RO.

Evaluator's Comments

---

* 11. REALIGN AFFECTED ROD TO ITS BANK POSITION. ***(Step 21)***

Standards

*(a) Places SHUTDN AND CONT ROD CONT SWITCH to the OUT position.
(b) Verifies outward rod motion indicated by observing affected rod IPRI.
(c) Acknowledges annunciator G-A-6 (ROD CONT SYS URGENT FAILURE).
*(d) Withdraws affected rod to required position.
(e) Continuously monitors SUR, PR NI's, IR NI's, ΔT, Tave, group step counters, IRPI, rod speed, out indication light and TR-1-409A.

Evaluator's Comments

---

* 12. CLOSE AFFECTED BANK LIFT COIL DISCONNECT SWITCHES. ***(Step 22)***

Standards

(a) Proceeds behind Vert Bd 1-2 to Lift Coil Disconnect Switch Panel.
*(b) Closes disconnect switches for affected bank (F-2, B-10, K-14, P-6, K-2, B-6 & F-14).
(c) Request alignment of Lift Coil Disconnect Switches to be independently verified.

CUES

- **If asked:** Lift Coil Disconnect Switches have been independently verified.

Evaluator's Comments

---

* 13. RESET ROD CONTROL URGENT FAILURE. ***(Step 24)***

Standards

*(a) Momentarily depresses ROD CONT SYS INTERNAL ALARM RESET pushbutton.
(b) Verifies annunciator G-A-6 (ROD CONT SYS URGENT FAILURE) clears.

Evaluator's Comments

---

* 14. TRANSFER ROD CONTROL TO MANUAL. ***(Step 25)***

Standards

Rotates ROD CONT MODE SELECT Switch from the CBA position to the MANUAL position.

Evaluator's Comments

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15. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that rod withdrawn and rod control in manual.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary
Job Performance Measure 65.03 (Rev 11)
RECOVER A DROPPED CONTROL ROD

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 65.03 (Rev 11)
RECOVER A DROPPED CONTROL ROD

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **15 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

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Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be PERFORMED in the simulator.
- A single dropped RCCA (P-10) has occurred. Reactor power has been reduced to 60% power and stabilized. AP-1.00 has been performed through step 11 and transition made to AP-1.01, step 4 where it has been performed through step 10.

Initiating Cues

- 0-AP-1.01, Control Rod Misalignment, step 12.
- Shift Supervisor direction.

Directions

- I am the Shift Supervisor. Control rod P-10 dropped about 1 hour ago due to a blown fuse. The unit has been stabilized and the Instrument Techs have repaired the fuse. A pre-job brief and ICCE brief have been held and we are now ready to withdraw the rod.
- Here's a copy of AP-1.01, I want you to recover the dropped control rod starting at step 12.
- When you finish the actions necessary to accomplish this and return the rods to MANUAL, please inform me.

LEVEL 2 DISTRIBUTION
This Document Should Be Verified
Prior to Use

VIRGINIA POWER
SURRY POWER STATION

ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
0-AP-1.01	CONTROL ROD MISALIGNMENT (With 2 Attachments)	11
		PAGE 1 of 7

PURPOSE

To provide guidance for realignment of control rod(s).

SIMULATOR

ENTRY CONDITIONS

1. Transition from 0-AP-1.00, ROD CONTROL SYSTEM MALFUNCTION.
2. Transition from 0-AP-1.02, INDIVIDUAL ROD POSITION INDICATORS(IRPI).
3. Misaligned control rod.

Senior Operations Manager is required for dropped rod recovery IAW VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions.

APPROVAL RECOMMENDED	APPROVED	DATE
W.R. Bathall		6/10/99
REVIEWED		

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	__CHECK ROD POSITIONS - ONLY ONE ROD DROPPED • Annunciator ()G-H2, RPI ROD BOTTOM ≤ 20 STEPS - LIT OR • Annunciator ()G-H1, NIS DROPPED ROD FLUX DECREASE ≥ 5% PER 2 SEC - LIT OR • Check rod bottom lights - ANY LIT	IF two or more rods dropped, THEN trip Reactor AND GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION. IF no rods dropped, THEN GO TO Step 6.
2.	__CHECK REACTOR POWER - GREATER THAN 25%	Trip Reactor and GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION.
3.	__REDUCE REACTOR POWER TO LESS THAN OR EQUAL TO 70% WITHIN 1 HOUR	
4.	__CHECK REACTOR AND TURBINE POWER - MATCHED AND STABLE	Use Rod Control in MANUAL and Turbine Controls as necessary to control power at less than or equal to 70%. IF power can NOT be controlled, THEN trip Reactor AND GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION.
5.	__VERIFY DELTA FLUX - IN BAND	Borate as necessary to restore delta flux to band.
6.	__REFER TO TECH SPEC TO DETERMINE LIMITING CONDITIONS FOR OPERATION • 3.12.A • 3.12.C	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

7. __PERFORM SHUTDOWN MARGIN CALCULATION IAW ()-OP-RX-001, SHUTDOWN MARGIN (CALCULATED AT POWER)

* *

CAUTION: The potential for dropping control rods increases while maintenance is being performed on the Rod Control System. Any control rod motion should be evaluated for the potential of dropping control rods.

* *

NOTE: No maintenance may be performed on the Rod Control system without prior approval from the Assistant Station Manager O & M, or his designee. This restriction should not prevent visual inspection of the Rod Control cabinets by the Maintenance Department.

8. __INITIATE A WORK REQUEST TO REPAIR INOPERABLE ROD

9. __SUBMIT A DEVIATION REPORT

10. __NOTIFY THE FOLLOWING:

- OMOC
- Engineering
- Chemistry if necessary

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: An infrequently conducted or complex test requires a Senior Operations Manager presence.

* *

11. __DIRECT SENIOR OPERATIONS MANAGER TO CONDUCT PRE-JOB BRIEF IAW ATTACHMENT 1

* *

CAUTION:
- This procedure is NOT valid for realignment of a control rod if Reactor is subcritical.
- Realignment SHALL be performed with Reactor power held constant at less than or equal to 75%.

* *

12. __CHECK POWER RANGE NIs - ANY DROPPED ROD SIGNAL PRESENT — GO TO Step 14.

13. __RESET NIS DROPPED ROD SIGNAL:

a) For each Power Range channel with a DROPPED ROD window LIT, perform the following:

1) Place the Power Range Test switch in RESET

2) Verify the DROPPED ROD window - NOT LIT

3) Return the Power Range Test switch to NORMAL

b) Verify annunciator ( )G-H1 clears

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

14. __TRANSFER ROD CONT MODE SEL SWITCH TO AFFECTED BANK

15. __ALIGN LIFT COIL DISCONNECT SWITCHES FOR AFFECTED BANK:

    a) Place all disconnect switches to OPEN position

    b) Place affected rod disconnect switch to CLOSE position

    c) Have alignment of disconnect switches independently verified

16. __RECORD BANK POSITION OF AFFECTED ROD:

    - Group 1 Step Counter:_____
    - Group 2 Step Counter:_____

* *

CAUTION:
- The affected withdrawal rate during realignment is limited to 2/P (P=fraction of Core Power where 100% power is equal to 1.0) steps per hour if affected rod remains misaligned for more than 12 hours or the duration of misalignment can NOT be determined.
- The withdrawal rate limitation may be relaxed with authorization from the Reactor Engineer or Nuclear Analysis and Fuels.

* *

17. __RECORD THE FOLLOWING:

    - Reactor power:_____
    - Withdrawal rate:_____

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE: Annunciator ( )G-A6, ROD CONT SYS URGENT FAILURE, will alarm when the affected rod is withdrawn indicating that the lift coils of the remaining rods in the bank are deenergized.	
18.	__CHECK AFFECTED ROD - ON BOTTOM	Do the following: a) Reset affected Group Step Counter to IRPI of misaligned rod. b) Reset P/A Converter of affected bank to IRPI of misaligned rod. c) Withdraw the rod until affected Group Step Counter is at 242. d) Reset affected Group Step Counter to 230. e) GO TO Step 21.
19.	__RESET AFFECTED GROUP STEP COUNTER TO 0	
20.	__RESET AFFECTED BANK P/A CONVERTER TO 000	
21.	__REALIGN AFFECTED ROD TO ITS BANK POSITION RECORDED IN STEP 16	IF rod will NOT align, THEN do the following: a) Have Engineering determine hot channel factors are within limits IAW 0-NPT-RX-010. b) GO TO Step 31.
22.	__CLOSE AFFECTED BANK LIFT COIL DISCONNECT SWITCHES	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23.	__HAVE ALIGNMENT OF DISCONNECT SWITCHES INDEPENDENTLY VERIFIED	
24.	__RESET ROD CONTROL URGENT FAILURE • Depress ROD CONT SYS INTERNAL ALARM RESET pushbutton	
25.	__TRANSFER ROD CONT MODE SEL SWITCH TO MANUAL	
26.	__VERIFY REACTOR AND TURBINE POWER - MATCHED AND STABLE	Adjust Rod Control or Turbine Controls to match and stabilize power.
27.	__VERIFY DELTA FLUX - IN BAND	Borate or dilute as necessary to restore delta flux to band.
28.	__DIRECT INSTRUMENT DEPARTMENT TO CHECK THE FOLLOWING FOR PROPER SETTINGS: • Master Cycler • P/A Converter • Bank Overlap Counter	
29.	__PLACE ROD CONT MODE SEL SWITCH TO AUTO IAW SHIFT SUPERVISOR DIRECTION	
30.	__CHECK INSTRUMENTATION SETPOINTS CHANGED DUE TO TECH SPEC REQUIREMENTS - RETURNED TO NORMAL	Direct Instrumentation Department to reset setpoints.
31.	__NOTIFY SHIFT SUPERVISOR	

- END -

1. Senior Operations Manager - Provide oversight and control of Infrequently Conducted or Complex Tests or Evolutions as defined in VPAP-0108.

   A. Before performing procedure Steps 11 through 24, a Senior Operations Manager will be assigned to exercise continuous responsibility for the oversight of the test/evolution. This individual shall:

      1. Have primary responsibility for ensuring that tests or evolutions are conducted in a manner that maximizes the margin of safety of the Unit.

      2. Oversee the test/evolution to ensure the Station is operated safely without becoming involved in the details.

      3. Be familiar with the test/evolution to the extent of knowing the general sequence, objectives, reactor safety considerations, portions of the test/evolution most susceptible to difficulty, and criteria for terminating the test/evolution.

      4. Attend at least one pre-test (pre-job) briefing.

      5. Have authority through the Shift Supervisor without relieving the Shift Supervisor's responsibility for safe Station operation.

      6. Exercise authority throuth the Shift Supervisor without relieving the Shift Supervisor's responsibility for safe Station operation.

      7. Remain at the Station during critical porions of the test/evolution, in a location where oversight and responsibility can be exercised effictively.

      8. Participate in turnovers, if required, due to the duration of a test/evolution.

      9. Maintain two-way communication capability with the Shift Supervisor during critical portions of the test/evolution.

   B. Prior to performing Steps 10 through 23 of the procedure, the Senior Operations Manager shall brief Operations Department and test/support personnel on management expectations, using the following checklist.

MANAGEMENT EXPECTATIONS BRIEFING CHECKLIST

___ The need to exercise caution and conservatism during the ICCE, particularly when uncertainties are encountered.

___ Emphasis on maintaining the highest margins of safety to place proper perspective on any sense of urgency that may otherwise prevail.

___ Assigned responsibilities for the activity and any deviation from normal shift duties and accountabililties.

___ The need for open communication.

___ Lessons learned from pertinent in-house and industry operating experience to assist Operations Department and support personnel in internalizing the lessons.

___ The need to stop the ICCE when unexpected conditions arise or unexpected behavior is experienced.

___ Strict compliance with procedure details.

___ Criteria for terminating the ICCE.

Briefing completed by: _____ _____ _____
Senior Operations Manager Date Time

2. Test Coordinator - The qualified Test Coordinator shall be responsible for coordinating the efforts of individuals performing a particular test and assuring the test is completed in a timely manner. The Test Coordinator shall conduct pre-test and turnover briefings using the following checklist.

The following items were covered during the pre-test (pre-job) briefing: (Check all that apply)

___ Test/evolution objectives.

___ Station and test/operating organization.

___ The specific position or person primarily responsible for the test/evolution.

___ Duties and responsibilities of individual personnel on the team. Ensure that each participant understands their individual and team responsibilities.

___ Establish the lines of communication steering the test/evolution.

___ Personnel special certifications and qualifications required.

___ Discussion of the initial conditions of the test/evolution, including station and system status.

___ Anticipated Unit performance.

___ Termination guidance for specific portions of the test/evolution and contingency plans for unexpected occurrences.

___ Risks associated with the test/evolution.

___ Discussion of interactions that may cause a Unit transient.

___ Discussion of any significant safety and radiological hazards.

___ Review of procedure precautions and limitations.

___ Review of procedure instructions and acceptance criteria.

___ Ensure that personnel have read and understand the necessary work procedures and are aware of specific hold points.

___ Discussion of Administratively approved process for deviating from the procedure, if it becomes necessary.

___ Discussion of the scheduled activities, schedule restraints, and the impact of other work in the area.

___ Discussion of the specific job and any departmental administrative controls required, such as RWPs, Tagouts, Flame Permits, or Fire Watches.

___ Identification of materials required for the activity and their availability, including parts and tools.

___ Discussion of barriers and Good Practices/Operating Experience noted from previous similar tests/evolutions.

___ Discussion of the work conditions, including any additional services required such as service air, ventilation, or lighting.

___ Discussion of the expected level of housekeeping, including cleanliness requirements, foreign material exclusion, and post-test/post-evolution cleanup.

___ Discussion of the need for a post-test/post-evolution review and what will be required of each participant to close out the test/evolution.

___ Discussion of the need to process DRs as soon as possible after discovery.

___ Define the final expected condition of the Station.

Briefing completed by: _____ _____ _____
Test Coordinator/Test Lead Date Time

3. SYSTEM ENGINEER - The engineer who has been designated to become knowledgeable in all aspects of the system and can be appointed as the Test Coordinator by the System Engineering Supervisor.

4. TEST LEAD - A person who is knowledgeable in all aspects of the procedure/test to be performed. A Test Lead will be appointed and will assume the Test Coordinator role for those procedures/tests which do not have an appointed Test Coordinator.

5. SHIFT SUPERVISOR - The Senior Reactor Operator (SRO) in direct charge of unit operations on shift, and the Station Management representative during backshifts, weekends, and holidays.

6. SYSTEM ENGINEERING SUPERVISOR - The supervising engineer who will ultimately review and approve the performance of the systems/components being tested in this test procedure, if applicable.

7. SHIFT TECHNICAL ADVISOR (STA) - On-shift engineering advisor who must remain informed of testing that may affect plant conditions.

PRE-TEST (PRE-JOB) BRIEFING MEETING ATTENDEES

	POSITION	PRINTED NAME	SIGNATURE
1.	Test Coordinator/ Test Lead		
2.	Senior Operations Manager		
3.	System Engineer		
4.	Shift Supervisor		
5.	STA		
6.	Operator		
7.	Operator		
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

DATE _____ TIME _____

1. Probable Causes

   a. Control rod misaligned.

2. References

   a. UFSAR - Sections 7.0, 14.0

   b. Tech Spec 3.12

   c. Tech Spec Change 203

   d. NSA Memo, Serial No. NSA-91162, Dated August 30, 1991

   e. CTS 1647

   f. VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions

   g. Tech Spec Amendment 186

   h. ()-OP-RX-001, Shutdown Margin (Calculated at Power)

   i. 0-NPT-RX-010, Engineering Support for Recovery of Misaligned RCCA (Hot Channel Factor and Maximum Permissible Power Determination)

   j. DCP 94-007, Removal of Turbine Runback on Dropped Rod

Developed for the Surry, March 2002, Initial Examination
Examination Report # 2002-

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-B-1-C

SIMULATOR

Title:

VERIFY NATURAL CIRCULATION FLOW

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

VERIFY NATURAL CIRCULATION FLOW.

Alternate Path:

[redacted]

Facility JPM #:

[redacted]

K/A Rating(s):

SYS002.A2.03 (RO 4.1/SRO 4.3)
EPE017.EK1.01 (RO 4.4/SRO 4.6)
SYS002.K5.13 (RO 3.3/SRO 3.6)

Task Standard:

1-ES-0.1, Reactor Trip Response, step 14.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform _____ Simulate _X_____

References:

1-ES-0.1, Reactor Trip Response

Validation Time: 5 min. **Time Critical:** No

==========

Candidate: _____ Time Start : _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

SIMULATOR SETUP INSTRUCTIONS:

- Call up 100% power IC and initialize. Place simulator in RUN.
- Trip Rx, allow conditions to stabilize, place RCPs in PTL, initiate slow cooldown using steam dumps to enhance NC flow. Run in this mode for ~10 minutes to establish NC flow indications.
- Place simulator in freeze until ready for JPM performance.
- Meter overrides for Tc slowly increasing 30 degrees and Th remaining static.

SIMULATOR OPERATOR INSTRUCTIONS:

- None

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

Curve Book

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions and state the task to be performed. The Simulator will be left in freeze during performance of the assessment, you are not required or permitted to manipulate controls to change unit conditions. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. You must verbalize everything that you are looking at to during the performance of the task. To indicate that you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor. A reactor trip with a loss of all RCPs occurred approximately 10 minutes ago. 1-E-0, Rx Trip or SI, has been completed and 1-ES-0.1 has been performed up through step 13. Here is a copy of ES-0.1. I need you to perform step 14. When you finish the actions necessary to accomplish this, please inform me.

INITIATING CUES:

I need you to complete this step.

JPM LEGEND:

Bold	Highlighted JPM Headings and notes/ provides emphasis (used extensively for Examiner's cues).
Italics	Highlight Examiner's cues.
Asterisks	Identify actions or subactions which must be performed correctly to complete critical task steps.

START TIME: _____

STEP 14 Title: **VERIFY NATURAL CIRCULATION** STANDARD: Verbalizes Step 14 Title. COMMENTS:	___ SAT ___ UNSAT
Step 14 First bullet: **RCS subcooling based on CETCs – GREATER THAN 30°F [85°F]** STANDARD: • Checks 1-RC-ICCM-A and/or 1-RC-ICCM-B for subcooling greater than 30°F. OR • Checks G-B1, APPROACH TO SATURATION TEMP ALARM, (Alarm Setpoint is 30°F) is clear. *EXAMINER'S CUES:* • *If asked, the indicated temperature has not changed for the last 15 minutes.* COMMENTS:	___ SAT ___ UNSAT

STEP 14 Second Bullet: **CETC temperatures – STABLE OR DECREASING** STANDARD: • Checks 1-RC-ICCM-A and/or 1-RC-ICCM-B for CETC temperatures stable or decreasing. *EXAMINER'S CUES:* • *When asked, the indicated temperature has not changed for the last 15 minutes.* COMMENTS:	___ SAT ___ UNSAT
STEP 14 Third Bullet: **SG Pressures – STABLE OR DECREASING** STANDARD: • Checks pressures stable or decreasing with the following : 1-MS-PR-1474 (all three steam generator pressures are displayed) or 1-MS-PR-1475 (all three steam generator pressures are displayed) or 1-MS-PI-1474, 1475, or 1476 (A steam generator pressures) and 1-MS-PI-1484, 1485, or 1486 (B steam generator pressures) and 1-MS-PI-1494, 1495, or 1496 (C steam generator pressures) *EXAMINER'S CUES:* • *When asked, the indicated steam generator pressures have not changed for the last 15 minutes.* COMMENTS:	___ SAT ___ UNSAT

STEP 14 Fourth Bullet: **RCS hot leg wide range temperatures – STABLE OR DECREASING** STANDARD: • Checks 1-RC-TR-413 for wide range hot leg temperature stable or decreasing. and • Checks 1-RC-TR-423 for wide range hot leg temperature stable or decreasing. and • Checks 1-RC-TR-433 for wide range hot leg temperature stable or decreasing. *EXAMINER'S CUES:* • *When asked, the indicated temperatures have not changed for the last 15 minutes.* COMMENTS:	___ SAT ___ UNSAT

STEP 14 Fifth Bullet: **RCS cold leg wide range temperatures – AT SATURATION TEMPERATURE FOR SG PRESSURE IAW SATURATION CURVE IN CURVE BOOK**	**CRITICAL STEP (*)** ___ SAT ___ UNSAT
STANDARD: • Checks the following for current SG pressure: 1-MS-PR-1474 (all three steam generator pressures are displayed) or 1-MS-PR-1475 (all three steam generator pressures are displayed) or 1-MS-PI-1474, 1475, or 1476 (A steam generator pressures) and 1-MS-PI-1484, 1485, or 1486 (B steam generator pressures) and 1-MS-PI-1494, 1495, or 1496 (C steam generator pressures) • Obtains the Curve Book from the Unit 1 RO's bookshelf. • Goes to either Saturation Pressure Temperature Curve in the curve book (Section 2 or 3). • Using the value for current steam generator pressure, determines the saturation temperature. • Compares the saturation temperature with indicated Tc on the following: • Checks 1-RC-TR-413 for wide range cold leg temperature. And • Checks 1-RC-TR-423 for wide range cold leg temperature. And • Checks 1-RC-TR-433 for wide range cold leg temperature. * Determines that the indicated wide range cold leg temperatures are greater than saturation temperature for the steam generators. • Goes to the RNO for Step 14. *EXAMINER'S CUES:* • *If asked, the indicated temperature have been slowly increasing over the last 15 minutes.* COMMENTS:	

STEP 14 RNO: Dump more steam STANDARD: • Verbalizes dumping more steam by using the steam dumps: 1) States that the Dmp Mode SEL Switch is taken to the Steam Press Mode 2) States that the Steam Header Controller manual increase button is depressed. *EXAMINER'S CUES:* • *If asked, steam flow has increased.* OR • Verbalizes dumping more steam by using one or more S/G PORV's: • States that one or more of the following would be opened in Automatic (by depressing the down arrow button thus decreasing the automatic setpoint until the valve open lights energize) or Manual (by depressing the up arrow button until the valve open lights energize). • 1-MS-RV-101A (A steam generator PORV) • 1-MS-RV-101B (B steam generator PORV) • 1-MS-RV-101C (C steam generator PORV) *EXAMINER'S CUES:* • *If asked, steam flow has increased.* *EXAMINER'S CUES:* One method of steam release MUST be selected to meet the critical step requirement. COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

REPORT TO SHIFT SUPERVISOR. STANDARD: Verbal status report made of task's completion. *EXAMINER'S CUES: Acknowledge applicant's report of task completion as the Shift Supervisor.* COMMENTS:	___ SAT ___ UNSAT

TIME STOP: _____

Critical Step Justification:

Substeps within the critical step block are designated with an asterisk (critical component of the step) or no asterisk (Not a critical component).

STEP 14 Fifth Bullet

- The fact that natural circulation is not occurring must be recognized so that operator action may be taken to correct it.

STEP 14 RNO

- Steam must be dumped to start natural circulation or core damage could result.

Critical Step Sequencing:

Step 14 Fifth Bullet before Step 14 RNO

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

I am the Shift Supervisor. A reactor trip with a loss of all RCPs occurred approximately 10 minutes ago. 1-E-0, Rx Trip or SI, has been completed and 1-ES-0.1 has been performed up to step 13. Here is a copy of ES-0.1. I need you to perform step 14. When you finish the actions necessary to accomplish this, please inform me.

INITIATING CUES:

I need you to complete this step.

TRANSFER THE SI SYSTEM TO THE COLD LEG RECIRCULATION MODE
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	03/01/02	New JPM	S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 52.01A (Rev 00)

Operator _____ Evaluator _____

Observer _____ Evaluation Date _____

Task

TRANSFER THE SI SYSTEM TO THE COLD LEG RECIRCULATION MODE.

Applicability

RO/SRO

Est Completion Time

7 Minutes

Actual Time

_____

NUREG-1122 Importance Ratings

SYS/006/K4.08 (RO 3.2/SRO 3.6)
SYS/006/A2.02 (RO 3.9/SRO 4.3)
SYS/006/A3.08 (RO 4.2/SRO 4.3)
SYS/006/A4.01 (RO 4.1/SRO 3.9)
SYS/006/A4.02 (RO 4.0/SRO 3.8)
SYS/006/K3.02 (RO 4.3/SRO 4.4)

Surry Importance Rating

RO 3.92/SRO 4.22

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 21b.
- Shift Supervisor 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.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- If no preset IC is available, this setup takes approximately 45 minutes.
- Call up 100% power IC and initialize. Place simulator in RUN.
- Initiate the following annunciator overrides: All nuisance alarms, which came in during a validation of JPM.
- Initiate the following switch overrides: SIP1A_LOCK, ON, active.
- Initiate the following Remote functions: DISA_SI860B_AOPEN, auto disable, active.
- Initiate malfunction for A loop cold leg rupture (MRC0101).
- Perform E-0 & transition to 1-E-1. Perform 1-E-1 through step 21, which checks for transition to ES-1.3.
- One (1) LHSI & two (2) HHSI pumps, two (2) ISRS should be running (no CS pumps should be running). HHSI pumps should be on redundant flowpath alignment and charging mini-flow recirc valves should be closed.
- When RWST level is ~19% (CSM101 of 6.0×10^5), freeze simulator for performance.

Performance Checklist

Directions to the Operator.

- I am the Shift Supervisor. A Large-Break LOCA has occurred on Unit 1. RWST level is 17%. 1-SI-P-1A ("A" LHSI Pump) is in PTL due to an overcurrent trip.
- Here's a copy of 1-ES-1.3, Transfer to Cold Leg Recirculation. I need you to transfer the SI system to the cold leg recirculation mode IAW steps 1-5.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 9 & 10 before 12; 12 before 13 & 14.
- **START TIME:** _____

---

1. REVIEW CAUTIONS & NOTE PRIOR TO STEP 1.

Standards

(a) Notes that SI recirc flow to RCS must be maintained at all times.
(b) Notes 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.

Evaluator's Comments

---

2. VERIFY BOTH RMT MODE TRANSFER SWITCHES IN RMT. ***(Step 1)***

Standards

Verifies RMT Mode transfer Switches in RMT.

Evaluator's Comments

---

3. RESET SAFETY INJECTION. ***(Step 2)***

Standards

Depresses both SI Reset pushbuttons on benchboard 1-1.

Evaluator's Note

If SI previously reset, verification of SI reset will suffice.

Evaluator's Comments

---

4. CHECK SW FLOW ESTABLISHED TO AT LEAST TWO RSHXs. ***(Step 3(a))***

Standards

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).

Evaluator's Comments

---

5. VERIFY AC EMERGENCY BUSES - ENERGIZED BY OFFSITE POWER. ***(Step 3(b))***

Standards

(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).

Evaluator's Comments

---

6. CHECK RS PUMPS ASSOCIATED WITH RS HXs SUPPLIED BY SW AT LEAST TWO RUNNING. ***(Step 3(c))***

Standards

Checks if the following pumps are running (breaker indication red light on and amps indicated):
(a) 1-RS-P-1A (associated w/ A HX),
(b) 1-RS-P-1B (associated w/ B HX),

Evaluator's Comments

---

* 7. VERIFY LHSI PUMPS - BOTH RUNNING. ***(Step 4)***

Standards

(a) Checks 1-SI-P-1B breaker indication red light on and amps indicated.
(b) Identifies that 1-SI-P-1A cannot be started.
(c) Identifies chg headers are split.
(d) Identifies "B" Chg pump on alternate header, "C" on normal.
*(e) Secures "B" Chg pump.
(f) Places "B" Chg pump in PTL.

Evaluator's Comments

---

8. ALIGN SI SYSTEM FOR RECIRC. ***(Step 5a & b)***

Standards

(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 and/or
- 1-CS-LI-100D.

(f) If RWST level not less than 13%, waits for level to reach 13%.

Evaluator's Note

If annunciators AA2, AB2, AC2, and AO2 are lit, the operator should identify auto RMT failure and proceed to step 4c.

Evaluator's Comments

---

9. ATTEMPT INITIATION OF RECIRC MODE TRANSFER - PHASE 1. ***(Step 5c(1))***

Standards

Checks Phase 1 White status light lit.

Evaluator's Comments

---

10. ALIGN LHSI PUMP DISCHARGE TO THE HHSI PUMP SUCTION. ***(Step 5c(2))***

Standards

(a) Verifies 1-SI-MOV-1863A OPEN.
(b) Checks valve open by observing red light on & green off.
(c) Verifies 1-SI-MOV-1863B 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.

Evaluator's Comments

---

11. CLOSE THE LHSI PUMP RECIRCULATION PATH TO THE RWST. ***(Step 5c(3))***

Standards

(a) Checks 1-SI-MOV-1885A closed by observing green light on & red off.
(b) Checks 1-SI-MOV-1885B closed by observing green light on & red off.
(c) Checks 1-SI-MOV-1885C closed by observing green light on & red off.
(d) Checks 1-SI-MOV-1885D closed by observing green light on & red off.

Evaluator's Comments

---

12. CHECK PHASE 2 AMBER STATUS LIGHT ON BENCHBOARD - LIT. ***(Step 5d(1))***

Standards

Verifies Phase 2 amber status light lit.

Evaluator's Comments

---

* 13. OPEN LHSI PUMP CONTAINMENT SUMP SUCTION ISOLATION VALVES. ***(Step 5d(2))***

Standards

(a) Verifies 1-SI-MOV-1860A 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.

Evaluator's Comments

---

14. CLOSE LHSI PUMP RWST SUCTION ISOLATION VALVES. ***(Step 5d(3))***

Standards

(a) Verifies 1-SI-MOV-1862A CLOSED.
(b) Checks 1-SI-MOV-1862A closed by observing green light on & red off.
(c) Opens 1-SI-MOV-1862B CLOSED.
(d) Checks 1-SI-MOV-1862B closed by observing green light on & red off.

Evaluator's Comments

15. CLOSE CHG PUMP RWST SUCTION ISOLATION VALVES. ***(Step 5d(4))***

Standards

(a) Verifies 1-CH-MOV-1115B CLOSED.
(b) Checks 1-CH-MOV-1115B closed by observing green light on & red off.
(c) Verifies 1-CH-MOV-1115D CLOSED.
(d) Checks 1-CH-MOV-1115D closed by observing green light on & red off.

Evaluator's Comments

16. VERIFY RECIRCULATION FLOW ESTABLISHED. ***(Step 5(e))***

Standards

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-1-940A (Total flow alt hdr).

Evaluator's Comments

17. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that cold leg recirculation established.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary
Job Performance Measure 52.01A (Rev 00)
TRANSFER THE SI SYSTEM TO THE COLD LEG RECIRCULATION MODE

Licensed Operator Programs

TASK PERFORMANCE SUMMARY

Job Performance Measure 52.01A (Rev 00)

TRANSFER THE SI SYSTEM TO THE COLD LEG RECIRCULATION MODE

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **7 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
Operator Directions Handout

Conditions

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

Initiating Cues

- 1-E-1, Loss of Reactor or Secondary Coolant, step 21b.
- Shift Supervisor direction.

Directions

- I am the Shift Supervisor. A Large-Break LOCA has occurred on Unit 1. RWST level is 17%. 1-SI-P-1A ("A" LHSI Pump) is in PTL due to an overcurrent trip.
- Here's a copy of 1-ES-1.3, Transfer to Cold Leg Recirculation. I need you to transfer the SI system to the cold leg recirculation mode IAW steps 1-5.
- When you finish the actions necessary to accomplish this, please inform me.

VIRGINIA POWER
SURRY POWER STATION

EMERGENCY PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-ES-1.3	TRANSFER TO COLD LEG RECIRCULATION	12
		PAGE 1 of 8

PURPOSE

To provide guidance to transfer the Safety Injection System to the cold leg recirculation mode.

ENTRY CONDITIONS

Transition from any of the following procedures:

- 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
- 1-ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.
- From any other emergency response procedure whenever RWST level reaches 16%.

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION:
- SI recirculation flow to RCS must be maintained at all times.
- Transfer to recirculation may cause high radiation in the Auxiliary Building.

* *

NOTE: Steps 1 through 5 should be performed without delay. FRs should NOT be implemented before the completion of these steps.

1. __VERIFY OR PLACE BOTH RMT MODE TRANSFER SWITCHES IN RMT

2. __RESET SI

3. __VERIFY SI RECIRC PHASE HEAT SINK:

a) Verify SW flow established to at least two RS HXs	a) IF less than 24 hours after reactor trip, THEN establish SW flow to at least two RS HXs. IF greater than 24 hours after reactor trip, THEN establish SW flow to at least one RS HX.
b) Verify AC emergency buses - ENERGIZED BY OFFSITE POWER	b) Stop CC and RHR pump(s) energized by EDG(s).
c) Verify RS pumps associated with RS HXs supplied by SW - AT LEAST TWO RUNNING • 1-RS-P-1A RS HX A • 1-RS-P-1B RS HX B • 1-RS-P-2A RS HX C • 1-RS-P-2B RS HX D	c) Start RS pump(s) associated with RS HX(s) supplied by SW.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	__VERIFY LHSI PUMPS - BOTH RUNNING	Start LHSI pumps. IF only one LHSI pump can be started, THEN run only one CHG pump IAW the following steps. a) IF SI headers are split, THEN run the CHG pump supplying the normal header AND place remaining CHG pumps in PTL. b) IF SI headers are NOT split, THEN run one CHG pump in the preferred order - C, B, A, AND place remaining CHG pumps in PTL.

* *

CAUTION: If suction source is lost to any SI or CS pump, the pump should be stopped.

* *

5.	__ALIGN SI SYSTEM FOR RECIRC:	
	a) Close CHG pump miniflow recirc valves: • 1-CH-MOV-1275A • 1-CH-MOV-1275B • 1-CH-MOV-1275C	a) Manually close 1-CH-MOV-1373. IF 1-CH-MOV-1373 does NOT close manually, THEN locally close.
	b) RWST Level - LESS THAN 13%	b) Do NOT continue. WHEN RWST level less than 13%, THEN GO TO Step 5c.

(STEP 5 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	ALIGN SI SYSTEM FOR RECIRC (Continued):	
	c) Verify Phase 1 - INITIATED 1) White Phase 1 Status light on bench board - LIT 2) LHSI discharge to HHSI - OPEN • 1-SI-MOV-1863A • 1-SI-MOV-1863B 3) LHSI recirc valves - CLOSED • 1-SI-MOV-1885A • 1-SI-MOV-1885B • 1-SI-MOV-1885C • 1-SI-MOV-1885D	c) Initiate RMT. Push both RMT actuation pushbuttons for each train. IF RMT has NOT actuated, THEN manually align valves.
	d) Verify Phase 2 - INITIATED 1) Amber Phase 2 Status light on bench board - LIT 2) LHSI suction from sump - OPEN • 1-SI-MOV-1860A • 1-SI-MOV-1860B 3) LHSI suction from RWST - CLOSED • 1-SI-MOV-1862A • 1-SI-MOV-1862B 4) CHG pump suction from RWST valves - CLOSED • 1-CH-MOV-1115B • 1-CH-MOV-1115D	d) IF swap over does NOT occur after 1 minute time delay, THEN manually align valves.

(STEP 5 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	ALIGN SI SYSTEM FOR RECIRC (Continued):	
	e) Verify recirculation flow - ESTABLISHED	e) Start pumps and align valves. IF cold leg flow can NOT be established, THEN align SI for hot leg recirc IAW 1-ES-1.4, TRANSFER TO HOT LEG RECIRCULATION. IF at least one flow path from the sump to the RCS can NOT be established or maintained, THEN GO TO 1-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.
6.	__CHECK IF CS SHOULD BE STOPPED:	
	a) Verify CS pumps - ANY RUNNING	a) GO TO Step 7.
	b) Check CS pumps - CAVITATING	b) Do NOT stop CS pumps. WHEN CS pumps cavitating, THEN do Steps 6c through 6f.
	c) Put CS pumps in PTL: • 1-CS-P-1A • 1-CS-P-1B	
	d) Close CS discharge valves: • 1-CS-MOV-101A • 1-CS-MOV-101B • 1-CS-MOV-101C • 1-CS-MOV-101D	d) Close suction MOV on CS pump(s) with an open discharge MOV.
	e) Close CHEM ADD TK OUTLT valves: • 1-CS-MOV-102A • 1-CS-MOV-102B	e) Locally close valves.
	f) GO TO Step 13	
7.	__CHECK CAT - LEVEL INDICATED	GO TO Step 13.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Equalizing the CAT and RWST levels with the CAT full will take approximately 90 minutes.

8. __EQUALIZE LEVEL IN CAT AND RWST

a) Open CHEM ADD TK OUTLT valves:

- 1-CS-MOV-102A
- 1-CS-MOV-102B

b) Verify CS Pump Suction valves - OPEN

- 1-CS-MOV-100A
- 1-CS-MOV-100B

b) Open CS Pump Suction valves.

c) Check CAT level - LESS THAN OR EQUAL TO RWST LEVEL

c) GO TO Step 15. WHEN CAT level less than or equal to RWST level, THEN perform Steps 9 through 14.

9. __ALIGN CS SYSTEM

a) Open CS discharge valves:

- 1-CS-MOV-101A
- 1-CS-MOV-101B
- 1-CS-MOV-101C
- 1-CS-MOV-101D

b) Start both CS Pumps

10. __CHECK CS PUMPS - CAVITATING

WHEN CS Pumps cavitating, THEN put CS Pumps in PTL AND GO TO Step 12.

11. __PUT CS PUMPS IN PTL

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

12. __REALIGN CS SYSTEM

    a) Close CS discharge valves:

    - 1-CS-MOV-101A
    - 1-CS-MOV-101B
    - 1-CS-MOV-101C
    - 1-CS-MOV-101D

    b) Close CHEM ADD TK OUTLT valves:

    - 1-CS-MOV-102A
    - 1-CS-MOV-102B

* *

CAUTION: CTMT Sump pH must be maintained greater than 7. This requirement must be met within 48 hours after RMT initiation.

* *

13. __NOTIFY TSC TO HAVE CHEMISTRY SAMPLE CTMT SUMP

NOTE: This procedure should be continued while CTMT Sump sample is being analyzed.

14. __CHECK CTMT SUMP pH - GREATER THAN 7	Consult TSC.
*15. __CHECK VCT LEVEL AND PRESSURE - INCREASING	GO TO Step 19.
16. __VERIFY VCT MAKEUP - SECURED	Secure VCT makeup. IF VCT level and pressure trend stabilizes, THEN GO TO Step 19.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Increasing VCT level and pressure indicates that 1-CH-230, VCT Outlet Check Valve, is leaking, causing 1-CH-RV-1382B, RCP Seal Return Line Relief Valve, to lift.

* *

17. __CHECK CHG PUMP MINIFLOW RECIRC VALVES - CLOSED • 1-CH-MOV-1275A • 1-CH-MOV-1275B • 1-CH-MOV-1275C	Close valves. IF VCT level and pressure trend stabilizes, THEN GO TO Step 19.
18. __CHECK VCT LEVEL AND PRESSURE TREND - STABILIZED	Do the following: a) Consult with TSC or plant staff. b) Locally isolate CHG Pump Seal Return line if desired: • Close 1-CH-231, Seal Water HX Outlet. OR • Close 1-CH-232, Seal Water HX Inlet.
19. __RETURN TO PROCEDURE AND STEP IN EFFECT	

- END -

RESPOND TO A LOSS OF THE OPERATING RHR PUMP
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	06/15/92		
02	1	03/01/93	Added Emergency Bus Verification to Step 4 IAW Rev. 4 of AP-27.00.	
03	2	09/03/93	Rev. 7 formatting changes.	
04	3	10/12/93	Remove CT for placing FCV-1605 back in automatic.	S93-1180
05	4	08/22/94	Changes in AP-27.00 and OP-RC-005.	S94-0832
06	5	07/25/96	KA number and procedure changes; component label verification.	S96-0221
07	6	03/23/98	Delete JPM # from trainee handouts.	S98-0286
08	7	12/09/98	Convert to Word.	S98-0936
09	8	03/01/02		S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 40.01 (Rev 08)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

RESPOND TO A LOSS OF THE OPERATING RHR PUMP.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	5 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
APE025.AA2.07 (RO 3.4/SRO 3.7) APE025.AA1.02 (RO 3.8/SRO 3.9) APE025.AA1.12 (RO 3.6/SRO 3.5) APE025.AA1.23 (RO 2.8/SRO 2.9) SYS005.A2.03 (RO 2.9/SRO 3.1) SYS005.A4.01 (RO 3.6/SRO 3.4) SYS005.A4.02 (RO 3.4/SRO 3.1)	RO 4.20/SRO 4.78

Conditions

- Task is to be SIMULATED in the plant or PERFORMED in the simulator.
- 1-RH-P-1A and RHR in service on "A" RHR HX with Rx vessel level at mid-nozzle.

Standards

- 1-RH-P-1B started and RHR flow restored in accordance with 1-AP-27.00, Loss of Decay Heat Removal Capability.

Initiating Cues

- Trip of the operating RHR pump.
- Shift Supervisor direction.

Terminating Cues

- 1-AP-27.00, Loss of Decay Heat Removal Capability, step 14 completed.

Procedures

- 1-AP-27.00, Loss of Decay Heat Removal Capability.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up RHR drained to mid-nozzle IC and initialize. Place simulator in RUN.
- Verify "A" RHR pump running and "B" in AUTO. Energize drained-down LTs. Verify RC-LI-100A at ≥ 12.7 feet and RC-LR-105 at ≥ 10 inches (12' 8").
- Implement malf for over-current trip of 1-RH-P-1A and allow annunciators B-G-6 & B-G-7 to alarm.
- Verify FCV-1605 in auto with flowrate set at 2500 gpm.
- Place simulator in FREEZE until ready to perform JPM.

Performance Checklist

Directions to the Operator.

- **IF THIS TASK IS TO BE SIMULATED, READ THE FOLLOWING:** This task is to be simulated. DO NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor and you are the unit RO. The unit has been operating on RHR at mid-nozzle for approximately 10 days with "A" RHR pump in service on "A" RHR heat exchanger with flow at 2500 GPM.
- We just received annunciator B-G-6, RHR HX LO FLOW, and the 1A RHR pump has tripped. Here is a copy of 1-AP-27.00, Loss of Decay Heat Removal Capability. I need you to perform the necessary steps to address this condition and restore RHR flow.
- When you complete AP-27.00, please inform me.

Notes to the Evaluator.

- IF THIS TASK IS TO BE SIMULATED, then DO NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 4 before 5 before 6.

START TIME: _____

---

1. READS CAUTIONS: LOSS OF RHR DUE TO TOTAL LOSS OF IA IS ADDRESSED BY AP-40.00, NON-RECOVERABLE LOSS OF IA; LOSS OF RHR MAY CAUSE CTMT RADIOLOGICAL CONDITIONS AND HEAT STRESS CONDITIONS TO DEGRADE, LOCAL ACTIONS IN CTMT SHOULD BE COORDINATED WITH HP; DURING SOLID PLANT OPERATION, INADVERTENT ACTUATION OF OPMS MAY OCCUR IF LETDOWN IS ISOLATED.

   Standards

   Reads cautions and recognizes that total loss of IA is not occurring.

   CUES

   - **If asked:** Provide cue PI-IA-100, INST AIR, indicates 105 psig.
   - **If asked:** Provide cue PI-SA-100, SERV AIR, indicates 100 psig.
   - **If asked:** Provide cue PI-IA-101, CTMT INST AIR, indicates 100 psig.
   - **If asked:** Provide cue Annunc B-E-6, IA LO HDR PRESS/IA COMPR 1 TRBL, is NOT lit.
   - **If asked:** Provide cue Annunc B-E-5, SERV AIR COMPR TRBL, is NOT lit.
   - **If asked:** Provide cue Annunc B-F-6, CTMT INST AIR HDR LO PRESS, is NOT lit.
   - **If asked:** Provide cue Annunc B-F-5, CTMT INST AIR COMPR TRBL, is NOT lit.

   Evaluator's Comments

---

2. CHECK RCS INVENTORY - DECREASING. ***(Step 1)***

Standards

(a) Checks pressurizer level stable and not decreasing.
(b) Checks standpipe level (1-RC-LI-100A) stable and not decreasing.
(c) Determines that reactor cavity has not been filled.
(d) Checks loop narrow range level recorder (1-RC-LR-105) reading and trace are stable and not decreasing.
(e) Checks containment sump level (1-DA-LI-100) is stable and not increasing.
(f) Checks RCS makeup rate not increasing.
(g) Checks PRT conditions (level, LI-1-470; pressure, PI-1-472; and temperature, TI-1-471) are stable and not increasing.
(h) Checks PDTT level (1-DG-LI-107) is stable and not increasing.
(i) Determines that RCS inventory is NOT decreasing and transitions to procedure STEP 4.

CUES

- **If asked:** Provide cue Pzr level is off-scale low.
- **If asked:** Provide cue Local standpipe level is reading 12.8 ft & stable.
- **If asked:** Provide cue Rx head is on, cavity is not flooded up.
- **If asked:** Provide cue 1-RC-LI-100A is reading 12.8 ft & stable.
- **If asked:** Provide cue 1-RC-LR-105 is reading 12 inches (12'10") & stable.
- **If asked:** Provide cue CTMT SUMP indicates 50% on DA-LI-100, <5" on DA-LI-110A & -110B, and 0% with steady trend on L-DA110B (Aux vent pnl).
- **If asked:** NO makeup has occurred for the last 30 minutes.
- **If asked:** Provide cue PRT level is 70% & stable (LI-1-470); PRT pressure is 3 psig & stable (PI-1-472); PRT temperature is 90°F & stable (TI-1-471).
- **If asked:** Provide cue PDTT level is 30% & stable (LI-DG-107).

Evaluator's Comments

3. VERIFY RHR PUMP - ONE RUNNING. ***(Step 4)***

Standards

(a) Determines 1-RH-P-1A not running (by observing green & amber breaker lights lit and no amps indicated).
(b) Determines 1-RH-P-1B not running (by observing green breaker light lit and no amps indicated).

CUES

- **If asked:** Provide cue 1-RH-P-1A has green & amber bkr lights lit & 0 amps indicated.
- **If asked:** Provide cue 1-RH-P-1B has green bkr light lit & 0 amps indicated.
- **If asked:** Provide cue 1-RH-FI-1605 indicates 0 gpm.
- **If asked:** Provide cue Annunc B-G-7, RHR PP 1A IN LOCAL CONTROL OR OL TRIP, is LIT.

Evaluator's Comments

* 4. PREPARE RHR SYSTEM FOR RHR PUMP START. ***(Step 4 RNO)***

Standards

(a) Determines emergency bus power available by verifying voltage on emergency bus voltage indicated.
*(b) Places 1-RH-FCV-1605 controller in MANUAL by momentarily depressing the MAN pushbutton.
*(c) Pushes the decrease pushbutton to decrease valve demand position until the demand indicates full closed.
(d) Notes amount of demand on hand controller for 1-RH-HCV-1758.
*(e) Turns 1-RH-HCV-1758 hand controller knob clockwise to increase valve demand position until the demand indicates full closed.

CUES

- **If asked:** Provide cue 1H and 1J 4160V bus are at 4280V.
- **If asked:** Provide cue FCV-1605 controller initially in AUTO; when MAN pushbutton pressed, controller swaps to MANUAL.
- **If asked:** Provide cue initial demand on FCV-1605 controller at 100% in AUTO; indicates 0% when properly operated.
- **If asked:** Provide cue initial demand on HCV-1758 controller at 97%; indicates 100% when properly operated.

Evaluator's Comments

---

* 5. START ONE RHR PUMP. ***(Step 4 RNO(b))***

Standards

(a) Announces starting 1-RH-P-1B on Gaitronics.
*(b) Starts 1-RH-P-1B by placing control switch to the START position.
(c) Verifies 1-RH-P-1B amps indicated and breaker RED light lit.

CUES

- **If asked:** Provide cue 1-RH-FI-1605 indicates 0 gpm.
- **If asked:** Provide cue 1-RH-P-1B amp meter indicates 25 amps (no-load).
- **If asked:** Provide cue prior to start RH-P-1B bkr lights are green on & red off. Following proper start, red light is on & green is off.

Evaluator's Comments

---

* 6. RESTORE RHR SYSTEM TO PRE-EVENT CONDITIONS. ***(Step 4 RNO(c))***

Standards

*(a) Increases RHR flow by pushing 1-RH-FCV-1605 increase pushbutton.
(b) Increases RHR flow to approximately 2500 gpm.
(c) Returns 1-FH-FCV-1605 to AUTOMATIC by momentarily depressing the AUTO pushbutton.
*(d) Turns 1-RH-HCV-1758 hand controller knob counter-clockwise to decrease valve demand position (reopen valve).
(e) Continues to turn 1-RH-HCV-1758 hand controller knob until demand indicates the pre-event setpoint.

CUES

- **If asked:** Provide cue prior to adjusting FCV-1605, FI-1605 indictes 0 gpm.
- **If asked:** Provide cue after adjusting FCV-1605, FI-1605 indicates 2500 gpm.
- **If asked:** Provide cue prior to adjusting HCV-1758, demand is 100%. After proper adjustment of HCV-1758, demand is restored to 97%.
- **If asked:** Provide cue 1-RH-TR-1604 GREEN (RHR HX out temp) indicates 132°F & stable. 1-RH-TR-1604 RED (RHR pp out temp) indicates 135°F & stable.

Evaluator's Comments

---

7. VERIFY RHR FLOW - INDICATED ON 1-RH-FI-1605. ***(Step 5)***

Standards

(a) Checks 1-RH-FI-1605 shows RHR system flow.

CUES

- **If asked:** Provide cue 1-RH-FI-1605 indicates 2500 gpm.
- **If asked:** Provide cue ERFCS reading of RHR flow indicates 2500 gpm.

Evaluator's Comments

8. CHECK RHR PUMP - VORTEXING. ***(Step 6)***

Standards

(a) Checks 1-RH-FI-1605 shows STABLE system flow and not oscillating.
(b) Checks 1-RH-P-1B amp indication shows STABLE pump amps and not oscillating.
(c) Transitions to procedure Step 12.

CUES

- **If asked:** Provide cue 1-RH-FI-1605 stable at 2500 gpm.
- **If asked:** Provide cue 1-RH-P-1B amps stable at 38 amps.

Evaluator's Comments

9. CHECK RHR HEAT SINK. ***(Step 12)***

Standards

(a) Checks RHR system flow on 1-RH-FI-1605.
(b) Checks RHR HX CC outlet header flow by observing 1-CC-FI-110A.
(c) Checks RHR CC outlet header temperature by observing 1-CC-TI-109A.
(d) Go to Step 14.

CUES

- **If asked:** Provide cue 1-RH-FI-1605 stable at 2500 gpm.
- **If asked:** Provide cue 1-CC-FI-110A indicates 40 x 100 gpm.
- **If asked:** Provide cue 1-CC-FI-110B indicates 25 x 100 gpm.
- **If asked:** Provide cue 1-CC-TV-109A indicates red light on & green light off.
- **If asked:** Provide cue 1-CC-TV-109B indicates red light on & green light off.
- **If asked:** Provide cue 1-CC-TI-109A indicates 88°F.
- **If asked:** Provide cue 1-CC-TI-109B indicates 82°F.

Evaluator's Comments

10. VERIFY RCS TEMPERATURE - STABLE OR DECREASING. ***(Step 14)***

Standards

(a) Checks Core Exit Thermocouples temperatures reading stable or decreasing.
(b) Checks RHR pump discharge temperature recorder (1-RH-TR-1604 RED PEN) stable or decreasing.
(c) If temperature increasing, then adjusts 1-RH-HCV-1758 control pot to decrease demand and increase flow through heat exchanger.
(d) Checks RHR HX outlet temperature recorder (1-RH-TR-1604 GREEN PEN) stable or decreasing.

CUES

- **If asked:** Provide cue CETCs indicate 138°F & stable.
- **If asked:** Provide cue 1-RH-TR-1604 RED PEN indicates 135°F & stable.
- **If asked:** Provide cue 1-RH-TR-1604 GREEN PEN indicates 132°F & stable.

Evaluator's Comments

11. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made of task completion.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary
Job Performance Measure 40.01 (Rev 08)
RESPOND TO A LOSS OF THE OPERATING RHR PUMP

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 40.01 (Rev 08)
RESPOND TO A LOSS OF THE OPERATING RHR PUMP

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **5 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

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Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be SIMULATED in the plant or PERFORMED in the simulator.
- 1-RH-P-1A and RHR in service on "A" RHR HX with Rx vessel level at mid-nozzle.

Initiating Cues

- Trip of the operating RHR pump.
- Shift Supervisor direction.

Directions

- **IF THIS TASK IS TO BE SIMULATED, READ THE FOLLOWING:** This task is to be simulated. DO NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor and you are the unit RO. The unit has been operating on RHR at mid-nozzle for approximately 10 days with "A" RHR pump in service on "A" RHR heat exchanger with flow at 2500 gpm.
- We just received annunciator B-G-6, RHR HX LO FLOW, and the 1A RHR pump has tripped. Here is a copy of 1-AP-27.00, Loss of Decay Heat Removal Capability. I need you to perform the necessary steps to address this condition and restore RHR flow.
- When you complete AP-27.00, please inform me.

ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-AP-27.00	LOSS OF DECAY HEAT REMOVAL CAPABILITY (With 11 Attachments)	10
		PAGE 1 of 19

PURPOSE

To provide guidance when the RHR System fails to remove decay heat.

ENTRY CONDITIONS

1. No RHR pumps running due to failure or loss of power.

2. Air-binding of the operating RHR pump as indicated by any of the following:

   - Motor amperage oscillations
   - Flow oscillations
   - Excessive pump noise
   - RHR HX LO FLOW annunciator, 1B-G6

3. Failure of the RHR system to control RCS temperature due to loss of Component Cooling or valve failure.

4. Loss of RCS inventory while on RHR as indicated by any of the following:

   - Increasing PRT level, pressure, or temperature
   - Local observation of RCS inventory loss
   - CTMT SUMP HI LVL annunciator, 1B-A3
   - SHUTDOWN COOLING LO LVL annunciator, 1B-G8
   - Decreasing trend on 1-RC-LR-105, COLD SHUTDOWN RCS LEVEL - NARROW RANGE

5. Transition from 1-FR-C.3, RESPONSE TO SATURATED CORE COOLING.

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION:
- Loss of RHR due to a total loss of IA is addressed by 0-AP-40.00, NON-RECOVERABLE LOSS OF IA.
- Loss of RHR may cause CTMT radiological and heat stress conditions to degrade. Local actions in CTMT should be coordinated with HP.
- During solid plant operation, inadvertent actuation of the OPMS may occur if letdown is isolated.

* *

1. __CHECK RCS INVENTORY - DECREASING GO TO Step 4.

   - PRZR level - DECREASING
   - Standpipe level - DECREASING
   - Reactor cavity level - DECREASING
   - RCS Narrow Range level - DECREASING

   - CTMT sump level - INCREASING
   - Makeup rate - INCREASING
   - PRT level, pressure, or temperature - INCREASING
   - PDTT level - INCREASING

   - RWST level - INCREASING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	__ATTEMPT TO IDENTIFY AND STOP INVENTORY LOSS:	
	a) Stop any known draining evolution	
	b) Close RHR LETDOWN FLOW valve • 1-RH-HCV-1142	b) Close 1-CH-PCV-1145.
	c) Close or verify closed RCS loop drains • 1-RC-HCV-1557A • 1-RC-HCV-1557B • 1-RC-HCV-1557C	
	d) Increase RCS makeup	
	e) Terminate any activities that could cause leakage • Valve alignments • Periodic testing • Maintenance	
	f) Coordinate local walkdowns with HP to identify and isolate RCS leakage	
	g) Check RCS level - STABLE OR INCREASING	g) <u>IF</u> RCS temperature greater than 200°F, <u>THEN</u> GO TO 1-AP-16.01, SHUTDOWN LOCA. <u>IF</u> RCS temperature less than 200°F, <u>THEN</u> align any available SI flowpath to maintain stable or increasing RCS level.
3.	__GO TO STEP 16	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	__VERIFY RHR PUMP - ONE RUNNING	IF Emergency Bus power is available, THEN do the following: a) Manually close RH control valves: • 1-RH-FCV-1605 • 1-RH-HCV-1758 b) Start one RHR pump. c) Adjust RH control valves to return flow to pre-event rate: • 1-RH-FCV-1605 • 1-RH-HCV-1758 d) IF an RHR pump can NOT be started, THEN GO TO Step 16. IF RHR pump NOT running due to loss of Emergency Bus power, THEN do the following: a) Verify initiated or initiate 1-AP-10.07, LOSS OF UNIT 1 POWER. b) GO TO Step 17.
5.	__VERIFY RHR FLOW - INDICATED ON RHR SYS FLOW • 1-RH-FI-1605	Verify opened or open the following valves: • 1-RH-MOV-1700 • 1-RH-MOV-1701 • 1-RH-MOV-1720A • 1-RH-MOV-1720B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	__CHECK RHR PUMP - VORTEXING • Flow indication on 1-RH-FI-1605 - OSCILLATING • Amperage indication - OSCILLATING	GO TO Step 12.

* *

CAUTION: RCS temperature may increase if RHR flow rate is less than required based on time after shutdown. (Attachment 1)

* *

7.	__REDUCE RHR FLOW TO STOP VORTEXING • Use 1-RH-FCV-1605 in MANUAL OR • Use 1-RH-HCV-1758	
8.	__CHECK RHR PUMP - STILL VORTEXING	GO TO Step 12.
9.	__CHECK RCS LEVEL - WITHIN ACCEPTABLE REGION • 1-RC-LI-100A (Attachment 2) OR • 1-RC-LR-105 (Attachment 3)	Restore RCS level to Acceptable Region of Attachment 2 or 3.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	__VERIFY RHR PUMPS - BOTH AVAILABLE	Restore RHR pump: a) Stop pump. b) Verify RHR flow - NONE INDICATED. c) Vent pump. • 1-RH-P-1A, 1-RH-9 • 1-RH-P-1B, 1-RH-3 d) Restart pump. e) <u>IF</u> RHR pump can <u>NOT</u> be restored, <u>THEN</u> GO TO Step 17. f) <u>IF</u> RHR pump is restored, <u>THEN</u> GO TO Step 12.
11.	__RESTORE RHR PUMPS: a) Stop vortexing pump b) Verify RHR flow - NONE INDICATED c) Manually close 1-RH-FCV-1605 and 1-RH-HCV-1758 d) Start other RHR pump e) Adjust RH control valves to return flow to pre-event rate: • 1-RH-FCV-1605 • 1-RH-HCV-1758	e) GO TO Step 17.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	__CHECK RHR HEAT SINK:	
	a) Flow on 1-RH-FI-1605 - NORMAL	a) Adjust 1-RH-HCV-1758 and 1-RH-FCV-1605 to control flow.
	b) CC to RHR HX	
	1) RHR HX CC Outlet HDR Flow - NORMAL • 1-CC-FI-110A OR • 1-CC-FI-110B	1) Verify opened or open 1-CC-TV-109A or 1-CC-TV-109B. IF TV can NOT be opened due to a localized loss of IA, THEN locally open IAW 0-FCA-16.00, LOCAL OPERATION OF AIR OPERATED VALVES. IF the in-service RHR HX TV can NOT be opened, THEN place the other RHR HX in service IAW 1-OP-RH-001, RHR OPERATIONS. IF CC flow can NOT be established to either RHR HX, THEN do the following: a. Evaluate initiating 1-AP-15.00, LOSS OF COMPONENT COOLING. b. GO TO Step 17.
	2) RHR HX CC Outlet HDR TEMP - NORMAL • 1-CC-TI-109A OR • 1-CC-TI-109B	2) Do the following: IF SW jumper from the CC HXs to Waterbox 2B in service and has isolated due to HI HI CLS and a Blackout on Unit 2, THEN GO TO Step 13. IF jumper NOT in service, THEN adjust SW to CC HXs and GO TO Step 14.
	c) GO TO Step 14	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: If loss of intake canal has occurred, SW flow to the CC HXs should be restored IAW 0-AP-12.01, LOSS OF INTAKE CANAL LEVEL.

* *

13. __RESTORE SW TO CC HXs:

a) Verify open or open one of the following:

- 1-SW-MOV-102A

OR

- 1-SW-MOV-102B

b) Close the following valves:

- 1-SW-940
- 1-SW-941

c) Verify closed or close 2-CW-MOV-206B

d) Send operator to breaker 2H1-1-8A for 2-CW-MOV-200B

e) Establish communications with operator at breaker

f) Open 2-CW-MOV-200B for approximately 15 seconds and have operator open breaker

g) Slowly open the following valves to reestablish CC HX SW flow:

- 1-SW-940
- 1-SW-941

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	__VERIFY RCS TEMPERATURE - STABLE OR DECREASING	Adjust 1-RH-HCV-1758 to control temperature. IF temperature can NOT be stabilized, THEN GO TO Step 17.
15.	__RETURN TO PROCEDURE IN EFFECT	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: RCS temperature may increase if RHR flow rate is less than required based on time after shutdown. (Attachment 1)

* *

NOTE:
- Changes in RCS pressure can result in vessel water level changes not shown by the RCS vessel level indicator.
- Any dilution of the RCS should be stopped until RHR flow has been reestablished.

16. __CHECK IF RHR PUMPS SHOULD BE STOPPED:	
a) RHR Pumps - ANY RUNNING	a) GO TO Step 17.
b) RCS level - WITHIN ACCEPTABLE REGION • 1-RC-LI-100A (Attachment 2) OR • 1-RC-LR-105 (Attachment 3)	b) Do the following: • Restore RCS level to Acceptable Region of Attachment 2 or 3 OR • Reduce RHR flow to Acceptable Region of Attachment 2 or 3 using 1-RH-FCV-1605 or 1-RH-HCV-1758
c) RHR pumps - VORTEXING • Flow indication on 1-RH-FI-1605 - OSCILLATING • Amperage indication - OSCILLATING	c) RETURN TO appropriate plant procedure.
d) Stop RHR pumps	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17.	__CHECK PRE-EVENT RCS LEVEL - GREATER THAN 16.25 FT ON 1-RC-LI-100A (15.7 FT ON LOCAL STANDPIPE)	GO TO Step 20.
18.	__CHECK PRE-EVENT RCS TEMPERATURE - LESS THAN 200°F	GO TO Step 22.
	NOTE: If RCS subcooling can NOT be maintained during this procedure. Steps 20 and 21 must be performed.	
*19.	__DETERMINE TIME TO 200°F BASED ON ACTUAL HEATUP RATE USING CETCs - LESS THAN 2 HOURS	Do the following: a) Evaluate open CTMT penetrations and make preparations for closure. b) IF time to 200°F becomes less than 2 hours, THEN perform Steps 20 and 21. c) GO TO Step 22.
20.	__INITIATE ACTIONS TO PROTECT PERSONNEL WORKING IN CTMT:	
	a) Notify HP	
	b) Evacuate non-essential personnel in CTMT	
	c) Periodically monitor CTMT radiation conditions	
	d) Verify CTMT purge - SECURED	d) Secure CTMT purge.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21.	__INITIATE ACTIONS TO ESTABLISH CTMT CLOSURE:	
	a) If initially at Reduced Inventory, establish CTMT closure IAW 1-OSP-CT-214, Containment Closure for Reduced or Potentially Reduced Inventory Conditions (Attachments 6 and 7)	
	b) If initially at Decreased Inventory, establish CTMT closure IAW 1-OP-CT-001, Containment Penetration Breach Log	
	c) If initially not at Reduced or Decreased Inventory, establish CTMT closure IAW Shift Supervisor direction	
	d) Check CTMT Closure Team - ESTABLISHED	d) Do the following: 1) Direct Mechanical Foreman to initiate 0-MCM-1202-6, Emergency Closure of the Equipment Hatch, as necessary. 2) GO TO Step 21f.
	e) Direct CTMT Closure Team to initiate 0-MCM-1202-6, Emergency Closure of the Equipment Hatch, as necessary	
	f) Verify closed or close at least one door of the Personnel Hatch	
22.	__START AVAILABLE CTMT AIR RECIRC FANS	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: • Steps 23 through 26 establish an alternate mode of decay heat removal.

• Attachment 10 may be used for cooling the RCS with the SFP and RWST coolers.

23. __CHECK THE FOLLOWING - AVAILABLE TO SUPPORT NATURAL CIRCULATION COOLING: — GO TO Step 25.

• 1-OSP-ZZ-003, Attachment 2 equipment - AVAILABLE

OR

• 1-OSP-ZZ-004, Attachment 2 equipment - AVAILABLE

24. __GO TO ATTACHMENT 4

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25.	__CHECK THE FOLLOWING - AVAILABLE TO SUPPORT REFLUX COOLING: • 1-OSP-ZZ-003, Attachment 3 OR 1-OSP-ZZ-004, Attachment 4 - EQUIPMENT AVABILABLE • RCS inventory - NOT DECREASING	IF CHG and LHSI Pumps NOT available due to electrical or other reasons, THEN GO TO Attachment 8 to align gravity feed. IF forced flow available, THEN do the following: a) IF PRZR available, THEN do the following: 1) Increase PRZR level to between 40 and 60% using any of the following: • Normal Charging • LHSI Pump • CHG Pump HHSI • Charging Crosstie 2) WHEN RHR system available, THEN GO TO Step 27. 3) IF RCS approaches saturation, THEN GO TO Attachment 6. b) IF PRZR NOT available, THEN do the following: 1) WHEN RHR system available, THEN GO TO Step 27. 2) IF RCS approaches saturation, THEN GO TO Attachment 6.
26.	__GO TO ATTACHMENT 5	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION:
- RCS standpipe level indication, 1-RC-LI-100A, will not indicate below actual RCS level of 12.1 FT.
- Personnel working in CTMT should be warned before the RCS is refilled to avoid inadvertent contamination of personnel working near RCS openings.
- Only borated water should be added to the RCS to maintain adequate shutdown margin.

* *

27. __CHECK RCS LEVEL — GO TO Step 29.

- Greater than 12.1 FT on 1-RC-LI-100A

OR

- Greater than 12 FT 1 IN on 1-RC-LR-105

28. __GO TO STEP 30

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29.	__REFILL THE RCS:	
	a) Align and start at least one CHG pump for hot leg injection	a) Align and start one LHSI pump for hot leg injection. IF a hot leg flow path is NOT available, THEN make up to the RCS using one of the following: 1) CHG pump to cold leg. 2) LHSI pump to cold leg. 3) RWST gravity feed or VCT overpressure feed. 4) Any other CHG flowpath.
	b) Refill the RCS until level is greater than required: • 12.1 FT on 1-RC-LI-100A OR • 12 FT 1 IN on 1-RC-LR-105	

NOTE:
- Before additional actions are taken to obtain alternate cooling sources, the time to boiling in the RCS should be considered when deciding how much time is needed to vent the RHR system.
- If adequate time to completely vent the RHR system is not available, air can be swept out of the RHR lines by filling the RCS to 13.5 FT, (off-scale high on 1-RC-LR-105) verifying 10°F RCS subcooling, and running an RHR pump at a flow rate greater than 2950 GPM.

30.	__VENT RHR SYSTEM AS NECESSARY:	
	a) Maintain RCS level while venting RHR system	
	b) Locally vent from 1-RH-42	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Extended operation at low RHR flowrates may cause cavitation concerns in 1-RH-FCV-1605.

* *

NOTE:
- Starting an RHR pump may result in a decrease in RCS level due to shrink or void collapse.
- The RCS level necessary to operate RHR pumps is a function of RHR flow. Attachment 2 or 3 provide guidance for determining the required RCS level.

31. __RESTORE RHR FLOW:

a) Close RH control valves

- 1-RH-HCV-1758
- 1-RH-FCV-1605

b) Start one RHR pump

c) Maintain RCS level IAW Attachment 2 or 3

d) Increase RHR bypass flow to the desired flowrate

(STEP 31 CONTINUED ON NEXT PAGE)

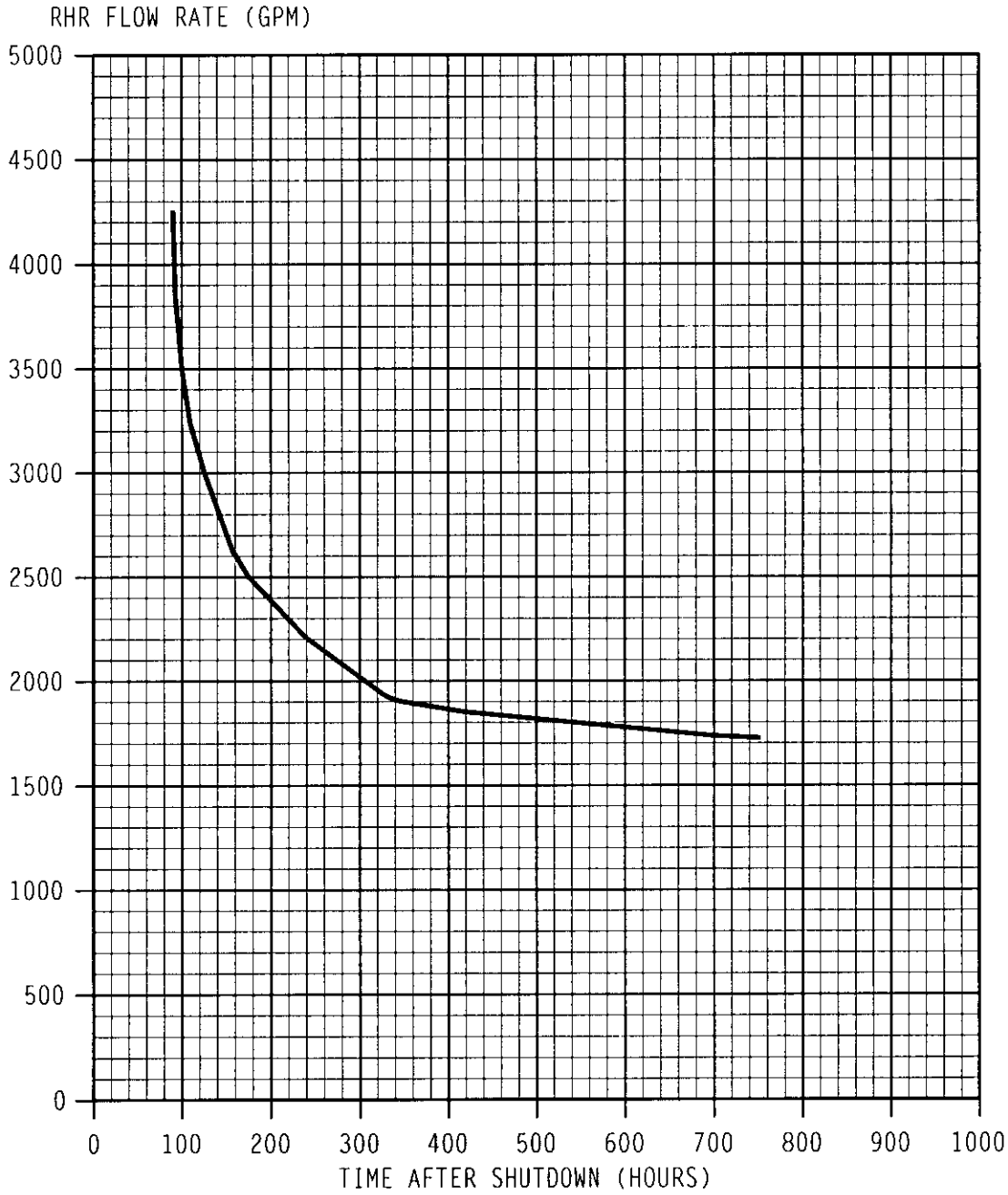
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31.	RESTORE RHR FLOW (Continued):	
	e) Check RHR flow - RESTORED	e) Do the following: 1) Continue to monitor CETCs. 2) Consult with TSC or plant staff and GO TO the appropriate Attachment for alternate means of decay heat removal: • Attachment 4, Natural Circulation Cooling • Attachment 5, Reflux Boiling Heat Removal • Attachment 6, Forced Feed Cooling • Attachment 8, Gravity Feed Cooling
	f) Terminate alternate mode of decay heat removal	
	g) Control RCS cooldown rate at less that 50°F/hr	
32.	__CHECK IF RCS MAKEUP SHOULD BE REDUCED:	
	a) RCS temperature - LESS THAN 200°F	a) Continue cooling with RHR.
	b) RCS level - STABLE OR INCREASING	b) Control charging flow to maintain RCS level IAW Attachment 2 or 3.
33.	__CHECK RCS TEMPERATURE - LESS THAN 140°F	Continue cooling with RHR. Return to Step 31c.

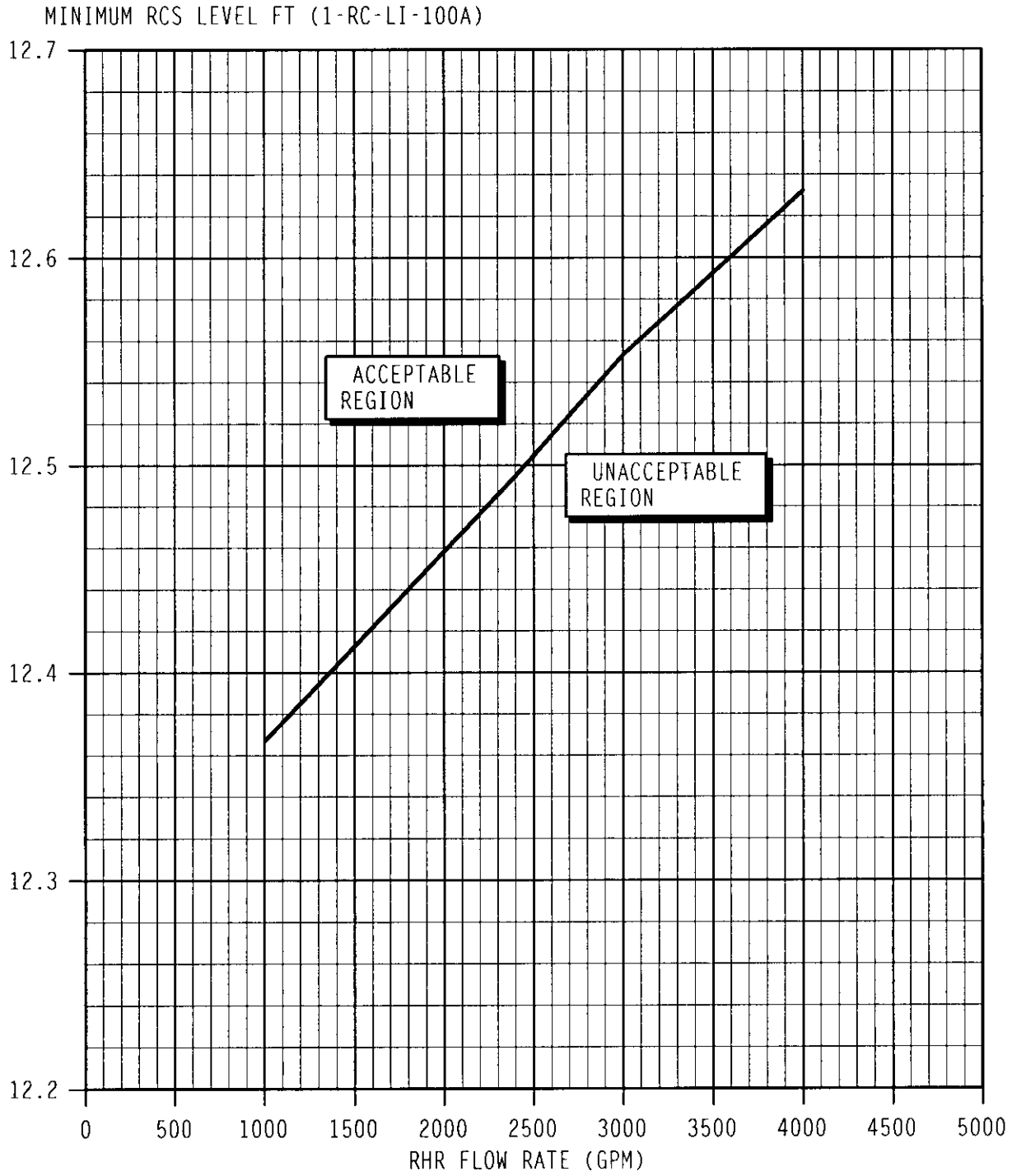
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

34. __RETURN TO PROCEDURE IN EFFECT

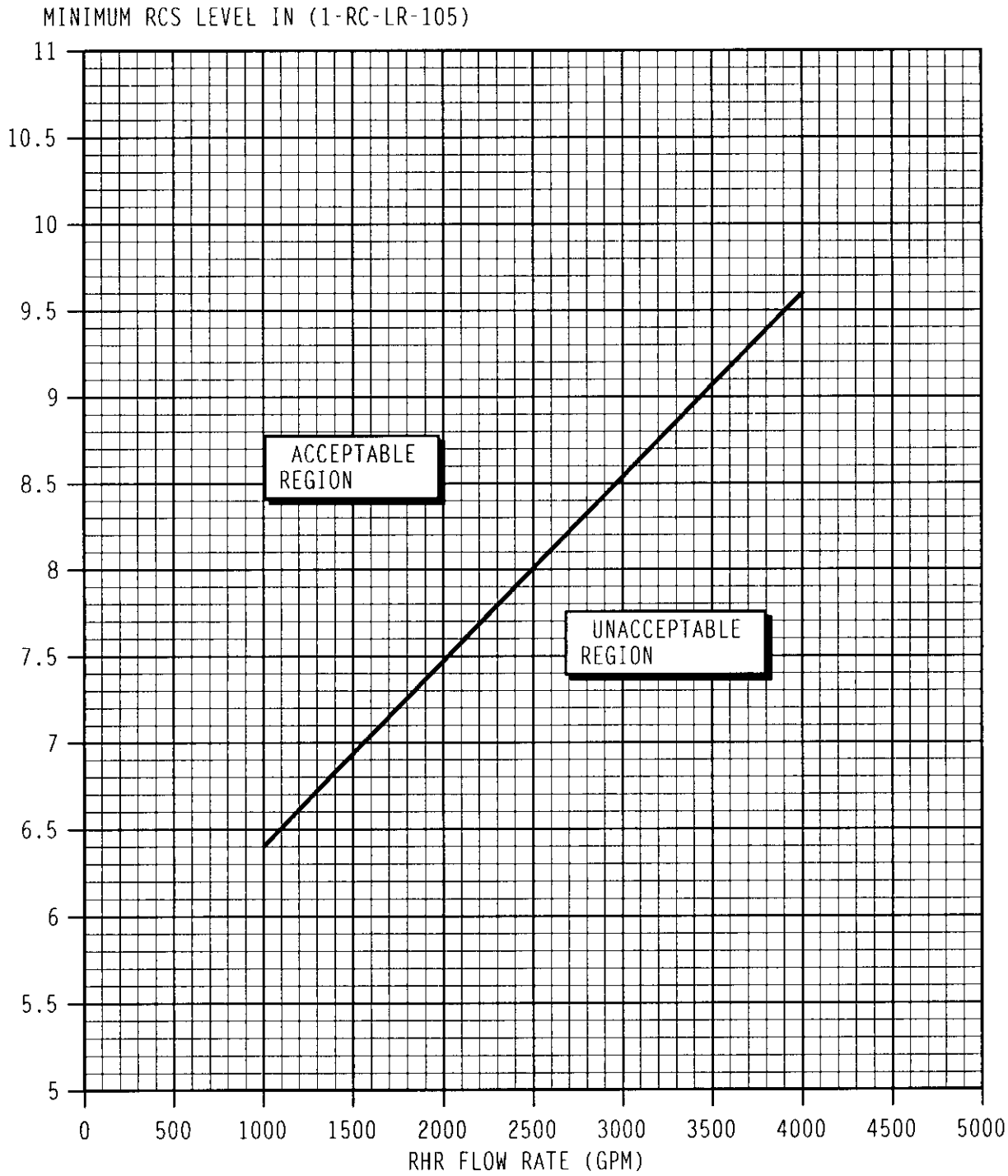
- END -

NUMBER 1-AP-27.00	ATTACHMENT TITLE RHR FLOW REQUIREMENT VERSUS TIME AFTER SHUTDOWN	REVISION 10
ATTACHMENT 1		PAGE 1 of 1




MINIMUM RCS LEVEL FT (1-RC-LI-100A)
12.7
12.6
12.5
12.4
12.3
12.2
ACCEPTABLE REGION
UNACCEPTABLE REGION
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
RHR FLOW RATE (GPM)

NUMBER 1-AP-27.00	ATTACHMENT TITLE MINIMUM RCS LEVEL VERSUS RHR FLOW (1-RC-LR-105)	REVISION 10
ATTACHMENT 3		PAGE 1 of 1



NOTE: The RCS must be pressurized and SG tubes filled for Natural Circulation cooling to be effective.

___ 1. Attempt to start an RCP IAW 1-OP-RC-001, STARTING AND RUNNING ANY RCP. IF an RCP can be started, THEN RETURN TO procedure in effect. IF an RCP can NOT be started, THEN GO TO Step 2.

___ 2. Verify running or start three CRDM fans.

___ 3. Control SG narrow range level between 11 and 65% in at least one SG:

- For AFW, control flow using 1-FW-MOV-151A through F.
- For CN, control flow using 1-FW-HCV-155A, B, or C.

___ 4. Control Pressurizer level between 15 and 75% using charging and letdown.

___ 5. Monitor RCS conditions for satisfactory Natural Circulation cooling:

- RCS Subcooling based on CETCs - GREATER THAN 30°F
- CETCs - STABLE OR SLOWLY DECREASING
- SG pressure - STABLE OR SLOWLY DECREASING
- WR hot leg temperature - STABLE OR SLOWLY DECREASING
- WR cold leg temperature - AT SATURATION FOR SG PRESSURE

___ 6. IF any of the above parameters indicate a loss of Natural Circulation, THEN slowly increase steam flow rate using Steam Dumps or SG PORVs.

___ 7. IF RCS cooldown is desired, THEN maintain cooldown rate less than or equal to 25°F/HR.

___ 8. WHEN RHR system available, THEN GO TO procedure Step 26.

___ 9. IF Natural Circulation can NOT control RCS temperature AND CETC temperatures are approaching saturation, THEN GO TO Attachment 5.

NOTE: • The number of SGs required for reflux cooling are as follows:

- 3 SGs, if shutdown less than 75 hours
- 2 SGs, if shutdown greater than or equal to 75 hours and less than 375 hours
- 1 SG, if shutdown greater than or equal to 375 hours

• Reflux cooling should occur when CETC temperatures are maintained between 280 and 290°F.

___ 1. Send an Operator to CTMT to close 1-RC-184, Reactor Vessel Head vent isolation.

___ 2. Verify closed or close both PRZR PORVs.

___ 3. Allow RCS CETC temperatures to increase to between 280 and 290°F.

___ 4. WHEN RCS temperature increases to between 280 and 290°F, THEN increase steam rate of SG(s) to maintain this temperature using SG PORV(s) or Steam Dumps to the Main Condenser.

___ 5. Control SG narrow range level between 11 and 65% in the required number of SGs:

- For AFW, control flow using 1-FW-MOV-151A through F.
- For CN, control flow using 1-FW-HCV-155A, B, or C.

NOTE: RCS makeup will be needed only to account for losses due to leakage.

___ 6. Control RCS level within the range of 1-RC-LR-105, COLD SHUTDOWN RCS LEVEL NARROW RANGE, using any of the following:

- Normal Charging
- RCP Seal Injection
- High Head or Low Head SI flow to the Cold or Hot legs

___ 7. Monitor RCS conditions for satisfactory Reflux cooling:

- CETCs - STABLE OR SLOWLY DECREASING

___ 8. WHEN RHR System available, THEN GO TO procedure Step 26.

___ 9. IF Reflux Boiling Heat Removal can NOT control RCS temperature, THEN GO TO Attachment 6.

* *

CAUTION:
- 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.

* *

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 can NOT be filled due to maintenance.

___ 1. Determine which LHSI Pump is to be started. IF LHSI Pump NOT available, THEN GO TO Step 13.

___ 1-SI-P-1A ___ 1-SI-P-1B

___ 2. Verify open or open LHSI PUMP SUCTION FROM RWST MOV for LHSI Pump to be started:

___ 1-SI-MOV-1862A or ___ 1-SI-MOV-1862B

___ 3. Verify open or open LHSI RECIRC PUMP MOVs for LHSI Pump to be started:

___ 1-SI-MOV-1885A and 1-SI-MOV-1885D or 1-SI-MOV-1885B and 1-SI-MOV-1885C

___ 4. Start LHSI Pump determined in Step 1.

___ 5. Establish RCS bleed path IAW the following:

___ a. IF PRZR Safety Valve previously removed, THEN GO TO Step 6.

___ b. IF time since shutdown is greater than 14 hours and less than 113 hours, THEN open two PRZR PORVs and the associated Block MOVs.

___ c. IF time since shutdown is greater than or equal to 113 hours, THEN open one PRZR PORV and the associated Block MOV.

___ 6. IF hot leg injection to be used, THEN do the following. IF cold leg injection to be used, THEN GO TO Step 7.

___ a. Throttle SI flow to RCS IAW Attachment 7 using LHSI TO HOT LEGS for running LHSI Pump:

___ 1-SI-MOV-1890A (Key 47) or ___ 1-SI-MOV-1890B (Key 48)

___ b. IF hot leg injection NOT controlling RCS temperature as indicated by increasing PRZR liquid and vapor space temperatures or by decreasing subcooling, THEN do either of the following:

- Increase SI flowrate.
- Swap to cold leg injection.

___ c. GO TO Step 11.

___ 7. Verify energized or locally close breaker for 1-SI-MOV-1890C, LHSI TO COLD LEGS. (1H1-2N 9A)

___ 8. Open 1-SI-MOV-1890C, LHSI TO COLD LEGS.

___ 9. Throttle SI flow to RCS IAW Attachment 7 using LHSI PUMP TO COLD LEGS. IF CETC temperatures decrease, THEN throttle flow to maintain stable temperature.

___ 1-SI-MOV-1864A or ___ 1-SI-MOV-1864B

___10. IF CETC temperatures can NOT be maintained less than 200°F, THEN do either of the following:

- Increase SI flowrate.
- Swap to hot leg injection.

___11. IF RWST level decreases to 16% due to RCS feed and bleed, THEN GO TO Step 24.

___12. WHEN RHR System available, THEN RETURN TO procedure Step 27.

13. Align CHG Pump suction to the RWST:

___ a. Open CHG PUMP SUCT FROM RWST MOVs:

- 1-CH-MOV-1115B
- 1-CH-MOV-1115D

___ b. Close CHG PUMP SUCTION FROM VCT MOVs:

- 1-CH-MOV-1115C
- 1-CH-MOV-1115E

14. Determine which CHG Pump is to be started:

___ 1-CH-P-1A ___ 1-CH-P-1B ___ 1-CH-P-1C

___ 15. Verify open or open the following MOVs for the CHG Pump determined in Step 14:

1-CH-P-1A	1-CH-P-1B	1-CH-P-1C
__1-CH-MOV-1267A	__1-CH-MOV-1269A	__1-CH-MOV-1270A
__1-CH-MOV-1267B	__1-CH-MOV-1269B	__1-CH-MOV-1270B
__1-CH-MOV-1275A	__1-CH-MOV-1275B	__1-CH-MOV-1275C
__1-CH-MOV-1286A	__1-CH-MOV-1286B	__1-CH-MOV-1286C
__1-CH-MOV-1287A	__1-CH-MOV-1287B	__1-CH-MOV-1287C

___ 16. Verify running or start one CHG Pump.

17. Establish RCS bleed path IAW the following:

___ a. IF PRZR Safety Valve previously removed, THEN GO TO Step 18.

___ b. IF time since shutdown is greater than 112 hours and less than 120 hours, THEN open two PRZR PORVs and the associated Block MOVs.

___ c. IF time since shutdown is greater than or equal to 120 hours, THEN open one PRZR PORV and the associated Block MOV.

NOTE: The hot leg flow path is preferred for RCS feed and bleed.

18. IF hot leg injection to be used, THEN do the following. IF cold leg injection to be used, THEN GO TO Step 19.

    ___ a. Send an Operator to the Auxiliary Building basement.

    ___ b. Using Attachment 7, direct local throttling of SI flow by opening the breaker for the selected MOV and throttling the selected MOV:

    ___ 1-SI-MOV-1869A, HHSI TO HOT LEGS (1H1-1 3C)
    ___ 1-SI-MOV-1869B, HHSI TO HOT LEGS (1J1-1 9A)

    ___ c. IF hot leg injection NOT controlling RCS temperature as indicated by increasing PRZR liquid and vapor space temperatures or by decreasing subcooling, THEN do either of the following:

    - Increase SI flowrate.
    - Swap to cold leg injection.

    ___ d. GO TO Step 22.

___ 19. Send an Operator to the Auxiliary Building basement.

___ 20. Using one of the following MOVs, direct local throttling of SI flow by opening the MOV's breaker and throttling the selected MOV IAW Attachment 7. IF CETC temperatures decrease, THEN throttle flow to maintain stable temperature.

___ 1-SI-MOV-1867C, HHSI TO COLD LEGS (1H1-1 2C)
___ 1-SI-MOV-1867D, HHSI TO COLD LEGS (1J1-1 8C)
___ 1-SI-MOV-1842, ALT HHSI TO COLD LEGS (1H1-2N 4B)

___ 21. IF CETC temperatures can NOT be maintained less than 200°F, THEN do either of the following:

- Increase SI flowrate.
- Swap to hot leg injection.

___ 22. IF RWST level decreases to 16% due to RCS feed and bleed, THEN GO TO Step 24.

___ 23. WHEN RHR System available, THEN RETURN TO procedure Step 27.

* *

CAUTION:
- When RWST level decreases to 13%, the SI system will align for cold leg recirculation, unless the RMT key switches are in the REFUEL position.
- If suction source is lost to any SI pump, the pump should be stopped.
- Long-term loss of RHR may require manual alignment of one RS HX.
- TSC should be consulted to determine preferred course of action.

* *

___ 24. IF RWST inventory can NOT support continued RCS feed and bleed, THEN perform either I or II below.

NOTE: An LCO clock may be entered on Unit 2 if the RWST is crosstied.

I. CHG PUMP SUCTION CROSSTIE

___ 1. Verify open or open CHG PUMP SUCT FROM RWST MOVs:

- 1-CH-MOV-1115B
- 1-CH-MOV-1115D

___ 2. Close CHG PUMP SUCTION FROM VCT MOVs:

- 1-CH-MOV-1115C
- 1-CH-MOV-1115E

___ 3. Open RWST CROSSTIE valves:

- 1-SI-TV-102A
- 1-SI-TV-102B

___ 4. Direct Unit 2 Operator to open RWST CROSSTIE valves:

- 2-SI-TV-202A
- 2-SI-TV-202B

___ 5. Start makeup to Unit 2 RWST.

6. WHEN RHR System available, THEN do the following:

   ___ a. Close the RWST CROSSTIE valves on Unit 1 and Unit 2.

   ___ b. Establish charging and letdown to maintain stable PRZR level and pressure.

   ___ c. RETURN TO procedure Step 27.

II. TRANSFER TO COLD LEG RECIRCULATION

___ 1. Verify CTMT sump level greater than 2.5 ft.

___ 2. Verify running or start one LHSI Pump on recirc with the RWST.

___ 3. Verify running or start one CHG Pump.

___ 4. Open LHSI Pump discharge MOV to CHG Pumps for running LHSI Pump:

- 1-SI-MOV-1863A, LHSI PUMP A TO ALT HHSI
- 1-SI-MOV-1863B, LHSI PUMP B TO NORMAL HHSI

___ 5. Close LHSI RECIRC PUMP MOVs for running LHSI Pump:

- 1-SI-MOV-1885A or 1-SI-MOV-1885B
- 1-SI-MOV-1885D 1-SI-MOV-1885C

___ 6. Open LHSI PUMP ( ) SUCTION FROM SUMP MOV for running LHSI Pump:

- 1-SI-MOV-1860A or 1-SI-MOV-1860B

___ 7. Close LHSI PUMP ( ) SUCTION FROM RWST MOVs for running LHSI Pump:

- 1-SI-MOV-1862A or 1-SI-MOV-1862B

___ 8. Close CHG PUMP SUCT FROM RWST MOVs:

- 1-CH-MOV-1115B and 1-CH-MOV-1115D

___ 9. Open any of the following as necessary to maintain stable CETC temperatures:

   ___ 1-SI-MOV-1867C, HHSI TO COLD LEGS
   ___ 1-SI-MOV-1867D, HHSI TO COLD LEGS
   ___ 1-SI-MOV-1842, ALT HHSI TO COLD LEGS

___ 10. Monitor CETC temperature, RCS subcooling, and CTMT Sump temperature.

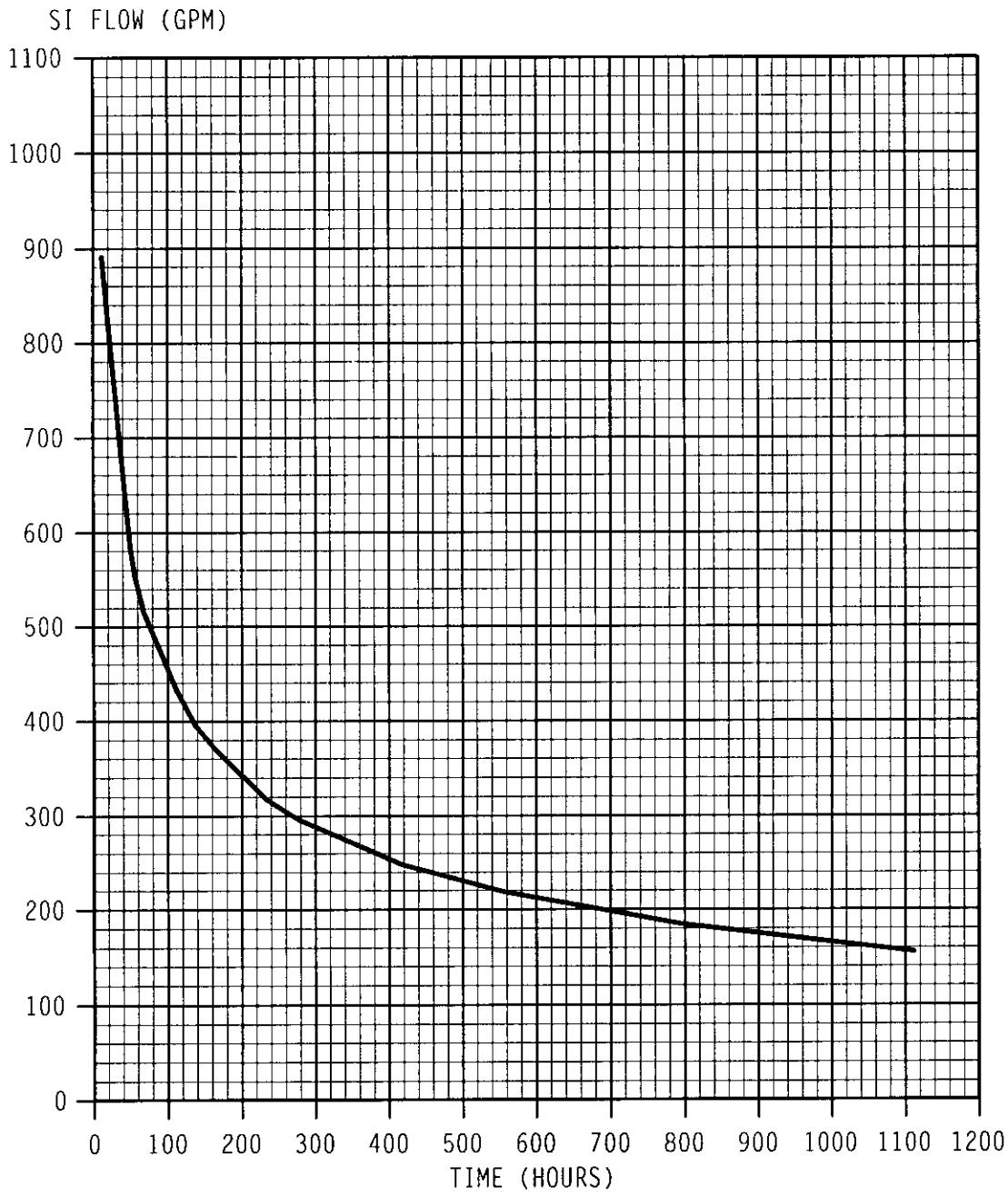
___ 11. Consult with TSC or plant staff on placing an RS HX in service.

___ 12. Maintain RCS heat removal using feed and bleed. WHEN RHR restored, THEN do the following:

___ a. Place RMT MODE keyswitch in REFUEL.

___ b. RETURN TO procedure Step 27.

NUMBER 1-AP-27.00	ATTACHMENT TITLE MINIMUM SI FLOW REQUIRED FOR DECAY HEAT REMOVAL	REVISION 10
ATTACHMENT 7		PAGE 1 of 1



* *

<u>CAUTION</u>:
- A PRZR Safety Valve must be removed for gravity feed cooling to be effective.
- With an initially full RWST aligned to a LHSI Cold leg flowpath, gravity feed will suppress boiling for one hour if time after shutdown is greater than 110 hours and less than 325 hours.
- With an initially full RWST aligned to a LHSI Cold leg flowpath, gravity feed will suppress boiling for three hours if time after shutdown is greater than 325 hours.

* *

<u>NOTE</u>:
- In order of priority, the flowpaths for aligning gravity feed are as follows:
  - LHSI to Cold legs
  - LHSI to Hot legs
  - CHG Pump to Cold legs
  - CHG Pump to Hot legs
- Attachment 9 may be used to determine the required RWST level to suppress boiling for one hour, based on time from shutdown.

___ 1. <u>IF</u> CHG Pump crosstie from Unit 2 desired for RCS feed, <u>THEN</u> GO TO Step 12. <u>IF</u> gravity feed desired, <u>THEN</u> continue in this Attachment.

___ 2. <u>IF</u> LHSI Pump flowpath to Cold leg to be used, <u>THEN</u> do the following. <u>IF</u> CHG Pump to be used, <u>THEN</u> GO TO Step 4.

___ a. Open LHSI PUMP SUCTION FROM RWST MOV:

- 1-SI-MOV-1862A or 1-SI-MOV-1862B

___ b. Open LHSI TO COLD LEGS MOV:

- 1-SI-MOV-1890C

___ c. Throttle SI flow to RCS IAW Attachment 7 using LHSI PUMP TO COLD LEGS MOV. <u>IF</u> CETC temperatures decrease, throttle flow to maintain stable temperature.

- 1-SI-MOV-1864A or 1-SI-MOV-1864B

___ d. IF CETC temperatures can NOT be maintained less than 200°F, THEN do either of the following:

- Swap to hot leg injection.
- Increase SI flowrate.

___ e. WHEN RHR system available, THEN RETURN TO procedure Step 27.

___ 3. IF LHSI Pump flowpath to Hot leg to be used, THEN do the following:

___ a. Open LHSI PUMP SUCTION FROM RWST MOV:

- 1-SI-MOV-1862A or 1-SI-MOV-1862B

___ b. Throttle LHSI TO HOT LEGS MOV IAW Attachment 7:

- 1-SI-MOV-1890A or 1-SI-MOV-1890B

___ c. IF hot leg injection NOT controlling RCS temperature as indicated by increasing PRZR liquid and vapor space temperatures OR by decreasing subcooling, THEN do either of the following:

- Swap to cold leg injection.
- Increase SI flowrate.

___ d. WHEN RHR system available, THEN RETURN TO procedure Step 26.

___ 4. Determine which CHG Pump to be used:

___ 1-CH-P-1A ___ 1-CH-P-1B ___ 1-CH-P-1C

___ 5. Verify open or open the following MOVs for the CHG Pump selected in Step 4:

1-CH-P-1A	1-CH-P-1B	1-CH-P-1C
__1-CH-MOV-1267A	__1-CH-MOV-1269A	__1-CH-MOV-1270A
__1-CH-MOV-1267B	__1-CH-MOV-1269B	__1-CH-MOV-1270B
__1-CH-MOV-1275A	__1-CH-MOV-1275B	__1-CH-MOV-1275C
__1-CH-MOV-1286A	__1-CH-MOV-1286B	__1-CH-MOV-1286C
__1-CH-MOV-1287A	__1-CH-MOV-1287B	__1-CH-MOV-1287C

___ 6. IF Cold leg flowpath to be used, THEN direct local throttling of flow to maintain CETC temperatures less than 200°F by opening the MOV's breaker and throttling the selected MOV:

__1-SI-MOV-1867C, HHSI TO COLD LEGS (1H1-1 2C)
__1-SI-MOV-1867D, HHSI TO COLD LEGS (1J1-1 8C)
__1-SI-MOV-1842, ALT HHSI TO COLD LEGS (1H1-2N 4B)

___ 7. IF CETC temperatures can NOT be maintained less than 200°F, THEN do either of the following:

- Swap to hot leg injection.
- Increase SI flowrate.

___ 8. GO TO Step 11.

___ 9. Using Attachment 7, direct local throttling of SI flow by opening the breaker for the selected MOV and throttling the selected MOV:

- 1-SI-MOV-1869A (1H1-1 3C) or 1-SI-MOV-1869B (1J1-1 9A)

___10. IF hot leg injection NOT controlling RCS temperature as indicated by increasing PRZR liquid and vapor space temperatures or decreasing subcooling, THEN do either of the following:

- Swap to cold leg injection.
- Increase SI flowrate.

___11. WHEN RHR system available, THEN RETURN TO procedure Step 27.

NOTE: An LCO clock may be entered on Unit 2 if Charging system is crosstied.

___12. Isolate charging line IAW either of the following:

__ a. Locally close 1-CH-304, Charging Line Isolation.
__ b. Close 1-CH-FCV-1122, CHG FLOW CNTRL.

___13. Verify HHSI to cold leg MOVs closed:

- 1-SI-MOV-1867C
- 1-SI-MOV-1867D

___14. Verify CHG line isolation MOVs open:

- 1-CH-MOV-1289A
- 1-CH-MOV-1289B

___15. Verify Unit 1 CHG pump C discharge MOVs open:

- 1-CH-MOV-1286C
- 1-CH-MOV-1287C

___16. Verify Unit 2 CHG Pump C discharge MOVs open:

- 2-CH-MOV-2286C
- 2-CH-MOV-2287C

___17. Verify Unit 2 CHG Pump(s) suction aligned to the RWST.

___18. Locally open 2-CH-447.

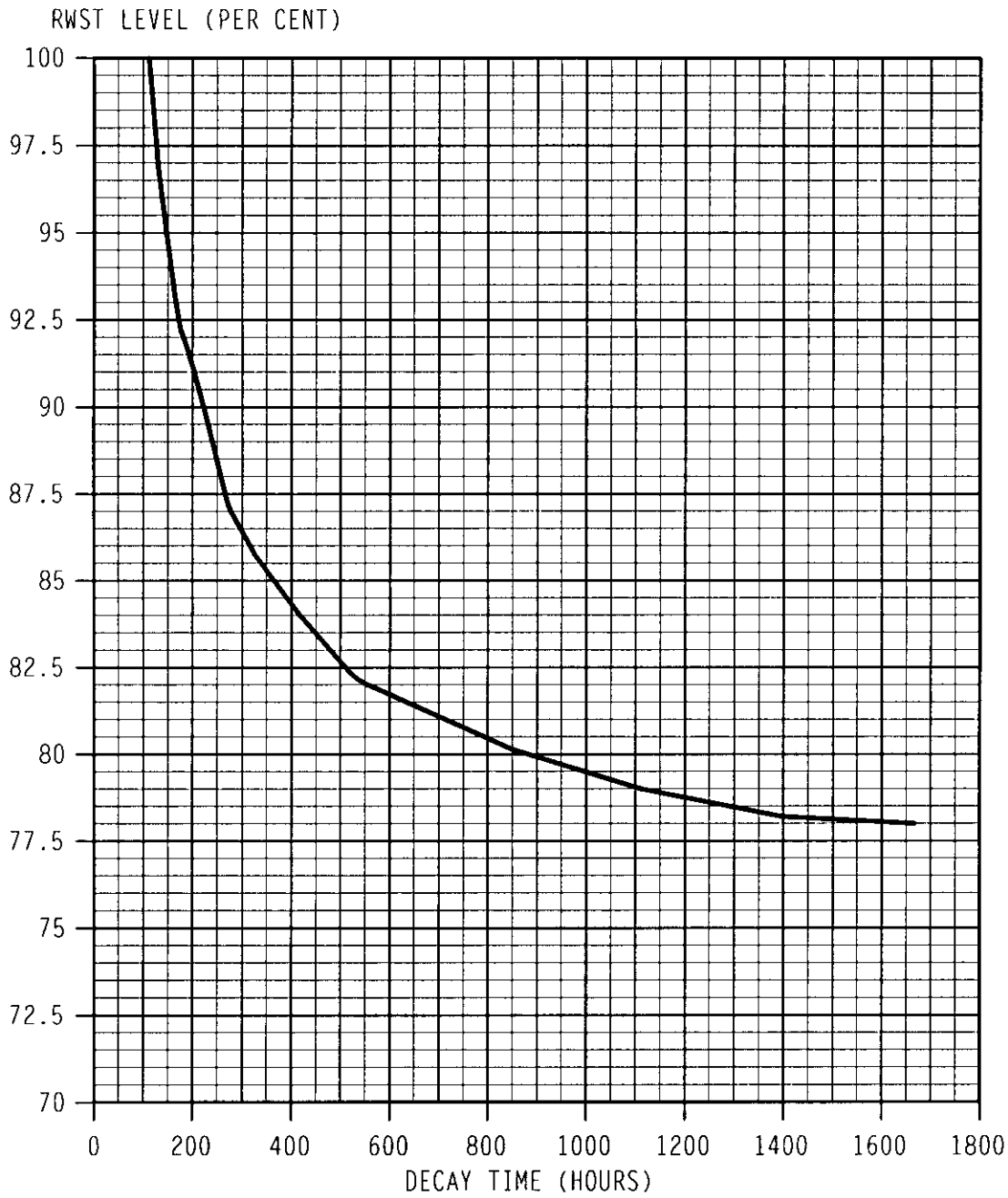
___19. Locally vent crosstie piping by operating 1-CH-732.

___20. Locally open 1-CH-728.

___21. Commence makeup to Unit 2 RWST.

___22. GO TO Step 17 of Attachment 6.

NUMBER 1-AP-27.00	ATTACHMENT TITLE	REVISION 10
ATTACHMENT 9	REQUIRED RWST LEVEL TO SUPPRESS BOILING FOR ONE HOUR USING GRAVITY FEED	PAGE 1 of 1



* *

CAUTION:
- This mode of heat removal can NOT be used when large RCS openings exist, the RX head is on, or RX cavity level does NOT exist or can NOT be established.
- Overexposure of plant personnel due to degraded RCS conditions should be considered before this lineup is performed. This lineup should not be attempted with actual or suspected fuel damage.

* *

___ 1. Verify full or fill the RX cavity IAW 1-OP-SI-003, FILLING THE REACTOR CAVITY.

___ 2. Open the Fuel Transfer Tube gate valve.

___ 3. Verify in service or place in service one SFP Cooling Pump.

___ 4. Stop RWST Recirc Pump, 1-CS-P-2A or 1-CS-P-2B.

___ 5. Locally stop any running SFP Purification Pump.

- 1-FC-P-3A or 1-FC-P-3B

___ 6. Locally perform the following valve line-up:

___ a. Open SFP Purification Pump suction for pump to be run:

___ 1-FC-44, 1-FC-P-3A
___ 1-FC-43, 1-FC-P-3B

___ b. Open SFP Purification Pump discharge for pump to be run:

___ 1-FC-46, 1-FC-P-3A
___ 1-FC-49, 1-FC-P-3B

___ c. Open 1-FC-72, Purification Pump header isolation.

___ d. Close 1-FC-29, Fuel Pit IX Bypass.

___ e. Close 1-FC-16, Fuel Pit IX inlet.

___ f. Close 2-FC-73, Unit 2 RWST discharge to SFP.

___ g. Open 1-FC-73, Unit 1 RWST discharge to SFP.

___ h. Open 1-FC-74, Unit 1 RWST discharge to SFP.

___ 7. Locally perform valve line-up for RWST refrigeration units.

a. 1-CS-MR-1A

___ 1. Open 1-CS-37, 1-CS-MR-1A inlet.
___ 2. Open 1-CS-40, 1-CS-MR-1A outlet.

b. 1-CS-MR-1B

___ 1. Open 1-CS-41, 1-CS-MR-1B inlet.
___ 2. Open 1-CS-44, 1-CS-MR-1B outlet.

___ 8. Close 1-CS-46, 1-CD-E-2A outlet.

___ 9. Close 1-CS-47, 1-CD-E-2B outlet.

10. <u>IF</u> RWST coolers (Chilled Water required) to be placed in service, <u>THEN</u> locally perform the following valve line-up.

a. 1-CD-E-2A

___ 1. Open 1-CS-35, 1-CD-E-2A inlet.
___ 2. Open 1-CS-46, 1-CD-E-2A outlet.

b. 1-CD-E-2B

___ 1. Open 1-CS-36, 1-CD-E-2B inlet.
___ 2. Open 1-CS-47, 1-CD-E-2B outlet.

___11. Open 1-CS-48, RWST cooler discharge to RWST.

___12. Locally start the SFP Purification Pump aligned in Step 6.

___13. Monitor RWST level for increase. As RWST level increases, align any available LHSI pump flowpath to provide cavity makeup.

___14. Maintain RCS heat removal. <u>WHEN</u> RHR restored, <u>THEN</u> RETURN TO procedure Step 27.

I. PROBABLE CAUSES:

1. Loss of RCS inventory
2. Valve mis-positioned
3. Loss of both RHR pumps
4. Loss of CC while on RHR

II. REFERENCES:

1. Generic Letter 88-17, Loss of Decay Heat Removal
2. UFSAR Section 9.3
3. 11448-FM-81A, 84A, 86A, 87A
4. Tech Spec 3.5
5. Background Information for WOG ARG-1, LOSS OF RHR WHILE OPERATING AT MID-LOOP CONDITIONS
6. CTS 189, Entire procedure
7. CTS 832, Step 1 eighth bullet
8. CTS 982, Step 29 and Attachment 6
9. CTS 1984, Step 2e
10. NE Technical Report 865, Rev. 3, Background and Guidance for Ensuring Adequate Backup Decay Heat Removal Following Loss of RHR, Attachments 4, 5, 6 and 9
11. NSA-93005, SPS, RHR OPERATION AT MID-LOOP IMPACT OF UPDATED INSTRUMENT ERRORS, Attachment 1

(References continued on next page)

(References continued)

12. 1-OSP-CT-214, CONTAINMENT CLOSURE FOR REDUCED OR POTENTIALLY REDUCED INVENTORY CONDITIONS

13. 0-AP-40.00, NON-RECOVERABLE LOSS OF INSTRUMENT AIR

14. 1-OP-SI-003, FILLING THE REACTOR CAVITY

15. 1-AP-16.01, SHUTDOWN LOCA

16. CTS 2746 (Steps 16 and 24)

17. CTS 2743 (DCP 94-030-3, Core Uprate)

18. TSCR 313, Amendment 207

RESPOND TO #3 EDG FAILURE TO LOAD
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	09/16/91		
02	1	09/18/91	Enhanced cues and time validation.	
03	2	07/16/92	Editorial/formatting changes.	
04	3	07/07/93	Procedure revision.	S93-0851
05	4	08/02/94	Procedure revisions.	S94-0853
06	5	08/15/95	Correct annunciator titles, annunciator locations, and question references.	S95-0719
07	6	11/18/96	KA number and procedure changes.	S96-0260
08	7	04/18/87	Correct cues for actual condition where EDG 3 loads are bus.	S97-0348
09	8	03/24/98	Delete JPM # from trainee handouts.	S98-0286
10	9	12/09/98	Convert to Word.	S98-0936
11	10	03/01/02		S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 55.06 (Rev 10)

Performed by _____ Questions by _____

Evaluator _____ Evaluation Date _____

Task

RESPOND TO #3 EDG FAILURE TO LOAD.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	15 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
SYS064.A4.06 (RO 3.9/SRO 3.9)	RO 4.00/SRO 3.44

Conditions

- Task is to be performed in the Simulator.
- A LOOP has occurred from 100% power. A unit trip W/ no SI has occurred.
- #1 EDG has properly loaded. However, #3 EDG has experienced a failure to auto-load, thereby leaving 1J bus de-energized.

Standards

- #3 EDG loaded on 1J bus (15J3 closed) IAW AP-17.05, EDG 3 EMERGENCY OPERATIONS.

Initiating Cues

- 1-AP-10.07, Loss of Unit 1 Power, step 2 RNO.
- Shift Supervisor direction.

Terminating Cues

- Report received that #3 EDG loaded on 1J bus and AP-17.05 completed.

Procedures

- AP-17.05, EDG 3 - EMERGENCY OPERATIONS.

Tools and Equipment

- None

Safety Considerations

- None

Performance Checklist

Simulator Setup:

- Recall IC#1 and enter malfunctions MEL01 1 sec TD, Loss Of Off-Site Power, and MEL1002 1 sec TD, Failure of #3 EDG to Load. Setup the simulator and place the simulator to run. Once the simulator is stable, make the malfunctions active and perform the immediate actions of E-0 and steps 1 and 2 of AP-10.07, wait about 10 minutes to allow the majority of the cooldown cycle on #3 EDG to expire, then freeze the simulator. Recall Extreme view ED6 (Bypass) screen and EL2 (25J3).

Directions to the Operator.

- I am the Shift Supervisor and you are the 3RD license. A loss of off-site power has occurred and the 1J bus is de-energized because #3 diesel failed to load. The #3 EDG stop pushbuttons have been depressed in accordance with AP-10.07.
- I need you to get a copy of AP-17.05 and load #3 EDG onto the 1J bus.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 5 then 15.
- **START TIME:** _____

---

1. OBTAIN COPY OF AP-17.05.

   Standards

   Goes to AP drawer (or AP book) and gets copy of AP-17.05.

   Evaluator's Comments

---

2. ACKNOWLEDGES CAUTIONS PRIOR TO STEP 1.

   Standards

   (a) Acknowledges CAUTION that an EDG should not run unloaded for more than ten minutes on a de-energized emergency bus.
   (b) If a running EDG has been stopped because the associated Emergency Bus is de-energized, the cooldown cycle should be completed before starting the EDG.
   (c) Acknowledges CAUTION that the SS should direct loading of EDG #3 to the 1J or 2J emergency bus to best support plant recovery.

   Evaluator's Comments

---

3. ASKS ELECTRICAL AND MECHANICAL DEPARTMENT TO PROVIDE ASSISTANCE. ***(Step 1)***

Standards

Requests SS to obtain Electrical and Mechanical Department assistance.

CUES

- **If asked:** Maintenance Department has been dispatched.

Evaluator's Comments

---

4. CHECK EDG 3 - WILL BE ALIGNED TO UNIT 1. ***(Step 2)***

Standards

Remembers instructions to load the EDG on 1J bus.

Evaluator's Comments

---

*5. COMMIT EDG # TO UNIT 1. ***(Step 3)***

Standards

*(a) Has Unit 2 place the bypass switch (switch 43-15J3) on # 3 EDG in bypass.
*(b) Has Unit 2 place 25J3 in PTL.

CUES

- Once the operator has told Unit two to place the bypass switch in bypass, then report it is in bypass.
- Once the operator has told Unit two to put 25J3 in PTL, then report 25J3 is in PTL.

SIMULATOR NOTE

- When the operator has requested the bypass switch, then use PEDS to put the bypass switch for Unit 2 #3 EDG in BYPASS.

Evaluator's Comments

---

6. ACKNOWLEDGES NOTE PRIOR TO STEP 4.

Standards

Acknowledges NOTE regarding the START FAILURE of the EDG.

Evaluator's Comments

---

7. CHECKS ANNUNCIATOR VSP-B-5, EMERG GEN 3 TRBL - NOT LIT. ***(Step 4)***

Standards

Checks annunciator VSP-B-5 NOT lit.

Evaluator's Comments

8. VERIFIES AUXILIARY TRIP RELAY - RESET. ***(Step 5)***

Standards

(a) Verifies AMBER light on Unit 1 EDG 3 control panel above EMERG GEN #3 TRIP AUX RESET BUTTON is lit and goes to RNO.
(b) Goes to Attachment 1.

Evaluator's Comments

9. READS NOTES PRIOR TO STEP 1 OF ATTACHMENT 1.

Standards

Reads notes about auxiliary trip relay and remembers the EDG was manually stopped.

Evaluator's Comments

10. IDENTIFIES "J" BUS IS DE-ENERGIZED BY NOTING 15J8 AND 15J3 ARE OPEN AND GOES TO ATTACHMENT 3.

Standards

Evaluator's Comments

11. STRIPS LOADS IAW ATTACHMENT 3.

Standards

(a) Places following in PTL.
1-SI-P-1B(14J3)
1-CS-P-1B(14J5)
1-RS-P-1B(14J4)
1-RS-P-2B(14J8)
1-VS-F-1B(14J7)
PRZR Heater Group A(14J9)
Identify 1-VS-58B powered from normal source
1-CH-P-1B(15J5)
1-CH-P-1C(15J2, ALT)
1-FW-P-3B(15J4)
(b) Verifies 15J8, 1J Bus normal supply breaker, OPEN
(c) Verifies 15J9, 1J Stub bus open by dispatching operator to breaker.

AFTER OPERATOR IS DISPATCHED THEN TELL OPERATOR 15J9 IS OPEN ALSO BOOTH OPERATOR SHOULD CALL AND REPORT REPAIRS HAVE BEEN MADE TO EDG THE BOOTH OPERATOR SHOULD CLEAR THE EDG MALFUNCTION PROVIDED EDG RPM=0

Evaluator's Comments

12. RETURNS TO ATTACHMENT 1 AND READS NOTE PRIOR TO STEP 2.

Standards

Reads note about differential fault.

Evaluator's Comments

13. CHECKS FOR CAUSE OF AUXILIARY TRIP RELAY ACTUATION. ***(Attachment 1, Step 2)***

Standards

(a) Remembers the EDG was manually stopped.
(b) When the cooldown cycle is complete, then pushes the EMERG GEN #3 TRIP AUX RESET pushbutton at the Unit 1 EMERG GEN NO 3 CONTROL panel.
(c) Returns to procedure step 6.

Evaluator's Comments

14. CHECKS EDG RUNNING. ***(Step 6)***

Standards

(a) Confirms engine is not running by checking engine RPM at zero.
(b) Goes to RNO.
(c) Goes to attachment 2.

Evaluator's Comments

---

*15. PERFORMS ATTACHMENT 2.

Standards

(a) Notes AUTO-EXERCISE EMERG GEN 3 switch is in EXERCISE.
(b) Notes 1J bus is de-energized and attachment 3 previously performed.
(c) Directs Auxiliary Operator to verify the Load Limit Control on the UG-8 Governor is at the maximum clockwise position, which is past the 10 mark.
*(d) Presses EMERG GEN NO. 3 ENGINE START pushbutton.
(e) Notes # 3 EDG is running by verifying RPMS.
(f) Verifies # 3 EDG RPM at 900.
*(g) Places AUTO-EXERCISE EMERG GEN 3 to AUTO.
(h) Returns to procedure step 8.

Evaluator's Comments

---

16. CHECKS BOTH J BUSES - ENERGIZED BY OFF-SITE POWER. ***(Step 8)***

Standards

(a) Verifies 1J bus not energized by off-site power by observing 15J8 breaker OPEN (GREEN light lit; RED light out).
(b) Checks 2J bus de-energized by asking Unit 2 operator or SS.
(c) Transitions to step 10.

CUES

- **If asked:** 15J8 breaker - GREEN light lit; RED light out.

Evaluator's Cue

2J bus is de-energized.

Evaluator's Comments

---

17. ACKNOWLEDGES NOTE PRIOR TO STEP 10.

Standards

(a) Acknowledges NOTE that if DC Bus de-energized, EDG output breaker and J Bus load breakers must be closed manually.
(b) Acknowledges NOTE that the following conditions must exist for the EDG output breaker to close automatically:
. EDG speed > 870 rpm,
. EDG incoming voltage > 113 volts,
. J8 breaker open,
. Control switch for the J3 breaker in AUTO AFTER TRIP,
. DC Control power available to the J3 breaker.

Evaluator's Comments

---

18. CHECKS EDG - SUPPLYING J BUS. ***(Step 10)***

Standards

(a) Verifies #3 EDG output breaker (ACB-15J3) CLOSED (red light ON).
(b) Verifies VOLTAGE indicated on J bus volt meter.

Evaluator's Comments

---

19. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that EDG 3 has been loaded onto the 1J bus.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary
Job Performance Measure 55.06 (Rev 10)
RESPOND TO #3 EDG FAILURE TO LOAD

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 55.06 (Rev 10)
RESPOND TO #3 EDG FAILURE TO LOAD

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **15 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be performed in the simulator.
- A LOOP has occurred from 100% power. A unit trip W/ no SI has occurred.
- #1 EDG has properly loaded. However, #3 EDG has experienced a failure to auto-load, thereby leaving 1J bus de-energized.

Initiating Cues

- 1-AP-10.07, Loss of Unit 1 Power, step 2 RNO.
- Shift Supervisor direction.

Directions

- I am the Shift Supervisor and you are the 3RD license. A loss of off-site power has occurred and the 1J bus is de-energized because #3 diesel failed to load. The #3 EDG stop pushbuttons have been depressed in accordance with AP-10.07.
- I need you to get a copy of AP-17.05 and load #3 EDG onto the 1J bus.
- When you finish the actions necessary to accomplish this, please inform me.

VIRGINIA POWER
SURRY POWER STATION

ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
0-AP-17.05	EDG 3 - EMERGENCY OPERATIONS (With 8 Attachments)	8 PAGE 1 of 11

PURPOSE

To provide guidance when EDG 3 fails to auto-start or fails to accept Emergency Bus loads when required.

SIMULATOR

ENTRY CONDITIONS

1. Transition from any of the following procedures:

- ( )-E-0, REACTOR TRIP OR SAFETY INJECTION
- ( )-ECA-0.0, LOSS OF ALL AC POWER
- ( )-AP-10.07, LOSS OF UNIT ( ) POWER
- Fire Contingency Action Procedures
- Annunciator Response Procedures

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	WB Hoss	12/8/01

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION:
- An EDG should NOT run unloaded for more than ten minutes if the associated Emergency Bus is deenergized.
- If a running EDG has been stopped because the associated Emergency Bus is deenergized, the EDG cooldown cycle should be completed before restarting the EDG.
- The SS should direct the aligning of EDG 3 to either 1J or 2J Emergency Bus to best support plant recovery.

* *

1. __ASK ELECTRICAL AND MECHANICAL DEPARTMENTS TO PROVIDE ASSISTANCE

2. __CHECK EDG 3 - WILL BE ALIGNED TO UNIT 1

   Do the following:

   a) Commit EDG 3 to Unit 2:

      1) Place the UNIT 1 PNL 3-1 SWITCH 43-25J3 IN BYP COMMITS NO. 3 EDG TO UNIT 2 in BYP.

      2) Place Emergency Supply Breaker 15J3 in PTL.

   b) GO TO Step 4.

3. __COMMIT EDG 3 TO UNIT 1:

   a) Place the UNIT 2 PNL 3-2 SWITCH 43-15J3 IN BYP COMMITS NO. 3 EDG TO UNIT 1 in BYP

   b) Place Emergency Supply Breaker 25J3 in PTL

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: If an auto-start signal has been received and the EDG has failed to start after three auto-start attempts, the auto-start circuit will be locked out and a START FAILURE alarm will be LIT at the Engine Control Cabinet. The EDG STOP pushbuttons and the ALARM RESET must be pushed to reset the auto-start circuit. This condition will not interfere with a LOCAL start attempt in the EDG room, but the cause of the failure should first be determined.

4. __CHECK ANNUNCIATOR VSP-B5, EMERG GEN 3 TRBL - NOT LIT	Do the following: a) Send an operator to investigate alarm. b) Perform applicable section of annunciator response procedure. c) WHEN problem corrected, THEN GO TO Step 5.
5. __VERIFY AUXILIARY TRIP RELAY - RESET: • Amber light on Unit 1 EDG 3 Control Panel - NOT LIT	GO TO Attachment 1.
6. __CHECK EDG - RUNNING	GO TO Attachment 2.

NOTE: The engine is in Governor Fast mode when the EDG is in AUTO, resulting in speed and load adjustments being very sensitive. Changes made with the EMERG GEN NO 3 SPEED ADJ control switch should be minimal to prevent engine overspeed.

7. __CHECK EDG SPEED - AT 900 RPM	Adjust engine speed to 900 rpm using the EMERG GEN NO 3 SPEED ADJ control switch.
8. __CHECK BOTH J BUSES - ENERGIZED BY OFFSITE POWER	GO TO Step 10.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	__GO TO STEP 31	
	NOTE: • If the B DC Bus is deenergized, the EDG output breaker and the J Bus load breakers must be closed manually. • The following conditions must exist for the EDG output breaker to close automatically: • EDG speed greater than 870 rpm • EDG INCOMING voltage greater than 113 volts • J8 breaker open • Control switch for the J3 breaker in AUTO AFTER TRIP • DC control power available to the J3 breaker	
10.	__CHECK EDG 3 - SUPPLYING J BUS • 15J3 - CLOSED OR • 25J3 - CLOSED	IF 1J Bus deenergized, THEN do the following: a) Strip loads IAW Attachment 3. b) GO TO Step 15. IF 2J Bus deenergized, THEN do the following: a) Strip loads IAW Attachment 4. b) GO TO Step 15. IF EDG 3 will be paralleled with the AAC Diesel Generator, THEN GO TO Step 15.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION:
- The load placed on any EDG should NOT exceed 2750 KW.
- When the EDG is the only source of power to an Emergency Bus, the associated CC Pump should NOT be in service if a HI-HI CLS is in progress. This restriction does NOT apply below RCS temperature of 350°F.

* *

NOTE:
- The approximate power required for J bus loads are as follows:
  - CC pump, 450 KW
  - AFW pump, 310 KW
  - RHR pump, 215 KW
  - ISRS pump, 225 KW
  - CS pump, 170 KW
  - CTMT Air Recirc Fan, 100 KW
  - CHG pump, 430 KW
  - PRZR Heaters, 200 KW
  - OSRS pump, 245 KW
  - LHSI pump, 190 KW
  - Filtered Exhaust Fan, 125 KW
- The RSS transformer cooling fans are powered from 1J1-1-3B2 or 2J1-1-4A2 depending on position of the throwover switch near 1-SA-TK-2 in Unit 1 Turbine BLDG basement. The switch should be verified aligned to an energized bus.
- Once the EDG has energized 1J or 2J Bus, the 480V MCC ABT should be verified aligned to an energized bus. (Verify by checking the CW MOVs powered from the J bus energized)

11. __LOAD ( )J BUS IAW SHIFT SUPERVISOR DIRECTION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	__VERIFY THE FOLLOWING PARAMETERS:	
	a) EMERG BUS ( )J voltage • Bus 1J - Between 4280 and 4400 Volts • Bus 2J - Between 4000 and 4400 Volts	a) Adjust voltage using EMERG GEN NO 3 VOLT ADJ control switch.
	b) EMERG BUS ( )J frequency - STABLE BETWEEN 59.7 AND 60.3 HZ	b) Adjust engine speed using EMERG GEN NO 3 SPEED ADJ control switch.
13.	__MONITOR EDG 3 PARAMETERS IAW ATTACHMENT 5	
14.	__GO TO STEP 31	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Continued operation of the EDG without field voltage will deplete the base tank fuel supply.

* *

15. __VERIFY EDG INCOMING VOLTAGE - GREATER THAN 113 VOLTS:

a) Turn SYNC-ACB-( )5J3 key switch to ON

b) Verify or establish generator voltage by momentarily depressing the EMERG GEN NO ( ) FIELD FLASH pushbutton

b) Do the following:

1) Locally verify closed or close the FIELD CIRCUIT BREAKER.

2) Locally reset the NO FIELD annunciator on the EDG Engine Control Cabinet.

3) Locally reset the Auxiliary Trip relay.

4) Momentarily depress the EMERG GEN NO 3 FIELD FLASH pushbutton.

c) Raise INCOMING voltage to 120 volts using EMERG GEN NO 3 VOLT ADJ control switch

c) Do the following:

1) Notify Electrical Department.

2) Secure the EDG until problem corrected.

3) WHEN voltage can be established, THEN RETURN TO Step 6.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16.	__CHECK EDG 3 - DESIRED TO PARALLEL WITH AAC DIESEL GENERATOR ON EMERGENCY BUS 1J	GO TO Step 18.
17.	__CHECK AAC DIESEL GENERATOR STATUS AND GO TO THE APPROPRIATE STEP OF 0-AP-17.06, AAC DIESEL GENERATOR - EMERGENCY OPERATIONS • Only Bus 1J supplied - GO TO STEP 13 of 0-AP-17.06 • Both Buses 1J and 2H supplied - GO TO STEP 50 of 0-AP-17.06	
18.	__VERIFY OPEN OR OPEN BREAKER ( )5J8	
19.	__CHECK ( )5J3 DC CONTROL POWER FUSES - INSTALLED	Do the following: a) Place 15J3 and 25J3 in PTL. b) Install fuses. c) Place 15J3 OR 25J3 in AUTO AFTER TRIP.
20.	__CHECK ( )5J3 - AUTO-CLOSED	GO TO Step 22.
21.	__GO TO STEP 27	
22.	__PLACE THE AUTO-EXERCISE EMERG GEN 3 SWITCH IN EXERCISE	
23.	__DEPRESS THE EMERG GEN NO 3 FAST START RESET PUSHBUTTON • Red light - LIT	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24.	__CHECK EDG SPEED - AT 900 RPM	Adjust engine speed using EMERG GEN NO 3 SPEED ADJ control switch.
25.	__VERIFY INCOMING VOLTS AT 120V	Adjust voltage using EMERG GEN NO 3 VOLT ADJ control switch.
	NOTE: Running voltage will indicate zero and the synchroscope will be motionless at this time.	
26.	__CLOSE EMERG SUP BREAKER ( )5J3	Notify Electrical Department. WHEN breaker is closed, THEN GO TO Step 27.
27.	__TURN THE SYNC KEY SWITCH FOR ( )5J3 TO OFF	
28.	__VERIFY THE FOLLOWING PARAMETERS:	
	a) EMERG BUS ( )J voltage • Bus 1J - Between 4280 and 4400 volts • Bus 2J - Between 4000 and 4400 Volts	a) Adjust voltage using EMERG GEN NO 3 VOLT ADJ control switch.
	b) EMERG BUS ( )J frequency - STABLE BETWEEN 59.7 AND 60.3 HZ	b) Adjust engine speed using EMERG GEN NO 3 SPEED ADJ control switch.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: • The load placed on any EDG should NOT exceed 2750 KW.

• When the EDG is the only source of power to an Emergency Bus, the associated CC Pump should NOT be in service if a HI-HI CLS is in progress. This restriction does NOT apply below RCS temperature of 350°F.

* *

NOTE: • The approximate power required for J bus loads are as follows:

- CC pump, 450 KW
- AFW pump, 310 KW
- RHR pump, 215 KW
- ISRS pump, 225 KW
- CS pump, 170 KW
- CTMT Air Recirc Fan, 100 KW
- CHG pump, 430 KW
- PRZR Heaters, 200 KW
- OSRS pump, 245 KW
- LHSI pump, 190 KW
- Filtered Exhaust Fan, 125 KW

• The RSS transformer cooling fans are powered from 1J1-1-3B2 or 2J1-1-4A2 depending on position of the throwover switch near 1-SA-TK-2 in Unit 1 Turbine BLDG basement. The switch should be verified aligned to an energized bus.

• Once the EDG has energized 1J or 2J Bus, the 480V MCC ABT should be verified aligned to an energized bus. (Verify by checking the CW MOVs powered from the J bus energized)

29. __LOAD ( )J BUS IAW SHIFT SUPERVISOR DIRECTION

30. __MONITOR EDG 3 PARAMETERS IAW ATTACHMENT 5

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31.	__CHECK THE FOLLOWING DAMPERS - BOTH OPEN • 1-VS-MOD-103B • 1-VS-MOD-103D	Do the following: a) IF Emergency Bus 1J has been de-energized during the course of this event, THEN initiate Attachment 6 to realign Battery Room Ventilation. b) IF Emergency Bus 2J has been de-energized during the course of this event, THEN initiate Attachment 7 to realign Battery Room Ventilation.
32.	__RETURN TO PROCEDURE IN EFFECT	

- END -

NOTE: • The Auxiliary trip relay actuates when any of the following occur:

- Manual stop
- Overcurrent trip on output breaker
- Differential fault on EDG output
- Overspeed trip
- Loss of Generator field

• Actuation of the auxiliary trip relay prevents the EDG output breaker from closing and locks out the EDG start circuit. After the initiating signal has cleared, the auxiliary trip relay must be reset to allow restarting the EDG.

• An overspeed condition will immediately shutdown the EDG and lockout the start circuits until the overspeed lever is reset.

• A differential fault or overcurrent trip will put the EDG into the cooldown cycle.

1. IF ( )J Bus is deenergized, THEN strip loads IAW Attachment 3 (1J Bus) or Attachment 4 (2J Bus).

NOTE: A differential fault will trip the EDG Exciter Field breaker.

2. Check for cause of Auxiliary Trip Relay actuation:

___ a. IF the EDG has been stopped manually stopped, THEN do the following:

___ 1. WHEN the cooldown cycle is complete, THEN push the EMERG GEN #3 TRIP AUX RESET pushbutton at the Unit 1 EMERG GEN NO 3 CONTROL PANEL:

___ 2. RETURN TO procedure Step 6.

___ b. Check breakers ( )5J3 and ( )5J8 for NO overcurrent trip indication:

- Annunciator ( )K-G4, 4KV EMERG BUS EMERG SUP BKR AUTO TRIP - NOT LIT
- Annunciator ( )K-F4, 4KV EMERG BUS NORM SUP AUTO TRIP - NOT LIT
- Local black flags on breaker relays - INDICATED
- Local breaker status - NORMAL

___ c. Check the following for NO differential trip indication on Unit 1 EMERG GEN NO 3 CONTROL PANEL:

- Black flags on EMER GEN NO 3 PHASE DIFF CUR RELAYS - INDICATED
- Red light (EMERG GEN NO 3 LOCKOUT - DIFF CUR RELAY) - LIT

___ d. Check annunciator VSP-A5, EMERG GEN 3 DIFF - NOT LIT.

___ e. IF an overcurrent or differential condition exists, THEN do the following:

__ 1. Reset the appropriate device as authorized by the Electrical Department.

__ 2. Push the EMERG GEN #3 TRIP AUX RESET pushbutton at the Unit 1 EMERG GEN NO 3 CONTROL PANEL:

__ 3. WHEN the EDG cooldown cycle is complete, THEN RETURN TO procedure Step 6.

3. IF an overspeed trip has occurred, THEN do the following:

___ a. Locally reset the overspeed trip lever as authorized by the Mechanical Department.

___ b. Locally reset alarms at the Engine Control Cabinet.

___ c. Push the EMERG GEN #3 TRIP AUX RESET pushbutton at the Unit 1 EMERG GEN NO 3 CONTROL PANEL:

___ d. RETURN TO procedure Step 6.

4. Check generator field voltage established IAW the following:

___ a. Turn the SYNC-ACB-( )5J3 key switch to the ON position.

___ b. Verify generator voltage on the INCOMING VOLT voltmeter greater than 113 volts.

___ c. IF voltage NOT established, THEN momentarily depress the EMERG GEN NO 3 FIELD FLASH pushbutton.

___ d. Increase INCOMING VOLTS to 125 (123 - 127) volts for Bus 1J or 120 volts for Bus 2J using the EMERG GEN NO 3 VOLT ADJ control switch. IF field voltage NOT established, THEN notify Electrical Department.

___ e. WHEN generator field voltage established, THEN do the following:

__ 1. Push the EMERG GEN #3 TRIP AUX RESET pushbutton at the Unit 1 EMERG GEN NO 3 CONTROL PANEL:

__ 2. RETURN TO procedure Step 6.

__ 1. Place AUTO-EXERCISE EMERG GEN 3 switch to EXERCISE.

__ 2. IF ( )J Bus de-energized, THEN strip loads IAW Attachment 3 (1J Bus) or Attachment 4 (2J Bus).

__ 3. Verify the Load Limit Control on the UG-8 Governor is at the maximum clockwise position, which is past the 10 mark.

__ 4. Press EMERG GEN NO. 3 ENGINE START pushbutton.

__ 5. IF engine has NOT started, THEN GO TO Step 6 of this Attachment.
IF engine has started, THEN do the following:

___ a. Verify speed at approximately 900 RPM. IF NOT at 900 RPM, THEN adjust speed using EMERG GEN NO 3 SPEED ADJ control switch.

___ b. Place AUTO-EXERCISE EMERG GEN 3 switch to AUTO.

___ c. RETURN TO procedure Step 8.

__ 6. Locally at the Engine Control Cabinet, put the AUTO START/LOCAL START selector switch in LOCAL START.

__ 7. Verify the NO FIELD alarm - NOT LIT.
IF the NO FIELD alarm is LIT, THEN do the following:

a. Locally reset the alarm.
b. Locally push the TRIP AUX RESET pushbutton on the Unit 1 EDG 3 Control Panel in the MCR.

__ 8. Locally verify EDG Battery voltage greater than 120 Volts. IF NOT, THEN do the following:

a. Verify closed or close the Battery Charger feeder breaker:

- EDG 3, 1J1-1A-151

b. IF DC power NOT restored, THEN working with the Electrical Department, restore DC power. WHEN DC power has been restored, THEN GO TO Step 9 of this Attachment.

__ 9. Locally verify the following breakers at the REMOTE EXCITATION CABINET - CLOSED.

- CB Start 1
- CB Start 2
- AC Control
- DC Control
- CB Alarm

__ 10. Locally verify EDG starting air available:

a. Verify opened or open all six Starting Air Tank isolation valves:

- 3-EG-3
- 3-EG-5
- 3-EG-7
- 3-EG-9
- 3-EG-11
- 3-EG-13

b. Verify pressure on both air starting banks greater than 175 psig. IF NOT, THEN do the following:

1. Verify closed or close EDG 3 Air Compressor supply breakers:

   - Air Compressor No. 1, 1J1-1A-1C
   - Air Compressor No. 2, 1J1-1A-2B

2. Operate both Air Compressors or crosstie air banks to establish greater than 165 psig on both banks. IF neither Air Compressor can be operated electrically, THEN do the following to operate the Lister Diesel:

   ___ a. Verify open or open EDG 3 Air Compressor 2 breaker:

   - 1J1-1A-2B

   ___ b. Direct Mechanical Department to swap belts on Air Compressor No. 2 to the Lister Diesel.

   ___ c. Verify full or fill the Lister Diesel Engine Lube Oil Reservoir.

   ___ d. Verify full or fill the Lister Diesel Engine Fuel Oil Tank.

___ e. Direct Security to place door in access to establish ventilation during Lister Diesel operation.

___ f. Start the Lister Diesel Engine.

___ g. Engage the engine clutch.

___ h. WHEN Number 2 Air Receiver Bank pressure increases to 195 to 205 psig, THEN verify the engine automatically stops. IF the engine does NOT stop, THEN do the following:

___ 1. Disengage the Lister Diesel clutch.

___ 2. Stop the Lister Diesel Engine.

NOTE: The electric fuel pump will continue to run following an auto-start signal. The pump will stop if an EDG shutdown signal (STOP pushbuttons, Differential current, Overcurrent, or Overspeed) is generated. If a shutdown signal has NOT been generated and the electric pump is NOT running, but the FUEL PRIME button does establish pressure, an attempt to start the EDG with the FUEL PRIME button depressed should be made after the start circuits are reset.

__ 11. Locally verify FUEL SYS FILT IN pressure on ENGINE CONTROL CABINET greater than 10 psig. IF NOT, THEN push the FUEL PRIME pushbutton AND hold until pressure is greater than 10 psig.

__ 12. Assign personnel to observe the exhaust from both sets of Air Start Motors.

* *

CAUTION: Personnel in the EDG Room should wear hearing protection at this time.

* *

NOTE: Local engine start will cause both start circuits to actuate simultaneously.

__ 13. Locally push the ENGINE START pushbutton.

__ 14. Verify Engine running at 900 rpm. IF NOT, THEN adjust using GOVERNOR CONTROL RAISE/LOWER switch.

__ 15. IF Engine NOT running, THEN contact Mechanical Department for assistance. WHEN repairs are complete, THEN RETURN TO Step 12 of this Attachment.

__ 16. Locally at the ENGINE CONTROL CABINET, put the AUTO START/LOCAL START selector switch in AUTO START.

__ 17. Put AUTO-EXERCISE EMERG GEN 3 switch in AUTO.

__ 18. RETURN TO procedure Step 8.

___ 1. To strip the 1J Bus, place the following control switches in PULL-TO-LOCK.

___ 1-SI-P-1B (14J3)

___ 1-CS-P-1B (14J5)

___ 1-RS-P-1B (14J4)

___ 1-RS-P-2B (14J8)

___ 1-VS-F-1B (14J7)

___ PRZR Heater Group A (14J9)

___ 1-VS-F-58B, if powered from ALTERNATE source, 14J1-3

___ 1-CH-P-1B (15J5)

___ 1-CH-P-1C (15J2, ALT)

___ 1-FW-P-3B (15J4)

___ 2. Verify open or open 15J8, 1J Bus Normal Supply Breaker.

___ 3. Verify open or <u>locally</u> open 15J9, 1J Stub Bus Supply Breaker.

___ 1. To strip the 2J Bus, place the following control switches in PULL-TO-LOCK.

___ 2-SI-P-1B (24J3)

___ 2-CS-P-1B (24J5)

___ 2-RS-P-1B (24J4)

___ 2-RS-P-2B (24J8)

___ 2-VS-F-1B (24J7)

___ PRZR Heater Group A (24J9)

___ 1-VS-F-58A, if powered from ALTERNATE supply, 24J1-1

___ 2-CH-P-1B (25J5)

___ 2-CH-P-1C (25J2, ALT)

___ 2-FW-P-3B (25J4)

___ 2. Verify open or open 25J8, 2J Bus Normal Supply Breaker.

___ 3. Verify open or <u>locally</u> open 25J9, 2J Stub Bus Supply Breaker.

1. Inform the Shift Supervisor if any of the following parameters can NOT be met.

   - Fuel System 1 Filter Differential Pressure - LESS THAN OR EQUAL TO 35 PSID
   - Fuel System 2 Filter Differential Pressure - LESS THAN OR EQUAL TO 35 PSID
   - Fuel Oil Base Tank Level - GREATER THAN 290 GALLONS
   - Auxiliary Fuel Oil Tank Level - BETWEEN 21 AND 34 INCHES
   - Engine Lube Oil Temperature, 3-EG-TI-302 - BETWEEN 95° AND 220°F
   - Lube Oil Pressure, 3-EG-PI-304 - GREATER THAN 44 PSIG
   - Lube Oil Sump Level - ABOVE THE LOW MARK ON THE DIPSTICK
   - Cooling Water Temperature, 3-EG-TI-301 - LESS THAN 200°F
   - Cooling Water Surge Tank Level - BETWEEN THE LOW AND FULL MARKS ON THE RUN PORTION OF THE SIGHT GLASS
   - Ambient Room Temperature, 3-AM-TI-302 - BETWEEN 26° AND 100°F
   - Radiator Air Louver Movement - MODULATE TO MAINTAIN COOLING WATER TEMPERATURE

Bus 1J

NOTE: The actions in Step 1 provide a positive air supply into Battery Room thereby preventing a Hydrogen build-up while batteries are being recharged.

___ 1. Align Battery Room 1B Ventilation.

___ a) Open slide damper 1-VS-DMP-134. (East Wall of Battery Room 1B)

___ b) Close slide damper 1-VS-DMP-135. (East Wall of Battery Room 1B)

___ c) Open Battery Room 1B door.

___ d) Establish fire watch and security watch.

___ 2. Record the time when Battery Room Ventilation was realigned:_____.

___ 3. Check 1J Emergency Bus - SEVEN HOURS HAVE ELAPSED SINCE VENTILATION REALIGNMENT. (Time recorded in Step 2.)

NOTE: The actions in Step 4 are taken to prevent over-cooling the Station Batteries and thus compromising the batteries' operability.

___ 4. Align Battery Room 1B Ventilation to prevent over-cooling Battery Rooms.

___ a) Open slide damper 1-VS-DMP-135. (East Wall of Battery Room 1B)

___ b) Close slide damper 1-VS-DMP-134. (East Wall of Battery Room 1B)

___ c) Close Battery Room 1B door.

___ d) Relax fire watch and security watch.

Bus 2J

NOTE: The actions in Step 1 provide a positive air supply into Battery Room thereby preventing a Hydrogen build-up while batteries are being recharged.

___ 1. Align Battery Room 2B Ventilation. Enter N/A if Bus 2J was not de-energized.

___ a) Open slide damper 2-VS-DMP-61. (Just North of EDG 3 ABT, seven feet off floor)

___ b) Close slide damper 2-VS-DMP-62. (Behind 2-EP-UPS-2B-1)

___ c) Open Access Panel in ESGR. (To the right of 2-EP-UPS-2B-1, six feet from floor on North wall of Battery Room)

___ d) Establish fire watch and security watch.

___ 2. Record the time when Battery Room Ventilation was realigned:_____.

___ 3. Check 2J Emergency Bus - SEVEN HOURS HAVE ELAPSED SINCE VENTILATION REALIGNMENT. (Time recorded in Step 2.)

NOTE: The actions in Step 4 are taken to prevent over-cooling the Station Batteries and thus compromising the batteries' operability.

___ 4. Align Battery Room 2B Ventilation to prevent over-cooling Battery Rooms.

___ a) Open slide damper 2-VS-DMP-62. (Behind 2-EP-UPS-2B-1)

___ b) Close slide damper 2-VS-DMP-61. (Just North of EDG 3 ABT, seven feet off floor)

___ c) Close Access Panel in ESGR.

___ d) Relax fire watch and security watch.

I. PROBABLE CAUSES:

1. Starting air bottles depleted
2. Fuel Oil System not primed
3. Start System logic failure
4. Engine Battery failure
5. Improper switch alignment
6. Speed-sensing circuitry failure

II. REFERENCES:

1. UFSAR Section 8.5-1
2. SOER 81.10
3. 11448-FE-1A1
4. ( )-AP-10.07, LOSS OF UNIT ( ) POWER
5. ( )-ECA-0.0, STATION BLACKOUT
6. Annunciator Response Procedure VSP-A5, EMERG GEN ( ) DIFF
7. Annunciator Response Procedure VSP-B5, EMERG GEN ( ) TRBL
8. Annunciator Response Procedure ( )K-F4, 4KV EMERG BUS NORM SUP AUTO TRIP
9. Annunciator Response Procedure ( )K-G4, 4KV EMERG BUS EMERG SUP BKR AUTO TRIP
10. 0-OP-EG-001, NUMBER 3 EMERGENCY DIESEL GENERATOR
11. 0-AP-17.06, AAC DIESEL GENERATOR - EMERGENCY OPERATIONS
12. DCP 92-052-3, AAC Diesel Generator Installation
13. DCP 99-002, Air Supply Modification to Vital Bus Battery Rooms
14. UFSAR Section 9.10.4.4, Battery Room Fire Protection
15. PI S-2001-2626, Minimum 1-VS-E-4A/4B Bus Voltage
16. CME 01-0041, Rev. 0, Final Control and Operating Arrangement of 1-VS-F-58A, -58B
17. PI S-2001-2974, EDG Failed to Start During Testing

PERFORM CLS COMPONENT VERIFICATION (E-0, ATTACHMENT 1)
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	02/25/89		
02	1	06/30/91	Editorial changes due to procedure revision.	
03	2	08/03/92	Editorial/format changes. Also, changes due to procedure revision.	
04	3	08/10/93	Revise per Attachment 1 revision and step 12 revision.	S93-0992
05	4	05/25/95	Reflect E-0 Attachment 1 revision.	S95-0392
06	5	08/15/95	Modify simulator setup and correct labeling/component inaccuracies.	S95-0716
07	6	08/20/96	KA number and procedure changes; component label verification.	S96-0270
08	7	03/25/98	Delete JPM # from trainee handouts.	S98-0286
09	8	12/09/98	Convert to Word.	S98-0936
10	9	03/01/02		S02-

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 67.01 (Rev 09)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

PERFORM CLS COMPONENT VERIFICATION (E-0, ATTACHMENT 1).

Applicability

RO/SRO

Est Completion Time

3 Minutes

Actual Time

_____

NUREG-1122 Importance Ratings

EPE011.EA1.07 (RO 4.4/SRO 4.4)
SYS022.A3.01 (RO 4.1/SRO 4.3)
SYS022.A4.01 (RO 3.6/SRO 3.6)
SYS026.A3.01 (RO 4.3/SRO 4.5)
SYS026.A4.01 (RO 4.5/SRO 4.3)
SYS026.A3.01 RO 3.9/SRO 4.2)

Surry Importance Rating

RO 4.07/SRO 3.56

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA is in progress with containment pressure > 23.0 psia.

Standards

- E-0, Reactor Trip or Safety Injection, Attachment 1.

Initiating Cues

- E-0, Reactor Trip or Safety Injection, step 12g.
- Shift Supervisor direction to perform E-0, Attachment 1.

Terminating Cues

- Verbal report made of E-0, Attachment 1 completion.

Procedures

- E-0, Reactor Trip or Safety Injection, Attachment 1.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize.
- Enter the malfunction for "A" RC loop cold leg rupture (MRC0101) with 1 sec TD.
- Implement the following Remote functions: DISA_CC140A_ACL auto disable, active.
- Implement the following Remote functions: DISA_CS101A/B_OPEN auto disable, active.
- Implement the following Remote functions: DIS_VSF1A_ATRIP auto disable, active.
- Start malfunction timer, trip RCPs and perform E-0 up to step 12f.
- Freeze simulator until ready to perform JPM.

Performance Checklist

Directions to the Operator.

- I am the Shift Supervisor. A large break LOCA has occurred on Unit 1. Containment pressure is above 23 psia.
- Here is a copy of E-0 Attachment 1. I need you to perform the CLS COMPONENT VERIFICATION.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None.
- **START TIME:** _____

---

* 1. VERIFY CONTAINMENT ISOLATION TRIP VALVES CLOSED.

Standards

Checks trip valve area of Vertical Board 1 and verifies the following trip valves are closed (green light on & red off):

(a) 1-RM-TV-100C.
(b) 1-RM-TV-100B.
(c) 1-RM-TV-100A.
(d) 1-CC-TV-105A.
(e) 1-CC-TV-105B.
(f) 1-CC-TV-105C.
*(g) Notes 1-CC-TV-140A not closed. Pushes close button and verifies that green light comes on.
(h) Identifies that green light and red light are off for 1-CC-TV-140B.
(i) 1-SV-TV-102.
(j) 1-CC-TV-110A.
(k) 1-CC-TV-110B.
(l) 1-IA-TV-101A.
(m) 1-CC-TV-110C.
(n) 1-IA-TV-100.
(o) 1-IA-TV-101B.

Evaluator's Comments

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* 2. VERIFY CONTAINMENT AIR RECIRC FANS TRIPPED.

Standards

Checks Unit 1 Vent panel to verify the following fans are tripped (amber light lit):
(a) 1-VS-F-1A running.
*(b) Secures 1-VS-F-1A. Observes green light on; red light off.
(c) 1-VS-F-1B

Evaluator's Comments

3. VERIFY RECIRC SPRAY SERVICE WATER RADIATION MONITOR PUMPS RUNNING.

Standards

Checks Unit 1 Radiation Monitoring Panel to verify the following pumps are running (Red light on Green light off):
(a) 1-SW-P-5A
(b) 1-SW-P-5B
(c) 1-SW-P-5C
(d) 1-SW-P-5D

Evaluator's Comments

4. VERIFY RS SW RADIATION MONITOR PUMP LOW FLOW ALARMS CLEAR.

Standards

Checks Unit 1 Annunciator Panel on Vertical Board 1 to verify the following alarms are clear:
(a) A-D-6, RS HX 1A RAD MON PP NO FLOW
(b) A-E-6, RS HX 1B RAD MON PP NO FLOW
(c) A-F-6, RS HX 1C RAD MON PP NO FLOW
(d) A-G-6, RS HX 1D RAD MON PP NO FLOW

Evaluator's Comments

* 5. VERIFY CS AND RS VALVE ALIGNMENTS.

Standards

Checks the CS/RS section of Benchboard 1-1 and verifies the following valves are open (red light on & green off):

(a) 1-CS-MOV-102A, Caustic Tank Outlet isolation.
(b) 1-CS-MOV-102B, Caustic Tank Outlet isolation.
(c) 1-RS-MOV-156A, ORS Pump Discharge isolation.
(d) 1-RS-MOV-156B, ORS Pump Discharge isolation.
(e) 1-RS-MOV-155A, ORS Pump Suction isolation.
(f) 1-RS-MOV-155B, ORS Pump Suction isolation.
(g) 1-CS-MOV-101B, CS Pump Discharge isolation not closed.
*(h) Opens 1-CS-MOV-101B. Observes red light on; green light off.
(i) 1-CS-MOV-101A, CS Pump Discharge isolation not closed.
*(j) Opens 1-CS-MOV-101A. Observes red light on; green light off.
(k) 1-CS-MOV-101D, CS Pump Discharge isolation.
(l) 1-CS-MOV-101C, CS Pump Discharge isolation.
(m) 1-CS-MOV-100A, CS Pump Suction isolation.
(n) 1-CS-MOV-100B, CS Pump Suction isolation.

Evaluator's Notes

Open either 101A or 101B for success.

Evaluator's Comments

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6. VERIFY RS HX SERVICE WATER VALVE ALIGNMENT.

Standards

Checks the CW/SW section of Benchboard 1-1 and verifies the following valves are open (red light lit):

(a) 1-SW-MOV-105A
(b) 1-SW-MOV-105B
(c) 1-SW-MOV-105C
(d) 1-SW-MOV-105D
(e) 1-SW-MOV-104A
(f) 1-SW-MOV-104B
(g) 1-SW-MOV-104C
(h) 1-SW-MOV-104D
(i) 1-SW-MOV-103A
(j) 1-SW-MOV-103B
(k) 1-SW-MOV-103C
(l) 1-SW-MOV-103D

Evaluator's Comments

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7. VERIFY SW OUTLET FLOW FROM RSHXs BETWEEN 6,000 GPM AND 12,500 GPM.

Standards

Checks the RSHX SW flow indicators in Vertical Board 1 to verify flow between 6,000 gpm and 12,500 gpm on:
(a) 1-SW-FI-106A, RS HX A
(b) 1-SW-FI-106B, RS HX B
(c) 1-SW-FI-106C, RS HX C
(d) 1-SW-FI-106D, RS HX D

Evaluator's Comments

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8. IDENTIFIES THAT HI-HI CLS WITH A BLACKOUT IS NOT IN PROGRESS.

Standards

Evaluator's Comments

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9. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made of task completion.

Evaluator's Comments **STOP TIME:** _____

Evaluator's Summary

Job Performance Measure 67.01 (Rev 09)

PERFORM CLS COMPONENT VERIFICATION (E-0, ATTACHMENT 1)

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 67.01 (Rev 09)
PERFORM CLS COMPONENT VERIFICATION (E-0 ATTACHMENT 1)

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **3 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☒

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Safety Practices Observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

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Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA is in progress with containment pressure > 23.0 psia.

Initiating Cues

- E-0, Reactor Trip or Safety Injection, step 12g.
- Shift Supervisor direction to perform E-0, Attachment 1.

Directions

- I am the Shift Supervisor. A large break LOCA has occurred on Unit 1. Containment pressure is above 23 psia.
- Here is a copy of E-0 Attachment 1. I need you to perform the CLS COMPONENT VERIFICATION.
- When you finish the actions necessary to accomplish this, please inform me.

VIRGINIA POWER
SURRY POWER STATION

EMERGENCY PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-E-0	REACTOR TRIP OR SAFETY INJECTION (With 5 Attachments)	44
		PAGE 1 of 18

PURPOSE

This procedure provides actions to verify proper response of the automatic protection systems following manual or automatic actuation of a Reactor trip or Safety Injection, to assess plant conditions, and to identify the appropriate recovery procedure.

ENTRY CONDITIONS

1) The following are symptoms that require a Rx trip, if one has NOT occurred:
   - A Reactor protection system setpoint has been exceeded
   - A Turbine protection system setpoint with power greater than P-7 setpoint has been exceeded

2) The following are symptoms of a reactor trip:
   - Any RED reactor trip first out annunciator - LIT
   - Rapid decrease in neutron flux level - INDICATED
   - All shutdown AND control banks - INSERTED
   - All rod bottom lights - LIT
   - Reactor trip AND bypass breakers - OPEN

3) The following are symptoms that require a Rx trip and SI, if one has not occurred
   - Low PRZR Pressure
   - High Containment pressure
   - Main Steam Line Header to Line Differential pressure
   - High Steam flow with low Tave
   - High Steam flow with low Steam pressure

4) The following are symptoms of a Reactor trip and Safety Injection:
   - Any SI first out annunciator - LIT
   - LHSI pumps - RUNNING

5) Transition from another procedure.

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[1]	__VERIFY REACTOR TRIP: a) Manually trip reactor b) Check the following: • Rod bottom lights - LIT • Reactor trip and bypass breakers - OPEN • Neutron flux - DECREASING	IF reactor will NOT trip, THEN GO TO 1-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS.
[2]	__VERIFY TURBINE TRIP: a) Manually trip the turbine b) Verify all turbine stop valves - CLOSED c) Isolate reheaters by closing MSR steam supply SOV • 1-MS-SOV-104 d) Verify generator output breakers - OPEN (Time Delayed)	b) IF turbine will NOT trip, THEN close MSTVs. c) IF reheater FCVs will NOT close, THEN close MSR steam supply MOVs. d) IF Generator Output Breakers do NOT open within 30 seconds, THEN manually open output breakers AND place the EXCITATION control switch in OFF.
[3]	__VERIFY BOTH AC EMERGENCY BUSES - ENERGIZED	Do the following: a) IF no AC Emergency Bus is energized, THEN GO TO 1-ECA-0.0, LOSS OF ALL AC POWER. b) Try to restore power to deenergized AC Emergency Bus. Initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[4]	__CHECK IF SI INITIATED:	

	a) Check if SI is actuated:
	• LHSI pumps - RUNNING
	• SI annunciators - LIT
	  • A-F-3
	  • A-F-4
		a) Check if SI is required or imminent as indicated by any of the following:
		• Low PRZR pressure
		• High CTMT pressure
		• High steamline differential pressure
		• High steam flow with low Tave or low line pressure
		
		<u>IF</u> SI is required, <u>THEN</u> GO TO Step 4b.
		
		<u>IF</u> SI is <u>NOT</u> required, <u>THEN</u> GO TO 1-ES-0.1, REACTOR TRIP RESPONSE.

	b) Manually initiate SI	

5.	__VERIFY FW ISOLATION:
	• Feed pump discharge MOVs - CLOSED
	  • 1-FW-MOV-150A
	  • 1-FW-MOV-150B
	• MFW pumps - TRIPPED
	• Feed REG valves - CLOSED
	• SG FW bypass flow valves - DEMAND AT ZERO
	• SG blowdown TVs - CLOSED
		Manually close valves and stop pumps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6.	__VERIFY CTMT ISOLATION PHASE I:
	• Phase I TVs - CLOSED
	• 1-CH-MOV-1381 - CLOSED
	• 1-SV-TV-102A - CLOSED
	• PAM isolation valves - CLOSED
	  • 1-DA-TV-103A
	  • 1-DA-TV-103B
		Manually close valves.

7.	__VERIFY AFW PUMPS RUNNING:
	a) MD AFW pumps - RUNNING (Time Delayed)
	b) TD AFW pump - RUNNING IF NECESSARY
		a) Manually start pumps.
		b) Manually open steam supply valves.
		  • 1-MS-SOV-102A
		  • 1-MS-SOV-102B

8.	__VERIFY SI PUMPS RUNNING: • CHG pumps - RUNNING • LHSI pumps - RUNNING	Manually start pumps.
9.	__CHECK CHG PUMP AUXILIARIES: • CHG pump CC pump - RUNNING • CHG pump SW pump - RUNNING	Manually start pumps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	__CHECK INTAKE CANAL: • Level - GREATER THAN 24 FT • Level - BEING MAINTAINED BY CIRC WATER PUMPS	IF level is less than 24 ft OR decreasing in an uncontrolled manner, THEN initiate 0-AP-12.01, LOSS OF INTAKE CANAL LEVEL.
11.	__CHECK IF MAIN STEAMLINES SHOULD BE ISOLATED:	
	a) Check if ANY of the following annunciators - HAVE BEEN LIT • E-F-10 (High Steam Flow SI) • B-C-4 (Hi Hi CLS Train A) • B-C-5 (Hi Hi CLS Train B)	a) Do the following: IF annunciator E-H-10 (Hdr/Line SI) LIT, THEN GO TO Step 11d. IF annunciator E-H-10 NOT LIT, THEN GO TO Step 12.
	b) Check MSTVs - CLOSED	b) Manually close valves.
	c) Check either of the following - ACTUATED • Hi steam flow SI OR • Header to line SI	c) GO TO Step 12.
	d) Verify RWST crosstie valves - OPEN • 1-SI-TV-102A • 1-SI-TV-102B • 2-SI-TV-202A • 2-SI-TV-202B	d) Manually open valves.
	e) Check RCS pressure - LESS THAN 185 PSIG	e) Put BOTH RMT mode transfer switches in REFUEL.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*12.	__CHECK IF CS REQUIRED:	
	a) CTMT pressure - HAS EXCEEDED 23 PSIA	a) Do the following: 1) IF CTMT pressure has exceeded 17.7 psia, THEN verify or align the following valves: • 1-RM-TV-100A - CLOSED • 1-RM-TV-100B - CLOSED • 1-RM-TV-100C - CLOSED • 1-SV-TV-102 - CLOSED • 1-IA-TV-101A - CLOSED • 1-IA-TV-101B - CLOSED • 1-IA-AOV-103 - OPEN 2) GO TO Step 13.
	b) Manually initiate HI HI CLS	
	c) Trip all RCPs	
	d) Verify CS pumps - RUNNING	d) Manually start pump(s). IF any pump will NOT start, THEN monitor OSRS pumps for cavitation. IF cavitation is indicated, THEN put affected OSRS pump in PTL.
	e) Check ISRS pumps - RUNNING (Time Delayed)	e) Manually start pumps.
	f) Check OSRS pumps - RUNNING (Time Delayed)	f) Manually start pumps.
	g) Initiate Attachment 1	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- Low PRZR pressure SI signal should be blocked when PRZR pressure decreases to less than 2000 psig.
- High steam flow SI signal should be blocked when Tave decreases to less than 543°F.
- CHG pumps should be run in the following order of priority: C, B, A.

13. __VERIFY SI FLOW:

a) HHSI to cold legs - FLOW INDICATED • 1-SI-FI-1961 (NQ) • 1-SI-FI-1962 (NQ) • 1-SI-FI-1963 (NQ) • 1-SI-FI-1943 or 1-SI-FI-1943A	a) Manually start pumps and align valves. IF flow NOT established, THEN consult with Shift Supervisor to establish another high pressure injection flowpath while continuing with this procedure. • Alternate SI to cold legs • Hot leg injection
b) Check CHG pumps - THREE RUNNING	b) GO TO Step 13e.
c) Reset SI	
d) Stop one CHG pump and put in AUTO	
e) RCS pressure - LESS THAN 185 PSIG	e) IF two LHSI pumps are running, THEN do the following: 1) Verify reset or reset SI. 2) Stop one LHSI pump and put in AUTO. 3) GO TO Step 14. IF one LHSI pump running, THEN GO TO Step 14.
f) LHSI flow - INDICATED	f) Manually start pumps and align valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	__VERIFY TOTAL AFW FLOW - GREATER THAN 350 GPM [450 GPM]	IF SG narrow range level greater than 11% [22%] in any SG, THEN control feed flow to maintain narrow range level AND GO TO Step 15. IF SG narrow range level less than 11% [22%] in all SGs, THEN manually start pumps AND align valves as necessary. IF AFW flow greater than 350 gpm [450 gpm] can NOT be established, THEN GO TO 1-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
15.	__CHECK AFW MOVs - OPEN	Manually align valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

16. __VERIFY SI VALVE ALIGNMENT: — Manually align valves.

a) CHG pump suction from RWST MOVs - OPEN

- 1-CH-MOV-1115B
- 1-CH-MOV-1115D

b) CHG pump suction from VCT MOVs - CLOSED

- 1-CH-MOV-1115C
- 1-CH-MOV-1115E

c) CHG line isolation MOVs - CLOSED

- 1-CH-MOV-1289A
- 1-CH-MOV-1289B

d) Letdown orifice isolation valves - CLOSED

- 1-CH-HCV-1200A
- 1-CH-HCV-1200B
- 1-CH-HCV-1200C

e) HHSI to cold legs - OPEN

- 1-SI-MOV-1867C
- 1-SI-MOV-1867D

f) LHSI suction from RWST - OPEN

- 1-SI-MOV-1862A
- 1-SI-MOV-1862B

g) LHSI to cold legs - OPEN

- 1-SI-MOV-1864A
- 1-SI-MOV-1864B

17. __VERIFY VENTILATION ALIGNMENT AND AC POWER ALIGNMENT IAW ATTACHMENT 2

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*18.	__CHECK RCS AVERAGE TEMPERATURE • STABLE AT 547°F OR • TRENDING TO 547°F	IF temperature less than 547 °F AND decreasing, THEN do the following: a) Stop dumping steam. b) IF cooldown continues, THEN control total feed flow. Maintain total feed flow greater than 350 gpm [450 gpm] until narrow range level greater than 11% [22%] in at least one SG. c) IF cooldown continues, THEN close MSTVs. IF temperature greater than 547 °F AND increasing, THEN do the following: • Dump steam to condenser. OR • Dump steam using SG PORVs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	__CHECK PRZR PORVs AND SPRAY VALVES:	
	a) PRZR PORVs - CLOSED	a) IF PRZR pressure less than 2335 psig, THEN manually close PORVs. IF any valve can NOT be closed, THEN manually close associated block valve. IF block valve can NOT be closed, THEN GO TO 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
	b) PRZR spray controls - DEMAND AT ZERO	b) IF PRZR pressure less than 2235 psig, THEN manually close valves. IF valves can NOT be closed, THEN stop RCP supplying failed spray valve: • RCP A for 1-RC-PCV-1455A • RCP C for 1-RC-PCV-1455B
	c) PORV block valves - AT LEAST ONE OPEN	c) Open one PORV block valve unless it was closed to isolate an open PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE: Seal injection flow should be maintained to all RCPs.	
*20.	__CHECK RCP TRIP AND MINIFLOW RECIRC CRITERIA:	
	a) HHSI to cold legs - FLOW INDICATED	a) GO TO Step 21.
	b) RCS subcooling - LESS THAN 30 °F [75°F]	b) GO TO Step 21.
	c) Stop all RCPs	
	d) RCS pressure - LESS THAN 1275 PSIG [1475 PSIG]	d) GO TO Step 21.
	e) Close CHG pump miniflow recirc valves: • 1-CH-MOV-1275A • 1-CH-MOV-1275B • 1-CH-MOV-1275C	e) Close 1-CH-MOV-1373.
21.	__CHECK IF SGs ARE NOT FAULTED: • Check pressures in all SGs - STABLE OR INCREASING • Check pressures in all SGs - GREATER THAN 100 PSIG	IF any SG pressure decreasing in an uncontrolled manner OR is completely depressurized, THEN GO TO 1-E-2, FAULTED STEAM GENERATOR ISOLATION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22.	__CHECK IF SG TUBES ARE NOT RUPTURED: • Condenser air ejector radiation - NORMAL • SG blowdown radiation - NORMAL • SG MS radiation - NORMAL • TD AFW pump exhaust radiation - NORMAL • SG NR Level - NOT INCREASING IN AN UNCONTROLLED MANNER	GO TO 1-E-3, STEAM GENERATOR TUBE RUPTURE.
23.	__CHECK RCS - INTACT INSIDE CTMT • CTMT radiation - NORMAL • CTMT pressure - NORMAL • CTMT RS sump level - NORMAL	GO TO 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
24.	__CHECK RCS - HAS BEEN MAINTAINED INTACT OUTSIDE CTMT a) Radiation Monitors - NORMAL • Kaman vent-vent • Auxiliary Building Control Area b) Sump annunciators - NOT LIT • VSP-F-4 • B-D-1 • B-D-2 • B-F-3	Determine cause of abnormal conditions. <u>IF</u> the cause is a loss of RCS inventory outside CTMT, <u>THEN</u> GO TO 1-ECA-1.2, LOCA OUTSIDE CONTAINMENT.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25.	__CHECK IF SI FLOW SHOULD BE REDUCED:	
	a) RCS subcooling based on CETCs - GREATER THAN 30°F	a) GO TO Step 26.
	b) Secondary heat sink:	b) GO TO Step 26.
	• Total feed flow to SGs - GREATER THAN 350 GPM OR • Narrow range level in at least one SG - GREATER THAN 11%	
	c) RCS pressure - STABLE OR INCREASING	c) GO TO Step 26.
	d) PRZR level - GREATER THAN 22%	d) Try to stabilize RCS pressure with normal PRZR spray. RETURN TO Step 25a.
	e) GO TO 1-ES-1.1, SI TERMINATION	
26.	__INITIATE MONITORING OF CRITICAL SAFETY FUNCTION STATUS TREES:	
	• Have STA begin monitoring of Status Trees	• Assign a person to initiate monitoring of Status Trees.
	• Use ERFCS	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*27.	__CHECK SG LEVELS:	
	a) Any narrow range level - GREATER THAN 11%	a) Maintain total feed flow greater than 350 gpm until narrow range level in at least one SG is greater than 11%.
	b) Check emergency buses - BOTH ENERGIZED	b) Locally isolate AFW header on deenergized bus if necessary to control level: • 1-FW-141 for H bus • 1-FW-156 for H bus • 1-FW-171 for H bus OR • 1-FW-140 for J bus • 1-FW-155 for J bus • 1-FW-170 for J bus
	c) Control feed flow to maintain narrow range level between 22% and 50%	c) IF narrow range level in any SG continues to increase in an uncontrolled manner, THEN GO TO 1-E-3, STEAM GENERATOR TUBE RUPTURE.
28.	__RESET BOTH TRAINS OF SI	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29.	__CHECK CC SYSTEM STATUS:	
	a) Check SW to CC HXs - IN SERVICE	a) Restore SW to CC HXs IAW 0-AP-12.01, LOSS OF INTAKE CANAL LEVEL, Steps 16 through 23.
	b) Check CC pumps - AT LEAST ONE RUNNING	b) Do the following: 1) IF RCP seal water return temperature greater than 235°F, THEN close 1-CC-TV-140A and B. • RCP A, T0181A • RCP B, T0182A • RCP C, T0183A 2) Locally throttle CC pump discharge valve to approximately 25% open: • 1-CC-558 for 1-CC-P-1A • 1-CC-564 for 1-CC-P-1B 3) Locally close stub bus tie breaker. 4) Start one CC pump. 5) Locally open discharge valve. IF a CC pump can NOT be started, THEN attempt to crosstie CC systems.
30.	__CHECK SECONDARY RADIATION:	
	a) Initiate Attachment 3	
	b) Radiation - NORMAL	b) GO TO 1-E-3, STEAM GENERATOR TUBE RUPTURE.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31.	__CHECK PRT CONDITIONS - NORMAL	Determine cause of abnormal conditions. IF PRZR PORVs or safety valves are leaking AND can NOT be isolated, THEN GO TO 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT.

* *

CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 250 psig, one LHSI pump must be manually restarted to supply water to the RCS.

* *

32.	__CHECK IF LHSI PUMPS SHOULD BE STOPPED:	
	a) RCS Pressure - GREATER THAN 250 PSIG	a) Do the following: 1) Verify at least one LHSI pump running. IF at least one LHSI pump NOT running, THEN manually restart one LHSI pump. 2) GO TO 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
	b) RCS Pressure - STABLE OR INCREASING	b) GO TO Step 33.
	c) Stop LHSI pumps and put in AUTO	
33.	__CHECK IF EDGs CAN BE STOPPED:	
	a) Verify AC emergency buses - BOTH ENERGIZED BY OFFSITE POWER	a) Verify initiated or initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.
	b) Stop any unloaded EDGs IAW Attachment 4	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

34. __RETURN TO STEP 18

- END -

LOCATION: Vertical Board VALVE POSITION: CLOSED
LIGHTS: GREEN

__1-RM-TV-100C

__1-RM-TV-100B

__1-RM-TV-100A

__1-CC-TV-105A

__1-CC-TV-105B __1-CC-TV-140A __1-CC-TV-110A

__1-CC-TV-105C __1-CC-TV-140B __1-CC-TV-110B __1-CC-TV-110C __1-IA-TV-100

__1-SV-TV-102 __1-IA-TV-101A __1-IA-TV-101B

LOCATION: Unit 1 Vent Panel RECIRC FAN STATUS: OFF
LIGHTS: AMBER

__1-VS-F-1A __1-VS-F-1B

LOCATION: Radiation Monitoring Panel PUMPS: RUNNING (Time delayed)

__1-SW-P-5A __1-SW-P-5B __1-SW-P-5C __1-SW-P-5D

LOCATION: Annunciator Panel A ALARMS: CLEAR

__A-D-6 RS HX 1A RAD MON PP NO FLOW

__A-E-6 RS HX 1B RAD MON PP NO FLOW

__A-F-6 RS HX 1C RAD MON PP NO FLOW

__A-G-6 RS HX 1D RAD MON PP NO FLOW

IF alarm is LIT, THEN stop associated rad monitor pump AND monitor SW activity using RI-SW-120.

LOCATION: Bench Board VALVE POSITION: OPEN
LIGHTS: RED

__1-CS-MOV-102A __1-CS-MOV-102B

__1-RS-MOV-156A __1-RS-MOV-156B

__1-CS-MOV-101B __1-CS-MOV-101D

__1-CS-MOV-101A __1-CS-MOV-101C

__1-RS-MOV-155A __1-RS-MOV-155B __1-CS-MOV-100A __1-CS-MOV-100B

LOCATION: Bench Board VALVE POSITION: OPEN
LIGHTS: RED

__1-SW-MOV-105A __1-SW-MOV-105B __1-SW-MOV-105C __1-SW-MOV-105D

__1-SW-MOV-104A __1-SW-MOV-104B __1-SW-MOV-104C __1-SW-MOV-104D

__1-SW-MOV-103A __1-SW-MOV-103B __1-SW-MOV-103C __1-SW-MOV-103D

Verify SW Outlet flow from RS HXs between 6,000 gpm and 12,500 gpm:

- 1-SW-FI-106A, RS HX A
- 1-SW-FI-106B, RS HX B
- 1-SW-FI-106C, RS HX C
- 1-SW-FI-106D, RS HX D

---------- IF EVENT - CLS HI HI AND LOSS OF RSS ----------

LOCATION: Bench Board VALVE POSITION: CLOSED
LIGHTS: GREEN

__1-CW-MOV-100A __1-CW-MOV-100B __1-CW-MOV-100C __1-CW-MOV-100D

__1-CW-MOV-106A __1-CW-MOV-106B __1-CW-MOV-106C __1-CW-MOV-106D

__1-SW-MOV-101A __1-SW-MOV-101B __1-SW-MOV-102A __1-SW-MOV-102B

___ 1. Check all REFUEL SFTY MODE switches in NORMAL. IF NOT, THEN do the following:

___ a. Notify Refueling SRO to stop refueling operations.

b. GO TO Step 4 of this Attachment. WHEN fuel is in a safe condition, THEN do the following:

___ 1. Put all REFUEL SFTY MODE switches in NORMAL.

___ 2. Verify damper alignment IAW Tables 1 and 2.

___ 3. Verify running or start both Filtered Exhaust Fans:

- 1-VS-F-58A
- 1-VS-F-58B

___ 4. GO TO Step 3 of this Attachment.

___ 2. Verify ventilation alignment IAW Tables 1 and 2.

TABLE 1

UNIT #1 VENTILATION PANEL

MARK NUMBER	EQUIPMENT STATUS
1-VS-F-4A & B	OFF
1-VS-HV-1A & B	OFF
1-VS-F-8A & B	OFF
1-VS-F-9A & B	GREEN
1-VS-F-59	GREEN
1-VS-F-6	OFF
1-VS-F-39	GREEN
1-VS-F-7A & B	GREEN
1-VS-HV-5	GREEN
1-VS-F-56A & B	GREEN
1-VS-F-40A & B	GREEN
1-VS-HV-4	GREEN
2-VS-F-40A or B	RED
2-VS-HV-4	GREEN

TABLE 2

VNTX PANEL

MARK NUMBER	EXPECTED EQUIPMENT STATUS	RESPONSE NOT OBTAINED
a. AOD-VS-107A & B	RED	a. Place AUX BLDG CENTRAL AREA MODE switch to FILTER.
AOD-VS-108	GREEN	
b. MOD-VS-100A & B	RED	b. • Place MOD-VS-100A in FILTER. • Place MOD-VS-100B in FILTER.
AOD-VS-106	GREEN	
c. MOD-VS-200A & B	GREEN	c. • Place MOD-VS-200A in UNFILTER. • Place MOD-VS-200B in UNFILTER.
AOD-VS-206	RED	
d. AOD-VS-103A & B	GREEN	d. • Place AOD-VS-103A in UNFILTER. • Place AOD-VS-103B in UNFILTER.
AOD-VS-104	GREEN	• Place AOD-VS-104 in FILTER.
e. AOD-VS-101A & B	GREEN	e. Place AOD-VS-101A and 101B in UNFILTER.
AOD-VS-102	GREEN	
f. AOD-VS-111A & B	GREEN	f. Place AOD-VS-109A and 109B in FILTER.
AOD-VS-110	GREEN	
g. AOD-VS-112A & B	GREEN	g. • Place AOD-VS-112A in CLOSE. • Place AOD-VS-112B in CLOSE.
h. MOD-VS-58A & B	RED	h. Start 1-VS-F-58A and 1-VS-F-58B
1-VS-F-58A & B	RED	

___ 3. Verify filtered exhaust flow: (as read on FI-VS-117A and FI-VS-117B)

- Total flow - GREATER THAN 32,400 CFM

AND

- Flow through each filter bank - LESS THAN 39,600 CFM

___ 4. Verify stopped or stop 1-VS-AC-4.

___ 5. Place 1-VS-43-VS103X, MCR ISOLATION switch to the OFF position.

___ 6. Verify closed or close MCR isolation dampers.

- 1-VS-MOD-103A
- 1-VS-MOD-103B
- 1-VS-MOD-103C
- 1-VS-MOD-103D

___ 7. Verify dumped or dump the MCR air bottles.

NOTE: The timer should be set for 60 minutes, minus the number of minutes since Safety Injection initiation.

___ 8. Set timer. WHEN SI has been in progress for one hour (when timer goes off), THEN immediately perform Step 17 to start one Emergency Supply Fan.

___ 9. Check readings on the following Differential Pressure Indicators - POSITIVE PRESSURE INDICATED.

- PDI-VS-100,D.P.-U1CR/U1TB (Unit 2 Turbine Ventilation Panel)
- PDI-VS-101,D.P.-U1RR/U1TB (Unit 2 Turbine Ventilation Panel)
- PDI-VS-200,D.P.-U2CR/U2TB (Unit 2 Turbine Ventilation Panel)
- PDI-VS-201,D.P.-U2RR/U2TB (Unit 2 Turbine Ventilation Panel)
- 1-VS-PDI-118 (Unit 1 Computer Room)
- 1-VS-PDI-116 (Near Unit 1 Semi-Vital Bus)
- 2-VS-PDI-215 (Unit 2 AC Room)
- 2-VS-PDI-206 (Near Unit 2 Semi-Vital Bus)

___10. IF any reading NOT positive, THEN initiate Attachment 5 to secure MCR boundary fans.

___11. Verify the following MCR and ESGR air conditioning equipment operating. IF NOT, THEN start equipment within 1 hour IAW the appropriate subsection of 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM.

- Two Control Room chillers
- One Unit 1 Control Room AHU
- One Unit 2 Control Room AHU
- One Unit 1 ESGR AHU
- One Unit 2 ESGR AHU

___12. Check all Station Service Buses - ENERGIZED. IF NOT, THEN initiate 1-AP-10.07, LOSS OF UNIT 1 POWER.

___13. Check annunciator VSP-J2 - LIT.

___14. Check Unit 1 RSST LTC time delay bypass light - LIT.

___15. IF both of the following conditions exist, THEN verify that Load Shed is activated.

- Unit 2 - SUPPLIED BY RSST
- Unit 2 RCPs - RUNNING

___16. IF Load Shed is required and not activated, THEN initiate 0-AP-10.10, LOSS OF AUTO LOAD SHED.

* *

CAUTION:
- Only one Emergency Supply Fan must be started in the following step.
- Chilled Water flow to the in-service Unit 1 MCR AHU must be throttled to at least 15 gpm when the Emergency Supply fan is started.
- Chilled Water flow to the in-service Unit 2 MCR AHU must be throttled to at least 25 gpm when the Emergency Supply fan is started.
- An Emergency Supply Fan must not be started if the filter is wet.

* *

17. WHEN SI has been in progress for one hour (when timer goes off), THEN immediately start ONE Emergency Supply Fan IAW the following: (1-VS-F-41 or 2-VS-F-41 preferred)

a. IF 1-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.

___ 1. Open 1-VS-MOD-104A, CONT RM EMERG SUP MOD.

___ 2. Start 1-VS-F-41.

b. IF 2-VS-F-41, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.

___ 1. Open 2-VS-MOD-204A, CONT RM EMERG SUP MOD.

___ 2. Start 2-VS-F-41.

c. IF 1-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the following substeps.

___ 1. Open 1-VS-MOD-104B, CONT RM EMERG SUP MOD.

___ 2. Start 1-VS-F-42.

d. IF 2-VS-F-42, CONT RM EMERG SUP FAN, will be used, THEN perform the the following substeps.

___ 1. Open 2-VS-MOD-204B, CONT RM EMERG SUP MOD.

___ 2. Start 2-VS-F-42.

___ e. Adjust Chilled Water flow to MCR AHUs IAW Step 17 Caution.

1 __VERIFY INSTRUMENT AIR AVAILABLE:

a) Check annunciator B-E-6 - NOT LIT

a) Crosstie IA from Unit 2 by opening 1-IA-44 and 2-IA-44. IF Unit 2 IA NOT available, THEN do the following:

1) Verify BC in service. IF BC NOT in service, THEN locally establish fire water cooling to IA compressors.

To align 1-IA-C-1 do the following:

a. Open 1-BC-170.
b. Open 1-BC-3.
c. Close 1-BC-231.
d. Close 1-BC-232.

To align 2-IA-C-1 do the following:

a. Open 2-BC-170.
b. Open 2-BC-3.
c. Close 2-BC-168.
d. Close 2-BC-2.
e. Open 1-IA-44 and 2-IA-44.

2) Locally start at least one IA compressor.

b) Check at least one CTMT IA compressor - RUNNING

- 1-IA-C-4A
- 1-IA-C-4B

b) IF CC pump running, THEN start one CTMT IA compressor. IF NOT, THEN locally crosstie to turbine building IA IAW one of the following(Zone 5 key required):

- 1-OP-IA-005, Administrative Control of Unit 1 IA to Unit 1 CTMT Valves 1-IA-446 and 1-IA-447

OR

- 1-OP-IA-006, Administrative Control of Unit 2 IA to Unit 1 CTMT Valves 2-IA-446 and 2-IA-447

2 __ALIGN SG BLOWDOWN FOR SAMPLING:

a) Locally close manual isolation valves:

- 1-BD-150 SG A
- 1-BD-152 SG A

- 1-BD-160 SG B
- 1-BD-162 SG B

- 1-BD-170 SG C
- 1-BD-172 SG C

b) Put SG blowdown permissive key switches in PERM (keys 66, 67, and 68)

c) Check annunciator H-D-1 - NOT LIT

c) Reset AMSAC.

d) Place AMSAC BYPASS switch in BYPASS

e) Open SG Blowdown trip valves:

- __ 1-BD-TV-100A
- __ 1-BD-TV-100B

- __ 1-BD-TV-100C
- __ 1-BD-TV-100D

- __ 1-BD-TV-100E
- __ 1-BD-TV-100F

f) Locally open manual isolation valves:

- 1-BD-150 SG A
- 1-BD-160 SG B
- 1-BD-170 SG C

3 __CHECK CC PUMPS - AT LEAST ONE RUNNING

Do the following:

1) WHEN CC restored, THEN do Steps 4 through 6.

2) RETURN TO procedure Step in effect.

NOTE: Use of portable radiation detectors, such as the RM-14, may provide the most rapid means of identification of a ruptured SG.

4 __HAVE CHEMISTRY DO THE FOLLOWING:

a) Sample all SGs

b) Use portable detectors to check each sample

c) Have count room do isotopic analysis

5 __MONITOR SG BLOWDOWN RADIATION MONITORS:

- RI-SS-112
- RI-SS-113

6 __REALIGN SG BLOWDOWN RADIATION MONITORS IAW 1-OP-RM-001, SG BLOWDOWN ALIGNMENT TO RADIATION MONITORS, AS NECESSARY

NOTE: • Only one EDG should be stopped at a time.

• EDG 1 should be stopped before EDG 3.

___ 1. Verify that the EMERG GEN NO () SPEED ADJ red light is LIT and the green light is NOT LIT.

NOTE: Adjustments to the UG-8 Governor should be made slowly with the EDG running to prevent hunting and surging by the governor.

2. Locally adjust the UG-8 Governor to the fast start settings:

___ a. Slowly adjust the Speed Droop Control setting to ZERO.

___ b. At the Engine Control Cabinet, using the Speed Control Switch, adjust EDG speed to match the speed knob pointer to the scribe mark on the dial.

___ c. Verify that the scribe marks on the gears are aligned.

___ 3. Use a Strobe Light to verify engine speed is between 895 and 905 rpm.

___ 4. Verify that the base tank fuel oil level is greater than 290 gallons.

NOTE: The Emergency Diesel Generator will continue to run for 9 1/2 minutes to 13 1/2 minutes after the Engine Stop pushbuttons are depressed. This unloaded run time allows engine metal temperatures to equalize, thereby reducing the stress on the engine.

___ 5. In the MCR, push both EMERG GEN NO () ENGINE STOP pushbuttons simultaneously to initiate the engine cool down and stop sequence.

___ 6. Verify engine speed remains between 895 and 905 rpm as indicated by the Strobe Light.

___ 7. Verify that the EMERG GEN #() TRIP AUX RESET amber light is LIT.

___ 8. Depress the following pushbuttons and verify that the associated amber light is NOT LIT.

• EDG 1 - Depress 1-EE-PB-EG1, EMERGENCY GENERATOR #1 PUSH BUTTON RESET, at the EDG Isolation Panel in the ESGR

• EDG 3 - Depress the EMERG GEN #3 TRIP AUX RESET BUTTON, on the Unit 1 EDG 3 Control Panel

___ 9. Verify that the EDG stops after the 9 1/2 minute to 13 1/2 minute cool down period.

10. At the UG-8 Governor, verify the following conditions:

___ a. Verify the scribe marks on the gears are aligned.

___ b. Verify the speed knob is at the scribe mark on the dial.

___ c. Verify the Speed Droop Control is set at Zero.

___ d. Verify the Load Limit Control is at the maximum clockwise position, which is past the 10 mark.

___11. <u>IF</u> the scribe marks are <u>NOT</u> in alignment, <u>THEN</u> notify the Shift Supervisor.

1. Secure MCR Boundary Fans by opening the following breakers.

___ • CABLE TRAY ROOM AIR HANDLING UNIT AHU-1, 1-EP-DB-HVAC, Ckt 1 (Unit 1 Switchgear Room, West wall)

___ • CABLE TRAY ROOM AIR HANDLING UNIT, 2-EP-DB-HVAC, Ckt 2 (Unit 2 Switchgear Room, South wall)

___ • 1-VS-F-16, CABLE TUNNEL EXHAUST FAN, 1-EP-BKR-1B2-1-2D (Unit 1 Switchgear Room)

___ • 2-VS-F-16, CABLE TUNNEL EXHAUST FAN, 2-EP-BKR-2B2-1-4D (Unit 2 Switchgear Room)

___ • 1-VS-F-RAF-1, CABLE TRAY ROOM RETURN FAN, 1-EP-BKR-1B2-1-3D (Unit 1 Switchgear Room)

___ • 2-VS-F-RAF-2, CABLE TRAY ROOM RET FAN, 2-EP-BKR-2B2-1-3D (Unit 2 Switchgear Room)

___ • 1-VS-HV-2, CABLE VAULT HTG AND VENT UNITS, 1-EP-BKR-1A1-1EA1 (Unit 1 Upper Cable Vault)

___ • 2-VS-HV-2, CABLE VAULT HTG AND VENT UNIT, 2-EP-BKR-2A1-1EA1 (Unit 2 Upper Cable Vault)

___ 2. Notify the Unit 1 CRO that the fans have been secured.

___ 3. Check readings on the following Differential Pressure Indicators - POSITIVE PRESSURE INDICATED.

- PDI-VS-100,D.P.-U1CR/U1TB (Unit 2 Turbine Ventilation Panel)
- PDI-VS-101,D.P.-U1RR/U1TB (Unit 2 Turbine Ventilation Panel)
- PDI-VS-200,D.P.-U2CR/U2TB (Unit 2 Turbine Ventilation Panel)
- PDI-VS-201,D.P.-U2RR/U2TB (Unit 2 Turbine Ventilation Panel)
- 1-VS-PDI-118 (Unit 1 Computer Room)
- 1-VS-PDI-116 (Near Unit 1 Semi-Vital Bus)
- 2-VS-PDI-215 (Unit 2 AC Room)
- 2-VS-PDI-206 (Near Unit 2 Semi-Vital Bus)

___ 4. IF any reading NOT positive, THEN verify secured or secure all Turbine Building Supply and Exhaust Fans. Circle any fan NOT initially secured.

MCC 1A1-2 Turbine Bldg, 9' 6" West

___ • 1-VS-F-29A, 1A1-2-2A
___ • 1-VS-F-29B, 1A1-2-2B

MCC 1B1-3 Turbine Bldg, 9' 6" West

___ • 1-VS-F-29F, 1B1-3-3B
___ • 1-VS-F-29E, 1B1-3-4D

MCC 1A2-2 Turbine Bldg, Mezzanine

___ • 1-VS-F-29C, 1A2-2-2B
___ • 1-VS-F-29D, 1A2-2-2C
___ • 1-VS-F-28B, 1A2-2-4C
___ • 1-VS-F-28A, 1A2-2-5B

MCC 1C2-2 Turbine Bldg, Mezzanine

___ • 1-VS-F-29G, 1C2-2-2B
___ • 1-VS-F-29H, 1C2-2-3B
___ • 1-VS-F-28C, 1C2-2-4A

MCC 2A1-2 Turbine Bldg, 9' 6" West

___ • 2-VS-F-29A, 2A1-2-2A
___ • 2-VS-F-29B, 2A1-2-2B

MCC 2B1-3 Turbine Bldg, 9' 6" West

___ • 2-VS-F-29E, 2B1-3-3B
___ • 2-VS-F-29F, 2B1-3-3C

MCC 2A2-2 Turbine Bldg, Mezzanine

___ • 2-VS-F-29C, 2A2-2-2B
___ • 2-VS-F-29D, 2A2-2-2C
___ • 2-VS-F-28A, 2A2-2-2D
___ • 2-VS-F-28B, 2A2-2-4C

MCC 2C2-2 Turbine Bldg, Mezzanine

___ • 2-VS-F-29G, 2C2-2-2B
___ • 2-VS-F-29H, 2C2-2-3B
___ • 2-VS-F-28C, 2C2-2-4A