FINAL SUBMITTAL

SURRY EXAM 2000-301

SEPTEMBER 14 - 21, 2000

NUREG-1021 - ES-501 - F.1.g

FINAL AS-GIVEN JPMs FOR EACH

WALK-THROUGH TEST

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-01

SIMULATOR

Title:

RESPOND TO A LOSS OF RHR COOLING

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

RESPOND TO A LOSS OF RHR COOLING.

Alternate Path:

Facility JPM #:

NEW

K/A Rating(s):

APE025.AA2.07 (RO 3.4/SRO 3.7)
APE025.AA1.12 (RO 3.6/SRO 3.5)
SYS005.A2.03 (RO 2.9/SRO 3.1)
SYS005.A4.02 (RO 3.4/SRO 3.1)
APE025.AA1.02 (RO 3.8/SRO 3.9)
APE025.AA1.23 (RO 2.8/SRO 2.9)
SYS005.A4.01 (RO 3.6/SRO 3.4)

Task Standard:

1-RH-P-1B started and RHR and CC flow to the RHR Heat Exchangers restored in accordance with 1-AP-27.00, Loss of Decay Heat Removal Capability.

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

1-AP-27.00, Loss of Decay Heat Removal Capability.
ND-88.2-H/T-1.2, Residual Heat Removal System

Validation Time: 15 min. **Time Critical:** No

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Candidate: ________________________________
NAME

Time Start : ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ________________________ ____________________________/________
NAME SIGNATURE DATE

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COMMENTS

____

____

SIMULATOR SETUP INSTRUCTIONS:

1. Call up RHR drained to mid-nozzle IC and initialize. Place simulator in RUN.
2. Verify "A" RHR pump running and "B" in AUTO. Energize drained-down LTs. Verify PG-223 unisolated using PEDS.
3. Implement malfunction for over-current trip of 1-RH-P-1A, closing of TCV-CC-109A/B and allow annunciators B-G-6 & B-G-7 to alarm.
4. Verify FCV-1605 in auto with flowrate set at 2500 gpm.
5. Place simulator in FREEZE until ready to perform JPM.
6. Recall the RHR screen on the P-250.

SIMULATOR OPERATOR INSTRUCTIONS:

- None

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

1-AP-27.00, Loss of Decay Heat Removal Capability.

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. All control room steps shall be performed for this JPM, including any required communications. 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. To indicate that you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the unit RO. The unit has been operating on RHR with the RCS drained to flange level for approximately 10 days with "A" RHR pump in service on both the "A" and "B" RHR heat exchangers. A lightning strike has caused disturbances in the RHR system. We just received annunciator B-G-6, RHR HX LO FLOW.

INITIATING CUES:

I need you to respond to this event.

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 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. (BEFORE STEP 1)** STANDARD: Reads cautions and recognizes that total loss of IA is not occurring. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 2: **CHECK RCS INVENTORY – DECREASING. (STEP 1)**	___ SAT
STANDARD: (a) Checks hot calibration pressurizer level is stable and not decreasing. (b) Checks standpipe level (1-RC-LI-100A) stable and not decreasing. (c) Checks cold calibration pressurizer level (reactor cavity) are stable and not decreasing. (d) Recognizes that loop narrow range level recorder (1-RC-LR-105) is not energized in the current plant conditions. (e) Checks containment sump level (1-DA-LI-100) stable and not increasing. (f) Checks PRT conditions (level, LI-1-470; pressure, PI-1-472; and temperature, TI-1-471) are stable and not increasing. (g) Checks PDTT level (1-DG-LI-107) is stable and not increasing. (h) Checks RWST level (CS-LI-100A, B, C, OR D) is stable and not decreasing (i) Determines that RCS inventory is NOT decreasing and by RNO transitions to procedure STEP 4. *EXAMINER'S CUES:* COMMENTS:	___ UNSAT

STEP 3: **VERIFY RHR PUMP - ONE RUNNING. (STEP 4)** TANDARD: (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). *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 4: PREPARE RHR SYSTEM FOR RHR PUMP START. (STEP 4 RNO)	CRITICAL STEP
TANDARD: (a) Determines emergency bus power available by verifying voltage indicated on 1J emergency bus. *(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. *(f) Starts 1-RH-P-1B by placing control switch to the START position. (g) Verifies 1-RH-P-1B amps indicated and breaker RED light lit. *(h) Increases RHR flow by pushing 1-RH-FCV-1605 increase pushbutton. (i) Increases RHR flow to approximately 3200 gpm. (j) Returns 1-FH-FCV-1605 to AUTOMATIC by momentarily depressing the AUTO pushbutton. *(k) Turns 1-RH-HCV-1758 hand controller knob counter-clockwise to decrease valve demand position (reopen valve). (l) Continues to turn 1-RH-HCV-1758 hand controller knob until demand indicates the pre-event setpoint. *EXAMINER'S CUES: Pre-event setpoint was 20% on 1-RH-HCV-1758.* COMMENTS:	___ SAT ___ UNSAT

STEP 5: **VERIFY RHR FLOW - INDICATED ON 1-RH-FI-1605. (STEP 5)** STANDARD: Checks 1-RH-FI-1605 shows RHR system flow. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 6: **CHECK RHR PUMP – VORTEXING. (STEP 6)** STANDARD: (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) By Step RNO transitions to procedure Step 12. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 7: **CHECK RHR HEAT SINK. (STEP 12)** TANDARD: (a) Checks RHR system flow normal on 1-RH-FI-1605. (b) Determines RHR HX CC outlet header flow abnormal by observing 1-CC-FI-110A and 1-CC-FI-110B. *(c) By Step RNO opens 1-CC-TV-109A or 1-CC-TV-109B. (d) Checks RHR CC outlet header temperature by observing 1-CC-TI-109A or 1-CC-TI-109B. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 8: **VERIFY RCS TEMPERATURE - STABLE OR DECREASING. (STEP 13)** STANDARD: (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. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 9: **REPORT TO SHIFT SUPERVISOR. (STEP 14)** TANDARD: Verbal status report made of task's completion and return to procedure and step in effect. *EXAMINER'S CUES: Acknowledge applicant's report of task completion as the Shift Supervisor. If asked, Tell trainee that another RO is performing GOP-2.6.* 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 # 4 RNO

- Isolation of the RHR Heat Exchanger bypass line by closing 1-RH-FCV-1605 and isolation of the RHR Heat Exchanger Discharge line by closing 1-RH-HCV-1758 is necessary to prevent damage to the RHR System while starting a RHR pump (excessive starting current, water hammer, cavitation, vortexing, etc.).

- The only operable pump 1-RH-P-1B must be started to provide the motive force for reactor coolant flow in the RHR system.

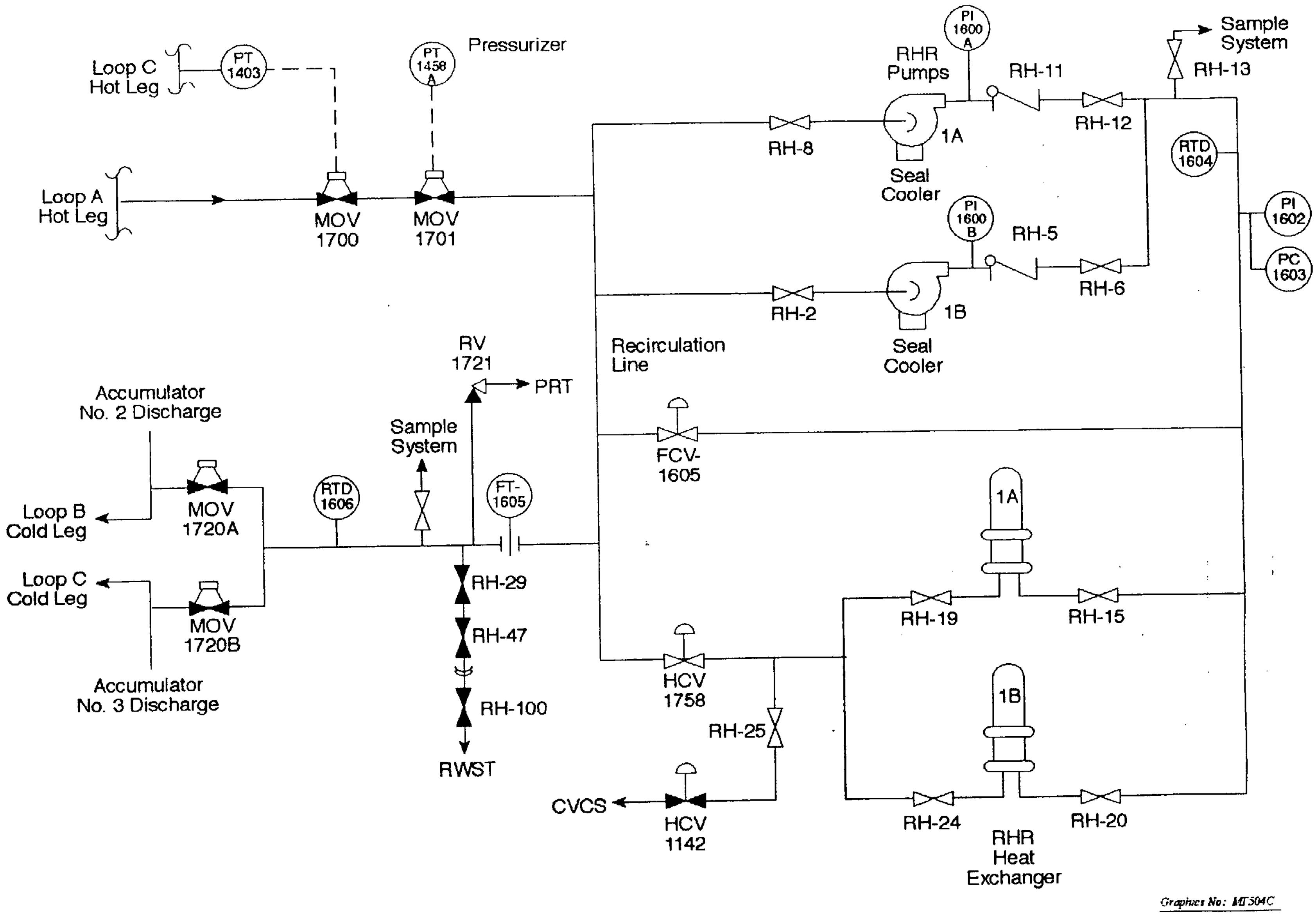
- 1-RH-FCV-1605 and 1-RH-HCV-1758 must be opened to establish flow of reactor coolant through the RHR system.

STEP # 12

- 1-CC-TV-109A or 1-CC-TV-109B must be opened to allow component cooling water, the heat sink for the RHR system, to flow through one of the two parallel heat exchangers.

Critical Step Sequencing:

Step 4 before 12.



RESIDUAL HEAT REMOVAL SYSTEM

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the unit RO. The unit has been operating on RHR with the RCS drained to flange level for approximately 10 days with "A" RHR pump in service on both the "A" and "B" RHR heat exchangers. A lightning strike has caused disturbances in the RHR system. We just received annunciator B-G-6, RHR HX LO FLOW.

INITIATING CUES:

I need you to respond to this event.

Level 2 Controlled Document
Maintained Systems Department
Do not remove this document for field work

VIRGINIA POWER
SURRY POWER STATION
ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-AP-27.00	LOSS OF DECAY HEAT REMOVAL CAPABILITY (With 11 Attachments)	9
		PAGE 1 of 18

PURPOSE

To provide guidance when the RHR System fails to remove decay heat.

SIMULATOR

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
W.R. Benthall		
REVIEWED VAL: T. DAMIZIA		10-2-98

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.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	__CHECK RCS INVENTORY - DECREASING • 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	GO TO Step 4.

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 15	

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 16.
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)

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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 16. 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 16.

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 <u>OR</u> • 1-CC-FI-110B	1) Verify opened or open 1-CC-TV-109A or 1-CC-TV-109B. <u>IF</u> TV can <u>NOT</u> be opened due to a localized loss of IA, <u>THEN</u> locally open IAW 0-FCA-16.00, LOCAL OPERATION OF AIR OPERATED VALVES. <u>IF</u> the in-service RHR HX TV can <u>NOT</u> be opened, <u>THEN</u> place the other RHR HX in service IAW 1-OP-RH-001, RHR OPERATIONS. <u>IF</u> CC flow can <u>NOT</u> be established to either RHR HX, <u>THEN</u> do the following: a. Evaluate initiating 1-AP-15.00, LOSS OF COMPONENT COOLING. b. GO TO Step 16.
	2) RHR HX CC Outlet HDR TEMP - NORMAL • 1-CC-TI-109A <u>OR</u> • 1-CC-TI-109B	2) Adjust SW flow to CC HXs. <u>IF</u> temperature can <u>NOT</u> be stabilized, <u>THEN</u> GO TO Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	__VERIFY RCS TEMPERATURE - STABLE OR DECREASING	Adjust 1-RH-HCV-1758 to control temperature. <u>IF</u> temperature can <u>NOT</u> be stabilized, <u>THEN</u> GO TO Step 16.
14.	__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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. __	CHECK IF RHR PUMPS SHOULD BE STOPPED:	
	a) RHR Pumps - ANY RUNNING	a) GO TO Step 16.
	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
16.	__CHECK PRE-EVENT RCS LEVEL - GREATER THAN 16.25 FT ON 1-RC-LI-100A (15.7 FT ON LOCAL STANDPIPE)	GO TO Step 19.
17.	__CHECK PRE-EVENT RCS TEMPERATURE - LESS THAN 200°F	GO TO Step 21.

NOTE: If RCS subcooling can NOT be maintained during this procedure, Steps 19 and 20 must be performed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*18.	__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 19 and 20. c) GO TO Step 21.
19.	__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
20.	__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-002, 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 20f.
	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	
21.	__START AVAILABLE CTMT AIR RECIRC FANS	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- Steps 22 through 25 establish an alternate mode of decay heat removal.
- Attachment 10 may be used for cooling the RCS with the SFP and RWST coolers.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22.	__CHECK THE FOLLOWING - AVAILABLE TO SUPPORT NATURAL CIRCULATION COOLING: • 1-OSP-ZZ-003, Attachment 2 equipment - AVAILABLE OR • 1-OSP-ZZ-004, Attachment 2 equipment - AVAILABLE	GO TO Step 24.
23.	__GO TO ATTACHMENT 4	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24.	__CHECK THE FOLLOWING - AVAILABLE TO SUPPORT REFLUX COOLING: • 1-OSP-ZZ-003, Attachment 3 <u>OR</u> 1-OSP-ZZ-004, Attachment 4 - EQUIPMENT AVABILABLE • RCS inventory - NOT DECREASING	<u>IF</u> CHG and LHSI Pumps <u>NOT</u> available due to electrical or other reasons, <u>THEN</u> GO TO Attachment 8 to align gravity feed. <u>IF</u> forced flow available, <u>THEN</u> do the following: a) <u>IF</u> PRZR available, <u>THEN</u> 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) <u>WHEN</u> RHR system available, <u>THEN</u> GO TO Step 26. 3) <u>IF</u> RCS approaches saturation, <u>THEN</u> GO TO Attachment 6. b) <u>IF</u> PRZR <u>NOT</u> available, <u>THEN</u> do the following: 1) <u>WHEN</u> RHR system available, <u>THEN</u> GO TO Step 26. 2) <u>IF</u> RCS approaches saturation, <u>THEN</u> GO TO Attachment 6.
25.	__GO TO ATTACHMENT 5	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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<u>CAUTION</u>:
- 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.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26.	__CHECK RCS LEVEL • Greater than 12.1 FT on 1-RC-LI-100A <u>OR</u> • Greater than 12 FT 1 IN on 1-RC-LR-105	GO TO Step 28.
27.	__GO TO STEP 29	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

28. __REFILL THE RCS:

a) Align and start at least one CHG pump for hot leg injection

RESPONSE NOT OBTAINED:

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.

29. __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.

30. __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

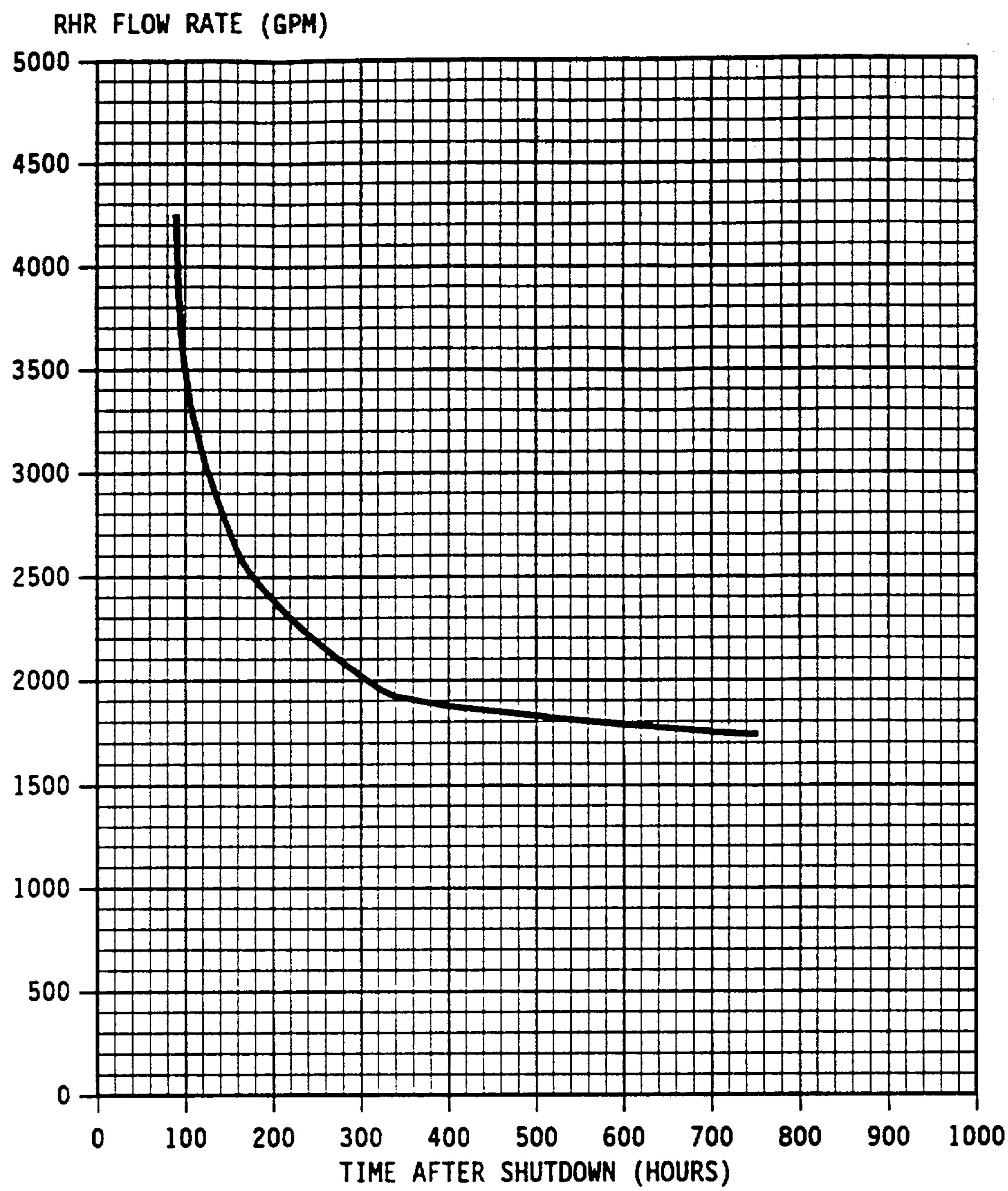
(STEP 30 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30.	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	
31.	__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.
32.	__CHECK RCS TEMPERATURE - LESS THAN 140°F	Continue cooling with RHR. Return to Step 30c.

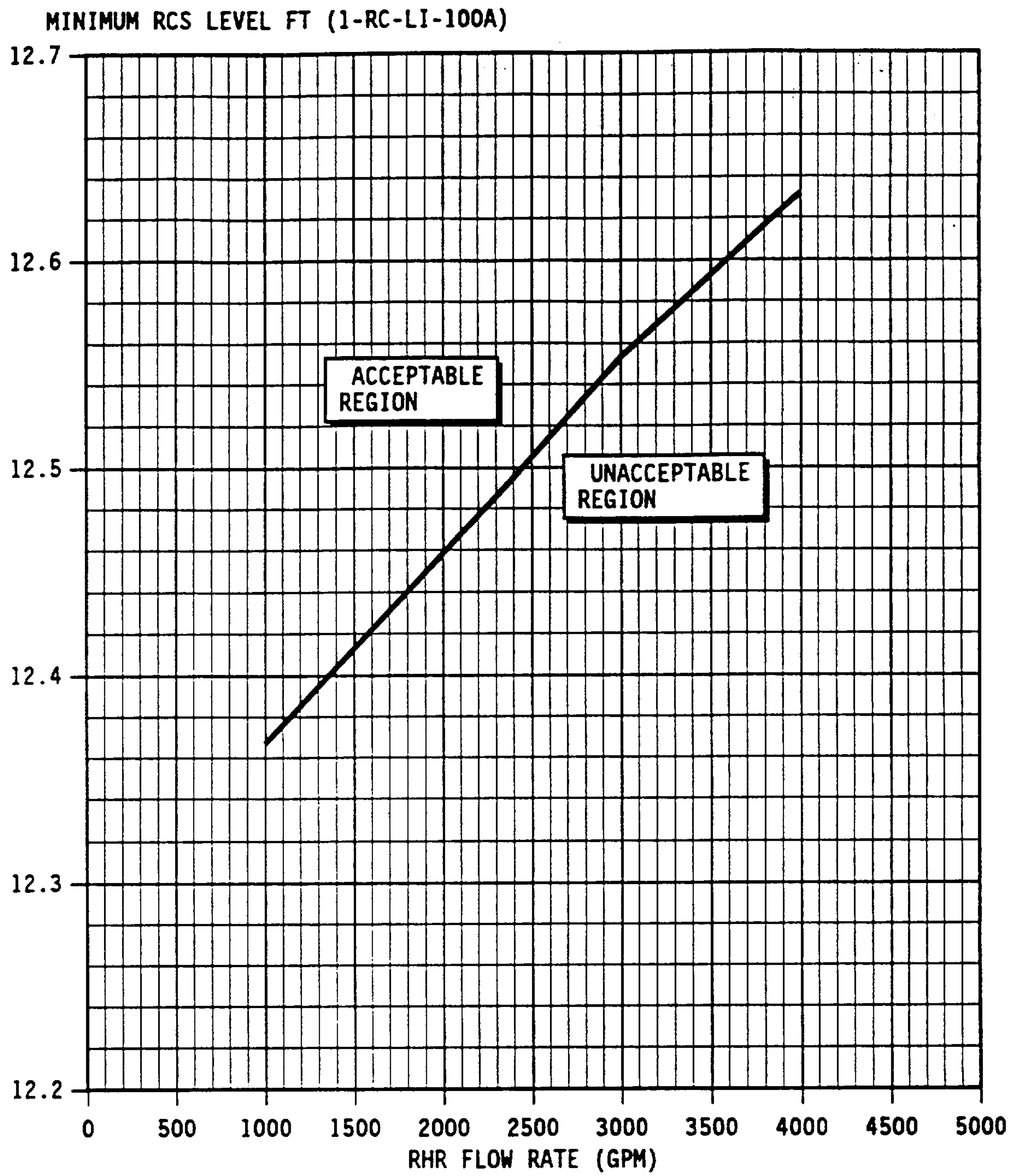
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33.	__RETURN TO PROCEDURE IN EFFECT	

- END -

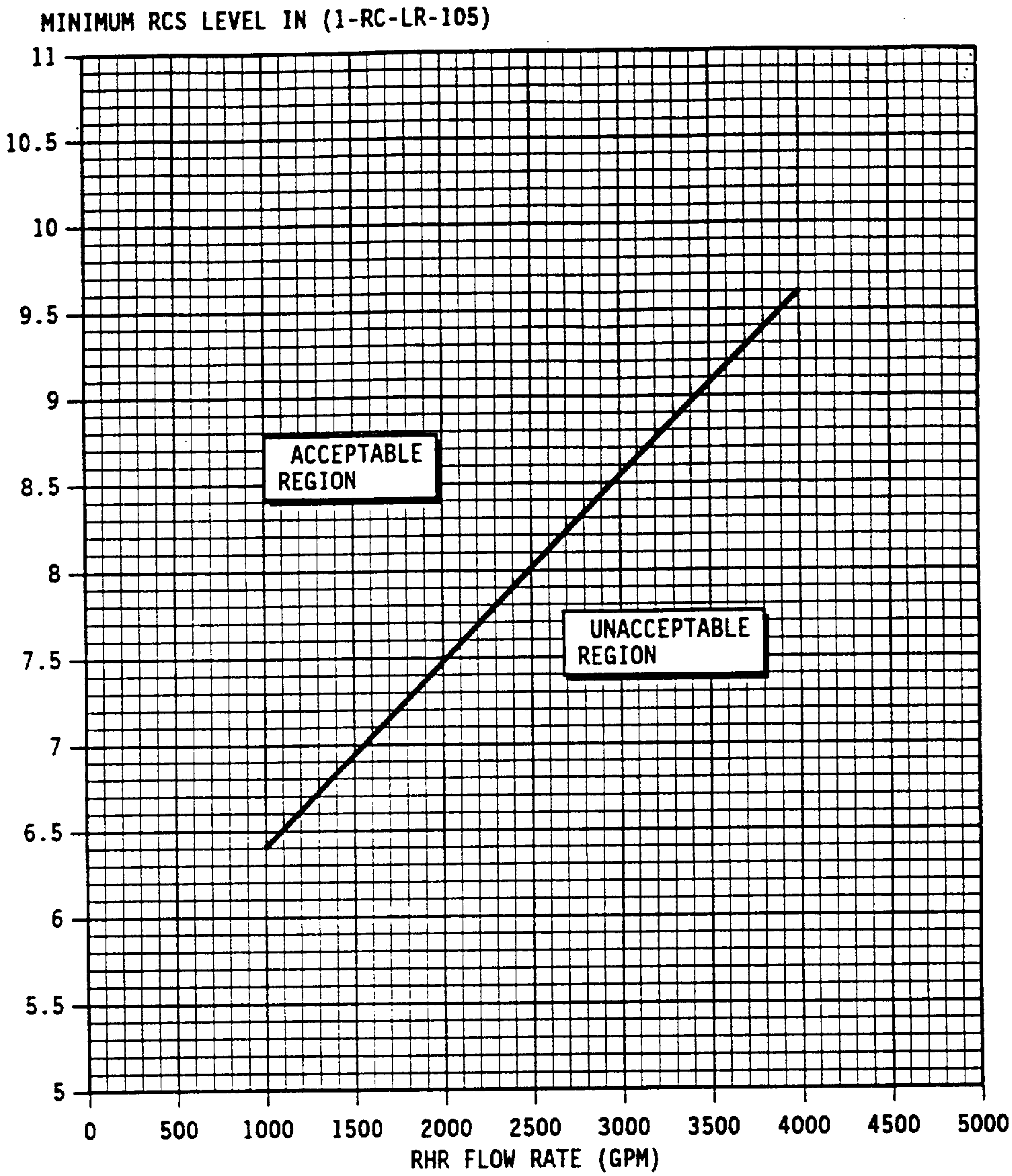
NUMBER	ATTACHMENT TITLE	REVISION
1-AP-27.00	RHR FLOW REQUIREMENT VERSUS TIME AFTER SHUTDOWN	9
ATTACHMENT 1		PAGE 1 of 1



NUMBER	ATTACHMENT TITLE	REVISION
1-AP-27.00	MINIMUM RCS LEVEL VERSUS RHR FLOW (1-RC-LI-100A)	9
ATTACHMENT 2		PAGE 1 of 1



NUMBER	ATTACHMENT TITLE	REVISION
1-AP-27.00	MINIMUM RCS LEVEL VERSUS RHR FLOW (1-RC-LR-105)	9
ATTACHMENT 3		PAGE 1 of 1



<u>NOTE</u>: 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. <u>IF</u> an RCP can be started, <u>THEN</u> RETURN TO procedure in effect. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> 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. <u>IF</u> any of the above parameters indicate a loss of Natural Circulation, <u>THEN</u> <u>slowly</u> increase steam flow rate using Steam Dumps or SG PORVs.

___ 7. <u>IF</u> RCS cooldown is desired, <u>THEN</u> maintain cooldown rate less than or equal to 25°F/HR.

___ 8. <u>WHEN</u> RHR system available, <u>THEN</u> GO TO procedure Step 26.

___ 9. <u>IF</u> Natural Circulation can <u>NOT</u> control RCS temperature <u>AND</u> CETC temperatures are approaching saturation, <u>THEN</u> 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.

* *

<u>CAUTION</u>:

- 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.

* *

<u>NOTE</u>: The hot leg flow path is preferred for RCS feed and bleed. The cold leg should be used if the hot leg is <u>NOT</u> available or the PRZR can <u>NOT</u> be filled due to maintenance.

___ 1. Determine which LHSI Pump is to be started. <u>IF</u> LHSI Pump <u>NOT</u> available, <u>THEN</u> 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 <u>or</u> 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. <u>IF</u> PRZR Safety Valve previously removed, <u>THEN</u> GO TO Step 6.

___ b. <u>IF</u> time since shutdown is greater than 14 hours and less than 113 hours, <u>THEN</u> open two PRZR PORVs and the associated Block MOVs.

___ c. <u>IF</u> time since shutdown is greater than or equal to 113 hours, <u>THEN</u> open <u>one</u> 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 26.

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 26.

* *

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 26.

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
- 1-SI-MOV-1885D

or

- 1-SI-MOV-1885B
- 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.

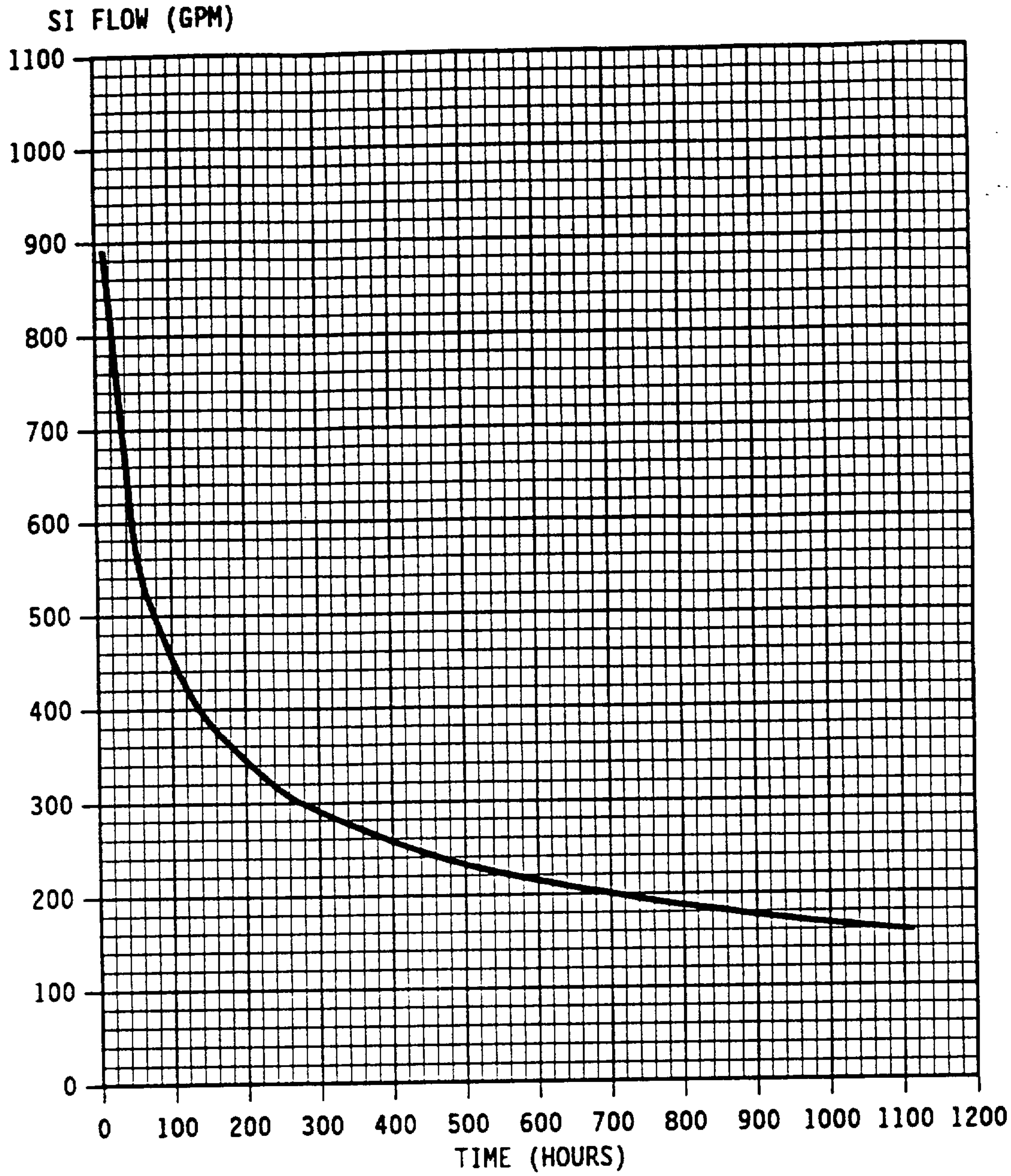
___ 11. Consult with TSC or plant staff on placing an RS HX in service.

___ 12. Maintain RCS heat removal using feed and bleed. <u>WHEN</u> RHR restored, <u>THEN</u> do the following:

___ a. Place RMT MODE keyswitch in REFUEL.

___ b. RETURN TO procedure Step 26.

NUMBER	ATTACHMENT TITLE	REVISION
1-AP-27.00	MINIMUM SI FLOW REQUIRED FOR DECAY HEAT REMOVAL	9
ATTACHMENT 7		PAGE 1 of 1



* *

CAUTION:
- 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.

* *

NOTE:
- 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. IF CHG Pump crosstie from Unit 2 desired for RCS feed, THEN GO TO Step 12. IF gravity feed desired, THEN continue in this Attachment.

___ 2. IF LHSI Pump flowpath to Cold leg to be used, THEN do the following. IF CHG Pump to be used, THEN 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. IF CETC temperatures decrease, throttle flow to maintain stable temperature.

- 1-SI-MOV-1864A or 1-SI-MOV-1864B

___ d. <u>IF</u> CETC temperatures can <u>NOT</u> be maintained less than 200°F, <u>THEN</u> do either of the following:

- Swap to hot leg injection.
- Increase SI flowrate.

___ e. <u>WHEN</u> RHR system available, <u>THEN</u> RETURN TO procedure Step 26.

___ 3. <u>IF</u> LHSI Pump flowpath to Hot leg to be used, <u>THEN</u> 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. <u>IF</u> hot leg injection <u>NOT</u> controlling RCS temperature as indicated by increasing PRZR liquid and vapor space temperatures <u>OR</u> by decreasing subcooling, <u>THEN</u> do either of the following:

- Swap to cold leg injection.
- Increase SI flowrate.

___ d. <u>WHEN</u> RHR system available, <u>THEN</u> 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:

<u>1-CH-P-1A</u>	<u>1-CH-P-1B</u>	<u>1-CH-P-1C</u>
___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 26.

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.

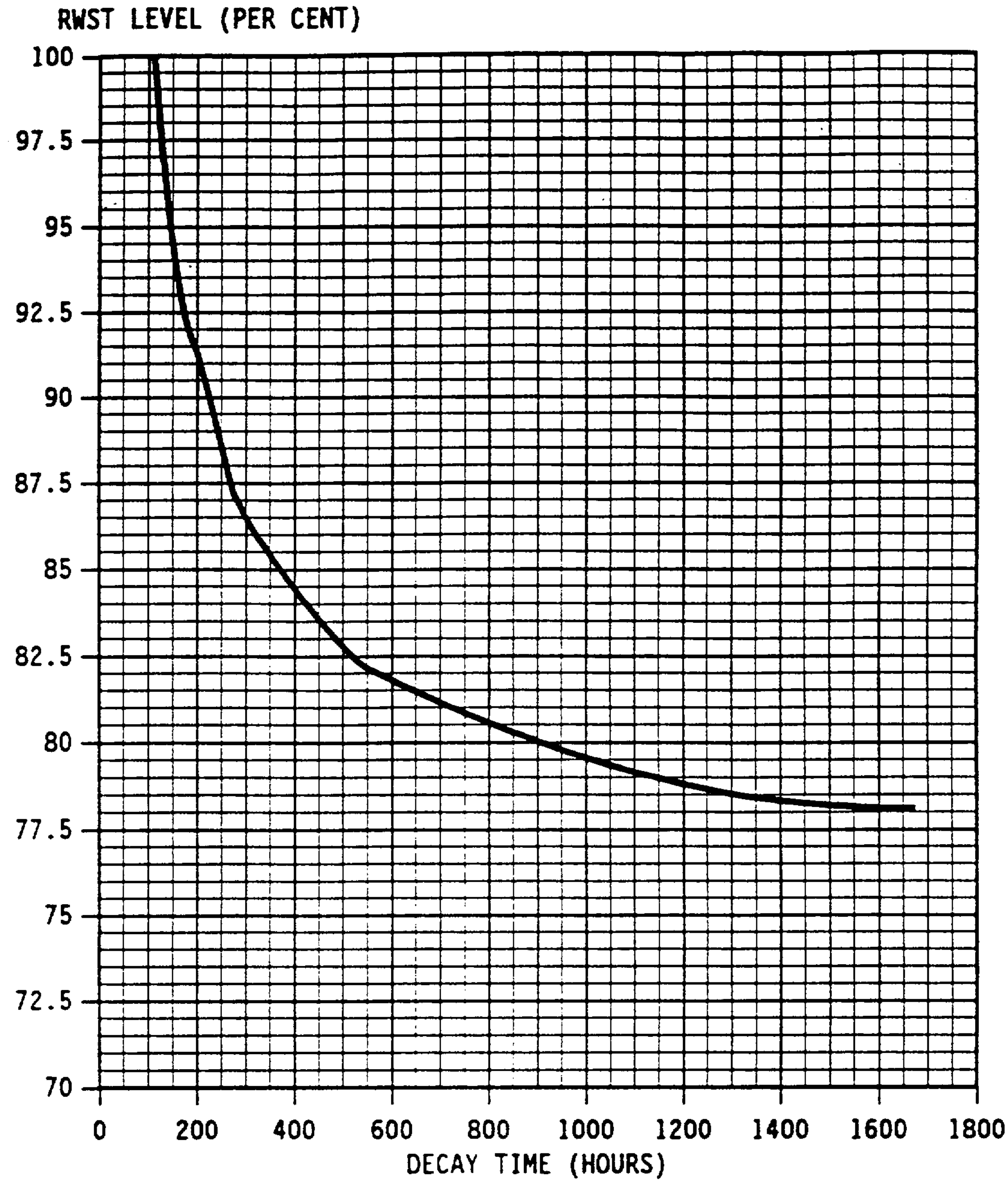
___19. Locally vent crosstie piping by operating 1-CH-732.

___20. Locally open 1-CH-728.

___21. Commence makeup to Unit 2 RWST.

___22. GO TO Step 17 of Attachment 6.

NUMBER	ATTACHMENT TITLE	REVISION
1-AP-27.00	REQUIRED RWST LEVEL TO SUPPRESS BOILING FOR ONE HOUR USING GRAVITY FEED	9
ATTACHMENT		PAGE
9		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. IF RWST coolers (Chilled Water required) to be placed in service, THEN 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. WHEN RHR restored, THEN RETURN TO procedure Step 26.

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 28 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

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-02

SIMULATOR

Title:

RECOVER A DROPPED CONTROL ROD

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

RECOVER A DROPPED CONTROL ROD.

Alternate Path:

During recovery of a dropped control rod, multiple control rods fall into the core requiring a reactor trip.

Facility JPM #:

NONE

K/A Rating(s):

APE003.AA1.02 (RO 3.6/SRO 3.4)

Task Standard:

Reactor trip performed in accordance with 0-AP-1.00 (Rod Control System Malfunction) or 1-AP-1.01 (Control Rod Misalignment) during withdrawal of Rod K-14 in accordance with 0-AP-1.01.

Preferred Evaluation Location: Simulator __X__ In-Plant ______

Preferred Evaluation Method: Perform __X__ Simulate ______

References:

0-AP-1.00, Rod Control System Malfunction (Rev. 6), and 0-AP-1.01, Control Rod Misalignment (Rev. 10).

Validation Time: 20 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:

1. Call up 56% power IC, enable group step counters & initialize. Verify all group step counters reading correctly (Control Bank "D" at 165/165 steps).

2. Call up Rod Control System screen on PEDS and display CBA's P-to-A converter or from SIMLOCH call up variable "RODPOS_DEMAND_A" and be prepared to set equal to zero. (SIMLOCH screen titled lcjpms)

3. Enter malfunction for dropped RCCA K-14 (MRD1219) with a 10 second delay. Perform 0-AP-1.00 (Rod Control System Malfunction) through step 12 and transition to 0-AP-1.01 (Control Rod Misalignment) step 4, perform through step 12 and stabilize plant.

4. Enter malfunctions MRD1217 (RCCA F-2) MRD1218 (RCCA B-10) and MRD1220 (RCCA P-6) for the other control rods in Control Bank "A" Group 1 with a 5 second time delay. Enter malfunction MRD2102 (Reactor Trip Pushbutton Failure on BB 1-2) with a 0 second time delay.

5. Sign off a copy of 0-AP-1.00 (Rod Control System malfunction) up to transition point and then sign off 0-AP-1.01(Control Rod Misalignment), from step 4 through step 11.

6. Set up analog trend recorders for Tave and Tref 555-565□F. (Analog Trend, TO499A, Address 1, Value 1, 555 Value 2, 10 Value 3, Start/Add; Analog Trend, TO496A, Address 2, Value 1, 555 Value 2, 10 Value 3, Start/Add).

7. **REMOVE MALFUNCTION** MRD1219 (RCCA K-14) & freeze simulator until ready to perform JPM.

8. Place the simulator in run for 10 minutes to identify nuisance annunciators, then override any nuisance annunciators to eliminate trainee distractions . Single Save any changes.

9. Single Restore NRC-SIM-JPM-002 saved conditions.

10. Place simulator in run when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

1. After directed by the Unit RO, the simulator instructor should perform TIME COMPRESSION, reset CBA P/A converter to 000 using PEDs display and then notify the RO.

2. When RCCA K-14 is at approximately 100 steps, implement malfunctions for remaining control rods in that group to drop.

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

0-AP-1.00, Rod Control System Malfunction (Rev. 6), and 0-AP-1.01, Control Rod Misalignment (Rev. 11).

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. All control room steps shall be performed for this JPM, including any required communications. 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. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

You are the Unit 1 Reactor Operator.

A single dropped rod (K-14) has occurred about an hour and 1/2 ago.

Reactor power has been reduced to approximately 57% power and stabilized with Control Bank "D" rod position at Group 1 @ 165 steps and Group 2 @ 165 steps.

AP-1.00, Rod Control System Malfunction, has been performed through step 12 and a transition made to AP-1.01, Control Rod Misalignment, step 4 where it has been performed through step 11.

The Pre-Job Brief has been conducted by the Senior Operations Manager IAW attachment 1 and rod recovery has been granted.

INITIATING CUES:

Here is the copy of the 0-AP-1.00, Rod Control System Malfunction completed up to the transition step 12 and 0-AP-1.01, Control Rod Misalignment completed through step 11. I need you to perform 0-AP-1.01 beginning at step 12 to recover control rod K-14 to its original position.

JPM LEGEND:

Bold	Highlighted JPM Headings and notes/ provide 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 1: **REVIEW CAUTIONS: THIS PROCEDURE IS NOT VALID FOR REALIGNMENT OF A CONTROL ROD IF REACTOR IS SUB CRITICAL; REALIGNMENT SHALL BE PERFORMED WITH REACTOR POWER HELD CONSTANT AT LESS THAN OR EQUAL TO 75%. (BEFORE STEP 12)** STANDARD: (a) Notes that this procedure is NOT valid for realignment of a control rod if the reactor is subcritical. Recalls from instructions and by observation that the reactor is at power. (b) Notes that realignment SHALL be performed with power held constant at less than or equal to 75%. Recalls from the instructions and by observation that the reactor is at 57% power. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 2: **CHECK POWER RANGE NI's – ANY DROPPED ROD SIGNAL PRESENT. (STEP 12)** STANDARD: • Examines NIS Power Range (PR) channels (N-41, 42, 43,or 44) for DROPPED ROD window lit. *EXAMINER'S CUES:* Examiner's Note: N41, 42, & 44 have a dropped rod signal present. N43 on the other side of the core from the dropped rod does not. COMMENTS:	

STEP 3: **RESET NUCLEAR INSTRUMENTATION SYSTEM (NIS) DROPPED ROD SIGNAL. (STEP 13)** STANDARD: (a) Takes POWER RANGE TEST Switch for all affected NIS channels from NORMAL to RESET, verifies DROPPED ROD window light goes out, and then returns switch to NORMAL. (b) Checks annunciator G-H-1 (NIS DROPPED ROD FLUX DECREASE >5% PER 2 SEC) cleared. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 4: **TRANSFER ROD CONT MODE SEL SWITCH TO AFFECTED BANK. (STEP 14)** STANDARD: *• Rotates ROD CONT MODE SEL SWITCH from the MANUAL to the CBA position. *EXAMINER'S CUES:* COMMENTS: Examiner's note: Rods may step if the switch is moved to standby due to the ± 1.5°F difference between Tave + Tref	**CRITICAL STEP** ___ SAT ___ UNSAT

<u>STEP 5</u>: **ALIGN LIFT COIL DISCONNECT SWITCHES FOR AFFECTED BANK. (STEP 15)** <u>STANDARD</u>: (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 in "ROD DISCONNECTED" or OPEN position. *. F-2 *. B-10 . K-14 *. P-6 *. K-2 *. B-6 *. F-14 *. P-10 (c) Places disconnect switch for K-14 in "ROD CONNECTED" or CLOSE position. (d) Requests alignment of Lift Coil Disconnect Switches to be independently verified. EXAMINER'S CUES: *When asked, Lift Coil Disconnect Switches have been independently verified.* <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT
<u>STEP 6</u>: **RECORD AFFECTED BANK POSITION. (STEP 15)** <u>STANDARD</u>: Records Group 1 and Group 2 Step Counter readings for Control Bank "A" at 226 steps. <u>COMMENTS</u>:	___ SAT ___ UNSAT

<u>STEP 7</u>: **READS CAUTION: THE AFFECTED WITHDRAWAL RATE DURING REALIGNMENT IS LIMITED TO 2/P (P=FRACTION OF CORE POWER WHERE 100% 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 LIMINTIATION MAY BE RELAXED WITH AUTHORIZATION FROM THE REACTOR ENGINEER OR NUCLEAR ANALYSIS AND FUELS. (BEFORE STEP 17)** <u>STANDARD</u>: • Recalls from the instructions that the rod has been dropped for less than 12 hours; therefore, there is no reduced limit on rod withdrawal speed. *EXAMINER'S CUES: If asked, Reactor Engineering has authorized that the 2/P rod speed limit be relaxed. No limit on rod speed is required.* <u>COMMENTS</u>:	___ SAT ___ UNSAT

STEP 8: **RECORDS REACTOR POWER AND ROD WITHDRAWAL RATE. (STEP 17)** STANDARD: (a) Checks reactor power by monitoring loop delta T meters, Benchboard 1-2 power range meters, Turbine Load meters on VB 1-2, meters on the NIS power range drawers, etc. and records value in the appropriate blank at step 17 (reactor power is approximately 57% by RCS loop delta Ts). (b) Determines rod withdrawal rate of 48 spm and records value in the appropriate blank at step 17. *EXAMINER'S CUES: If asked, instruct RO to not exceed 60% power, a 1 dpm SUR, or RCS average temperature >563°F during dropped rod recovery.* COMMENTS:	___ SAT ___ UNSAT
STEP 9: **READS NOTE: ANNUNCIATOR 1G-A6, ROD CONT SYS UNGENT FAILURE, WILL ALARM WHEN THE AFFECTED ROD IS WITHDRAWN INDICATING THAT THE LIFT COILS OF THE REMAINING RODS IN THE BANDK ARE DENERGIZED. (BEFORE STEP 18)** STANDARD: • Reads note. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 10: CHECK AFFECTED ROD ON BOTTOM. (STEP 18)

___ SAT

___ UNSAT

STANDARD:

- Checks control rod K-14 on core bottom (Individual Rod Position Indication K-14 at 0 and rod bottom light lit).

EXAMINER'S CUES: If asked, I&C has verified that the rod is on the bottom by taking voltage readings in the relay room (search coils are on longer available having been disconnected). Rod K-14 is on the bottom.

COMMENTS:

STEP 11: RESET AFFECTED GROUP STEP COUNTER TO 0. (STEP 19)

CRITICAL STEP

___ SAT

___ UNSAT

STANDARD:

*Pulses down or resets to zero the Group Step Counter for CONT BANK "A" GP 1 from fully withdrawn height to a reading of 000 steps.

EXAMINER'S CUES: If candidate pulses or resets to zero CONTROL BANK "A" GP 2, then a follow-up question is warranted to explore candidate's system knowledge concerning which control rods make up group one and group two. This is recoverable if corrected prior to initiation of rod movement.

EXAMINER'S NOTE: If candidate pulses down Control Bank "A" GP ~~1~~ 2 and then subsequently verbalizes the error then tell the candidate, "I understand that you should not have "zeroed" this step counter. I will contact I&C to look at resetting this counter and I will review Technical Specifications. Proceed with dropped rod retrieval.

COMMENTS:

STEP 12: **RESET AFFECTED BANK P/A CONVERTER TO 000. (STEP 20)**	**CRITICAL STEP**
STANDARD: (a) Contacts Inside Service Building or another auxiliary operator. (b) Directs watchstander/operator to go to Unit 1's P/A converter in Unit 1 Relay Room (just off Unit 1 ESGR). *(c) Directs watchstander/operator to reset Control Bank "A" P/A converter (pulse P/A converter 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-1-409A (BANK A ROD POSITION AND INSERTION LIMIT) pen 2 (ROD POSITION) tracks to 0. EXAMINER'S CUES: *Once requested by the applicant the P/A convertor for the requested bank will be set to 000 by the booth operator.* COMMENTS:	___ SAT ___ UNSAT

STEP 13: **REALIGN AFFECTED ROD TO ITS BANK POSITION RECORDED IN STEP 16. (STEP 21)**	**CRITICAL STEP**
STANDARD:	___ SAT
*(a) Places SHUTDN AND CONT ROD CONT SWITCH to the OUT position. (b) Verifies outward rod motion indicated by observing affected rod K-14 IPRI and K-14 rod bottom light extinguishes. (c) Acknowledges annunciator G-A-6 (ROD CONT SYS URGENT FAILURE). *(d) Begins withdrawing affected rod (K-14) 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 during control rod withdrawal.	___ UNSAT
EXAMINER'S CUES: Once the Reactor Operator has withdrawn RCCA K-14 to approximately 100 steps, the booth operator will cause the other three rods in this group to drop into the core.	
COMMENTS:	

STEP 14: **IDENTIFIES MULTIPLE DROPPED CONTROL RODS.** TANDARD: (a) Identifies/Acknowledges the following annunciators: G-H-1 (NIS DROPPED ROD FLUX DECREASE >5% PER SEC), G-H-2 (RPI ROD BOTTOM < 20 STEPS), G-C-4 (UPPER ION CHAMBER DEVIATION OR AUTO DEFEAT < 50%), and G-D-4 (LOWER ION CHAMBER DEVIATION OR AUTO DEFEAT < 50%). (b) Identifies multiple control rods have dropped into the core by observing the following plant response and indications (to include but not limited to): lowering RCS pressure, lowering RCS average temperature, reduction in reactor power, rod bottom lights, and IRPI. (c) Informs the Unit SRO of multiple dropped control rods. *EXAMINER'S CUES: If asked, acknowledge RO's communications and instruct the RO to take appropriate actions as necessary.* COMMENTS:	___ SAT ___ UNSAT

STEP 15: **MANUALLY TRIP REACTOR.** STANDARD: *(a) Momentarily depresses reactor trip pushbutton on Benchboard 1-1. (b) Initiates 1-E-0, Reactor Trip or Safety Injection, immediate actions. *EXAMINER'S CUES:* *EXAMINER'S NOTES:* *Reactor Trip Pushbutton on Benchboard 1-2 does not function which will require candidate to use pushbutton on Benchboard 1-1 to successfully trip the reactor.* *1-E-0 immediate actions are not being evaluated. Once the candidate has manually tripped the reactor, the Examiner can have the simulator placed in FREEZE.* *The candidate can perform a reactor trip procedurally by entering 1-AP-1.00 after identifying additional control rods have dropped. 1-AP-1.00 step 5 Response Not Obtained column requires a reactor trip if more than one rod is affected.* *The candidate can perform a reactor trip procedurally by entering 1-AP-1.01 after identifying additional control rods have dropped. 1-AP-1.01 step 1 Response Not Obtained column requires a reactor trip if more than one rod is affected.* *The candidate recalls from memory that the reactor can remain at power during a dropped rod condition if only one rod is affected (Technical Specification 3.12.C)* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 16: **REPORT TO SHIFT SUPERVISOR (EVALUATOR).** TANDARD: Verbal status report made that reactor is tripped and 1-E-0 immediate actions are in progress. COMMENTS: END OF TASK	___ 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 # 4 - Rotates the rod control switch to the affected bank's (CBA) position to prepare the rod control system for dropped rod recovery. If another bank is selected and subsequent steps are performed, actual rod misalignment will result due to inappropriate operator action.**

- **STEP # 5 - Places all disconnect switches for the unaffected rods in the affected bank to the "ROD DISCONNECTED" position (dropped rod disconnect switch must be in "ROD CONNECTED" position at end of step). This ensures that only the dropped rod is lifted during the recovery process. If all unaffected rod disconnect switches are not in the "ROD DISCONNECTED" position, then subsequent operator actions will result in unanticipated rod motion and rod misalignment.**

- **STEP # 11 - Pulses group step counter for CONT BANK A GP 2 to 000 to coincide with the dropped rod position in the core. This allows the operator to adequately monitor the dropped rod rod position during rod recovery in subsequent steps as required by reactivity management guidelines.**

- **STEP #12 - Directs watchstander/operator to reset Control Bank "A" P/A converter (pulse P/A converter for CBA from fully withdrawn down to 000 steps). Failure to perform this action would result in an artificially high P/A reading which would prevent G-G-5 (ROD BANK A LO LIMIT) and G-H-5 (ROD BANK A EXTRA LO LIMIT) from alarming at their true setpoint, thus removing valuable alarm indications from the unit reactor operator. (Reactivity Management concern)**

- **STEP #13- Places SHUTDN AND CONT ROD CONT SWITCH to the OUT position. Withdraws affected rod towards required position. This action is required by the operator to begin actual recovery of the dropped rod and return it to its programmed position in the core.**

- **STEP #15- Manually trip reactor. With multiple dropped control rods, procedures require the reactor to be tripped to prevent operation outside of current safety analysis.**

Critical Step Sequencing:

Steps 4, 5, 11 & 12 (any order) before step 13 to ensure the dropped rod and rod position indicators are adequately prepared for rod recovery. This ensures only one rod will step out and that the RO can monitor its movements during rod recovery.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are the Unit 1 Reactor Operator.

A single dropped rod (K-14) has occurred about an hour and 1/2 ago.

Reactor power has been reduced to approximately 57% power and stabilized with Control Bank "D" rod position at Group 1 @ 165 steps and Group 2 @ 165 steps.

AP-1.00, Rod Control System Malfunction, has been performed through step 12 and a transition made to AP-1.01, Control Rod Misalignment, step 4 where it has been performed through step 11.

The Pre-Job Brief has been conducted by the Senior Operations Manager IAW attachment 1 and rod recovery has been granted.

INITIATING CUES:

Here is the copy of the 0-AP-1.00, Rod Control System Malfunction completed up to the transition step 12 and 0-AP-1.01, Control Rod Misalignment completed through step 11. I need you to perform 0-AP-1.01 beginning at step 12 to recover control rod K-14 to its original position.

Procedure: *0-AP-1.00*

Rev: *006* PAR: *0*

Title: *ROD CONTROL SYSTEM MALFUNCTION*

SIMULATOR

Effective Date: *09/22/1998*

Station: *Surry* Docbase: *SUMIND*

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ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
0-AP-1.00	ROD CONTROL SYSTEM MALFUNCTION (With 1 Attachment)	6
		PAGE 1 of 5

PURPOSE

To provide guidance to respond to Rod Control system malfunctions.

ENTRY CONDITIONS

1. Continuous rod insertion or withdrawal.
2. Dropped control rod or rods.
3. Failure of automatic control system.
4. Transition from Annunciator ()G-B5, COMPU PRINTOUT ROD CONT SYS.
5. Transition from Annunciator ()G-H2, RPI ROD BOTTOM≤ 20 STEPS.
6. Transition from Annunciator ()G-A6, ROD CONT SYS URGENT FAILURE.
7. Transition from Annunciator ()G-H1, NIS DROPPED ROD FLUX DECREASE≥ 5% PER 2 SEC.

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: The minimum temperature for criticality is 522F. If Tave decreases below this temperature, Tech Spec 3.1.e must be reviewed.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[1]	CHECK FOR EITHER OF THE FOLLOWING: • Continuous rod withdrawal • Continuous rod insertion	GO TO Step 4.
[2]	__STOP ROD MOTION: a) Put ROD CONT MODE SEL switch in MANUAL b) Verify rod motion - STOPPED	b) Trip Reactor and GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION.
3.	__GO TO STEP 13	
4.	CHECK IF ANY 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 • Rod Bottom Lights - ANY LIT	IF deviation between any IRPI and associated Step Counter greater than or equal to 8 steps, THEN GO TO 0-AP-1.02, INDIVIDUAL ROD POSITION INDICATORS. IF deviation between all IRPIs and associated Step Counters less than 8 steps, THEN do the following: a) IF any IRPI indicating erratically, THEN notify Instrument Department. b) GO TO Step 13.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	✓ CHECK ONLY ONE ROD AFFECTED	Trip Reactor and GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION. 6
6.	✓ CHECK REACTOR POWER - GREATER THAN 25%	Trip Reactor and GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION. 6
7.	✓ CHECK UNIT CONDITIONS - STABLE	Trip Reactor and GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION. 6
8.	✓ PLACE ROD CONTROL IN MANUAL	
9.	✓ REDUCE REACTOR POWER TO LESS THAN OR EQUAL TO 70% WITHIN 1 HOUR	
10.	✓ 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%. <u>IF</u> power can <u>NOT</u> be controlled, <u>THEN</u> trip Reactor <u>AND</u> GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION.
11.	✓ RECORD THE TIME THE ROD WAS DROPPED: • 1½ hours ago	
12.	✓ GO TO 0-AP-1.01, CONTROL ROD MISALIGNMENT, STEP 4	
13.	__CHECK FOR ROD CONTROL URGENT FAILURE: • Annunciator ()G-A6, ROD CONT SYS URGENT FAILURE - LIT	GO TO Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	__TRANSFER ROD CONTROL:	
	a) Put ROD CONT MODE SEL switch in MANUAL	
	b) Do NOT move rods	
15.	__IDENTIFY AFFECTED ROD CONTROL CABINET:	
	a) Send Operator to locally check cabinets	
	b) Check failure - NOT IN LOGIC CABINET	b) Do NOT move rods. GO TO Step 18.
	c) Check failure - NOT IN POWER CABINET 1BD OR 2BD	c) Do NOT move rods. GO TO Step 18.
	d) Operate D bank rods as necessary in BANK SELECT	
	e) GO TO Step 18	
16.	__CHECK FOR FAILURE OF AUTO ROD CONTROL: • Temperature deviation - GREATER THAN 1.5°F • Rod motion with less than 1.5°F temperature deviation • Speed demand and no rod motion • Direction demand and no rod motion • Rods step in wrong direction • Operator observation of any other abnormality	GO TO Step 21.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17.	__TRANSFER ROD CONTROL: a) Put ROD CONT MODE SEL switch in MANUAL b) Operate rods to restore Tave	
18.	__VERIFY REACTOR AND TURBINE POWER - MATCHED AND STABLE	Adjust turbine controls to match and stabilize power. <u>IF</u> power can <u>NOT</u> be controlled, <u>THEN</u> trip the Reactor <u>AND</u> GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION.
19.	__VERIFY DELTA FLUX - IN BAND	Borate or dilute to restore delta flux in band.
20.	__INITIATE WORK REQUEST	

<u>NOTE</u>: 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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21.	__NOTIFY THE FOLLOWING: • OMOC • STA	

- END -

I. PROBABLE CAUSES:

1. Continuous rod withdrawl or insertion
   - Logic cabinet circuitry failure
   - Failure of input signal to control system
2. Dropped Rod
   - Power failure to grippers (Open circuit, blown fuse)
3. Rod Control Urgent Failure
   - Rod control circuitry failure
4. Automatic Control Failure
   - Rod control circuitry failure

II. REFERENCES:

1. SCARF-OER-89-3327 (Step 7)
2. SER-6-89
3. Tech Spec 3.12
4. UFSAR 7.0, 14.0
5. Tech Spec Amendment 186 (Step 4)
6. DCP 94-007, Removal of Turbine Runback on Dropped Rod

Procedure: *0-AP-1.01*

Rev: *011* PAR: *0*

Title: *CONTROL ROD MISALIGNMENT*

SIMULATOR

Effective Date: *06/10/1999*

Station: *Surry* Docbase: *SUMIND*

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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).

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
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

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. 11
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:___________

* *

<u>CAUTION</u>:
- 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	<u>IF</u> rod will <u>NOT</u> align, <u>THEN</u> 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 10 through 23, 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.

<u>MANAGEMENT EXPECTATIONS BRIEFING CHECKLIST</u>

____ 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 ______________

NUMBER 0-AP-1.01	ATTACHMENT TITLE	REVISION 11
ATTACHMENT 2	PROBABLE CAUSES AND REFERENCES	PAGE 1 of 1

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, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-03

SIMULATOR

Title:

RESTORE OFFSITE POWER TO 1H 4160V EMERGENCY BUS IAW AP-10.08

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

RESTORE OFFSITE POWER TO 1H 4160V EMERGENCY BUS IAW AP-10.08

Alternate Path:

Facility JPM #:

LO JPM # 18.06

K/A Rating(s):

EPE055.EA1.01 (RO 4.3/SRO 4.5)
EPE055.EA2.06 (RO 3.7/SRO 4.1)

Task Standard:

AP-10.08, Station Power Restoration.

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

AP-10.08, Station Power Restoration.

Validation Time: 13 min. **Time Critical:** No

==

Candidate: ______________________________
NAME

Time Start : ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ______________________ __________________________/________
NAME SIGNATURE DATE

==

COMMENTS

____

____

____

SIMULATOR SETUP INSTRUCTIONS:

1. Call up IC #1 and initialize.
2. Place the simulator in run.
3. From PEDS using the transfer bus screen open breaker 15F1.
4. Place 1-CC-P-1A control switch in PTL.
5. From PEDS using the emergency bus screen close the stub bus 15H9.
6. Place the control switches for 1-SW-P-10B and 1-CC-P-2B to off and return to auto.
7. Green flag ACB-15F1, ~~green flag 15H8,~~ and red flag 15H3.
8. Once conditions have stabilized then freeze the simulator.

SIMULATOR OPERATOR INSTRUCTIONS:

- None

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

AP-10.08, Station Power Restoration.

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. All control room steps shall be performed for this JPM, including any required communications. 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. To indicate that you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor. We have had a loss of 34.5 KV Bus 6. The Unit conditions have been stabilized IAW AP 10.07, Loss of Unit 1 Power. Bus 6 has been re-energized using a local switching order and power has been restored to the low level intake.

Here is a copy of AP-10.08, Station Power Restoration.

INITIATING CUES:

Steps 1 thru 20 have been performed. I need you to restore power to 1H Bus from off-site and inform me when #1 EDG may be shut down.

Unit 2 operator will perform all necessary evolutions on Unit 2 when requested.

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 1: **REVIEW NOTE: THE RAD WASTE FACILITY IS POWERED FROM BUS NUMBER 6. (BEFORE STEP 21)** STANDARD: • Acknowledges NOTE that the RAD waste facility is powered from bus 6. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 2: **VERIFY 34.5 KV BUS 6 ENERGIZED BY OFFSITE POWER. (STEP 21)** STANDARD: (a) Checks C.B. L-202 on switchyard status panel closed by observing the red light on and the green light off. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 3: **VERIFY RSS TRANSFORMER "C" ENERGIZED. (STEP 22)** TANDARD: Checks C.B. 262 on switchyard status panel closed by observing the red light on and the green light off. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 4: **CHECK 15F1 OPEN. (STEP 23)** STANDARD: Checks ACB-15F1 open by observing green light ON and red light OFF for 15F1. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 5: **READS CAUTION: THE LOAD PLACD ON ANY EDG SHOULD NOT EXCEED 2750 KW. (BEFORE STEP 24)** STANDARD: • Acknowledges caution that load placed on EDG should not exceed 2750 KW. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 6: **ENERGIZE TRANSFER BUS "F". (STEP 24)**

CRITICAL STEP

STANDARD:

___ SAT

___ UNSAT

(a) Verifies breaker ACB-15H8 open by observing the green light on and the red light off.
(b) Verifies breaker ACB-25J8 open by asking Unit 2 operator.
(c) Verifies breaker ACB-15C1 open by observing the green light on and the red light off.
(d) Verifies breaker ACB-25C1 open by asking Unit 2 operator.
(e) Checks breaker ACB-15C2 shut by observing red light on and green light off. Therefore, its control switch is not reset.
(f) Checks breaker ACB-25C2 shut by asking Unit 2 operator. Therefore, its control switch is not reset.
*(g) Closes breaker ACB-15F1 by taking control switch to close and holding until the red light comes on and the green light goes off.

EXAMINER'S CUES *When asked, Unit 2 operator will respond that:*

2J bus is energized by #3 EDG.
ACB-25J8 is open.
ACB-25C1 is open.
ACB-25C2 is shut.

COMMENTS:

STEP 7: **CHECK 4160V BUS 1H ENERGIZED FROM EDG 1. (STEP 25)** STANDARD: • Checks 4160 V bus 1H energized by observing voltage on the EDG Panel. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 8: **PLACE 1H BUS IN PARALLEL WITH TRANSFER BUS F IAW ATTACHMENT 8. (STEP 26)** STANDARD: • Goes to Attachment 8. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 9: **PARALLEL 1H BUS TO THE "F" TRANSFER BUS. (ATTACHMENT 8)**	**CRITICAL STEP**

STANDARD:

(a) Turns to AP-10.08, Attachment 8.
*(b) Turns the #1 EDG AUTO-EXERCISE switch to EXERCISE.
(c) Acknowledges annunciator C-G-6 (#1 EDG auto start disabled).
*(d) Pushes the fast start reset push button.
(e) Checks the fast start reset red light is illuminated.
*(f) Notifies auxiliary operator to adjust speed droop from 0 to the scribe mark.
*(g) Turns sync switch ACB-15H8 "ON".
(h) Adjusts incoming voltage to within ±5 volts of running voltage using VOLT ADJ switch.
*(i) Adjusts EDG speed until sync scope is moving slowly in the fast direction using the SPEED ADJ switch.
(j) Resets breaker disagreement on breaker ACB-15H8 by momentarily turning switch to the open position and observing amber light goes out.
*(k) Closes the ACB-15H8 breaker when the sync scope is between 5 minutes of and 12 o'clock.
(l) Verifies Kilowatts are greater than zero.
(m) Using the volt adj switch, maintain reactive 100 - 500 Kilovars out and emerg bus 1H volts between 4000 and 4400 volts.
(n) Turns sync switch ACB-15H8 off.

___ SAT

___ UNSAT

EXAMINER'S CUES: After the call is made to the auxiliary operator the booth operator will inform the applicant that the speed droop has been set to the scribe mark.

Simulator timing response to closing the ACB-15H8 breaker is slow. The breaker may not actually close until the sync scope is slightly beyond 12 o'clock.

COMMENTS:

STEP 10: **REPORT TO SHIFT SUPERVISOR (EVALUATOR).** STANDARD: Verbal status report that offsite power has been restored to 1H emergency bus and #1 EDG may be shut down IAW 1-OP-EG-001. *EXAMINER'S CUES: The service building operator will shutdown the #1 EDG IAW 1-OP-EG-001.* COMMENTS:	___ SAT ___ UNSAT

TIME STOP: ________

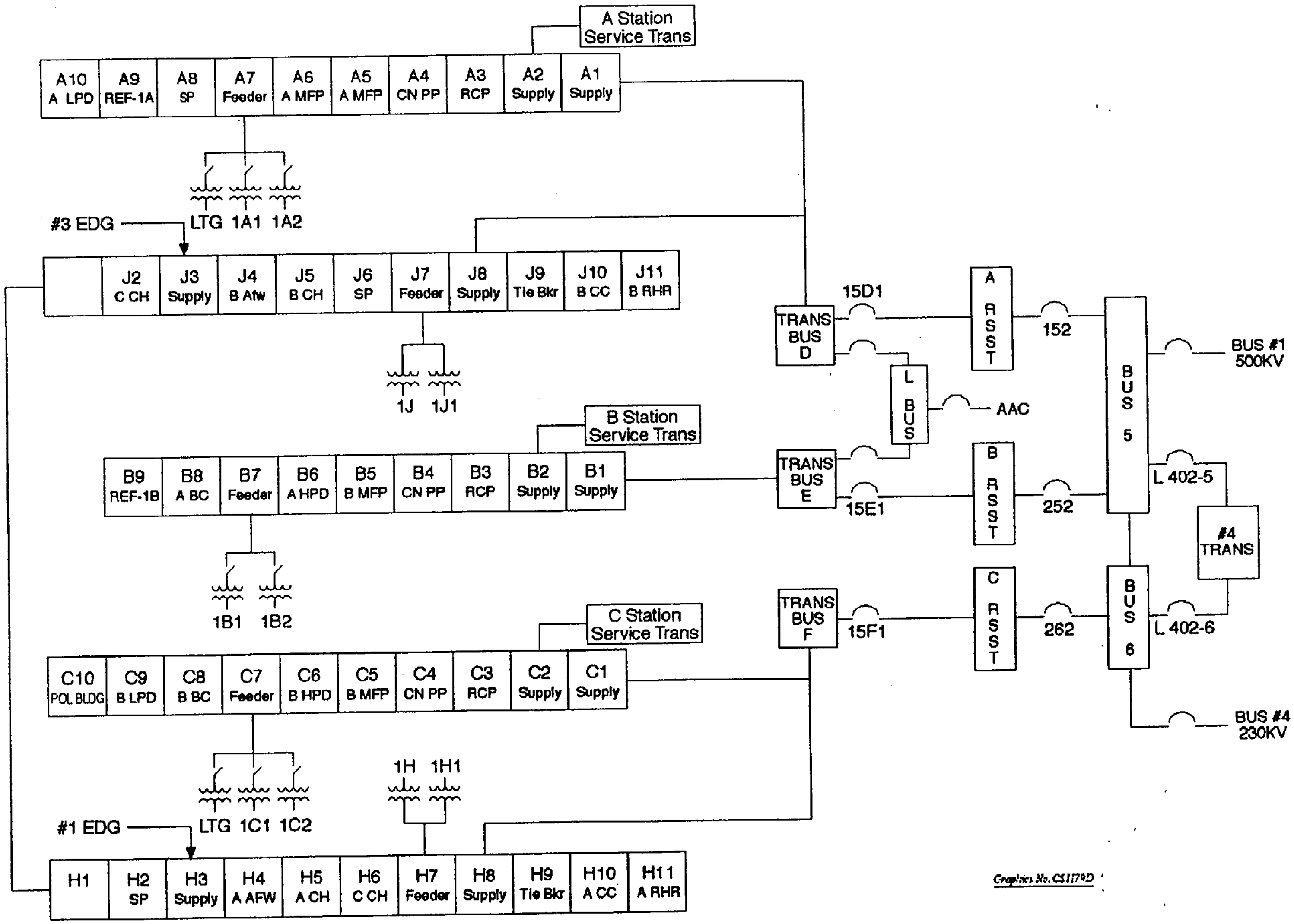
Critical Step Justification:

Substeps within the critical step block are designated with an asterisk (critical component of the step) or no asterisk (Not a critical component).

- **STEP # 6 – Breaker ACB-15F1, must be closed to supply main power to series breaker ACB-15H8.**
- **STEP # 9 – Breaker ACB-15H8, must be closed to energize the 1H bus.**

Critical Step Sequencing:

6g, before 9k; 9f before 9k.



DISTRIBUTION

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

I am the Shift Supervisor. We have had a loss of 34.5 KV Bus 6. The Unit conditions have been stabilized IAW AP 10.07, Loss of Unit 1 Power. Bus 6 has been re-energized using a local switching order and power has been restored to the low level intake.

Here is a copy of AP-10.08, Station Power Restoration.

INITIATING CUES:

Steps 1 thru 20 have been performed. I need you to restore power to 1H Bus from off-site and inform me when #1 EDG may be shut down.

Unit 2 operator will perform all necessary evolutions on Unit 2 when requested.

Procedure: *0-AP-10.08*

Rev: *004* PAR: *0*

Title: *STATION POWER RESTORATION*

SIMULATOR

Effective Date: *04/13/2000*

Station: *Surry* Docbase: *SUMIND*

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

This leader page is part of the controlled document and must remain with the procedure as a permanent record.

Approval signatures for electronically distributed procedures are maintained on file.

CONTROLLED COPY

VIRGINIA POWER
SURRY POWER STATION

ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
0-AP-10.08	STATION POWER RESTORATION (With 10 Attachments)	4
		PAGE 1 of 16

PURPOSE

To provide guidance to restore the normal offsite power source to the Emergency or Station Service Buses.

ENTRY CONDITIONS

Transition from any of the following procedures:

- ( )-AP-10.07, LOSS OF UNIT ( ) POWER
- 0-AP-17.06, AAC DIESEL GENERATOR - EMERGENCY OPERATIONS
- ( )-E-0, REACTOR TRIP OR SAFETY INJECTION
- ( )-E-1, LOSS OF REACTOR OR SECONDARY COOLANT
- ( )-ES-1.1, SI TERMINATION
- ( )-ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION
- ( )-E-3, STEAM GENERATOR TUBE RUPTURE
- ( )-ECA-0.0, LOSS OF ALL AC POWER
- ( )-ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED
- ( )-ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL SGs
- ( )-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED
- ( )-ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED
- ( )-ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: 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 shall be aligned to an energized bus.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	CHECK 34.5 KV BUS NUMBER 5 - ENERGIZED FROM OFFSITE POWER • C.B. L-102 - CLOSED OR • C.B. L402/5 - CLOSED	Do the following: a) Continue efforts to restore offsite power to Bus 5. b) WHEN offsite power available, THEN perform Steps 2 through 20. c) GO TO Step 21.
2.	VERIFY RESERVE STATION SERVICE TRANSFORMER A - ENERGIZED • C.B. 152 on SWITCH YARD STATUS Panel - CLOSED	Restore RSS Transformer A to service IAW Attachment 1. IF RSS Transformer can NOT be restored, THEN GO TO Step 10.
3.	CHECK 15D1 - OPEN	IF 1J Emergency Bus energized from offsite power, THEN GO TO Step 10. IF 1J Emergency Bus NOT energized from offsite power, THEN GO TO Step 8.
4.	__CHECK AAC DIESEL GENERATOR - SUPPLYING ONLY TRANSFER BUS D	IF AAC Diesel Generator supplying both Transfer Buses D and E, THEN GO TO Attachment 3. IF AAC Diesel Generator NOT supplying Transfer Bus D, THEN GO TO Step 7.
5.	__PARALLEL AAC DIESEL GENERATOR AND RSS TRANSFORMER A IAW ATTACHMENT 2	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	__GO TO STEP 10	

* *

<u>CAUTION</u>: The load placed on an EDG should NOT exceed 2750 KW.

* *

<u>NOTE</u>: The Reserve Station Service Transfer Bus supply breakers, 15D1, 15E1, and 15F1 must be held in the CLOSE position for approximately 15 seconds.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	__ENERGIZE TRANSFER BUS D:	
	a) Verify the following breakers - OPEN • 15J8 • 15A1 • 25A1	a) Manually open breakers.
	b) Check 15A2 - TRIPPED	b) GO TO Step 7d.
	c) Reset (green-flag) control switch for 15A2	
	d) Check 25A2 - TRIPPED	d) GO TO Step 7f.
	e) Reset (green-flag) control switch for 25A2	
	f) At the LW panel, place the Synchronizing Switch for 15D1, 0-AAC-1SS-15D1, in ON	
	g) Close 15D1	
	h) At the LW panel, place the Synchronizing Switch for 15D1, 0-AAC-1SS-15D1, in OFF	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.	__CHECK 4160V BUS 1J - ENERGIZED FROM EDG 3	Energize 1J bus: a) Open or verify open 15J3. b) Put the following equipment in PTL: • 1-CH-P-1B • 1-CH-P-1C (ALT) • 1-FW-P-3B (Verify or reset AMSAC) • 1-CC-P-1B • 1-RH-P-1B • 1-CS-P-1B • 1-RS-P-1B • 1-RS-P-2B • 1-SI-P-1B c) Turn on 15J8 SYNC switch. d) Close 15J8. e) Turn off 15J8 SYNC switch. f) Load Emergency Bus to support plant recovery. g) GO TO Step 10.
9.	__PLACE 1J BUS IN PARALLEL WITH TRANSFER BUS D IAW ATTACHMENT 4	
10.	√ VERIFY RESERVE STATION SERVICE TRANSFORMER B - ENERGIZED • C.B. 252 on SWITCH YARD STATUS Panel - CLOSED	Restore RSS Transformer to service IAW Attachment 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.	√ CHECK 15E1 - OPEN	IF 2H Emergency Bus energized from offsite power, THEN GO TO Step 18. IF 2H Emergency Bus NOT energized from offsite power, THEN GO TO Step 16.
12.	__CHECK AAC DIESEL GENERATOR - SUPPLYING ONLY TRANSFER BUS E	IF AAC Diesel Generator supplying BOTH Transfer Buses D and E, THEN GO TO Attachment 3. IF AAC Diesel Generator NOT supplying either Transfer Bus, THEN GO TO Step 15.
13.	__PARALLEL AAC DIESEL GENERATOR AND RSS TRANSFORMER B IAW ATTACHMENT 5	
14.	__GO TO STEP 18	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: The load placed on any EDG should NOT exceed 2750 KW.

* *

15. __ENERGIZE TRANSFER BUS E:

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	a) Verify the following breakers - OPEN • 25H8 • 15B1 • 25B1	a) Manually open breakers.
	b) Check 15B2 - TRIPPED	b) GO TO Step 15d.
	c) Reset (green-flag) control switch for 15B2	
	d) Check 25B2 - TRIPPED	d) GO TO Step 15f.
	e) Reset (green-flag) control switch for 25B2	
	f) At the LW panel, place the Synchronizing Switch for 15E1, 0-AAC-1SS-15E1, in ON	
	g) Close 15E1	
	h) At the LW panel, place the Synchronizing Switch for 15E1, 0-AAC-1SS-15E1, in OFF	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16.	__CHECK 4160V BUS 2H - ENERGIZED FROM EDG 2	Energize 2H bus: a) Open or verify open 25H3. b) Put the following equipment in PTL: • 2-CH-P-1A • 2-CH-P-1C (NORM) • 2-FW-P-3A (Verify or reset AMSAC) • 1-CC-P-1C • 2-RH-P-1A • 2-CS-P-1A • 2-RS-P-1A • 2-RS-P-2A • 2-SI-P-1A c) Turn on 25H8 SYNC switch. d) Close breaker 25H8. e) Turn off 25H8 SYNC switch. f) Load emergency bus to support plant recovery. g) GO TO Step 18.
17.	__PLACE 2H BUS IN PARALLEL WITH TRANSFER BUS E IAW ATTACHMENT 6	
18.	✓VERIFY SCREENWELL TRANSFORMER 2G - ENERGIZED	Restore Screenwell Transformer to service IAW Attachment 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	✓ CHECK 4160V BUS 2G - ENERGIZED AS INDICATED ON SCREENWELL SUPERVISORY PANEL • 25G1 - CLOSED OR • 1G and 2G Buses - CROSSTIED	Do the following local actions: a) Put 25G1 in the Auto After Trip position. b) Open or verify open 15G8. c) Open or verify open all Unit 2 CW pump breakers. d) Turn 25G1 SYNC switch ON. e) Close 25G1. f) Turn 25G1 SYNC switch OFF. g) Verify 15G8 - AUTO CLOSES. IF 15G8 NOT closed, THEN contact Electricians before attempting manual closure of 15G8.
20.	✓ START CW PUMP(s) TO SUPPORT PLANT RECOVERY IAW OP-48.1.1, STARTING ANY CW PUMP	

NOTE: The RAD WASTE FACILITY is powered from Bus Number 6.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21.	__VERIFY 34.5 KV BUS NUMBER 6 - ENERGIZED BY OFFSITE POWER • C.B. L-202 on SWITCH YARD STATUS Panel - CLOSED OR • C.B. L402/6 on SWITCH YARD STATUS Panel - CLOSED	Do the following: a) Continue efforts to restore Bus 6. b) WHEN Bus 6 energized, THEN do Steps 22 through 31.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22.	__VERIFY RESERVE STATION SERVICE TRANSFORMER C - ENERGIZED • C.B. 262 on SWITCH YARD STATUS Panel - CLOSED	Restore RSS Transformer to service IAW Attachment 1.
23.	__CHECK 15F1 - OPEN	<u>IF</u> 1H Emergency Bus energized from offsite power, <u>THEN</u> GO TO Step 27. <u>IF</u> 1H Emergency Bus <u>NOT</u> energized from offsite power, <u>THEN</u> GO TO Step 25.

* *

<u>CAUTION</u>: The load placed on any EDG should NOT exceed 2750 KW.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24.	__ENERGIZE TRANSFER BUS F:	
	a) Verify the following breakers - OPEN • 15H8 • 25J8 • 15C1 • 25C1	a) Manually open breakers.
	b) Check 15C2 - TRIPPED	b) GO TO Step 24d.
	c) Reset (green-flag) control switch for 15C2	
	d) Check 25C2 - TRIPPED	d) GO TO Step 24f.
	e) Reset (green-flag) control switch for 25C2	
	f) Close 15F1	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25.	__CHECK 4160V BUS 1H - ENERGIZED FROM EDG 1	Energize 1H bus: a) Open or verify open 15H3. b) Put the following equipment in PTL: • 1-CH-P-1A • 1-CH-P-1C (NORM) • 1-FW-P-3A (Verify or reset AMSAC) • 1-CC-P-1A • 1-RH-P-1A • 1-CS-P-1A • 1-RS-P-1A • 1-RS-P-2A • 1-SI-P-1A c) Turn on 15H8 SYNC switch. d) Close 15H8. e) Turn off 15H8 SYNC switch. f) Load Emergency Bus to support plant recovery. g) GO TO Step 27.
26.	__PLACE 1H BUS IN PARALLEL WITH TRANSFER BUS F IAW ATTACHMENT 8	
27.	__CHECK 2J BUS - ENERGIZED FROM OFFSITE POWER	GO TO Step 29.
28.	__GO TO STEP 31	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29.	___CHECK 4160V BUS 2J - ENERGIZED FROM EDG 3	Energize 2J bus: a) Open or verify open 25J3. b) Put the following equipment in PTL: • 2-CH-P-1B • 2-CH-P-1C (ALT) • 2-FW-P-3B (Verify or reset AMSAC) • 1-CC-P-1D • 2-RH-P-1B • 2-CS-P-1B • 2-RS-P-1B • 2-RS-P-2B • 2-SI-P-1B c) Turn on 25J8 SYNC switch. d) Close 25J8. e) Turn off 25J8 SYNC switch. f) Load Emergency Bus to support plant recovery. g) GO TO Step 25.
30.	___PLACE 2J BUS IN PARALLEL WITH TRANSFER BUS F IAW ATTACHMENT 4	
31.	___VERIFY SCREENWELL TRANSFORMER 1G - ENERGIZED • C.B. 162 on SWITCH YARD STATUS Panel - CLOSED	Restore Screenwell Transformer to service IAW Attachment 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32.	__CHECK 4160V BUS 1G - ENERGIZED AS INDICATED ON SCREENWELL SUPERVISORY PANEL • 15G1 - CLOSED <u>OR</u> • 1G and 2G Buses - CROSSTIED	Do the following local actions: a) Put 15G1 in the Auto After Trip position. b) Open or verify open 15G8. c) Open or verify open all Unit 1 CW pump breakers. d) Turn 15G1 SYNC switch ON. e) Close 15G1. f) Turn 15G1 SYNC switch OFF. g) Verify 15G8 - AUTO CLOSES. <u>IF</u> 15G8 <u>NOT</u> closed, <u>THEN</u> contact Electricians before attempting manual closure of 15G8.
33.	__VERIFY EMERGENCY BUSES 1J AND 2J - BOTH ENERGIZED FROM OFFSITE POWER	Do the following: a) Load EDG 3 on the deenergized Emergency Bus. b) <u>WHEN</u> both J Buses energized from offsite power, <u>THEN</u> do Step 34. c) GO TO Step 35.
34.	__SHUTDOWN EDG 3 IAW 0-OP-EG-001, NUMBER 3 EMERGENCY DIESEL GENERATOR, SECTION 5.3 AS NECESSARY	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35.	__VERIFY SCREENWELL TRANSFORMERS - BOTH ENERGIZED AS INDICATED ON SWITCHYARD STATUS PANEL • C.B. 352 - CLOSED AND • C.B. 162 - CLOSED	Do the following: a) WHEN transformers energized, THEN do Step 36. b) GO TO Step 37.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: If necessary to split out Screenwell Buses, an electrician will be required to verify that bus voltages are matched.

36.	__VERIFY SCREENWELL BUSES 1G AND 2G - SPLIT OUT AS INDICATED ON SCREENWELL SUPERVISORY PANEL	Do the following: a) Place Unit 1 and Unit 2 Screenwell Transformer Tap Changer in MANUAL. b) Verify racked in or rack in the open supply breaker. • 15G1 OR • 25G1 c) Match 1G and 2G Bus voltages to within +/- 5 volts. d) Close the SYNC switch on the open supply breaker: • 15G1 OR • 25G1 e) Close the open supply breaker. f) Open the SYNC switch closed in Step 36d RNO. g) Open 15G8. h) Return Unit 1 and Unit 2 Screenwell Transformer Tap Changers to AUTO.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Station Service Buses must not be returned to service until Transfer Buses D and E are split out. (NOT crosstied with the 05L1 and 05L3 breakers)

* *

37. __RESTORE NORMAL STATION SERVICE BUSES TO SERVICE IAW LOCAL SWITCHING ORDER AS NECESSARY

38. __EVALUATE LOADS AND REALIGN IAW SHIFT SUPERVISOR DIRECTION

- CHG PPs
- CC PPs
- Filtered Exhaust Fans
- Semi-vital Bus

- MCR Chillers

39. __CHECK THE FOLLOWING DAMPERS - BOTH OPEN

- 1-VS-MOD-103B
- 1-VS-MOD-103D

RESPONSE NOT OBTAINED:

IF EITHER Unit 1 Emergency Bus has been de-energized during the course of this event, THEN initiate Attachment 9 to realign Battery Room(s) Ventilation. 4

IF EITHER Unit 2 Emergency Bus has been de-energized during the course of this event, THEN consult with TSC or Shift Supervisor to: 4

- Monitor H2 in Battery Rooms 2A and 2B
- Provide ventilation for Battery Rooms 2A and 2B or secure Battery Charger to prevent H2 buildup 4

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40.	___RETURN TO PROCEDURE IN EFFECT	

4

- END -

I. RSST A

___ 1. Locally verify opened or open 34.5 KV Oil Circuit Breaker(OCB) 152.

___ 2. Verify opened or open 4160V breaker 15D1.

___ 3. Locally verify closed or close the following disconnects:

- Switch 154
- Switch 155
- Switch 1515

___ 4. Locally close OCB 152.

___ 5. RETURN TO step in effect.

II. RSST B

___ 1. Locally verify opened or open 34.5 KV OCB 252.

___ 2. Verify opened or open 4160V breaker 15E1.

___ 3. Locally verify closed or close the following disconnects:

- Switch 254
- Switch 255
- Switch 2515

___ 4. Locally close OCB 252.

___ 5. RETURN TO step in effect.

III. RSST C

___ 1. Locally verify opened or open 34.5 KV OCB 262.

___ 2. Verify opened or open 4160V breaker 15F1.

___ 3. Verify closed or close the following disconnects:

- Switch 264
- Switch 265
- Switch 2615

___ 4. Locally close OCB 262.

___ 5. RETURN TO step in effect.

NOTE:
- Continuous communications will be necessary to operate the AAC Diesel Generator in coincidence with the MCR indications and controls for breaker 15D1.
- The speed of the AAC Diesel Generator should NOT be adjusted while the diesel is supplying a bus in parallel with the system.

___ 1. Check ACB-15A2, Sta Serv Norm Sup Bkr - TRIPPED. IF breaker tripped, THEN reset (green flag) the control switch. IF breaker NOT tripped, THEN GO TO Step 2.

___ 2. Check ACB-25A2, Sta Serv Norm Sup Bkr - TRIPPED. IF breaker tripped, THEN reset (green flag) the control switch. IF breaker NOT tripped, THEN GO TO Step 3.

___ 3. Reset (green-flag) the control switch for ACB-15D1, Res Sta Serv Xfer Sup Bkr.

___ 4. At the Liquid Waste Panel, place the Synchronizing switch for 15D1, 0-AAC-1SS-15D1, in ON.

___ 5. Match voltages to within plus or minus 5 volts between RSST A and Transfer Bus D using the VOLTAGE CONTROL switch on the AAC Control Panel OR the RSST A tap changer in MANUAL. (Use Unit 1 MCR Sync-Volts Running (Bus), for RSST A voltage,and Sync Volts Incomming (Generated), for Transfer Bus D voltage.

___ 6. Using the SPEED CONTROL switch on the AAC Control Panel, adjust speed until the Unit 1 MCR Synchroscope is rotating slowly in the FAST direction.

NOTE:
- The breaker control switch for 15D1 must be held in the closed position for approximately 15 seconds.
- The AAC Diesel Generator will automatically ramp to full load once breaker 15D1 is closed.

___ 7. WHEN the synchroscope needle approaches the 12 o'clock position, AND the Synchronization Lights are NOT LIT, THEN close ACB-15D1, Res Sta Serv Xfer Sup Bkr.

___ 8. At the Liquid Waste Panel, place the Synchronizing switch for 15D1, 0-AAC-1SS-15D1, in OFF.

___ 9. At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in NORMAL.

NOTE: The AAC Diesel Generator does not need to ramp to full load before unloading can start in Step 10.

10. Unload the AAC Diesel Generator:

___ a. At the GENERATOR CONTROL PANEL, push the INITIATE UNLOADING button.

___ b. Using the VOLTAGE CONTROL switch on the AAC Control Panel, maintain Generator KILOVARs between minus 200 and plus 200 KILOVARS as indicated on the GENERATOR VARS meter.

___ c. WHEN the GENERATOR POWER meter on the Generator Control Panel indicates approximately 200 KW, THEN place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___ 11. Perform the following at the AAC Control Panel to secure the AAC Diesel Generator:

___ a. Wait 5 to 10 minutes for the AAC Diesel to cool down.

___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ c. IF EDG 3 running, THEN secure EDG 3 IAW Attachment 4.

___ d. Check power available to Line Circuit #469. WHEN power available, THEN perform Steps e through o.

___ e. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480V Alternate Feed, in TRIP.

___ f. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ g. Reset and place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ h. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ i. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ j. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ k. Place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.

___ l. Verify that all auto-start signals are clear by checking annunciators 1K-D3, 1K-E3, 1K-F3, BUS 1(D, E, F) UNDERVOLT - NOT LIT.

NOTE: The white light associated with the SEQUENCE MODE SELECTOR switch will light when the auto-start sequence is reset.

___ m. WHEN all auto-start signals are clear, THEN reset the auto-start sequence by placing the SEQUENCE MODE SELECTOR switch on the AAC Control Panel, by placing the switch in AUTO after OFF/RESET.

___ n. Place the Synch Switch Key inside the Generator Control Panel cubicle.

___ o. Check Diesel Engine crankcase oil level. IF oil level is NOT between the ADD and FULL marks on the ENGINE STOPPED WITH COLD OIL side of the dipstick, THEN have the Maintenance Department fill as necessary.

___12. Order fuel oil to refill the Fuel Oil Day Tank.

___13. RETURN TO procedure Step 10.

NOTE: The purpose of this Attachment is to restore offsite power to Buses 1J and 2H, if both buses are supplied by the AAC Diesel Generator. This Attachment may be used if RSST A or RSST B, or both, are available.

___ 1. IF RSST A available, THEN perform Steps 1 through 15. IF NOT, THEN GO TO Step 16.

___ 2. Check ACB 15A2, Sta Serv Norm Sup Bkr - TRIPPED. IF breaker tripped, THEN reset (green flag) the control switch. IF breaker NOT tripped, THEN GO TO Step 3.

___ 3. Check ACB 25A2, Sta Serv Norm Sup Bkr - TRIPPED. IF breaker tripped, THEN reset (green flag) the control switch. IF breaker NOT tripped, THEN GO TO Step 4.

___ 4. Reset (green-flag) the control switch for ACB-15D1, Res Sta Serv Xfer Sup Bkr.

___ 5. At the Liquid Waste Panel, place the Synchronizing switch for 15D1, 0-AAC-1SS-15D1, in ON.

___ 6. Match voltages to within plus or minus 5 volts between RSST A and Transfer Bus D using the VOLTAGE CONTROL switch on the AAC Control Panel OR the RSST A tap changer in MANUAL. (Use Unit 1 MCR Sync-Volts Running (Bus), for RSST A voltage, and Sync Volts Incoming (Generated), for Transfer Bus D voltage.

___ 7. Using the SPEED CONTROL switch on the AAC Control Panel, adjust speed until the Unit 1 MCR Synchroscope is rotating slowly in the FAST direction.

NOTE
- The breaker control switch for 15D1 must be held in the closed position for approximately 15 seconds.
- The AAC Diesel Generator will automatically ramp to full load once breaker 15D1 is closed.

___ 8. WHEN the synchroscope needle approaches the 12 o'clock position, AND the Synchronization Lights are NOT LIT, THEN close ACB-15D1, Res Sta Serv Xfer Sup Bkr.

___ 9. At the Liquid Waste Panel, place the Synchronizing switch for 15D1, 0-AAC-1SS-15D1, in OFF.

___ 10. At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in NORMAL.

* *

CAUTION: The Station Service Reserve Supply Breakers (ACBs-15A1, 15B1, 25A1, and 25B1) shall NOT be closed while Transfer Buses D and E are crossconnected through the Bus 0L. ACB-15A1 may remain closed ONLY to supply an MER 5 Chiller for Appendix R concerns.

* *

NOTE:
- The AAC Diesel Generator does not need to ramp to full load before unloading can start in Step 11.
- When Breaker 05M4 is tripped, RSST A will be powering Buses 1J, 2H, and the AAC Diesel Generator Building.

___11. Unload the AAC Diesel Generator:

___ a. At the GENERATOR CONTROL PANEL, push the INITIATE UNLOADING button.

___ b. Using the VOLTAGE CONTROL switch on the AAC Control Panel, maintain Generator KILOVARs between minus 200 and plus 200 KILOVARS as indicated on the GENERATOR VARS meter.

___ c. WHEN the GENERATOR POWER meter on the Generator Control Panel indicates approximately 200 KW, THEN place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___12. Perform the following at the AAC Control Panel to secure the AAC Diesel Generator.

___ a. Wait 5 to 10 minutes for the AAC Diesel to cool down.

___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ 13. WHEN RSST B available, THEN perform the following.

___ a. Have an Electrician place the RSST A Automatic Load Tap Changer in MANUAL.

___ b. Have an Electrician place the RSST B Automatic Load Tap Changer in MANUAL.

___ c. Match voltages to within plus or minus 5 volts between RSST A and B using the RSST B tap changer. The adjustment will be seen on the Unit 1 MCR Sync-Volts meter. (Running)

___ d. Close Breaker ACB-15E1, Res Sta Serv Xfer Sup Bkr.

___ e. Place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in trip.

___ f. Have an Electrician place the RSST A Automatic Load Tap Changer in AUTOMATIC.

___ g. Have an Electrician place the RSST B Automatic Load Tap Changer in AUTOMATIC.

___ 14. Check power available to Line Circuit #469. WHEN power available, THEN perform the following:

___ a. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480V Normal Feed, in TRIP.

___ b. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ c. Reset and place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ d. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ e. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ f. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ g. Place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.

___ 15. RETURN TO procedure Step in effect.

___ 16. Check ACB 15B2, Sta Serv Norm Sup Bkr - TRIPPED. IF breaker tripped, THEN reset (green flag) the control switch. IF breaker NOT tripped, THEN GO TO Step 17.

___ 17. Check ACB 25B2, Sta Serv Norm Sup Bkr - TRIPPED. IF breaker tripped, THEN reset (green flag) the control switch. IF breaker NOT tripped, THEN GO TO Step 18.

___18. Reset (green-flag) the control switch for ACB-15E1, Res Sta Serv Xfer Sup Bkr.

___19. At the Liquid Waste Panel, place the Synchronizing switch for 15E1, 0-AAC-1SS-15E1, in ON.

___20. Match voltages to within plus or minus 5 volts between RSST B and Transfer Bus E using the VOLTAGE CONTROL switch on the AAC Control Panel <u>OR</u> the RSST B tap changer in MANUAL. (Use Unit 1 MCR Sync-Volts Running (Bus), for RSST B voltage, and Sync Volts Incoming (Generated), for Transfer Bus E voltage.

___21. Using the SPEED CONTROL switch on the AAC Control Panel, adjust speed until the Unit 2 MCR Synchroscope is rotating <u>slowly</u> in the FAST direction.

<u>NOTE</u>:
- The breaker control switch for 15E1 must be held in the closed position for approximately 15 seconds.
- The AAC Diesel Generator will automatically ramp to full load once breaker 15E1 is closed.

___22. <u>WHEN</u> the synchroscope needle approaches the 12 o'clock position, <u>AND</u> the Synchronization Lights are NOT LIT, <u>THEN</u> close ACB-15E1, Res Sta Serv Xfer Sup Bkr.

___23. At the Liquid Waste Panel, place the Synchronizing switch for 15E1, 0-AAC-1SS-15E1, in OFF.

___24. At EDG 2 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-25H8, in NORMAL.

*

CAUTION: The Station Service Reserve Supply Breakers (ACBs-15A1, 15B1, 25A1, and 25B1) shall NOT be closed while Transfer Buses D and E are crossconnected through the Bus OL. ACB-15A1 may remain closed ONLY to supply an MER 5 Chiller for Appendix R concerns.

*

NOTE:
- The AAC Diesel Generator does not need to ramp to full load before unloading can start in Step 25.
- When Breaker 05M4 is tripped, RSST B will be powering Buses 1J, 2H, and the AAC Diesel Generator Building.

___ 25. Unload the AAC Diesel Generator:

___ a. At the GENERATOR CONTROL PANEL, push the INITIATE UNLOADING button.

___ b. Using the VOLTAGE CONTROL switch on the AAC Control Panel, maintain Generator KILOVARs between minus 200 and plus 200 KILOVARS as indicated on the GENERATOR VARS meter.

___ c. WHEN the GENERATOR POWER meter on the Generator Control Panel indicates approximately 200 KW, THEN place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___ 26. Perform the following at the AAC Control Panel to secure the AAC Diesel Generator.

___ a. Wait 5 to 10 minutes for the AAC Diesel to cool down.

___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ 27. WHEN RSST A available, THEN perform the following.

___ a. Have an Electrician place the RSST B Automatic Load Tap Changer in MANUAL.

___ b. Have an Electrician place the RSST A Automatic Load Tap Changer in MANUAL.

___ c. Match voltages to within plus or minus 5 volts between RSST A and B using the RSST B tap changer. The adjustment will be seen on the Unit 1 MCR Sync-Volts meter. (Running)

___ d. Close Breaker ACB-15D1, Res Sta Serv Xfer Sup Bkr.

___ e. Place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in trip.

___ f. Have an Electrician place the RSST B Automatic Load Tap Changer in AUTOMATIC.

___ g. Have an Electrician place the RSST A Automatic Load Tap Changer in AUTOMATIC.

___28. Check power available to Line Circuit #469. WHEN power available, THEN perform the following:

___ a. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480V Normal Feed, in TRIP.

___ b. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ c. Reset and place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ d. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ e. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ f. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ g. Place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in TRIP.

___29. RETURN TO procedure Step in effect.

__ 1. Put the EDG 3 AUTO-EXERCISE switch for both units in EXERCISE and check annunciator 0-VSP-C5 LIT.

__ 2. Push the FAST START RESET button and verify that the red light comes on.

__ 3. Turn the SPEED DROOP knob from 0 to the scribe mark.

__ 4. Turn the SYNC switch to ON.

__ACB-15J8 __ACB-25J8

__ 5. Using the EMERG GEN NO 3 VOLT ADJ (CONT) switch, adjust the INCOMING VOLT to within plus or minus 5 of the RUNNING VOLT.

__ 6. Using the EMERG GEN NO 3 SPEED ADJ (CONT) switch, adjust the RPM until the SYNC (Synchroscope) is moving slowly in the FAST direction.

__ 7. <u>WHEN</u> the Synchroscope is between 5 minutes of and 12 o'clock, <u>THEN</u> close the NORM SUP (J8) switch <u>AND</u> verify that MEGAWATTs are greater than 0.

__ 8. Using the VOLT ADJ (CONT) switch, maintain reactive 0.1 to 0.5 MEGAVARS out and EMERG BUS VOLTS between 4000 and 4400.

__ 9. Turn the SYNC switch to OFF.

__ 10. RETURN TO procedure Step in effect.

<u>NOTE</u>:
- Continuous communications will be necessary to operate the AAC Diesel Generator in coincidence with the MCR indications and controls for breaker 15E1.
- The speed of the AAC Diesel Generator should <u>NOT</u> be adjusted while the diesel is supplying a bus in parallel with the system.

___ 1. Check ACB-15B2, Sta Serv Norm Sup Bkr - TRIPPED. <u>IF</u> breaker tripped, <u>THEN</u> reset (green flag) the control switch. <u>IF</u> breaker <u>NOT</u> tripped, <u>THEN</u> GO TO Step 2.

___ 2. Check ACB-25B2, Sta Serv Norm Sup Bkr - TRIPPED. <u>IF</u> breaker tripped, <u>THEN</u> reset (green flag) the control switch. <u>IF</u> breaker <u>NOT</u> tripped, <u>THEN</u> GO TO Step 3.

___ 3. Reset (green-flag) the control switch for ACB-15E1, Res Sta Serv Xfer Sup Bkr.

___ 4. At the Liquid Waste Panel, place the Synchronizing switch for 15E1, 0-AAC-1SS-15E1, in ON.

___ 5. Match voltages to within plus or minus 5 volts between RSST B and Transfer Bus E using the VOLTAGE CONTROL switch on the AAC Control Panel <u>OR</u> the RSST B tap changer in MANUAL. (Use Unit 1 MCR Sync-Volts Running (Bus), for RSST B voltage, and Sync Volts Incomming (Generated), for Transfer Bus E voltage.

___ 6. Using the SPEED CONTROL switch on the AAC Control Panel, adjust speed until the Unit 1 MCR Synchroscope is rotating <u>slowly</u> in the FAST direction.

<u>NOTE</u>:
- The breaker control switch for 15E1 must be held in the closed position for approximately 15 seconds.
- The AAC Diesel Generator will automatically ramp to full load once breaker 15E1 is closed.

___ 7. <u>WHEN</u> the synchroscope needle approaches the 12 o'clock position, <u>AND</u> the Synchronization Lights are NOT LIT, <u>THEN</u> close ACB-15E1, Res Sta Serv Xfer Sup Bkr.

___ 8. At the Liquid Waste Panel, place the Synchronizing switch for 15E1, 0-AAC-1SS-15E1, in OFF.

___ 9. At EDG 2 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-25H8, in NORMAL.

<u>NOTE</u>: The AAC Diesel Generator does not need to ramp to full load before unloading can start in Step 10.

10. Unload the AAC Diesel Generator:

___ a. At the GENERATOR CONTROL PANEL, push the INITIATE UNLOADING button.

___ b. Using the VOLTAGE CONTROL switch on the AAC Control Panel, maintain Generator KILOVARs between minus 200 and plus 200 KILOVARS as indicated on the GENERATOR VARS meter.

___ c. <u>WHEN</u> the GENERATOR POWER meter on the Generator Control Panel indicates approximately 200 KW, <u>THEN</u> place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___11. Perform the following at the AAC Control Panel to secure the AAC Diesel Generator:

___ a. Wait 5 to 10 minutes for the AAC Diesel to cool down.

___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ c. <u>IF</u> EDG 2 running, <u>THEN</u> secure EDG 2 IAW Attachment 7.

___ d. Check power available to Line Circuit #469. <u>WHEN</u> power available, <u>THEN</u> perform Steps e through o.

___ e. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480V Alternate Feed, in TRIP.

___ f. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ g. Reset and place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ h. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ i. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ j. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ k. Place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in TRIP.

___ l. Verify that all auto-start signals are clear by checking annunciators 1K-D3, 1K-E3, 1K-F3, BUS 1(D, E, F) UNDERVOLT - NOT LIT.

NOTE: The white light associated with the SEQUENCE MODE SELECTOR switch will light when the auto-start sequence is reset.

___ m. WHEN all auto-start signals are clear, THEN reset the auto-start sequence by placing the SEQUENCE MODE SELECTOR switch on the AAC Control Panel, by placing the switch in AUTO after OFF/RESET.

___ n. Place the Synch Switch Key inside the Generator Control Panel cubicle.

___ o. Check Diesel Engine crankcase oil level. IF oil level is NOT between the ADD and FULL marks on the ENGINE STOPPED WITH COLD OIL side of the dipstick, THEN have the Maintenance Department fill as necessary.

___12. Order fuel oil to refill the Fuel Oil Day Tank.

___13. RETURN TO procedure Step 18.

__ 1. Put the EDG 2 AUTO-EXERCISE switch in EXERCISE and check annunciator 2C-G6 LIT.

__ 2. Push the FAST START RESET button and check that the red light is on.

__ 3. Turn the SPEED DROOP knob from 0 to the scribe mark.

__ 4. Turn the SYNC ACB-25H8 switch to ON.

__ 5. Using the EMERG GEN 2 VOLT CONT switch, adjust the INCOMING VOLT to within plus or minus 5 of the RUNNING VOLT.

__ 6. Using the EMERG GEN 2 SPEED CONT switch, adjust the RPM until the synchroscope is moving slowly in the FAST direction.

__ 7. WHEN the synchroscope is between 5 minutes of and 12 o'clock, THEN close the EMERG SUP ACB-25H8 switch AND check that KWs are greater than 0.

__ 8. Using the VOLT CONT switch, maintain reactive 100 to 500 KILOVARS out and EMERG BUS 2H VOLTS between 4000 and 4400 VOLTS.

__ 9. Turn the SYNC ACB-25H8 switch to OFF.

__ 10. Shutdown EDG 2 IAW 2-OP-EG-001, NUMBER 2 EMERGENCY DIESEL GENERATOR, Section 5.3.

__ 11. RETURN TO procedure Step in effect.

I. Transformer 1

___ 1. Verify opened or open 34.5 KV OCB 162.

___ 2. Locally verify opened or open 4160V breaker 15G1.

___ 3. Locally verify closed or close the following disconnects:

- Switch 164
- Switch 165
- Switch 1615

___ 4. Locally close OCB 162.

___ 5. RETURN TO step in effect.

II. Transformer 2

___ 1. Verify opened or open 34.5 KV OCB 352.

___ 2. Locally verify opened or open 4160V breaker 25G1.

___ 3. Locally verify closed or close the following disconnects:

- Switch 354
- Switch 355
- Switch 3515

___ 4. Locally close OCB 352.

___ 5. RETURN TO step in effect.

NUMBER 0-AP-10.08	ATTACHMENT TITLE	REVISION 4
ATTACHMENT 8	PARALLELING THE 1H BUS TO THE TRANSFER BUS	PAGE 1 of 1

__ 1. Put the EDG 1 AUTO-EXERCISE switch in EXERCISE and check annunciator 1C-G6 LIT.

__ 2. Push the FAST START RESET button and check that the red light is on.

__ 3. Turn the SPEED DROOP knob from 0 to the scribe mark.

__ 4. Turn the SYNC ACB-15H8 switch to ON.

__ 5. Using the EMERG GEN NO 1 VOLT ADJ switch, adjust the INCOMING VOLT to within plus or minus 5 of the RUNNING VOLT.

__ 6. Using the EMERG GEN NO 1 SPEED ADJ switch, adjust the RPM until the synchroscope is moving slowly in the FAST direction.

__ 7. <u>WHEN</u> the synchroscope is between 5 minutes of and 12 o'clock, <u>THEN</u> close the EMERG SUP ACB-15H8 switch <u>AND</u> check that KWs are greater than 0.

__ 8. Using the VOLT ADJ switch, maintain reactive 100 to 500 KILOVARS out and EMERG BUS 1H VOLTS between 4000 and 4400 VOLTS.

__ 9. Turn the SYNC ACB-15H8 switch to OFF.

__ 10. Shutdown EDG 1 IAW 1-OP-EG-001, NUMBER 1 EMERGENCY DIESEL GENERATOR, Section 5.3.

__ 11. RETURN TO Step 27.

I. Bus 1H

NOTE: The actions in Step 1 provide a positive air supply into the Battery Room thereby preventing a Hydrogen build-up while batteries are being recharged.

___ 1. Align Battery Room 1A Ventilation. Enter N/A if previously aligned in 0-AP-17.04.

___ a) Open slide damper 1-VS-DMP-132. (East Wall of Battery Room 1A)

___ b) Close slide damper 1-VS-DMP-133. (East Wall of Battery Room 1A)

___ c) Open Battery Room 1A door.

___ d) Establish fire watch and security watch.

___ 2. Record the time when Battery Room Ventilation was realigned:___________.

___ 3. Check 1H 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 1A Ventilation to prevent over-cooling Battery Rooms.

___ a) Open slide damper 1-VS-DMP-133. (East Wall of Battery Room 1A)

___ b) Close slide damper 1-VS-DMP-132. (East Wall of Battery Room 1A)

___ c) Close Battery Room 1A door.

___ d) Relax fire watch and security watch.

II. Bus 1J

NOTE: The actions in Step 1 provide a positive air supply into the Battery Room thereby preventing a Hydrogen build-up while batteries are being recharged.

___ 1. Align Battery Room 1B Ventilation. Enter N/A if previously aligned in 0-AP-17.05 or 0-AP-17.06.

___ a) Open slide damper 1-VS-DMP-134. (West Wall of Battery Room 1B)

___ b) Close slide damper 1-VS-DMP-135. (West 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. (West Wall of Battery Room 1B)

___ b) Close slide damper 1-VS-DMP-134. (West Wall of Battery Room 1B)

___ c) Close Battery Room 1B door.

___ d) Relax fire watch and security watch.

I. PROBABLE CAUSES:

1. Low System Frequency and Voltage

II. REFERENCES:

1. DC-88-36
2. Virginia Power System Restoration Plan
3. 10 CFR 50.63
4. NUMARC 87-00
5. SCARF 89-1454-001 (entire procedure)
6. UFSAR Sections 8.4, 8.5
7. Tech Spec 3.9, 3.16
8. OP-48.1.1, Starting Any CW Pump
9. 0-OP-EG-001, Number 3 Emergency Diesel Generator
10. 1-OP-EG-001, Number 1 Emergency Diesel Generator
11. 2-OP-EG-001, Number 2 Emergency Diesel Generator
12. DCP 92-052, Alternate Diesel Generator Installation
13. DCP 99-002, Air Supply Modification to Vital Bus Battery Rooms

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-04

PLANT OR SIMULATOR

Title:

RE-ALIGN MCR VENTILATION FOR A FUEL HANDLING ACCIDENT IN THE FUEL BUILDING

CANDIDATE ____

EXAMINER ____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

RE-ALIGN MCR VENTILATION FOR A FUEL HANDLING ACCIDENT IN THE FUEL BUILDING

Alternate Path:

Facility JPM #:

NEW

K/A Rating(s):

APE036.AK3.03 (RO3.7/SRO4.1)

Task Standard:

Completion of 0-AP-22.00, Fuel Handling Abnormal Conditions immediate action steps.

Preferred Evaluation Location: Simulator _____ In-Plant __X____

Preferred Evaluation Method: Perform __X__ Simulate ______

References:

0-AP-22.00, Fuel Handling Abnormal Conditions.

Validation Time: 5 min. **Time Critical:** NO

==

Candidate: ______________________________ (NAME)

Time Start : ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ______________________ (NAME) ______________________ (SIGNATURE) / ________ (DATE)

==

COMMENTS

____

____

____

SIMULATOR SETUP INSTRUCTIONS:

1. Call up 100% IC and initialize.
2. Place the Fuel Building on filtered exhaust (VS-F-58A and B) with 0-OP-VS-014. The MCR is on normal ventillation.
3. Delete switch override 1-VS-MOD-103B open ON and close OFF.
4. Enter the malfunctions for Fuel Bldg Bridge Crane, New Fuel Area, and Vent-Vent RMs so that Alert and High Alarms are lit. Override the annunciator VSP-C-1.
5. Start the air compressor for simulating air pressure to the MCR and close the door from the simulator booth to the simulator. This door must be closed in order to have positive air pressure indicated in the simulator.
6. Place the Simulator in freeze until JPM Performance.
7. Set Simloch to display variables.

SIMULATOR OPERATOR INSTRUCTIONS:

- None

TOOLS/EQUIPMENT/PROCEDURES NEEDED:

0-AP-22.00, Fuel Handling Abnormal Conditions.

READ TO OPERATOR

DIRECTION TO TRAINEE: Read the appropriate instructions based on location of JPM performance.

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. 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. To indicate that you have completed your assigned task, return the handout sheet I provided you.

OR

TASK TO BE PERFORMED IN THE PLANT:

I will explain the initial conditions, and state the task to be performed. All in plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. 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. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor. Unit 1 is operating at 100% power, Unit 2 is at CSD for refueling. Fuel Building is on filtered exhaust using the 58 A and B fans due to Fuel Shuffling being performed. There has been a Fuel Handling accident in the Fuel Building. The Fuel handling crew has placed the leaking fuel assembly in a safe condition and has evacuated the Fuel Building.

INITIATING CUES:

- I need you to respond to this event from memory (without procedure(s)).

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 1: **CHECK FUEL REPAIR – IN PROGRESS. (Step [1])** STANDARD: Recalls from the Initial Conditions that no fuel repair is in progress. Goes to Step 4 based on the RNO. *EXAMINER'S CUES: If asked, there is no fuel repair in progress.* *EXAMINER'S NOTE: Immediate action steps of AP-22.00, Fuel Handling Abnormal Conditions are required.* COMMENTS:	___ SAT ___ UNSAT
STEP 2: **STOP FUEL HANDLING OPERATIONS. (Step [4])** STANDARD: Recalls from the Initial Conditions that Fuel Handling Operations have been stopped. *EXAMINER'S CUES: If asked, fuel handling operations have been completed.* COMMENTS:	___ SAT ___ UNSAT

STEP 3: **EVACUATE THE AFFECTED AREA. (Step [5])** • **Containment or Fuel Building** STANDARD: Recalls from the Initial Conditions that the Fuel Building has been evacuated. *EXAMINER'S CUES: If asked, the Fuel Building has been evacuated.* COMMENTS:	___ SAT ___ UNSAT

STEP 4: **SECURE NORMAL MCR VENTILATION. (Step [6])** • **Close 1-VS-MOD-103C** • **Close 1-VS-MOD-103D** • **Verify stopped or stop 1-VS-F-15** • **Verify stopped or stop 1-VS-AC-4** STANDARD: *(a) Closes 1-VS-MOD-103C by placing the control switch in the close position. *(b) Closes 1-VS-MOD-103D by placing the control switch in the close position. (c) Verifies MCR exhaust fan 1-VS-F-15 secured (green light on, red light off) (e) Verifies MCR supply fan 1-VS-AC-4 secured (green light on, red light off) *EXAMINER'S CUES:* *(a) When asked, 1-VS-MOD-103C has green light on and red light off.* *(b) When asked, 1-VS-MOD-103D has green light on and red light off.* *(c) When asked, 1-VS-F-15 has green light on and red light off.* *(d) When asked, 1-VS-F-4 has green light on and red light off.* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5: **DUMP MCR BOTTLED AIR. (Step [7])**
 	
• **Close 1-VS-MOD-103B (Dumps Unit 1 Cable Vault air bottles).**
• **Set timer for 60 minutes.**
• **Check positive pressure of 0.05 inches – being maintained.**
  • **PDI-VS-110**
  • **PDI-VS-101**
  • **PDI-VS-200**
  • **PDI-VS-201**
• **Check all Main Station Batteries – Freshening charge in progress.**
• **RNO Go to Step 8.**
 	
STANDARD:
 	
*(a) Closes 1-VS-MOD-103B by placing the control switch in the close position. (green light on, red light off)
(b) Sets timer for 60 minutes.
(c) Verifies positive pressure indicated on PDI-VS-100, 101, 200, 201 is ≥ .05 inches of water.
(d) Determines all Main Station Batteries are not on a freshening charge by asking the Shift Supervisor.
 	
EXAMINER'S CUES:
 	
(a) When asked, 1-VS-MOD-103B has green light on and red light off.
(c) When asked, PDI-VS-100, 101, 200, and 201 are indicating 0.2 inches of water.
(d) When asked, the Main Station Batteries are not on a freshening charge.
 	
COMMENTS:
	CRITICAL STEP
	
	___ SAT
	
	___ UNSAT

STEP 6: **REPORT TO SHIFT SUPERVISOR (EVALUATOR).** STANDARD: Verbal status report of task completion made. COMMENTS:	___ SAT ___ UNSAT

TIME STOP: ________

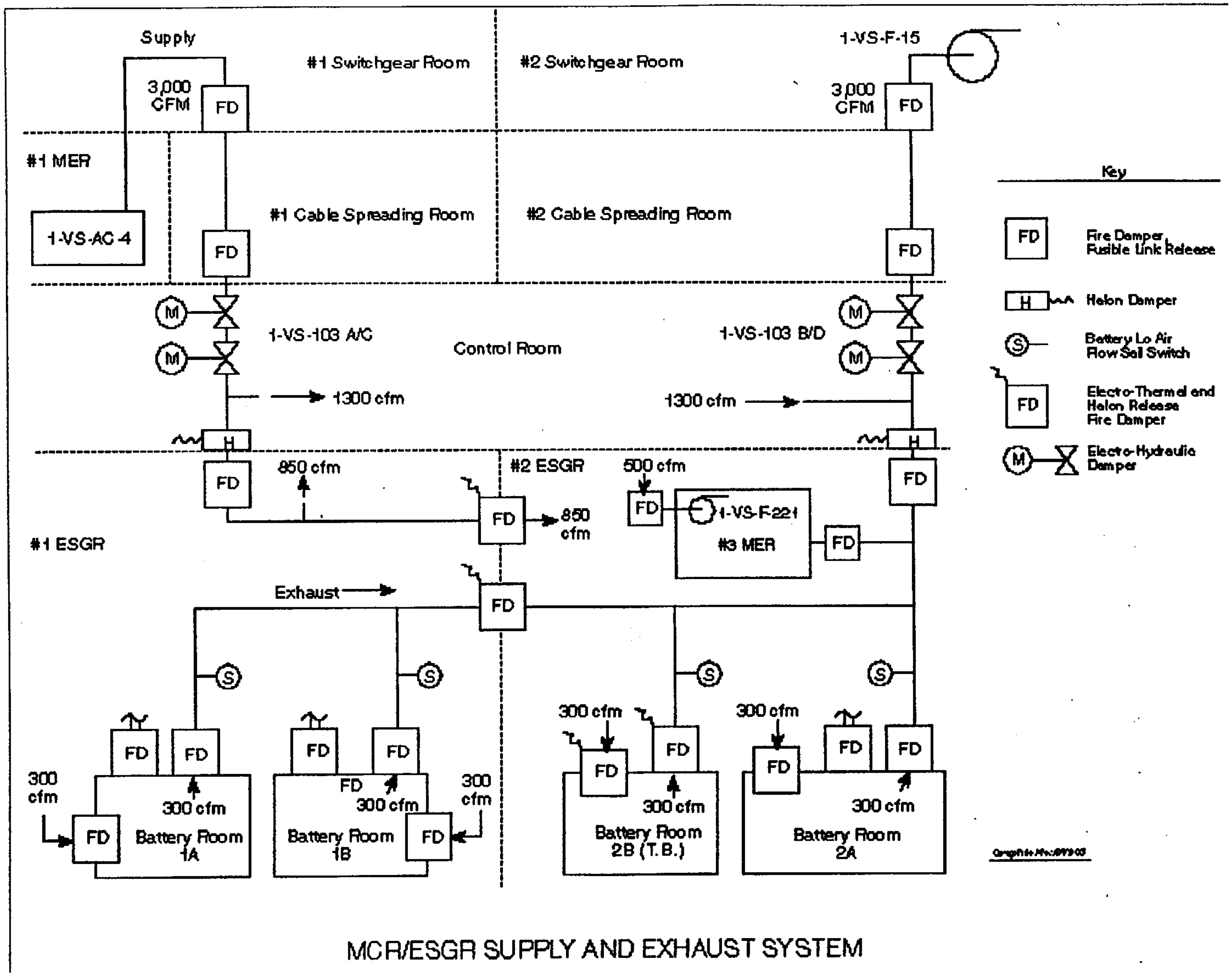
Critical Step Justification:

Substeps within the critical step block are designated with an asterisk (critical component of the step) or no asterisk (Not a critical component).

- **STEP # 4 - Dampers 1-VS-MOD-103C and D must be closed in order to isolate the MCR. MCR isolation is essential for a positive pressure to be built up in the MCR.**
- **STEP # 5 - Damper !-VS-MOD-103A must be closed which releases bottle air pressure into the MCR.**

Critical Step Sequencing:

Step 4 before Step 5.



MCR/ESGR SUPPLY AND EXHAUST SYSTEM

CANDITATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

I am the Shift Supervisor. Unit 1 is operating at 100% power, Unit 2 is at CSD for refueling. Fuel Building is on filtered exhaust using the 58 A and B fans due to Fuel Shuffling being performed. There has been a Fuel Handling accident in the Fuel Building. The Fuel handling crew has placed the leaking fuel assembly in a safe condition and has evacuated the Fuel Building.

INITIATING CUES:

I need you to respond to this event from memory (without procedure(s)).

VIRGINIA POWER
Level 2 Distribution
SURRY POWER STATION
This document should be verified and annotated to a controlled source as required to perform work.
ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
0-AP-22.00	FUEL HANDLING ABNORMAL CONDITIONS	15
	(With 2 Attachments)	PAGE 1 of 6

PURPOSE

To provide guidance in the event of fuel failure during handling.

SIMULATOR

ENTRY CONDITIONS

1. Fuel cladding failure as determined by radiation monitor alarm from any of the following monitors:
   - 1-RM-RMS-152, New Fuel Storage Area
   - 1-RM-RMS-153, Fuel Pit Bridge
   - 1-VG-RMS-109/110, Victoreen Vent/Vent
   - 1-VG-RMS-131-1/2, Kaman Vent/Vent
   - ()-RM-RMS-()59/()60, Containment Particulate/Gas
   - ()-RM-RMS-()62, Manipulator Crane
2. Fuel cladding failure as determined by observation. (bubbles or cloudiness, separation of fuel rod)

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED		8/03/00

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[1]	__CHECK FUEL REPAIR - IN PROGRESS	GO TO Step 4.
[2]	__CHECK LOCAL RADIATION CONDITIONS - NORMAL	GO TO Step 4.
[3]	__GO TO STEP 18	
[4]	__STOP FUEL HANDLING OPERATIONS	
[5]	__EVACUATE THE AFFECTED AREA • Containment OR • Fuel Building	
[6]	__SECURE NORMAL MCR VENTILATION a) Close 1-VS-MOD-103C b) Close 1-VS-MOD-103D c) Verify stopped or stop 1-VS-F-15 d) Verify stopped or stop 1-VS-AC-4	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[7]	__DUMP MCR BOTTLED AIR:	
	a) Close 1-VS-MOD-103B (Dumps Unit 1 Cable Vault air bottles)	
	b) Set timer for 60 minutes	
	c) Check positive pressure of 0.05 inches - BEING MAINTAINED • PDI-VS-110 • PDI-VS-101 • PDI-VS-200 • PDI-VS-201	c) Close 1-VS-MOD-103A. (Dumps MER 3 air bottles)
	d) Check all Main Station Batteries - FRESHENING CHARGE IN PROGRESS	d) GO TO Step 8.
	e) Notify Electrical Department that Battery Room must be monitored for explosive concentration	
* 8.	__CHECK FUEL HANDLING ACCIDENT - IN PROGRESS FOR ONE HOUR (WHEN TIMER GOES OFF)	Do the following: a) <u>WHEN</u> Fuel Handling accident has been in progress for one hour (when timer goes off), <u>THEN</u> immediately perform Step 9. b) GO TO Step 10.

STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED

* *

CAUTION:
- 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.
- Only one Emergency Supply Fan must be started.

* *

9. __IMMEDIATELY START ONE EMERGENCY SUPPLY FAN IAW THE FOLLOWING: (1-VS-F-41 or 2-VS-F-41 PREFERRED)

   a) Start 1-VS-F-41 IAW the following:

      1) Open 1-VS-MOD-104A, CONT RM EMERG SUP MOD

      2) Start 1-VS-F-41

   OR

   b) Start 2-VS-F-41 IAW the following:

      1) Open 2-VS-MOD-204A, CONT RM EMERG SUP MOD

      2) Start 2-VS-F-41

   OR

(STEP 9 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9. IMMEDIATELY START <u>ONE</u> EMERGENCY SUPPLY FAN IAW THE FOLLOWING: (1-VS-F-41 or 2-VS-F-41 PREFERRED) (CONTINUED)

   c) Start 1-VS-F-42 IAW the following:

      1) Open 1-VS-MOD-104B, CONT RM EMERG SUP MOD

      2) Start 1-VS-F-42

   OR

   d) Start 2-VS-F-42 IAW the following:

      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 9 Caution

10. __PLACE 1-VS-43-VS103X, MCR ISOLATION SWITCH ON UNIT 2 VS PANEL IN OFF

11. __INITIATE ATTACHMENT 1

12. __NOTIFY THE FOLLOWING:

    - Shift Supervisor
    - Health Physics

13. __OPERATE FUEL BUILDING VENTILATION AS DIRECTED BY HEALTH PHYSICS

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	__CHECK CONTAINMENT RADIATION - HIGH ALARM ON ANY OF THE FOLLOWING MONITORS: • ( )-RM-RI-( )59 • ( )-RM-RI-( )60 • ( )-RM-RI-( )62	GO TO Step 17.
15.	__VERIFY CTMT PURGE - SECURED	
	a) CTMT PURGE SUP MOVs - CLOSED • ( )-VS-MOV-( )00A • ( )-VS-MOV-( )00B • ( )-VS-MOV-( )00C • ( )-VS-MOV-( )00D	a) Close valves.
	b) CTMT PURGE SUP fans - OFF • 1-VS-F-4A • 1-VS-F-4B	b) Stop fans.
	c) CTMT PURGE BYP valve - CLOSED • ( )-VS-MOV-( )01	c) Close valve.
16.	__CHECK THAT NO DIRECT PATHS FROM CTMT ATMOSPHERE TO THE OUTSIDE ATMOSPHERE EXIST	
17.	__EVALUATE MCR AND TURBINE BUILDING VENTILATION AND REALIGN IAW SHIFT SUPERVISOR DIRECTION	15
18.	__PROVIDE NOTIFICATIONS AS NECESSARY: • STA • OMOC • Shift Supervisor	

- END -

___ 1. 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)

___ 2. IF any reading NOT positive, THEN dispatch operator to perform Step 3 to secure MCR boundary fans. Otherwise, enter N/A for Steps 3 through 5.

3. 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)

___ 4. 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)

___ 5. <u>IF</u> any reading <u>NOT</u> positive, <u>THEN</u> dispatch operator to verify secured or secure all Turbine Building Supply and Exhaust Fans. Circle any fan <u>NOT</u> initially secured.

<u>MCC 1A1-2</u> Turbine Bldg, 9' 6" West

___ • 1-VS-F-29A, 1A1-2-2A
___ • 1-VS-F-29B, 1A1-2-2B

<u>MCC 1B1-3</u> Turbine Bldg, 9' 6" West

___ • 1-VS-F-29F, 1B1-3-3B
___ • 1-VS-F-29E, 1B1-3-4D

<u>MCC 1A2-2</u> 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

<u>MCC 1C2-2</u> 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 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 Mezzanine

___ • 2-VS-F-29G, 2C2-2-2B
___ • 2-VS-F-29H, 2C2-2-3B
___ • 2-VS-F-28C, 2C2-2-4A

I. PROBABLE CAUSE:

1. Fuel Clad failure

   - Dropped fuel assembly
   - Heavy load dropped on fuel

2. Equipment failure

   - Loss of power
   - Misalignment
   - Mechanical failure
   - Loss of air

II. REFERENCES:

1. UFSAR Chapter 11 and Section 14.4

2. ET NAF No. 98-0180, Rev 0, Surry Fuel Handling Accident

3. ET NAF No. 98-0180, Rev 1, March 22, 1999, Surry Fuel Handling Accident

4. Station Deviation S-99-0787 (Step 1 Caution)

5. Plant Issue S-1999-2494

6. DCP 99-109, VS MCR PRESSURE ENVELOPE FAN TRIP & DPI MODIFICATION

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-05

SIMULATOR

Title:

REMOVE A FAILED POWER RANGE NI FROM SERVICE

APPLICANT ____

EXAMINER ____

REGION II

INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

REMOVE A FAILED POWER RANGE NI FROM SERVICE.

Alternate Path:

N/A

Facility JPM #:

LO JPM # 62.01

K/A Rating(s):

SYS015.A4.02 (RO 3.9/SRO 3.9)

Task Standard:

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

Preferred Evaluation Location:

Simulator _X_ In-Plant ______

Preferred Evaluation Method:

Perform _X_ Simulate ______

References:

1-AP-4.00, Nuclear Instrumentation Malfunction, Rev. 11.

Validation Time: 10 min. **Time Critical:** No

==

Candidate: ______________________________________
NAME

Time Start : ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ______________________________ ____________________________________/________
NAME SIGNATURE DATE

==

COMMENTS

____

____

____

SIMULATOR SETUP INSTRUCTIONS:

1. Recall protected IC for 100% power and initialize.
2. Place simulator in RUN.
3. Implement malfunction for low failure of NI-1-41 (MNI10 @ 0% degradation).
4. Stabilize unit at ~100% power. Place the simulator in freeze and save.
5. Run simulator for 10 minutes to determine nuisance annunciators, then place the simulator in freeze.
6. Recall JPM saved conditions and override all nuisance annunciators to minimize trainee distractions. Save the conditions and store.
7. Recall JPM saved conditions.
8. Place simulator in run when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

- None

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

1-AP-4.00, Nuclear Instrumentation Malfunction, Rev. 11.

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. All control room steps shall be performed for this JPM, including any required communications. 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. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

You are the Unit 1 Reactor Operator.

Unit 1 is stable at 100% power with all systems in automatic.

A transient has just occurred on Unit 1.

INITIATING CUES:

I need you to respond to this transient.

JPM LEGEND

Bold	Highlighted JPM Headings and notes/ provide 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 1: Recognizes that N41 has failed low and obtains a copy of AP-4.0 STANDARD: (a) Recognizes that N-41 has failed low by observing the benchboard power range meters, the drawer mounted power range meters, or annunciators (G-H1, NIS Dropped Rod Flux Decrease > 5% per 2 seconds, G-E4, NIS Power Range Channel Average Flux Deviation > 4%). (b) Obtains a copy of AP-4.0, Nuclear Instrumentation Malfunction. *EXAMINER'S CUES: If asked, a copy of AP-4.0 must be obtained from the appropriate file cabinet.* COMMENTS:	___ SAT ___ UNSAT
STEP 2: **(STEP 1) CHECK NI MALFUNCTION – POWER RANGE** STANDARD: • Recognizes that a power range NI has failed low and proceeds to Step 2. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 3: **(STEP 2) STABILIZE UNIT CONDITIONS** STANDARD: • Verifies that unit conditions are stable by observing no changes in Tavg, Tref , Turbine Load, RCS pressure, etc. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 4: **(STEP 3) CHECK N-44 FAILED** STANDARD: • Recalls that N-44 did not fail and by RNO goes to step 5. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 5: **(STEP 5) CHECK POWER RANGE CHANNELS – ONLY ONE FAILED** STANDARD: • Verifies that ONLY one power range channel has failed and goes to step 6. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 6: **(NOTE PRIOR TO STEP 6) NOTE: PERFORMANCE OF ATTACHMENT 1 TO PLACE THE FAILED POWER RANGE CHANNEL IN TRIP REQUIRES I&C ASSISTANCE.** STANDARD: • Contacts I&C and request their assistance in placing channel I Overpower / Overtemperature bistables in trip. *EXAMINER'S CUES: If asked, have the trainee proceed without waiting on the I&C Technicians.* COMMENTS:	___ SAT ___ UNSAT
STEP 7: **(STEP 6) INITIATE ATTACHMENT 1 TO PLACE FAILED CHANNEL IN TRIP WITHIN SIX HOURS.** STANDARD: • Initiates attachment 1. *EXAMINER'S CUES: If asked, have the trainee proceed without waiting on the I&C Technicians.* COMMENTS:	___ SAT ___ UNSAT

STEP 8: **DEFEAT FAILED CHANNEL ON COMPARATOR & RATE DRAWER. (ATTACHMENT 1, STEP 1, SECOND BULLET, SUBSTEPS a, and b.)**	**CRITICAL STEP**
STANDARD: *(a) Proceeds to the Comparator & Rate Drawer (NIS Panels) and selects the failed channel (N41) on the COMPARATOR CHANNEL DEFEAT Switch. (b) Checks COMPARATOR DEFEAT bistable light on. (c) Verifies annunciator 1G-E4, NIS PWR RNG CH AVG FLUX DEVIATION, is not lit.	___ SAT ___ UNSAT
COMMENTS:	
STEP 9: **DEFEAT FAILED CHANNEL ON MISCELLANEOUS CONTROL AND INDICATION DRAWER. (ATTACHMENT 1, STEP 1, 2nd BULLET SUBSTEPS a THROUGH f)**	**CRITICAL STEP**
STANDARD: *(a) Selects the failed channel (BYPASS PR N41) on the ROD STOP BYPASS Switch. (b) Verifies annunciator 1G-G1, NIS PWR RNG HI FLUX ROD STOP, is not lit. *(c) Selects the failed channel (PRN41) on the UPPER SECTION Defeat Switch. (d) Checks Upper Section CHANNEL DEFEAT bistable light (on drawer) illuminates. (e) Verifies annunciator 1G-C4, UPPER ION CHAMBER DEVIATION OR AUTO DEFEAT <50%, is not lit. *(f) Selects the failed channel (PRN41) on the LOWER SECTION Defeat Switch. (g) Checks Lower Section CHANNEL DEFEAT bistable light (on drawer) illuminates. (h) Verifies annunciator 1G-D4, LOWER ION CHAMBER DEVIATION OR AUTO DEFEAT <50%, is not lit.	___ SAT ___ UNSAT
COMMENTS:	

	CRITICAL STEP
STEP 10: **DEFEAT CHANNEL ON FAILED CHANNEL'S POWER RANGE DRAWER. (ATTACHMENT 1, STEP 2, SUBSTEPS a, b, and c)**	
STANDARD: *(a) Removes NIS Power Range Channel 1 (NI-1-41) INSTRUMENT POWER fuses (labeled 118V 5A AC INST PWR). (b) Places Channel 1 POWER RANGE TEST Switch in the TEST position. (c) Checks CHANNEL IN TEST bistable light (on drawer) illuminates. (d) Acknowledges annunciators 1G-C3 (NIS PWR RNG LOSS OF DET VOLT) and 1E-E5 (NIS PWR RNG HI STPT CH 1). (e) Verifies annunciator 1G-H1, NIS DROPPED ROD FLUX DECREASE >5% PER 2 SEC, is ~~not~~ lit.	___ SAT ___ UNSAT
EVALUATOR'S NOTE: **If trainee starts to perform step 2, intervene and state only step 1 was required.** **Only 1 instrument power fuse is ~~requried~~** required **to satisfy the intent of step (a) above.**	
COMMENTS:	
STEP 11: **REPORT TO SHIFT SUPERVISOR (EVALUATOR).**	
STANDARD: Verbal status report made that NIS Power Range Channel 1, NI-1-41, defeated in accordance with 1-AP-4.00, Attachment 1, step 1.	___ SAT ___ UNSAT
COMMENTS:	
END OF TASK	

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).

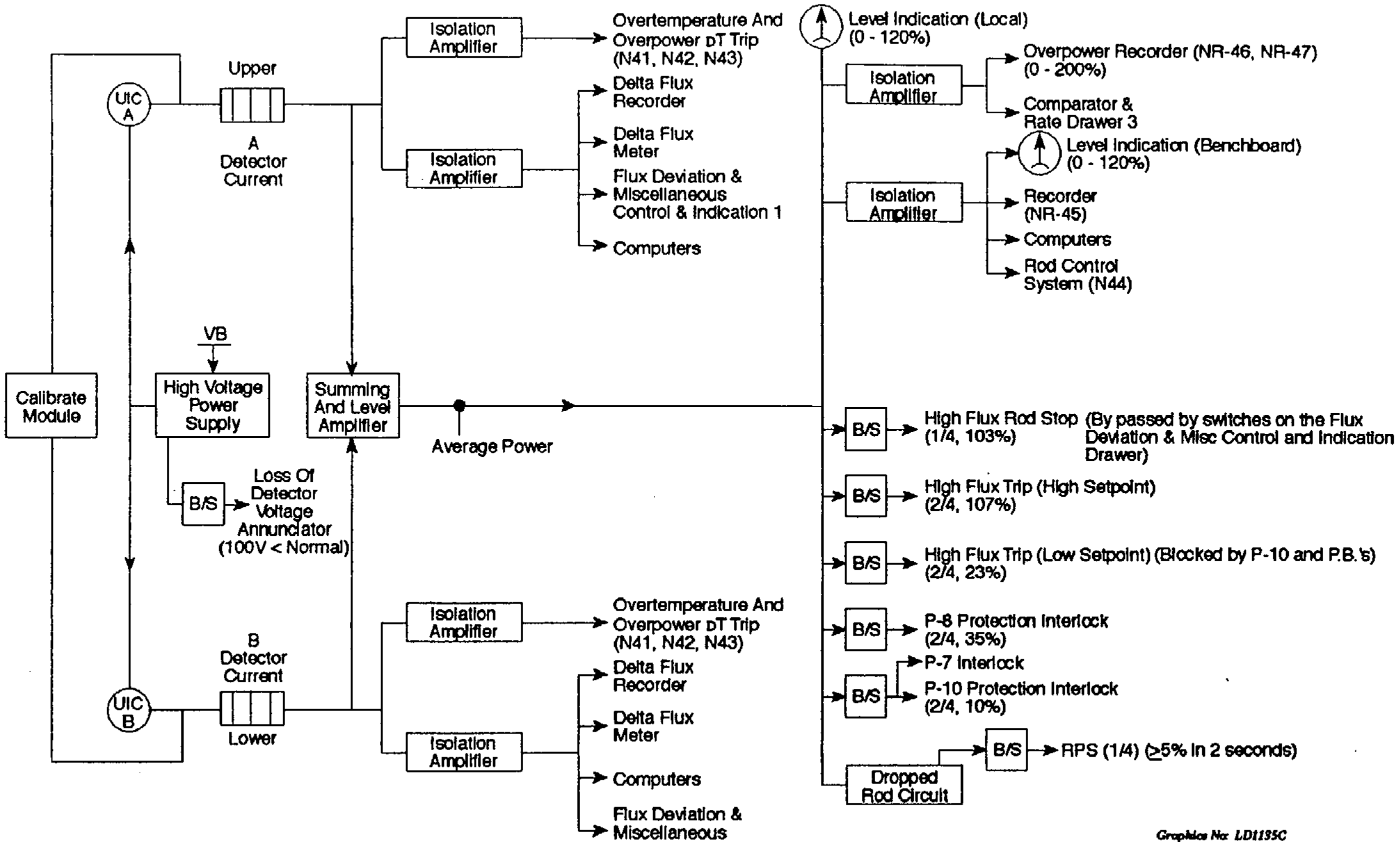
- **STEP # 8 - Placing the COMPARATOR CHANNEL DEFEAT Switch to the N41 position removes the failed input to the power range comparator section and allows alarm reset. The comparator section monitors the difference between the highest and lowest reading power range channels to indicate possible quadrant power tilt. The circuitry inputs to an alarm circuit if the difference exceeds 4% to inform the operator of an abnormal condition. Failure to clear this alarm removes monitoring deviation between operable channels.**

- **STEP # 9 - Placing the ROD STOP BYPASS Switch to the BYPASS PR N41 position ensures manual and automatic control rod capability when the failed channel is placed in trip. The UPPER and LOWER SECTION Defeat Switches are selected to the failed channel to remove failed channel input to the quadrant power tilt annunciator. Technical Specifications identify allowable Quadrant Power Tilt as 2.0%. Failure to bypass results in loss of automatic and manual rod withdrawal.**

- **STEP #10 - The failed power range instrument fuses are pulled to place the channel in trip to comply with Technical Specifications. Failure to place the channel in trip would lead to an LCO violation.**

Critical Step Sequencing:

8 before 9 before 10.



Upper/Lower Ion Chamber Current to ΔT Protection System for Δø Penalty

Overpower Rod Stop 1/4 at 103%

Overpower Rx Trip 2/4 at 107%

Overpower Rx Trip (Low) 2/4 at 23%, manually blocked by P-10

P-8 3/4 PR < 35% blocks Low Flow Trip in 1/3 Loops

P-10 2/4 PR 10%, allows manual block of overpower trip (low stpt), IR High Flux Trip and Rod Stop, Blocks reset of SR High Voltage

Dropped Rod (1/4) 5% reduction in 2 secs

1 - Compares Upper Detectors to the Avg of the Upper Detectors.

2 - Compares Lower Detectors to the Avg of the Lower Detectors.

3 - Compares Channel Avgs to the lowest channel.

POWER RANGE CHANNEL

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are the Unit 1 Reactor Operator.

Unit 1 is stable at 100% power with all systems in automatic.

A transient has just occurred on Unit 1.

INITIATING CUES:

I need you to respond to this transient.

Procedure: *1-AP-4.00*

Rev: *013* PAR: *0*

SIMULATOR

Title: ***NUCLEAR INSTRUMENTATION MALFUNCTION***

Effective Date: *09/28/1999*

Station: *Surry* Docbase: *SUMIND*

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

This leader page is part of the controlled document and must remain with the procedure as a permanent record.

Approval signatures for electronically distributed procedures are maintained on file.

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NUMBER	PROCEDURE TITLE	REVISION
1-AP-4.00	NUCLEAR INSTRUMENTATION MALFUNCTION (With 6 Attachments)	13
		PAGE 1 of 8

PURPOSE

To provide guidance for malfunctions of the Nuclear Instrumentation System.

ENTRY CONDITIONS

1. Malfunction of any NI channel indicated by erratic or lost indication.
2. Malfunction of any NI channel indicated by any of the following annunciators:
   - 1G-A3, NIS SOURCE RNG LOSS OF DET VOLT
   - 1G-B3, NIS INT RNG LOSS OF DET VOLT
   - 1G-C3, NIS PWR RNG LOSS OF DET VOLT
   - 1G-D3, NIS INT RNG CH 1 LOSS OF COMPENSATION VOLT
   - 1G-E3, NIS INT RNG CH 2 LOSS OF COMPENSATION VOLT
3. Invalid Reactor Trip signal exists from any NI channel.
4. Invalid Rod Stop signal exists from any PR or IR NI channel.

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	___CHECK NI MALFUNCTION - POWER RANGE FAILURE	GO TO Step 7.
2.	___STABILIZE UNIT CONDITIONS	
3.	___CHECK N-44 - FAILED	GO TO Step 5.
4.	___VERIFY ROD CONTROL - IN MANUAL	Place Rod Control in MANUAL.
5.	___CHECK POWER RANGE CHANNELS - ONLY ONE FAILED	Do the following: a) Place the unit in HSD within six hours. b) GO TO Step 7.

<u>NOTE</u>: Performance of Attachment 1 to place the failed Power Range Channel in trip requires I&C assistance.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	___INITIATE ATTACHMENT 1 TO PLACE FAILED CHANNEL IN TRIP WITHIN SIX HOURS	
7.	___CHECK NI MALFUNCTION - INTERMEDIATE RANGE FAILURE	GO TO Step 14.
8.	___STABILIZE UNIT CONDITIONS	
9.	___INITIATE ATTACHMENT 2	
10.	___CHECK REACTOR POWER - GREATER THAN 10%	GO TO Step 14.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*11.	__CHECK THE FOLLOWING: • Reactor shutdown - REQUIRED AND • Both IR channels - FAILED LOW	GO TO Step 14. IF Reactor shutdown becomes necessary AND both IR channels are failed low, THEN perform Steps 12 and 13.

* *

CAUTION: The P-6 permissive is not enabled if both Intermediate Range channels fail low.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	__PERFORM A REACTOR SHUTDOWN: a) Initiate power reduction IAW the appropriate GOP: • 1-GOP-2.1, UNIT SHUTDOWN, POWER DECREASE FROM MAXIMUM ALLOWABLE POWER TO 25% - 30% REACTOR POWER • 1-GOP-2.2, UNIT SHUTDOWN, 25% - 30% REACTOR POWER TO 2% REACTOR POWER b) At 15% power, manually trip the Reactor and initiate 1-E-0, REACTOR TRIP OR SAFETY INJECTION	
13.	__VERIFY SOURCE RANGE CHANNELS - BOTH ENERGIZED	Energize Source Range high voltage by pushing the Source Range trip reset pushbuttons: • 1/N 39A, TR A • 1/N 39B, TR B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	__CHECK NI MALFUNCTION - SOURCE RANGE FAILURE	GO TO Step 32.
15.	__STABILIZE UNIT CONDITIONS	
16.	__CHECK REACTOR POWER - GREATER THAN P-6 (1 x 10^{-10} Amps)	GO TO Step 22.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

17. __VERIFY BOTH SOURCE RANGE CHANNELS - HIGH VOLTAGE OFF

Do the following:

a) Attempt to block high voltage by depressing SOURCE RNG BLOCK pushbuttons:

- 1/N 33A, TR A
- 1/N 33B, TR B

b) IF Source Range high voltage OFF, THEN GO TO Step 32.

c) IF high voltage still NOT OFF, THEN do the following:

1) Place LEVEL TRIP switch for failed channel(s) in BYPASS.

2) Pull the instrument power fuses on the failed channel(s).

3) Refer to Tech Spec Table 3.7-1, Item 4.

4) Make entry in Plant Status Log and Shift turnover sheets to reinstall fuses when RX power decreases to less than 5 x 10^{-11} amps.

5) WHEN RX power decreases to less than 5 x 10^{-11} amps, THEN do the following:

a. Reinstall the instrument power fuses on the failed channel(s).

b. Place the LEVEL TRIP switch(es) in NORMAL.

c. IF both Source Range Channels failed, THEN perform Attachment 3.

d) GO TO Step 32.

18. __PLACE LEVEL TRIP BYPASS SWITCH FOR FAILED CHANNEL(s) IN BYPASS

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	__REVIEW TECH SPEC TABLE 3.7-1, ITEM 4	
20.	__VERIFY SOURCE RANGE CHANNELS - AT LEAST ONE OPERABLE	Enter Action Statement to perform Attachment 3 during the next Reactor trip or shutdown.
21.	__GO TO STEP 32	
22.	__CHECK REFUELING OPERATIONS - IN PROGRESS	GO TO Step 24.
23.	__REVIEW TECH SPEC 3.10.A.3	
24.	__VERIFY SOURCE RANGE CHANNELS - AT LEAST ONE OPERABLE	Do the following: a) Initiate Attachment 3. b) GO TO Step 29.
25.	__CHECK CTMT - OCCUPIED	GO TO Step 27.
26.	__VERIFY AUDIBLE SOURCE RANGE INDICATION - AVAILABLE IN CONTAINMENT	Do the following: a) Place Channel select switch on front of Audio Count Rate drawer to an operable channel. b) <u>IF</u> Audio Count Rate still <u>NOT</u> available in CTMT, <u>THEN</u> place switch in back of Audio Count Rate drawer to A1 or A2 position. (Audio Count Rate will <u>NOT</u> be available in MCR). c) <u>IF</u> neither channel can give audible indication, <u>THEN</u> evacuate CTMT.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27.	__HAVE RX ENGINEERING OR THE STA PERFORM 0-NSP-RX-001, CHI-SQUARED TEST, TO EVALUATE OPERABLE SR DETECTOR RELIABILITY	
28.	__MONITOR SUBCRITICAL CONDITIONS OF THE CORE WITH THE SR DETECTOR AND THE GAMMA-METRICS NARROW RANGE MONITORS	
29.	__CHECK REACTOR TRIP BREAKERS - CLOSED WITH CONTROL RODS CAPABLE OF WITHDRAWAL	Do the following: a) Maintain Reactor power below P-6. b) Verify adequate Shutdown Margin within one hour and once each 12 hours thereafter. c) Perform one of the following: • Verify racked out or rack out the MG set supply breakers: • 14C2-2 • 14A1-3 <u>OR</u> • Verify racked out or rack out the MG set output breakers <u>OR</u> • Verify racked out or rack out the Reactor Trip breakers d) GO TO Step 32.
30.	__MAINTAIN REACTOR POWER BELOW P-6	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31.	__CHECK THE FAILED CHANNEL - RESTORED WITHIN 48 HOURS	Do the following: a) Open the Reactor Trip breakers within the next hour. b) Verify adequate Shutdown Margin within one hour and once each 12 hours thereafter.
32.	__NOTIFY THE FOLLOWING • Instrument Shop • OM on call	

- END -

ONE POWER RANGE CHANNEL INOPERABLE

1. Perform the following at the NIS panel.

   - Comparator and Rate Drawer

   ___ a. Select the failed channel on the COMPARATOR CHANNEL DEFEAT switch.

   ___ b. Verify annunciator 1G-E4, NIS PWR RANGE CH AVG FLUX DEVIATION - NOT LIT.

   - Miscellaneous Control and Indication Panel

   ___ a. Select the failed channel on the ROD STOP BYPASS switch.

   ___ b. Verify annunciator 1G-G1, NIS PWR RNG HI FLUX ROD STOP - NOT LIT.

   ___ c. Select the failed channel on the UPPER SECTION defeat switch.

   ___ d. Verify annunciator 1G-C4, UPPER ION CHAMBER DEVIATION OR AUTO DEFEAT < 50% - NOT LIT.

   ___ e. Select the failed channel on the LOWER SECTION defeat switch.

   ___ f. Verify annunciator 1G-D4, LOWER ION CHAMBER DEVIATION OR AUTO DEFEAT < 50% - NOT LIT.

2. Place the failed Power Range channel in trip IAW the following:

   ___ a. At the Power Range drawer, remove the INSTRUMENT POWER fuses.

   ___ b. At the Power Range drawer, put the POWER RANGE TEST switch in the TEST position.

   ___ c. Verify annunciator 1G-H1, NIS DROPPED ROD FLUX DECREASE > 5% PER 2 SEC - LIT.

3. Remove the following P-250 points for the failed channel from scan:

   ___ • N-41, N0041A and N0042A
   ___ • N-42, N0043A and N0044A
   ___ • N-43, N0045A and N0046A
   ___ • N-44, N0047A and N0048A

4. Have I&C place the OTΔT and OPΔT bistables for the failed channel in TRIP and verify the associated annunciators - LIT

CHANNEL I

___ BS-1-412B-1, Annunciator 1E-C7, RX TRIP CH 1 OΔT LOOP 1A
___ BS-1-412B-2, Annunciator 1G-F4, OVPWR ΔT TURB RNBK & ROD STOP CH 1
___ BS-1-412C-1, Annunciator 1E-C6, RX TRIP CH 1 OΔT LOOP 1A
___ BS-1-412C-2, Annunciator 1G-F3, OVTEMP ΔT TURB RNBK & ROD STOP CH 1

CHANNEL II

___ BS-1-422B-1, Annunciator 1E-D7, RX TRIP CH 2 OΔT LOOP 1B
___ BS-1-422B-2, Annunciator 1G-G4, OVPWR ΔT TURB RNBK & ROD STOP CH 2
___ BS-1-422C-1, Annunciator 1E-D6, RX TRIP CH 2 OΔT LOOP 1B
___ BS-1-422C-2, Annunciator 1G-G3, OVTEMP ΔT TURB RNBK & ROD STOP CH 2

CHANNEL III

___ BS-1-432B-1, Annunciator 1E-E7, RX TRIP CH 3 OΔT LOOP 1C
___ BS-1-432B-2, Annunciator 1G-H4, OVPWR ΔT TURB RNBK & ROD STOP CH 3
___ BS-1-432C-1, Annunciator 1E-E6, RX TRIP CH 3 OΔT LOOP 1C
___ BS-1-432C-2, Annunciator 1G-H3, OVTEMP ΔT TURB RNBK & ROD STOP CH 3

5. IF Reactor power is greater than 75%, THEN do either a OR b below.

___ a. Determine the core quadrant balance using the incore movable detectors when any of the following occur:

- Twelve hours have passed since the last core quadrant balance was performed.
- A change in Reactor power level greater than 10%.
- Control rod movement of greater than 30 inches. (48 steps)

OR

___ b. Within four hours, reduce Reactor power to less than 75% of rated power and reduce the High Flux trip setpoint to less than 85% of rated power.

___ 6. IF Reactor power is less than 75%, and will remain there, THEN within four hours, reduce the High Flux trip setpoint to less than 85% of rated power.

___ 7. Refer to Tech Spec Table 3.7-1, Item 2 (Operator Action 2A).

<u>NOTE</u>: 1-OPT-RP-001, Monthly Check Of Permissive Status Lights P-6, P-7, P-8 AND P-10, should be used to aid in Permissive Status Light verification.

___ 8. Refer to Tech Spec Table 3.7-1, Item 20.

___ 9. Refer to Tech Spec 3.12.D.

<u>NOTE</u>: 1-OPT-RP-001, Monthly Check Of Permissive Status Lights P-6, P-7, P-8 AND P-10, should be used to aid in Permissive Status Light verification.

<u>AVG POWER GREATER THAN 10%</u>

1. Continue unit operation.
2. Place the LEVEL TRIP switch for the failed channel(s) in BYPASS.
3. Refer to Tech Spec Table 3.7-1, Item 3. (Operator Action 3)
4. Refer to Tech Spec Table 3.7-1, Item 20. (Operator Action 13)

<u>AVG POWER LESS THAN 10%</u> (one channel failed)

1. Below P-6 (10^{-10} amps), restore the channel to operable status before Reactor power is increased to greater than P-6 (10^{-10} amps).
2. Above P-6 (10^{-10} amps), restore the channel to operable status before Reactor power is increased to greater than 10%.
3. Refer to Tech Spec Table 3.7-1, Item 3. (Operator Action 3)
4. Refer to Tech Spec Table 3.7-1, Item 20. (Operator Action 13)

<u>AVG POWER LESS THAN 10%</u> (both channels failed)

1. <u>IF</u> Reactor power is in the power range, <u>THEN</u> restore at least one channel to operable status within six hours <u>OR</u> return unit to HSD.
2. <u>IF</u> Reactor power is <u>NOT</u> in the power range, <u>THEN</u> insert all rods by tripping the reactor <u>AND</u> manually reinstate the source range.
3. Refer to Tech Spec 3.0.1.

___ 1. Insert all rods by tripping the Reactor as necessary.

___ 2. Evacuate the Containment.

___ 3. Monitor subcritical conditions of the core with the Gamma-Metrics source range monitors.

NOTE: At least one Gamma-Metrics source range channel must be monitored to permit CTMT entry. If the Gamma-Metrics source range channels do not agree within 1/2 decade but are both tracking neutron count rate, both channels may be used to monitor subcritical conditions of the core.

___ 4. Record initial count rate on Gamma-Metrics source range monitors.

________ 1-NI-NFI-1270A1 ________ 1-NI-NFI-190A1

___ 5. Continue to record count rate on Gamma-Metrics monitors at 15 minute intervals using Attachment 4.

___ 6. IF count rate on any Gamma-Metrics source range monitor increases by 1/2 decade, THEN evacuate CTMT.

___ 7. Rackout the Rod Drive MG set supply breakers, 14C2-2 and 14A1-3.

8. Isolate the PG flowpath to the blender by performing the following:

___ a. Close and place a Blue Tag on 1-CH-223.
___ b. Place Blue Tags on 1-CH-212, 1-CH-215, and 1-CH-218

___ 9. WHEN Steps 5 through 8 are complete, THEN CTMT entry is permitted.

___10. Verify adequate shutdown margin within one hour and at least once every 12 hours thereafter IAW 1-OP-RX-002, Shutdown Margin (Calculated At Zero Power).

NOTE: The RCS may be cooled down to 530°F.

___11. Do NOT cooldown to less than 530°F or make any changes to plant status which may add positive reactivity.

___12. IF cooldown less than 530°F required, THEN borate to Xenon free CSD.

___13. IF PG makeup to the RCS is required, THEN the flowpath must be secured within 15 minutes after makeup is complete. (Use Attachment 5 to record makeups)

___14. Refer to Tech Spec Table 3.7-1, Item 4. (Operator Action 4 or 5)

* *

CAUTION: CTMT must be evacuated if count rate on a Gamma-Metrics source range monitor increases by 1/2 decade above the previous reading or an increasing trend is observed.

* *

NOTE: The table should be duplicated as necessary to take all readings.

___ 1. Enter the readings from Step 4 of Attachment 3 at Hour 1, time 00.

___ 2. Continue to take readings at 15 minute intervals and record in the table until at least one Source Range Nuclear Instrument is operable.

	00	+ 15	+ 30	+ 45
Hour 1	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 2	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 3	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 4	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 5	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 6	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 7	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 8	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 9	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)
Hour 10	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)	______ (190A1) ______(1270A1)

NUMBER 1-AP-4.00	ATTACHMENT TITLE	REVISION 13
ATTACHMENT 5	RCS MAKEUP LOG	PAGE 1 of 1

NOTE: When 1-CH-223 is used to isolate the dilution flowpath, it should be closed while RCS makeup is in progress to minimize the effects of pressure binding on the valve.

Date	SS Notified (√)	Operator briefed (√)	PG Isol Valve Opened (vlv no./ time)	Dilution or makeup stopped and 15 min clock started (time)	PG Isol Valve closed and 15 min clock stopped (Init/time)	PG Isol valve closed IV (Init)
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I. PROBABLE CAUSES:

1. Loss of power
2. Circuit failure
3. Detector failure
4. Improper calibration

II. REFERENCES:

1. Tech Spec Table 3.7-1
2. Tech Spec 3.12.D
3. Tech Spec 3.12.B.4
4. Tech Spec 3.10.A.3
5. Tech Spec 3.0.1
6. UFSAR Sect 7.4
7. 1-E-0, REACTOR TRIP OR SAFETY INJECTION
8. 1-GOP-2.1, UNIT SHUTDOWN, POWER DECREASE FROM MAXIMUM ALLOWABLE POWER TO 25% - 30% REACTOR POWER
9. 1-GOP-2.2, UNIT SHUTDOWN, 25% - 30% REACTOR POWER TO 2% REACTOR POWER
10. 1-OP-RX-002, SHUTDOWN MARGIN (CALCULATED AT ZERO POWER)
11. 1-OPT-RP-001, MONTHLY CHECK OF PERMISSIVE STATUS LIGHTS P-6, P-7, P-8, AND P-10
12. CTS 2466, Procedure revised for actions upon loss of control power to Power Range NIs
13. DCP 94-007, Removal of Turbine Runback on Dropped Rod
14. Safety Evaluation No. 97-008, Rev. 1 (Attachments 3, 4, and 5)
15. CTS 4735, Placing Protection Channels in Trip (Attachment 1)

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-06

SIMULATOR

Title:

TRANSFER THE SI SYSTEM TO HOT LEG RECIRCULATION

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

TRANSFER THE SI SYSTEM TO HOT LEG RECIRCULATION

Alternate Path:

Facility JPM #:

LO JPM # 52.02

K/A Rating(s):

SYS006.K3.02 (RO 4.3/SRO 4.4)
SYS006.K4.08 (RO 3.2/SRO 3.6)
SYS006.A4.01 (RO 4.1/SRO 3.9)
SYS006.A4.02 (RO 4.0/SRO 3.8)

Task Standard:

1-ES-1.4, Transfer to Hot Leg Recirculation.

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

1-ES-1.4, Transfer to Hot Leg Recirculation.
ND-91-H/T-2.2, SI Tc Injection

Validation Time: 12 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:

1. If no pre-staged IC is available, this setup takes ~55 minutes.
2. Call up 100% power IC & initialize. Put "A" Chg PP in PTL.
3. From SIMLOC, energize MOV-1890A, 1890B, 1890C, 1869A & 1869B.
4. Place keys (#46 (2 each) & 47 (2 each) in MOV control switches for 1890A, 1890B, 1869A & 1869B.
5. Remove red tag magnets from the MOV's
6. Initiate a LBLOCA on "A" loop; perform 1-E-0 and transfer to 1-E-1; perform E-1, Loss of Reactor or Secondary Coolant, up to step 28; 2 HHSI pumps (C on normal hdr/B on alt hdr) and 2 LHSI pumps are to be operating on Cold Leg Recirc.
7. After system is stable on Cold Leg Recirc, freeze simulator for JPM performance.

SIMULATOR OPERATOR INSTRUCTIONS:

- None

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

1-ES-1.4, Transfer to Hot Leg Recirculation.

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. All control room steps shall be performed for this JPM, including any required communications. 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. To indicate that you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the Unit RO. We have reached the 9 hour point after a major LOCA on Unit 1. Currently the SI system is in the Cold Leg Recirculation mode.

INITIATING CUES:

I need you to get a copy of 1-ES-1.4 and transfer the SI system to Hot Leg Recirculation.

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 1: **REVIEW NOTE: If ANY HOT LEG INJECTION MOV WILL NOT OPEN, THE TSC SHOULD BE CONSULTED TO DETERMINE THE OPTIMAL SI ALIGNMENT. (BEFORE STEP 1)** STANDARD: Reads note and realizes if any Hot Leg injection MOV will not open, then the TSC should be consulted to determine the optimal SI alignment. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

	CRITICAL STEP
STEP 2: **ALIGN "A" LHSI PUMP TO THE HOT LEG FLOWPATH. (STEP 1)** TANDARD: (a) Verifies "A" LHSI pump running by observing breaker indication red light on, amps indicated, and flow indication on 1-SI-FI-1945. *(b) Closes 1-SI-MOV-1864A ("A" LHSI to Tc) by holding control switch in CLOSE position. (c) Verifies 1-SI-MOV-1864A closed by observing green light on & red off. *(d) Throttles open 1-SI-MOV-1890A ("A" LHSI to Th) until "A" LHSI pump stabilized flow < 3500 gpm as shown on 1-SI-FI-1945. (e) Verifies B LHSI pump running by observing breaker indication red light on, amps indicated, and flow indicated on 1-SI-FI-1946. *(f) Closes 1-SI-MOV-1864B ("B" LHSI to Tc) by holding control switch in CLOSE position. (g) Verifies 1-SI-MOV-1864B closed by observing green light on & red off. *(h) Throttles open 1-SI-MOV-1890B ("B" LHSI to Th) until "B" LHSI pump stabilized flow < 3500 gpm as shown on 1-SI-FI-1946. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT
STEP 3: **READS CAUTION AND NOTE (BEFORE STEP 2).** STANDARD: (a) Notes that the amount of time the CHG pumps are stopped should be minimized. (b) Notes that CHG pumps order of priority is C, B, A. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 4: **CHECK CHARGING PUMPS - TWO RUNNING. (STEP 2)** STANDARD: (a) Checks that 1-CH-P-1C running by observing breaker indication red light on and amps indicated. (b) Checks that 1-CH-P-1B running by observing breaker indication red light on and amps indicated. *EXAMINER'S CUES:* COMMENTS:	___ SAT ___ UNSAT

STEP 5: **VERIFY CHG PUMP REDUNDANT FLOW PATHS ESTABLISHED. (STEP 3)**	___ SAT
STANDARD:	___ UNSAT

(a) Verifies 1-CH-P-1C aligned to normal SI HDR by checking the following MOVs:
- Checks 1-CH-MOV-1286C open by observing red light on and green off.
- Checks 1-CH-MOV-1287C closed by observing green light on and red off.

(b) Verifies 1-CH-P-1B aligned to alternate SI HDR by checking the following MOVs:
- Checks 1-CH-MOV-1287B open by observing red light on and green off.
- Checks 1-CH-MOV-1286B closed by observing green light on and red off.

(c) Checks HHSI flow through the normal and alternate SI HDR by observing:
- 1-SI-FI-1940 (total flow ALT HDR).
- 1-SI-FI-1940A (total flow ALT HDR).
- 1-SI-FI-1943 (total flow NORMAL HDR).
- 1-SI-FI-1943A (total flow NORMAL HDR).
- 1-SI-FI-1961 (A LOOP FT).
- 1-SI-FI-1962 (B LOOP FT).
- 1-SI-FI-1963 (C LOOP FT).

(d) Checks 1-SI-MOV-1842 open by observing red light on and green off.

EXAMINER'S CUES: • *If asked: about CHG pump HDR lineups, then tell them it is what you see(the operator must use available indications to determine which CHG pumps are aligned to which SI HDR).*

COMMENTS:

STEP 6: **GO TO STEP 6 (STEP 4).** STANDARD: • Goes to Step 6 *EXAMINER'S CUES:* COMMENTS:	

STEP 7: **ALIGN CHG NORMAL FLOW PATH FOR HOT LEG RECIRCULATION. (STEP 6)**

CRITICAL STEP

___ SAT

___ UNSAT

STANDARD:

(a) Stops 1-CH-P-1C by placing control switch in Pull-To-Lock position.
(b) Verifies "C" CHG pump stopped by observing no breaker indicating lights lit and no amps indicated.
(c) Acknowledges annunciators C-D-3 (RCP 1A SHAFT SEAL WTR LO INJ FLOW), C-E-3 (RCP 1B SHAFT SEAL WTR LO INJ FLOW), and C-F-3 (RCP 1C SHAFT SEAL WTR LO INJ FLOW).
*(d) Opens 1-SI-MOV-1869B (HHSI to Th).
(e) Verifies 1-SI-MOV-1869B open by observing red light on & green off.
*(f) Closes 1-SI-MOV-1867C (HHSI to Tc).
(g) Verifies 1-SI-MOV-1867C closed by observing green light on & red off.
*(h) Closes 1-SI-MOV-1867D (HHSI to Tc).
(i) Verifies 1-SI-MOV-1867D closed by observing green light on & red off.
*(j) Re-starts 1-CH-P-1C by placing control switch to Start position.
(k) Verifies "C" Chg pump started by observing breaker indication red light on and amps indicated.
(l) Verifies HHSI flow through the normal header by observing:
- 1-SI-FI-1943 (header total flow),
- 1-SI-FI-1943A (header total flow),
- 1-SI-FI-1933, (hot leg loop flow located above cold leg)
- 1-SI-FI-1960, (hot leg loop flow located above cold leg)
- 1-SI-FI-1932, (hot leg loop flow located above cold leg)

EXAMINER'S CUES:

COMMENTS:

STEP 8: ALIGN CHG ALTERNATE FLOW PATH FOR HOT LEG RECIRCULATION. (STEP 7)	CRITICAL STEP
STANDARD: (a) Stops 1-CH-P-1B by placing control switch in Pull-To-Lock position. (b) Verifies "B" CHG pump stopped by observing no breaker indicating lights lit and no amps indicated. *(c) Opens 1-SI-MOV-1869A (HHSI to Th). (d) Verifies 1-SI-MOV-1869A opens by observing red light on & green off. *(e) Closes 1-SI-MOV-1842 (HHSI to Tc). (f) Verifies 1-SI-MOV-1842 closes by observing green light on & red off. *(g) Re-starts 1-CH-P-1B by placing control switch to Start position. (h) Verifies "B" Chg pump starts by observing breaker indication red light on and amps indicated. (i) Verifies HHSI flow through the alternate header by observing: • 1-SI-FI-1940 (header total flow), • 1-SI-FI-1940A (header total flow), • 1-SI-FI-1933, (hot leg loop flow located above cold leg) • 1-SI-FI-1960, (hot leg loop flow located above cold leg) • 1-SI-FI-1932, (hot leg loop flow located above cold leg) COMMENTS:	___ SAT ___ UNSAT
STEP 9: REPORT TO SHIFT SUPERVISOR (EVALUATOR). STANDARD: Verbal status report made that Hot Leg Recirc established. COMMENTS:	___ SAT ___ UNSAT

TIME STOP: ________

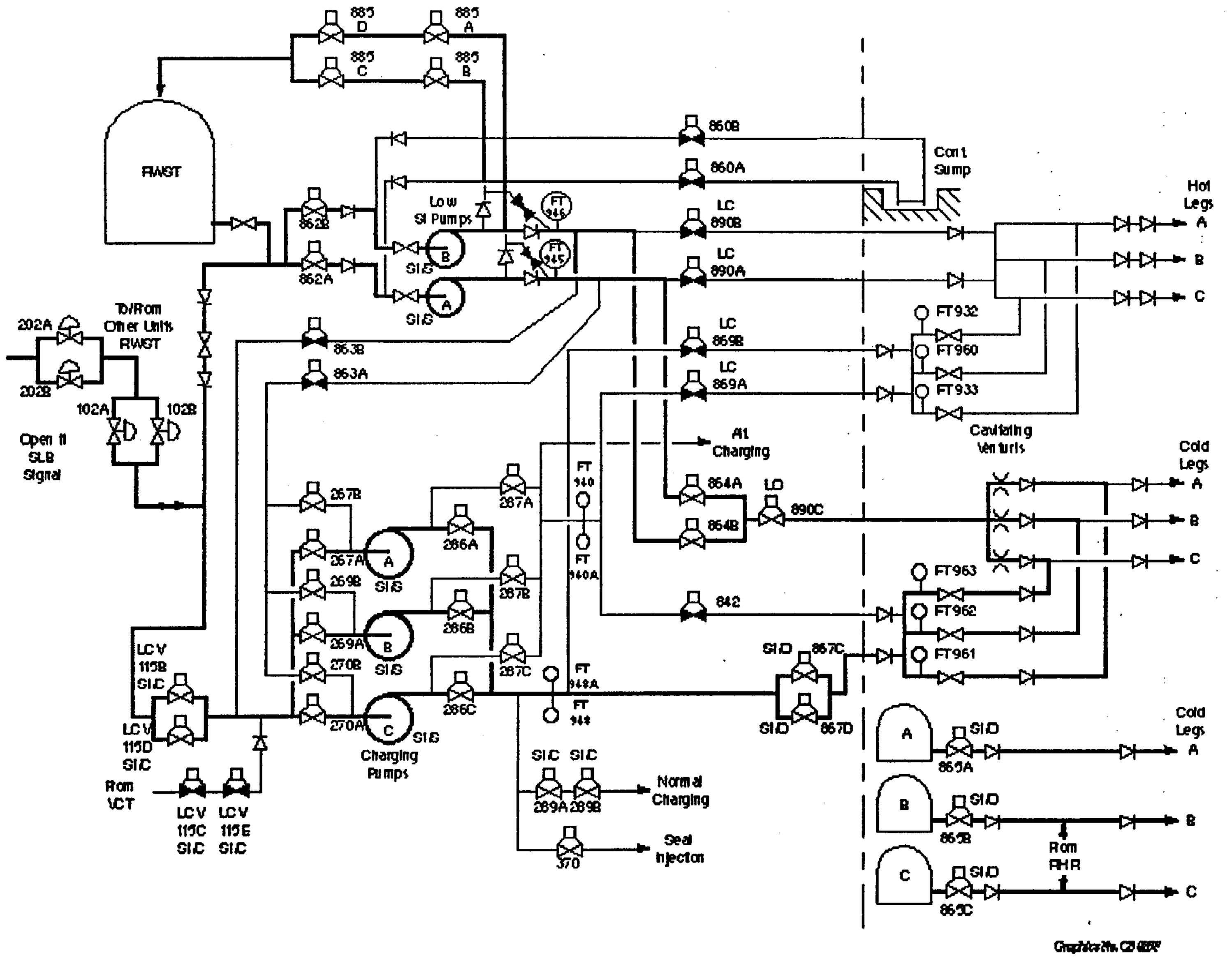
Critical Step Justification:

Substeps within the critical step block are designated with an asterisk (critical component of the step) or no asterisk (Not a critical component).

- **STEP # 2 - These valve manipulations must be performed in order to maintain low head flow to the core.**
- **STEP # 7- These valve manipulations must be performed in order to maintain normal high head flow to the core.**
- **STEP # 8- These valve manipulations must be performed in order to maintain alternate high head flow to the core.**

Critical Step Sequencing:

- 2b before 2d and 2f before 2h.
- 7d, 7f, and 7h before 7j
- 8c and 8e before 8g



SI To INJECTION

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the Unit RO. We have reached the 9 hour point after a major LOCA on Unit 1. Currently the SI system is in the Cold Leg Recirculation mode.

INITIATING CUES:

I need you to get a copy of 1-ES-1.4 and transfer the SI system to Hot Leg Recirculation.

VIRGINIA POWER
SURRY POWER STATION
Level 2 Distribution
This document should be verified and annotated to a controlled source as required to perform work.
EMERGENCY PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-ES-1.4	TRANSFER TO HOT LEG RECIRCULATION	4
		PAGE 1 of 7

PURPOSE

To provide guidance to transfer the Safety Injection system to hot leg recirculation mode.

SIMULATOR

ENTRY CONDITIONS

1) Transition from any of the following procedures:
    - 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
    - 1-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION,

2) Direction from TSC.

ENTERED BY
MAR 15 1994
TKL

APPROVAL RECOMMENDED	APPROVED	DATE
REVIEWED	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	MAR 15 1994

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<u>NOTE</u>: If any hot leg injection MOV will not open, the TSC should be consulted to determine the optimal SI alignment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	__ALIGN LHSI FLOW PATH FOR HOT LEG RECIRCULATION:	
	a) Verify LHSI pump A - RUNNING	a) GO TO Step 1e.
	b) Close LHSI pump A discharge to cold legs: • 1-SI-MOV-1864A	
	c) Throttle open LHSI pump A discharge to hot legs to 3500 gpm: • 1-SI-MOV-1890A	
	d) Maintain LHSI pump A flow - LESS THAN 3500 GPM • 1-SI-FI-1945	
	e) Verify LHSI pump B - RUNNING	e) GO TO Step 2.
	f) Close LHSI pump B discharge to cold legs: • 1-SI-MOV-1864B	
	g) Throttle open LHSI pump B discharge to hot legs to 3500 gpm: • 1-SI-MOV-1890B	
	h) Maintain LHSI pump B flow - LESS THAN 3500 GPM • 1-SI-FI-1946	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: The amount of time that CHG pumps are stopped should be minimized.

* *

NOTE: CHG pumps should be run in the following order of priority: C, B, A.

2. __CHECK CHG PUMPS - TWO RUNNING

RESPONSE NOT OBTAINED:

IF one CHG pump is running, THEN do the following:

a) Put the running CHG pump in PTL.

b) Open HHSI to hot legs:

- 1-SI-MOV-1869B

c) Close HHSI to cold legs:

- 1-SI-MOV-1867C
- 1-SI-MOV-1867D

d) Start the CHG pump stopped in Step 2a.

e) Verify HHSI flow:

- 1-SI-FI-1943
- 1-SI-FI-1943A 4
- 1-SI-FI-1933 (NQ)
- 1-SI-FI-1960 (NQ)
- 1-SI-FI-1932 (NQ)

f) GO TO Step 8.

IF three CHG pumps running, THEN stop one pump AND put in PTL.

3. __VERIFY CHG PUMP REDUNDANT FLOW PATHS - ESTABLISHED

RESPONSE NOT OBTAINED: GO TO Step 5.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	__GO TO STEP 6	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: The highest priority CHG pump should be aligned to the normal header.

5. __ESTABLISH CHG PUMP REDUNDANT FLOW PATHS:

a) Verify or put the standby CHG pump in PTL

b) Open alternate HHSI to cold legs:

- 1-SI-MOV-1842

c) Align one CHG pump to flow through the normal SI HDR by closing the associated alternate discharge MOV:

- 1-CH-P-1A   1-CH-MOV-1287A
- 1-CH-P-1B   1-CH-MOV-1287B
- 1-CH-P-1C   1-CH-MOV-1287C

d) Align the other running CHG pump to flow through the alternate SI HDR by closing the associated normal discharge MOV:

- 1-CH-P-1A   1-CH-MOV-1286A
- 1-CH-P-1B   1-CH-MOV-1286B
- 1-CH-P-1C   1-CH-MOV-1286C

e) Close the normal discharge MOV on the NON-RUNNING CHG pump:

- 1-CH-P-1A   1-CH-MOV-1286A
- 1-CH-P-1B   1-CH-MOV-1286B
- 1-CH-P-1C   1-CH-MOV-1286C

f) Verify HHSI flow through BOTH headers

- 1-SI-FI-1940
- 1-SI-FI-1940A 4
- 1-SI-FI-1943
- 1-SI-FI-1943A 4

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6. __ALIGN CHG NORMAL FLOW PATH FOR HOT LEG RECIRCULATION:

   a) Put the CHG pump supplying the normal SI HDR in PTL

   b) Open HHSI to hot legs:

   - 1-SI-MOV-1869B

   c) Close HHSI to cold legs:

   - 1-SI-MOV-1867C
   - 1-SI-MOV-1867D

   d) Start the CHG pump stopped in Step 6a

   e) Verify HHSI flow:

   - 1-SI-FI-1943
   - 1-SI-FI-1943A 4

   - 1-SI-FI-1933 (NQ)
   - 1-SI-FI-1960 (NQ)
   - 1-SI-FI-1932 (NQ)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

7. __ALIGN CHG ALTERNATE FLOW PATH FOR HOT LEG RECIRCULATION:

    a) Put the CHG pump supplying the alternate SI HDR in PTL

    b) Open HHSI to hot legs:

    - 1-SI-MOV-1869A

    c) Close HHSI to cold legs:

    - 1-SI-MOV-1842

    d) Start the CHG pump stopped in Step 7a

    e) Verify HHSI flow:

    - 1-SI-FI-1940
    - 1-SI-FI-1940A 4

    - 1-SI-FI-1933 (NQ)
    - 1-SI-FI-1960 (NQ)
    - 1-SI-FI-1932 (NQ)

8. __RETURN TO PROCEDURE AND STEP IN EFFECT

- END -

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Control Room Systems

NRC-CRS-JPM-07

SIMULATOR

Title:

Venting/Purging the PRT to the Vent Vent System

IAW 1-OP-RC-011

Section 5.5

CANDIDATE ____________________

EXAMINER ____________________

REGION II

INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Venting/Purging the PRT to the Vent Vent System.

Alternate Path:

N/A

Facility JPM #:

NEW

K/A Rating(s):

SYS007.A1.02 (RO 2.7/SRO 2.9)

Task Standard:

Completion of 1-OP-RC-011, Venting/Purging the PRT to the Vent Vent System, Section 5.5.

Preferred Evaluation Location: Simulator __X__ In-Plant ______

Preferred Evaluation Method: Perform __X__ Simulate ______

References:

1-OP-RC-011, Pressurizer Relief Tank Operations

Validation Time: 30 min. **Time Critical:** No

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Applicant: ________________________________ Time Start : ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ________________________ ______________________________/________
NAME SIGNATURE DATE

==

COMMENTS

____

____

____

SIMULATOR SETUP INSTRUCTIONS:

1. Recall protected IC for CSD conditions.
2. Place simulator in RUN.
3. Stabilize unit . Place the simulator in freeze.
4. Run simulator for 10 minutes to determine nuisance annunciators, then place the simulator in freeze.
5. Recall JPM saved conditions and override all nuisance annunciators to minimize trainee distractions.
6. Recall JPM saved conditions.
7. Place simulator in run when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

JPM Step 1 – When asked as HP tell the applicant that the PRT sample indicates $\leq 5 \times 10^{-2}$ µCi/ml.

JPM Step 12 – When asked for a MISCellaneous GrounD BATCH release permit then tell the candidate that it is on the way.

JPM Step 14 - When asked to connect a poly hose securely from 1-RC-ICV-5025, PRT PT-1472 VENT (-3 foot elev), to the nearest Containment Purge exhaust ductwork vent (-27 foot elev). Then inform the candidate that time compression has occurred and the poly hose is attached to the Containment Purge Exhaust ductwork.

JPM Step 16 – When asked to throttle open 1-RC-ICV-5025, PRT PT-1472 VENT, while keeping release rate low enough to not allow Radiation Monitors beyond ALERT. Then decrease Simloch variable RCM921 (PRT nitrogen mass) one unit every few seconds while monitoring RCP911 (PRT Nitrogen Pressure in psia) to simulate purging the PRT. Stop decrease when the candidate informs you to stop.

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

- 1-OP-RC-011, Pressurizer Relief Tank Operations
- MISC GRD BATCH Release Permit

DIRECTIONS TO APPLICANT:

I will explain the initial conditions and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. 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. To indicate that you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the unit RO. The unit is in CSD with all RCS loops isolated and drained to flange level, Containment vacuum is broken and Containment Purge is in Operation. All leakage paths to the PRT have been isolated. All Pressurizer Safety Valves and PORV's are installed. Chemistry has taken a sample of the PRT gas and it has been delivered to HP for analysis and appropriate permit generation one hour ago.

INITIATING CUES:

I need you to purge the PRT to the Vent Vent system in accordance with 1-OP-RC-011 starting at Step 5.5. I have personnel standing by to perform necessary steps outside the control room. When you have completed the task please inform me.

JPM LEGEND:

Bold	Highlighted JPM Headings and notes/ provide 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: ______

Venting/Purging the PRT to the Vent Vent System

STEP 1: **OBSERVES CAUTION (BEFORE STEP 5.5.1)**

- **HP must be notified prior to the start or re-initiation of a PRT release to Vent Vent. (Reference 2.4.1)**
- **If the PRT gas sample indicates Xe-133 activity greater than or equal to 5 x 10 $^{-2}$ µCi/ml, the release shall be made to the Overhead Gas System.**

STANDARD:

- Notes that HP must be notified prior to the start or re-initiation of a PRT release to Vent Vent.
- Notes that if the PRT gas sample indicates Xe-133 activity greater than or equal to 5 x 10 $^{-2}$ µCi/ml, the release shall be made to the Overhead Gas System.

EXAMINER'S CUES: If asked, HP has been contacted to sample the PRT gas and generate the appropriate release permit (stated in initial conditions).

If asked, HP must be contacted to determine if sample activity is > 5 x 10 $^{-2}$ µCi/ml.

COMMENTS:

STEP 2: **OBSERVES NOTE (BEFORE STEP 5.5.1)** • **If the Pressurizer is solid, gas leakage through an unisolated Pressurizer PORV is considered terminated and PRT release to Process Vent or Vent-Vent is permissible with HP count room concurrence.** STANDARD: • Obseves that the Pressurizer is not solid;however, the PRZR PORV's are closed. Therefore, this is a batch release.not a continuous release. *EXAMINER'S CUES: If asked, the pressurizer conditions are as you see them.* COMMENTS:	_____SAT _____UNSAT

STEP 3:	**(Step 5.5.1) Verify that the following conditions are met before proceeding. (✓)**	
( )	**Verify that no unisolated leakage path into the PRT exists. Otherwise, enter N/A for this Subsection and perform Subsection 5.7, Installing PRT Vent to the Overhead Gas System.**	_____SAT
( )	**Containment vacuum is broken and Containment purge is in operation IAW 1-OP-VS-001, Containment Ventilation.**	_____UNSAT
( )	**Health Physics Count Room has been notified that the Unit 1 PRT will be vented to the Vent Vent System and provide the status of the PRZR PORVs (Reference 2.3.13)**	
( )	**The following Vent vent radiation monitors are operable .** ● **RI-VG109-, VENT VNT SMPL - PARTIC** ● **RI-VG110, VENT VNT SMPL - GAS**	
( )	**The following vent vent radiation monitors are operable.** ● **RI-VG-131-1, VNT STACK No. 2 EFFLUENT MON NORM RNG** ● **RI-VG-131-2, VNT STACK No. 2 EFFLUENT MON HI RNG** **OR** ● **1-RI-VG-123, Vent Stack No. 2 Inlet (H) Range Rad Monitor.**	
STANDARD:	• Recalls from the initial conditions that all leakage paths into the PRT have been isolated. • Recalls from the initial conditions that containment vacuum is broken and containment purge is in operation. • Contacts HP to tell them the release path is the Vent Vent and that the PZR PORV's are both closed. • Determines that the Victoreen Vent Vent radiation monitors are operable by observing normal operation of RI-VG-109 and RI-VG-110. • Determines that the Kaman Vent Vent radiation monitors are operable by observing normal operation of RI-VG-131-1 and RI-VG-131-2. or • Instructs Service Building North yard operator to verify operability of NRC radiation monitor 1-RI-VG-123.	

EXAMINER'S CUES:

- *If asked, there are no unisolated leakage paths into the PRT.*
- *If asked, Containment Conditions are as you see them.*
- *If asked, HP must be contacted the release path (Vent Vent) and the PZR PORV status (both closed).*
- *If asked, the Victoreen Vent Vent radiation monitors RI-VG-109 and RI-VG-110 are as you see them (operable).*
- *If asked, the Kaman Vent Vent radiation monitors RI-VG-131-1 and RI-VG-131-2 are as you see them (operable).*
- *If asked, an auxiliary operator must sent to determine the status of the NRC Vent Vent radiation monitor 1-RI-VG-123. (located in the Emergency Switchgear Room and it is operable).*

COMMENTS:

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<u>STEP 4</u>: **(Step 5.5.2) Adjust PRT Level by selecting desired condition and performing the associated substeps.**

The PRT needs to be purged.

Or

The PRT needs to be vented due to leakage past the PRZR Svs or PORVs.

Raise PRT level to less than or equal to 95% IAW Subsection 5.2, stopping level increase before PRT pressure exceeds 30 psig.

<u>STANDARD:</u>

- Recalls from the initiating cue. that the PRT needs to be purged to the Vent Vent system.
- Recalls from the initial conditions that the RCS is in CSD.
- Goes to Step 5.2 to raise PRT level to ≤ 95%, stopping before PRT pressure > 30 psig.

EXAMINER'S CUES:

- *If asked, the PRT needs to be purged to the Vent Vent System.*
- *If asked, the RCS is in Cold Shutdown (CSD).*
- *If asked, raise the PRT level to 90%.*

<u>COMMENTS:</u>

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_____SAT

_____UNSAT

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STEP 5: **(STEP 5.2) Filling the PRT** **5.2.1 Notify the STA that the Unit 1 PRT will be filled.** ***5.2.2 Open 1-RC-TV-1519A, PRZR RELIEF TK PRI GRADE WTR OTSD TRIP VV.** **5.2.3 Verify closed or close 1-RC-HCV-1523, PRT DRAIN.** ***5.2.4 Open 1-RC-HCV-1519B, PRT MAKEUP, to fill the PRT.** **NOTE: When the Unit is in CSD or RSD, the PRT may be filled to 95% to assist in venting/purging the PRT to the Vent/Vent or Process Vent System.** ***5.2.5 WHEN the desired level is reached, THEN close 1-RC-HCV-1519B.** **5.2.6 At the discretion of the Shift Supervisor, close 1-RC-TV-1519A. Otherwise, enter N/A** STANDARD: (a) Notifies the STA via Gaitronics or phone that the Unit 1 PRT will be filled. *(b) Opens 1-RC-TV-1519A, PRZR RELIEF TK PRI GRADE WTR OTSD TRIP VV by depressing the Red Open pushbutton and holding it until its Green close pushbutton light is Off and the Red pushbutton light is On. (c) Verifies closed 1-RC-HCV-1523, PRT DRAIN (Green light On and Red light Off). *(d) Opens 1-RC-HCV-1519B, PRT MAKEUP, to fill the PRT (Red light On and Green light off). (e) Reads note and recalls from initial conditions that the RCS is in CSD and the PRT may be filled to 95% which will assist in purging the PRT to the Vent/Vent System. *(f) Closes 1-RC-HCV-1519B when the desired level (90%) is reached. (g) Closes 1-RC-TV-1519A. *EXAMINER'S CUES:* • *When asked, the desired PRT level is 90% unless PRT pressure increases to > 30 psig in the PRT then stop.* • *When asked, you want 1-RC-TV-1519A to be closed.* COMMENTS:	Critical Step _____SAT _____UNSAT

<u>STEP 6</u>: **(STEP 5.5.3) Adjust pressure by selecting desired condition and performing the associated substeps. <u>IF</u> venting the PRT of excess ntirogen after draindown, <u>THEN</u> enter N/A.** **The PRT Needs to be purged, Unit Mode CSD or RSD** **Verify or increase PRT pressure to between 15 psig and 30 psig IAW Subsection 5.4.** <u>STANDARD:</u> (a) Recalls from Initial cue that the PRT is to be purged. (b) Recalls from the initial conditions that the RCS is in CSD. *EXAMINER'S CUES:* • *If asked, the PRT needs to be purged.* • *If asked, the PRT pressure is to be raised to 20 psig.* <u>COMMENTS:</u>	_____SAT _____UNSAT

STEP 7:		
5.4 Adding Nitrogen to the PRT. **5.4.1 Verify PRT pressure needs to be increased (normal operating range is 2 to 4 psig).** **5.4.2 Verify one of the following substeps. (✓)** **( ) 1SI-TV-100, ACCUM & PRT N2 SUP O/S TV is closed with an upstream N_2 supply valved in.** **OR** **( ) Accumulator N_2 pressure is available for makeup.** **5.4.3 Verify the following valves are closed.** **a. 1-SI-TV-101A, ACCUM VENT HDR I/S TV** **b. 1-SI-TV-101B, ACCUM VENT HDR O/S TV** **c. HCV-1936, ACCUMS VENT LINE FLOW SETPT** **d. HCV-1898, PRZR RELIEF TK N2 ISOL VLV** **e. HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A** **f. HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B** **g. HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C**		_____SAT _____UNSAT

STANDARD:

(a) Recalls from previous step that PRT pressure needs to be increased.
(b) Asks Shift Supervisor which nitrogen source is to be used.
(c) Verifies valves in correct position (green light on Red light off).

EXAMINER'S CUES: When asked, 1-SI-TV-100, Accumulator and PRT N_2 Outside Trip Valve is closed with an upstream N_2 supply valved in. This is the N_2 source to be used.

COMMENTS:

<u>STEP 8</u>: **(Step 5.4.4) Determine is the needed increase in N_2 pressure is large (greater than 2 psig) or small (less than 2 psig), and perform <u>one</u> of the following steps. (✓)** **( ) <u>If</u> the needed N_2 pressure increase is large, <u>Then</u> perform Step 5.4.5.** **( ) If the needed N_2 pressure is small, <u>Then</u> perform Step 5.4.6.** <u>STANDARD</u>: (a) Determines that the needed pressure increase is large and selects Step 5.4.5 to be performed. *EXAMINER'S CUES: If asked, then agree with the determination of either large or small increase.* <u>COMMENTS</u>:	_____SAT _____UNSAT
<u>STEP 9</u>: **OBSERVES CAUTION PRIOR TO STEP 5.4.5.** **PRT pressure must be closely monitored during the pressurization evolution and Nitrogen must be secured as close to the source as possible. Extreme care must be used when opening the N_2 transfer valves, the large ΔP between the PRT and the N_2 makeup source can generate a very high flow rate.** <u>STANDARD</u>: Notes that PRT pressure must monitored closely. *EXAMINER'S CUES:* <u>COMMENTS</u>:	_____SAT _____UNSAT

STEP 10:	(Step 5.4.5) IF the needed N_2 pressure increase is large, THEN perform the following. Otherwise, enter N/A a. *Verify open or open 1-RC-HCV-1549, PRT VENT.	Critical Step _____SAT
CAUTION:	If using an SI accumulator as the nitrogen source for the PRT, SI Accumulator pressure will decrease. To prevent making the SI Accumulator inoperable, pressure must be maintained above the 600 psia limit specified in Tech Spec 3.3.A.2 when the Accumulator is required to be operable. b. Open one of the source valves. (√) Maintain the SI Accumulators within the limits specified in Tech Spec 3.3.A.2. *( ) 1SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP. ( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A ( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B ( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C *5.4.5.c Open HCV-1936 as Required and Observe the PRT Pressure Increasing *5.4.5.d Close HCV-1936 at the desired PRT pressure. 5.4.5.e Close the source valve opened in Substep b. (✓) ( ) 1SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP. ( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A ( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B ( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C 5.4.5.f Close 1-RC-HCV-1549, PRT VENT	_____UNSAT
STANDARD:	*(a) Opens 1-RC-HCV-1549, PRT VENT (RED light ON and GREEN light OFF). *(b) Opens 1-SI-TV-100 (RED light ON and GREEN light OFF. *(c) Opens HCV-1936 and monitors pressure increase. (d) Acknowledges Annunciator C-F7 when PRT pressure exceeds 10 psig. *(e) Closes HCV-1936 when at approximately 20 psig in the PRT.	

(e) Closes 1-SI-TV-100 (GREEN light ON and RED light OFF). (f) Closes 1-RC-HCV-1549, (GREEN light ON and RED light OFF). *EXAMINER'S CUES: If asked, 1-SI-TV-100, Accumulator and PRT N_2 SUP is the N_2 source to be used.* *EXAMINER'S NOTE: Once PRT pressure is raised to 20 psig and HCV-1936 is closed the PRT pressure will decrease until 1-RC-HCV-1549 is closed. Final PRT pressure of 15-25 psig is acceptable.* COMMENTS:	

STEP 11: **(Step 5.4.7) Verify the following valves are <u>closed</u>.** **a. 1-SI-TV-101A, ACCUM VENT HDR I/S TV** **b. 1-SI-TV-101B, ACCUM VENT HDR O/S TV** **c. HCV-1936, ACCUMS VENT LINE FLOW SETPT** **d. HCV-1898, PRZR RELIEF TK N2 ISOL VLV** **e. HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A** **f. HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B** **g. HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C**	_____SAT _____UNSAT
STANDARD: Verifies the following valves are closed. • 1-SI-TV-101A, ACCUM VENT HDR I/S TV (Green light ON and Red light OFF) • 1-SI-TV-101B, ACCUM VENT HDR O/S TV (Green light ON and Red light OFF) • HCV-1936, ACCUMS VENT LINE FLOW SETPT (set to 0%) • HCV-1898, PRZR RELIEF TK N2 ISOL VLV (Green light ON and Red light OFF) • HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A (Green light ON and Red light OFF) • HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B (Green light ON and Red light OFF) • HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C (Green light ON and Red light OFF) EXAMINER'S CUES: COMMENTS:	

STEP 12: **(Step 5.5.4) Determine if PRT gas can be released to the Vent Vent System.** **a. Notify Chemistry Department to sample the PRT gas space for release.** **b. <u>IF</u> PRT gas sample activity allows release to the Vent Vent System, <u>THEN</u> issue a MSC GRD BATCH Release Permit for venting the PRT to the Vent Vent System. Otherwise, enter N/A.** **c. <u>IF</u> sample results indicate Xe-133 activity is greater than or equal to 5 x 10^{-2}µ Ci/ml, <u>THEN</u> enter N/A for Steps 5.5.5 through 5.5.12 and GO TO Subsection 5.7. Otherwise enter N/A.** STANDARD: (a) Recalls from initial conditions that the Chemistry Department has already provided a sample of PRT gas to HP. (b) Contacts HP to obtain a Miscellaneous Ground Batch release permit. (c) Contacts HP to get the results of the PRT gas sample. *EXAMINER'S CUES: If asked, Chemistry Department has already provided a sample of PRT gas to HP for analysis over an hour ago.* *When asked, then initial for the HP Count Room (Step 5.5.4.b, this indicates that the gas activity is low enough to be released.)* EXAMINER'S NOTE: When the candidate asks HP for the batch release permit he will be told that it is on the way to the MCR. You will hand it to the applicant on the next step of the procedure (Step 5.5.5). COMMENTS:	_____SAT _____UNSAT

JPM-07: Step 13 (Step 5.5.5)

Evaluator's Que: Tell the candidate that the Miscellaneous Batch Ground Release permit has been reviewed by the Shift Supervisor and you are authorized to continue with the release.

STEP 13: **(Step 5.5.5) Obtain a MISC GRD BATCH Release Permit for venting the PRT to the Vent Vent System.** STANDARD: Obtains a MISC GRD BATCH release permit for venting the PRT to the Vent Vent System. *EXAMINER'S CUES: ~~Once the applicant states that he is waiting for the~~ MISCellaneous GRounD Batch release ~~permit to then hand it~~ to the applicant.* COMMENTS: Assume you have obtained the Miscellaneous Ground Batch release permit and are authorized to release. See sheet	_____SAT _____UNSAT
STEP 14: **(Step 5.5.6) Connect a poly hose securely from 1-RC-ICV-5025, PRT PT-1472 VENT (-3 foot elev), to the nearest Containment Purge Exhause ductwork vent (-27 foot elev).** STANDARD: Contacts operator in the containment to attach the hose and directs him to attach the hose. *EXAMINER'S CUES: If asked, there is an operator waiting in a low dose area in containment.* COMMENTS:	_____SAT _____UNSAT

STEP 15: **(Step 5.5.7) Verify the following valves are closed.** **a. 1-RC-HCV-1549, PRT VENT** **b. 1-RC-HCV-1550, PRT NITROGEN SUPPLY** **c. HCV-1936, ACCUMS VNT LINE FLOW SETPT.** **d. 1-SS-TV-104A, PRT GAS SPACE SMPL I/S/ TV** **e. 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV**	_____SAT _____UNSAT
STANDARD: Verifies the following valves are closed. • 1-RC-HCV-1549, PRT VENT (Green light ON and Red light OFF). • 1-RC-HCV-1550, PRT NITROGEN SUPPLY (Green light ON and Red light OFF). • HCV-1936, ACCUMS VNT LINE FLOW SETPT (set to 0%). • 1-SS-TV-104A, PRT GAS SPACE SMPL I/S/ TV (Green light ON and Red light OFF). • 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV(Green light ON and Red light OFF). EXAMINER'S CUES: COMMENTS:	

STEP 16: **(Step 5.5.8) Throttle open 1-RC-ICV-5025, PRT PT-1472 VENT, while keeping release rate low enough to not allow Rad Monitors beyond ALERT.** STANDARD: Contacts the operator in the containment to open the instrument valve in containment. *EXAMINER'S CUES: If asked, you want the venting operation to begin.* COMMENTS:	_____SAT _____UNSAT
STEP 17: **(Step 5.5.9) Monitor PRT pressure until pressure is between 0 to 2 psig.** STANDARD: Monitors PRT pressure until pressure is between 0 to 2 psig. *EXAMINER'S CUES: Tell candidate to vent the PRT down to 2 psig.* COMMENTS:	_____SAT _____UNSAT

STEP 18: **(Step 5.5.10) Close 1-RC-ICV-5025, PRT PT-1472 VENT.** STANDARD: Tells the operator in containment to shut the instrument valve thus securing the PRT purge. EXAMINER'S CUES: COMMENTS:	_____SAT _____UNSAT
STEP 19: **(Step 5.5.11)** STANDARD: Skips this step since hydrogen is not being purged. *EXAMINER'S CUES:* *If asked, hydrogen is not being purged from the PRT.* COMMENTS:	_____SAT _____UNSAT

<u>STEP 20</u>: **(Step 5.5.12) When PRT pressure and level are at the desired valves, Then verify the following valves are closed.** **a. 1-SI-TV-101A, ACCUM VENT HDR I/S TV** **b. 1-SI-TV-101B, ACCUM VENT HDR O/S TV** **c. 1-RC-HCV-1549, PRT VENT** **d. HCV-1936, ACCUMS VNT LINE FLOW SETPT** **e. 1-RC-ICV-5025, PRT PT-1472 VENT** <u>STANDARD</u>: Verifies the following valves are closed : • 1-SI-TV-101A, ACCUM VENT HDR I/S TV (green light on and red light off) • 1-SI-TV-101B, ACCUM VENT HDR O/S TV (green light on and red light off) • 1-RC-HCV-1549, PRT VENT (green light on and red light off) • HCV-1936, ACCUMS VNT LINE FLOW SETPT (set to 0%) • 1-RC-ICV-5025, PRT PT-1472 VENT (green light on and red light off) EXAMINER'S CUES: <u>COMMENTS</u>:	_____SAT _____UNSAT

TIME STOP: ________

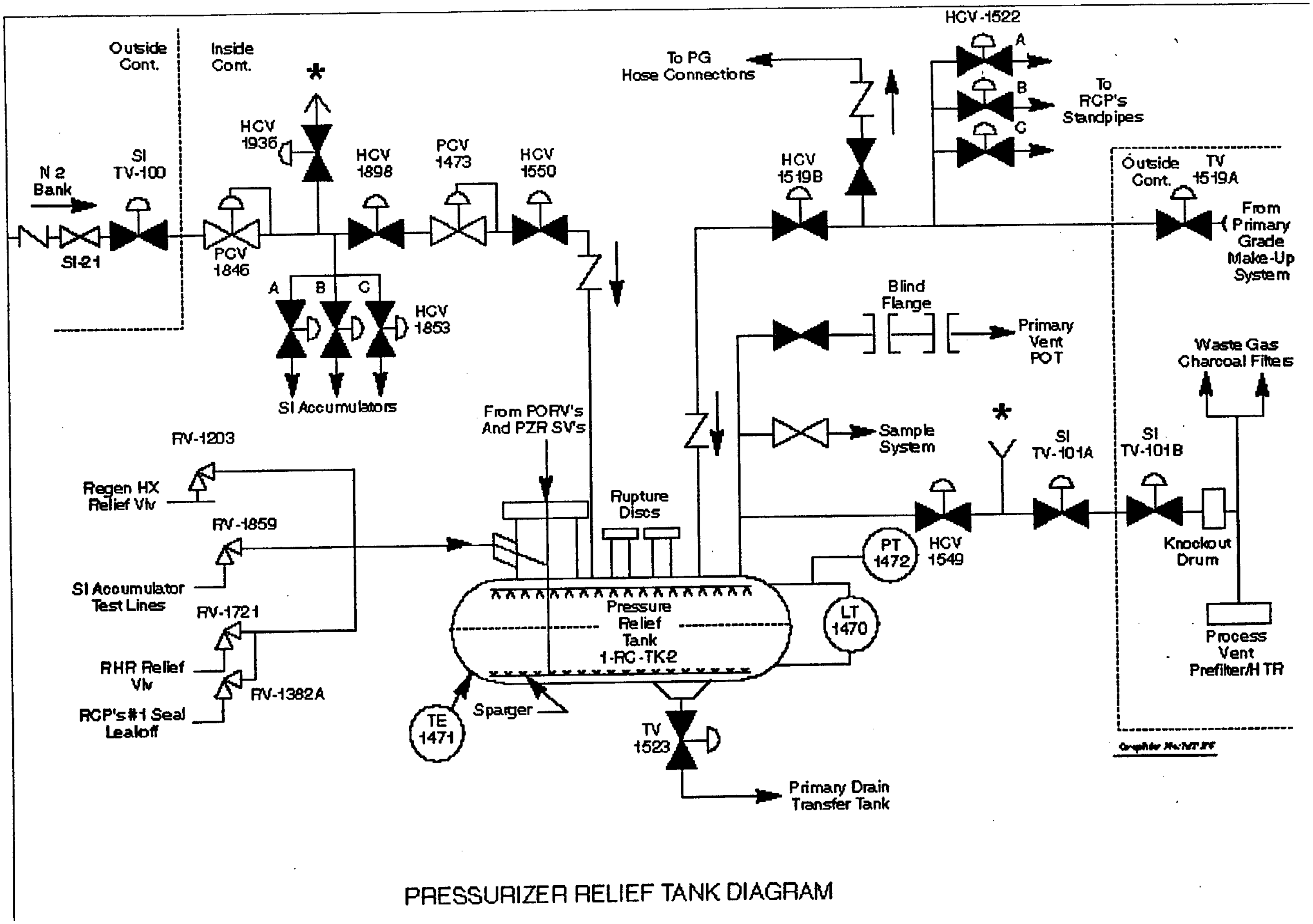
Critical Step Justification:

Substeps within the critical step block are designated with an asterisk (critical component of the step) or no asterisk (Not a critical component).

- STEP # 5 - These two valves (1-RC-HCV-1519A and B) must be opened in order for primary grade water to flow into the PRT.
- STEP # 10- HCV-1936 must be opened to provide a path for nitrogen to flow into the PRT.

Critical Step Sequencing:

Step 5 before step 10



PRESSURIZER RELIEF TANK DIAGRAM

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the unit RO. The unit is in CSD with all RCS loops isolated and drained to flange level, Containment vacuum is broken and Containment Purge is in Operation. All leakage paths to the PRT have been isolated. All Pressurizer Safety Valves and PORV's are installed. Chemistry has taken a sample of the PRT gas and it has been delivered to HP for analysis and appropriate permit generation one hour ago.

INITIATING CUES:

I need you to purge the PRT to the Vent Vent system in accordance with 1-OP-RC-011 starting at Step 5.5. I have personnel standing by to perform necessary steps outside the control room. When you have completed the task please inform me.

Procedure: *1-OP-RC-011*

Rev: *009* PAR: *0*

Title: ***PRESSURIZER RELIEF TANK OPERATIONS***

SIMULATOR

Effective Date: *04/11/2000*

Station: *Surry* Docbase: *SUMIND*

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

This leader page is part of the controlled document and must remain with the procedure as a permanent record.

Approval signatures for electronically distributed procedures are maintained on file.

CONTROLLED COPY

VIRGINIA POWER

SURRY POWER STATION

PROCEDURE NO:	1-OP-RC-011
REVISION NO	9
UNIT NO:	1
EFFECTIVE DATE:	ON FILE
EXPIRATION DATE: (Temporary Procedures Only)	N/A

PROCEDURE TYPE: **OPERATING PROCEDURE**

PROCEDURE TITLE:

PRESSURIZER RELIEF TANK OPERATIONS

REVISION SUMMARY:

- Revised to provide consistency with Unit 2 procedure. 1. Added last bullet to Purpose. 2. Added P & L 4.7, added second Cautions before Steps 5.5.1 and 5.6.1, and revised Steps 5.5.4 and 5.6.4 to indicate that the PRT must be vented to the Overhead Gas system if Xe-133 activity is greater than or equal to 5×10^{-2} µCi/ml. 3. Added Step 5.4.1. 4. Revised Step 5.7.1 to allow Steps removing jumper from Unit 2 PRT to Overhead Gas system to be NAd. 5. Added Steps 5.7.5.c and 5.8.2.g to verify proper alignment of 1-SS-80.
- Incorporated E-PAR {P1} Added Subsection 5.9 to provide instructions for venting the PRT to the Process Vent System via the sample system.
- Incorporated E-PAR {P2} from 2-OP-RC-011. Added Subsection 5.7 to Step 5.1.2 table and added more directions to Step 5.6.4.c.
- Incorporated Operations comments. 1. Revised Step 5.4.1 to make less restrictive. 2. Clarified RMs requirement in Step 5.5.1. 3. Revised Steps 5.5.8 and 5.5.11.b.6 to state throttle 1-RC-ICV-5025. 4. Revised Step 5.5.11.2 and Caution to delete reference to TS 3.3.A.2 since SI ACCs are not required to be operable at CSD. 5. Added PRT to Step 5.6.6.
- Revised in response to DR S-00-0492. 1. Added P & L 4.8. 2. Added Note before Step 5.5.1. 3 Added first condition to Steps 5.5.1, 5.6.1, and 5.9.1.

PROCEDURE WRITER: *J. E. Gibson / R. Mushenheim* VALIDATOR: *Earl Washington / Skip Irwin*

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:

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To provide instructions for performing the following actions with the Pressurizer Relief Tank (PRT).

- Filling the PRT
- Draining the PRT
- Adding Nitrogen to the PRT
- Venting/Purging the PRT to Vent Vent System
- Venting/Purging the PRT to the Process Vent System
- Venting the PRT to the Overhead Gas System

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR, Section 4.2, Reactor Coolant System Design and Operation

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specifications 3.3.A.2, SI Accumulators

2.3 Technical References

2.3.1 1-OP-VS-001, Containment Ventilation

2.3.2 1-OP-23.1, Process Vent System

2.3.3 1-OP-RC-004, Draining the RCS to Reactor Flange Level.

2.3.4 1-OP-RC-005, Draining the RCS from Flange Level to Mid-Nozzle (Reduced Inventory)

2.3.5 1-GOP-2.5, Unit Shutdown, RCS Cooldown from 345°F-350°F to 195°F

2.3.6 11448-FM-82B, Sample System

2.3.7 11448-FM-83B, Vent and Drain System

2.3.8 11448-FM-86B, Reactor Coolant System

2.3.9 11448-FM-87A, RHR System

2.3.10 11448-FM-88C, CVCS System

2.3.11 11448-FM-89A and 89B, Safety Injection System

2.3.12 0-DRP-004, Precautions, Limitations and Setpoints

2.3.13 VPAP-2103, Offsite Dose Calculation Manual

2.3.14 SE 98-054, Rev. 0, PRT Vent Jumpers

2.4 **Commitment Documents**

2.4.1 DR S-98-2607 Communications related to PRT release and containment purge.

2.4.2 DR S-98-1323, Ensure if PRZR PORVs are open, PRZR volume is accounted for in PRT release form

2.4.3 DR S-00-0492, PRT released with leakage through 2-RC-PCV-2455C

Init **Verif**

3.0 INITIAL CONDITIONS

None

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Extreme care must be used when the N_2 transfer valves are being opened. The large ΔP between the PRT and the N_2 makeup source can generate a very high flow rate.

4.2 The Process Vent and Vent Vent radiation monitors must be watched closely when PRT vent/purge flow is being established.

4.3 If using an SI Accumulator as the nitrogen source for the PRT, SI Accumulator pressure will decrease. To prevent making the SI Accumulator inoperable, pressure must be maintained above the 600 psia limit specified in Tech Spec 3.3.A.2 when the Accumulator is required to be operable.

4.4 The hose used in Subsections 5.7 and 5.8 to vent the PRT to the Overhead should be stainless steel flex braid rated for at least 150 psig.

4.5 HP must be notified concerning the status of the PRZR PORVs to account for the additional gas from the RCS if the PORVs are open. **(Reference 2.4.2)**

4.6 To assure accurate accounting of discharged radioactivity, Health Physics personnel must periodically sample Vent-Vent or Process Vent as appropriate during the release of a PRT. HP must be notified prior to the start <u>OR</u> reinitiation of such a release **(Reference 2.4.1)**.

4.7 If the PRT gas sample indicates Xe-133 activity greater than or equal to 5×10^{-2} µCi/ml, the release shall be made to the Overhead Gas System.

4.8 If any unisolated leakage path exists into the PRT, the release shall be made to the Overhead Gas system.

5.0 INSTRUCTIONS

5.1 PRT Evolutions

jid 5.1.1 Compare PRT parameters with the following table.

Parameter (Normal band)	MCR Instrument	Computer Point	Annunciator	Annunciator Alarm Value
Level (60 to 80 %)	L1-1-470	L0485A (P-250) L1RC001A (ERF)	1C-G7 1C-H7	High - 83% Low - 59%
N_2 pressure (Normally 2 to 4 psig) (2 to 10 psig during draindown)	P1-1-472	P0485A (P-250) P1RC001A (ERF)	1C-F7	High 10 psig
Temperature (70 to 120 °F)	T1-1-471	T0485A (P-250) T1RC001A (ERF)	1C-E7	High - 125°F

jhd 5.1.2 Based on present conditions, perform the required subsection to adjust PRT parameters. (√) Enter N/A for the subsections that will not be performed.

Status (√)	Present Conditions	Actions to be Performed	Initials
N/A	PRT Tank level low	Perform Subsection 5.2	N/A
N/A	PRT Tank level high	Perform Subsection 5.3	N/A
N/A	PRT Tank N_2 pressure low	Perform Subsection 5.4	N/A
✓	PRT Tank N_2 pressure high or PRT to be vented/purged of hydrogen and radioactive gases	Perform Subsection 5.3, 5.5, 5.6, 5.7. or 5.9	jhd

Performed by: ______________ ______ ______________ ______
Signature Initial Print Date

______________ ______ ______________ ______
Signature Initial Print Date

5.2 Filling the PRT

______ 5.2.1 Notify the STA that the Unit 1 PRT will be filled.

______ 5.2.2 Open 1-RC-TV-1519A, PRZR RELIEF TK PRI GRADE WTR OTSD TRIP VV.

______ 5.2.3 Verify closed or close 1-RC-HCV-1523, PRT DRAIN.

______ 5.2.4 Open 1-RC-HCV-1519B, PRT MAKEUP, to fill the PRT.

NOTE: When the Unit is in CSD or RSD, the PRT may be filled to 95% to assist in venting/purging the PRT to the Vent/Vent or Process Vent System.

______ 5.2.5 <u>WHEN</u> the desired level is reached, <u>THEN</u> close 1-RC-HCV-1519B.

______ 5.2.6 At the direction of the Shift Supervisor, close 1-RC-TV-1519A. Otherwise, enter N/A.

Performed by:

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

5.3 Draining the PRT

* *

CAUTION:
- If the Pressurizer relieves to the PRT with the PRT level below the sparger, and the PRT spray is not available, a rapid increase in PRT pressure will occur. To maintain PRT pressure control, the 1-RC-HCV-1519B, PRT MAKEUP, flowpath must remain available until the RCS temperature is less than 190°F.
- PRT pressure must not be allowed to decrease to less than 2 psig while the PRT is being drained unless the PRT is vented to the Process Vent System.

* *

______ 5.3.1 Notify the STA that Unit 1 PRT will be drained.

______ 5.3.2 Verify either a positive pressure is present in the PRT or the PRT is vented to the Process Vent System. IF required, THEN perform Subsection 5.4 to establish a positive pressure before continuing.

* *

CAUTION:
- To prevent an unplanned RCS dilution, PRT draining is prohibited during Unit 1 or Unit 2 stripper degas evolutions.
- If Overhead Gas System pressure is high and the PRT is vented to the Process Vent System, then an unmonitored release may occur when the PRT drain is opened.

* *

______ 5.3.3 Open 1-RC-HCV-1523, PRT DRAIN, to begin draining the PRT.

NOTE: If the PRT level is greater than 10%, N_2 flow from the PRT to the Pressurizer will be restricted.

______ 5.3.4 IF preparing to drain to Reactor Vessel Flange level in 1-OP-RC-004 or Mid-Nozzle in 1-OP-RC-005, THEN drain to between 5 percent and 10 percent level. Otherwise, enter N/A.

______ 5.3.5 Monitor PDTT level and start Primary Drain Transfer pumps as required.

______ 5.3.6 <u>WHEN</u> the desired level is obtained in the PRT, <u>THEN</u> close 1-RC-HCV-1523.

Performed by:	______________ Signature	______ Initial	______________ Print	______ Date
	______________ Signature	______ Initial	______________ Print	______ Date
	______________ Signature	______ Initial	______________ Print	______ Date

5.4 Adding Nitrogen to the PRT

_____ 5.4.1 Verify PRT pressure needs to be increased (normal operating range is 2 to 4 psig).

_____ 5.4.2 Verify one of the following substeps. (√)

( ) 1-SI-TV-100, ACCUM & PRT N2 SUP O/S TV is closed with an upstream N_2 supply valved in.

OR

( ) Accumulator N_2 pressure is available for makeup.

5.4.3 Verify the following valves are closed.

_____ a. 1-SI-TV-101A, ACCUM VENT HDR I/S TV

_____ b. 1-SI-TV-101B, ACCUM VENT HDR O/S TV

_____ c. HCV-1936, ACCUMS VNT LINE FLOW SETPT

_____ d. HCV-1898, PRZR RELIEF TK N2 ISOL VV

_____ e. HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

_____ f. HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

_____ g. HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

______ 5.4.4 Determine if the needed increase in N_2 pressure is large (greater than 2 psig) or small (less than or equal to 2 psig), and perform one of the following steps. (√)

( ) IF the needed N_2 pressure increase is large, THEN perform Step 5.4.5.

( ) IF the needed N_2 pressure increase is small, THEN perform Step 5.4.6.

* *

CAUTION: PRT pressure must be closely monitored during the pressurization evolution and Nitrogen must be secured as close to the source as possible. Extreme care must be used when opening the N_2 transfer valves; the large ΔP between the PRT and the N_2 makeup source can generate a very high flow rate.

* *

______ 5.4.5 IF the needed N_2 pressure increase is large, THEN perform the following. Otherwise, enter N/A.

______ a. Verify open or open 1-RC-HCV-1549, PRT VENT.

* *

CAUTION: If using an SI Accumulator as the nitrogen source for the PRT, SI Accumulator pressure will decrease. To prevent making the SI Accumulator inoperable, pressure must be maintained above the 600 psia limit specified in Tech Spec 3.3.A.2 when the Accumulator is required to be operable.

* *

______ b. Open one of the source valves. (√) Maintain the SI Accumulators within the limits specified in Tech Spec 3.3.A.2.

( ) 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP

( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

______ c. Open HCV-1936 as required and observe the PRT pressure increasing.

______ d. Close HCV-1936 at the desired PRT pressure.

______ e. Close the source valve opened in Substep b. (√)

( ) 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP

( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

______ f. Close 1-RC-HCV-1549, PRT VENT.

* *

CAUTION: If using an SI Accumulator as the nitrogen source for the PRT, SI Accumulator pressure will decrease. To prevent making the SI Accumulator inoperable, pressure must be maintained above the 600 psia limit specified in Tech Spec 3.3.A.2 when the Accumulator is required to be operable.

* *

______ 5.4.6 <u>IF</u> the needed N_2 pressure increase is small, <u>THEN</u> perform the following. Otherwise, enter N/A.

______ a. Open HCV-1936, ACCUMS VNT LINE FLOW SETPT.

______ b. Cycle one of the following source valves long enough to pressurize the transfer header. (√)

( ) 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP

( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

______ c. Verify the source valve opened in Substep b is closed. (√)

( ) 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP

( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

______ d. Open 1-RC-HCV-1549, PRT VENT, and observe the PRT pressure increasing.

______ e. Close 1-RC-HCV-1549, PRT VENT.

______ f. Repeat Substeps b through e until desired pressure is achieved.

______ g. Close HCV-1936, ACCUMS VNT LINE FLOW SETPT.

5.4.7 Verify the following valves are closed.

______ a. 1-SI-TV-101A, ACCUM VENT HDR I/S TV

______ b. 1-SI-TV-101B, ACCUM VENT HDR O/S TV

______ c. HCV-1936, ACCUMS VNT LINE FLOW SETPT

______ d. HCV-1898, PRZR RELIEF TK N2 ISOL VV

______ e. HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

______ f. HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

______ g. HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

Performed by:

	Signature	Initial	Print	Date
Performed by:				

5.5 Venting/Purging the PRT to the Vent Vent System

* *

CAUTION:
- HP must be notified prior to the start or reinitiation of a PRT release to Vent Vent. **(Reference 2.4.1).**
- If the PRT gas sample indicates Xe-133 activity greater than or equal to 5×10^{-2} µCi/ml, the release shall be made to the Overhead Gas System.

* *

NOTE: If the Pressurizer is solid, gas leakage through an unisolated Pressurizer PORV is considered terminated and PRT release to Process Vent or Vent-Vent is permissible with HP Count Room concurrence.

______ 5.5.1 Verify that the following conditions are met before proceeding. (√)

( ) Verify that no unisolated leakage path into the PRT exists. Otherwise, enter N/A for this Subsection and perform Subsection 5.7, Installing PRT Vent to the Overhead Gas System.

( ) Containment vacuum is broken and Containment purge is in operation IAW 1-OP-VS-001, Containment Ventilation.

( ) Health Physics Count Room has been notified that the Unit 1 PRT will be vented to the Vent Vent System and provide the status of the PRZR PORVs. (Reference 2.3.13)

( ) The following vent vent radiation monitors are operable.

- RI-VG109, VENT VNT SMPL - PARTIC
- RI-VG110, VENT VNT SMPL - GAS

( ) The following vent vent radiation monitors are operable.

- RI-VG-131-1, VNT STACK No. 2 EFFLUENT MON NORM RNG
- RI-VG-131-2, VNT STACK No. 2 EFFLUENT MON HI RNG

OR

- 1-RI-VG-123, Vent Stack No. 2 Inlet (H) Range Rad Monitor

5.5.2 Adjust PRT level by selecting desired condition and performing the associated substeps.

Desired Condition	Unit Mode	Actions	Initials
• The PRT needs to be purged or • The PRT needs to be vented due to leakage past the PRZR SVs or PORVs.	CSD or RSD	• Raise PRT level to less than or equal to 95% IAW Subsection 5.2, stopping level increase before PRT pressure exceeds 30 psig.	______
• The PRT needs to be vented of excess nitrogen after draindown and the PRT lined up to the Process Vent System	CSD or RSD	• Verify PRT drained IAW Subsection 5.3 to between 5% and 10% as indicated on LI-1-470, PRZR RELIEF TK LVL.	______

______ 5.5.3 Adjust PRT pressure by selecting desired condition and performing the associated substeps. IF venting the PRT of excess nitrogen after draindown, THEN enter N/A.

Desired Condition	Unit Mode	Actions	Initials
• The PRT needs to be purged	CSD or RSD	• Verify or increase PRT pressure to between 15 psig and 30 psig IAW Subsection 5.4.	______
• The PRT needs to be vented	CSD or RSD	• Verify or increase PRT pressure less than or equal to 30 psig IAW Subsection 5.4.	______

5.5.4 Determine if PRT gas can be released to the Vent Vent System.

______ a. Notify Chemistry Department to sample the PRT gas space for release.

______ HP Count Room b. IF PRT gas sample activity allows release to the Vent Vent System, THEN issue a MSC GRD BATCH Release Permit for venting the PRT to the Vent Vent System. Otherwise, enter N/A.

______ c. IF sample results indicate Xe-133 activity is greater than or equal to 5×10^{-2} µCi/ml, THEN enter N/A for Steps 5.5.5 through 5.5.12 and GO TO Subsection 5.7. Otherwise enter N/A.

______ 5.5.5 Obtain a MISC GRD BATCH Release Permit for venting the PRT to the Vent Vent system.

______ 5.5.6 Connect a poly hose securely from 1-RC-ICV-5025, PRT PT-1472 VENT (-3 foot elev), to the nearest Containment Purge Exhaust ductwork vent (-27 foot elev).

______ 5.5.7 Verify the following valves are closed.

______ a. 1-RC-HCV-1549, PRT VENT

______ b. 1-RC-HCV-1550, PRT NITROGEN SUPPLY

______ c. HCV-1936, ACCUMS VNT LINE FLOW SETPT.

______ d. 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

______ e. 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

______ 5.5.8 Throttle open 1-RC-ICV-5025, PRT PT-1472 VENT, while keeping release rate low enough to not allow Rad Monitors beyond ALERT.

______ 5.5.9 Monitor PRT pressure until pressure is between 0 to 2 psig.

______ 5.5.10 Close 1-RC-ICV-5025, PRT PT-1472 VENT.

_____ 5.5.11 IF the PRT is to be purged to eliminate hydrogen gas, THEN monitor PRT pressure until pressure is 2 psig (1 to 3 psig) AND perform the following. Otherwise, enter N/A.

_____ a. Close or verify closed 1-RC-ICV-5025, PRT PT-1472 VENT.

b. Pressurize the PRT as follows.

_____ 1. Open HCV-1936, ACCUMS VNT LINE FLOW SETPT.

* *

CAUTION: If using an SI Accumulator as the nitrogen source for the PRT, SI Accumulator pressure will decrease.

* *

_____ 2. Open a Nitrogen source valve. (√)

( ) 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP

( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

_____ 3. Verify the PRT High Pressure Alarm (1C-F7) at 10 psig.

______ 4. ADJUST PRT pressure IAW Step 5.5.3, AND close the source valve opened in Substep 2. (√)

( ) 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP

( ) HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A

( ) HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B

( ) HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C

______ 5. Obtain a MISC GRD BATCH Release Permit for venting the PRT to the Vent Vent System if required by HP.

______ 6. To maintain Rad Monitors below the ALERT setpoint, throttle 1-RC-ICV-5025, PRT PT-1472 VENT, as necessary.

NOTE: Reduction of hydrogen concentration to a value as low as reasonably possible is desirable, with 4 percent hydrogen being the lower limit on flammability which must always be met.

______ 7. WHEN PRT pressure is approximately 2 psig, THEN repeat Substeps 5.5.11.a and b IAW Attachment 1, PRT Purge to Vent Vent Continuation Sheet, as necessary until Chemistry determines that the PRT atmosphere is in spec. Record final results below and in the Unit Log.

Oxygen level (less than 2.0%) ____________________ %

Hydrogen level (less than 4.0%) ___________ %

______ 5.5.12 WHEN PRT pressure and level are at the desired values, THEN verify the following valves are closed. (√)

( ) 1-TV-SI-101A, ACCUM VENT HDR I/S TV

( ) 1-TV-SI-101B, ACCUM VENT HDR O/S TV

( ) 1-RC-HCV-1549, PRT VENT

( ) HCV-1936, ACCUMS VNT LINE FLOW SETPT

( ) 1-RC-ICV-5025, PRT PT-1472 VENT

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

5.6 Venting/Purging the PRT to the Process Vent System

* *

CAUTION: • HP must be notified prior to the start or reinitiation of a PRT release to Process Vent. **(Reference 2.4.1).**

CAUTION: • If the PRT gas sample indicates Xe-133 activity greater than or equal to 5×10^{-2} µCi/ml, the release shall be made to the Overhead Gas System.

* *

______ 5.6.1 Verify the following conditions are met before proceeding. (√)

( ) Verify that no unisolated leakage path into the PRT exists. Otherwise, enter N/A for this Subsection and perform Subsection 5.7, Installing PRT Vent to the Overhead Gas System.

( ) Health Physics Count Room has been notified that the Unit 1 PRT will be vented to the Process Vent System and provide the status of the PRZR PORVs. (Reference 2.3.13, **Reference 2.4.2**)

( ) The following process vent radiation monitors are operable.

- RI-GW101, PROCESS VNT PARTIC
- RI-GW102, PROCESS VNT - GAS
- RI-GW-130-1, PROCESS VNT EFFLUENT MON NORM RNG
- RI-GW-130-2, PROCESS VNT EFFLUENT MON HI RNG
- RM-GW-122, PROCESS VNT (GASEOUS WASTE)

( ) The Process Vent System is in operation IAW 1-OP-23.1, Process Vent System.

_____ 5.6.2 Adjust PRT level by selecting desired condition and performing the associated substeps.

Desired Condition	Unit Mode	CTMT Vacuum	Actions	Initials
• The PRT needs to be purged or • The PRT needs to be vented due to leakage past the PRZR SVs or PORVs.	Power Ops, HSD, or ISD	NOT Broken	• Raise PRT level to the high level alarm point (1C-G7, PRZ RELIEF TANK HI LEVEL) IAW Subsection 5.2, stopping level increase before PRT pressure exceeds 10 psig.	_____
• The PRT needs to be purged or • The PRT needs to be vented due to leakage past the PRZR SVs or PORVs.	CSD or RSD	Broken or NOT Broken	• Raise PRT level to less than or equal to 95% IAW Subsection 5.2, stopping level increase before PRT pressure exceeds 30 psig.	_____
• The PRT needs to be vented of excess nitrogen after draindown and the PRT lined up to the Process Vent System	ISD, CSD or RSD	Broken	• Verify PRT drained IAW Subsection 5.3 to between 5% and 10% as indicated on LI-1-470, PRZR RELIEF TK LVL.	_____

______ 5.6.3 Adjust PRT pressure by selecting desired condition and performing the associated substeps. IF venting the PRT of excess nitrogen after draindown, THEN enter N/A.

Desired Condition	Unit Mode	CTMT Vacuum	Actions	Initials
• The PRT needs to be purged or • The PRT needs to be vented due to leakage past the PRZR SVs or PORVs.	Power Ops or HSD	NOT Broken	• Verify or increase PRT pressure less than or equal to 10 psig IAW Subsection 5.4.	______
• The PRT needs to be purged	ISD, CSD or RSD	Broken or NOT Broken	• Verify or increase PRT pressure to between 15 psig and 30 psig IAW Subsection 5.4.	______
• The PRT needs to be vented	ISD, CSD or RSD	Broken or NOT Broken	• Verify or increase PRT pressure less than or equal to 30 psig IAW Subsection 5.4.	______

NOTE: Chemistry Dept. has the capability of using a vacuum pump to sample the PRT at low pressures.

5.6.4 Determine if PRT gas can be released to the Process Vent System.

______ a. Notify Chemistry Department to sample the PRT gas space for release.

______
HP Count Room

b. IF sample results indicate Xe-133 activity is less than 5×10^{-2} µCi/ml, THEN issue a MISC ELE BATCH Release Permit for venting the PRT to Process Vent. Otherwise, enter N/A.

______ c. IF sample results indicate Xe-133 activity is greater than or equal to 5×10^{-2} µCi/ml, or the Shift Supervisor directs release to the overhead, THEN enter N/A for Steps 5.6.5 through 5.6.11 and GO TO Subsection 5.7. Otherwise enter N/A.

______ 5.6.5 Obtain a MISC ELE BATCH Release Permit for venting the PRT to the Process Vent system.

5.6.6 Verify that Unit 2 PRT is not aligned to the Process Vent System by performing the following.

______ a. Verify closed 2-SI-TV-201A, ACCUM VENT HDR I/S TV.

______ b. Verify closed 2-SI-TV-201B, ACCUM VENT HDR O/S TV.

* *

CAUTION: High pressure N_2 must not be lined up to the Process Vent System.

* *

5.6.7 Verify the following valves are closed.

______ a. Verify closed 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP.

______ b. Verify closed 1-SI-TV-101A, ACCUM VENT HDR I/S TV.

______ c. Verify closed 1-SI-TV-101B, ACCUM VENT HDR O/S TV.

______ d. Verify closed HCV-1936, ACCUMS VNT LINE FLOW SETPT.

______ e. Verify closed HCV-1898, PRZR RELIEF TK N2 ISOL VV.

______ f. Verify closed HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A.

______ g. Verify closed HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B.

______ h. Verify closed HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C.

______ i. Verify closed 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

______ j. Verify closed 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

______ 5.6.8 Open 1-RC-HCV-1549, PRT VENT.

5.6.9 Vent the PRT to the Process Vent System by performing the following substeps.

______ a. Record the PRT pressure and level on the release form.

______ b. Close 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL.

______ c. Open 1-SI-TV-101A, ACCUM VENT HDR I/S TV.

______ d. Open 1-SI-TV-101B, ACCUM VENT HDR O/S TV.

______ e. To maintain PROCESS VNT PARTIC and GAS Monitors below the ALERT setpoint, throttle 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL, as necessary.

NOTE: PRT level can be increased IAW Subsection 5.2 to maximize volume released.

______ f. Monitor PRT pressure until pressure is approximately at <u>one</u> of the following. (√)

( ) 0 to 2 psig if Containment vacuum has been broken.

( ) Between 6 and 8 psig if Containment vacuum has not been broken.

______ g. Close the following accumulator vent trip valves and GW isolation valve.

( ) Close 1-SI-TV-101A, ACCUM VENT HDR I/S TV.

( ) Close 1-SI-TV-101B, ACCUM VENT HDR O/S TV.

( ) Close 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL.

______ h. Record the PRT pressure and level on the release form.

______ i. <u>IF</u> repeated PRT venting is necessary to lower pressure and raise level, <u>THEN</u> perform Attachment 2, PRT Vent to Process Vent Continuation Sheet, not exceeding a maximum of 10 psig, until desired pressure is obtained. Otherwise, enter N/A.

_____ 5.6.10 IF the PRT is to be purged to eliminate hydrogen or radioactive gas, THEN perform the following. Otherwise, enter N/A.

_____ a. Close or verify closed the following accumulator vent trip valves and GW isolation valve.

( ) 1-SI-TV-101A, ACCUM VENT HDR I/S TV

( ) 1-SI-TV-101B, ACCUM VENT HDR O/S TV

( ) 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL

_____ b. Adjust PRT pressure in accordance with Step 5.6.3.

_____ c. IF PRT pressure will be increased to 10 psig or greater, THEN verify the PRT High Pressure Alarm (1C-F7) at 10 psig. Otherwise, enter N/A.

_____ d. Obtain a MISC ELE BATCH Release Permit for venting the PRT to the Process Vent System.

_____ e. Open 1-SI-TV-101A and 1-SI-TV-101B.

_____ f. To maintain Rad Monitors below the ALERT setpoint, throttle 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL, as necessary.

NOTE: Reduction of hydrogen concentration to a value as low as reasonably possible is desirable, with 4 percent hydrogen being the lower limit on flammability which must always be met.

_____ g. WHEN PRT pressure is approximately 2 psig if Containment vacuum has been broken or between 6 and 8 psig if Containment vacuum has not been broken, THEN perform Attachment 3, PRT Purge to Process Vent Continuation Sheet, as necessary until Chemistry determines that the PRT atmosphere is in spec. Record final results below and in the Unit Log.

Oxygen level (less than 2.0%) ________________ %

Hydrogen level (less than 4.0%) ________ %

5.6.11 Return the PRT to service by performing either Substep a or Substep b.

a. IF no bubble exists in the Pressurizer, THEN align the PRT to continuously vent to the Process Vent System by performing the following.

____ 1. Verify PRT level between 5 percent and 10 percent.

____ 2. Verify open or open 1-SI-TV-101A, ACCUM VENT HDR I/S TV.

____ 3. Verify open or open 1-SI-TV-101B, ACCUM VENT HDR O/S TV.

____ 4. Verify open or open 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL.

____ 5. Verify closed HCV-1936, ACCUMS VNT LINE FLOW SETPT.

____ 6. Verify open 1-RC-HCV-1549, PRT VENT.

____ 7. Notify the Unit 2 SRO, RO and Health Physics Count Room that the Unit 1 RCS will remain aligned to the Process Vent System until the Outage is complete and the Unit 1 RCS is filled and vented.

____ b. IF a bubble exists in the Pressurizer, THEN return PRT pressure and level to their normal values, AND perform the following. (√)

( ) Close 1-SI-TV-101A, ACCUM VENT HDR I/S TV.

( ) Close 1-SI-TV-101B, ACCUM VENT HDR O/S TV.

( ) Verify closed 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

( ) Verify closed 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

( ) Verify closed 1-RC-HCV-1519B, PRT MAKEUP.

( ) Verify closed 1-RC-HCV-1523, PRT DRAIN.

( ) Verify closed or close 1-RC-HCV-1549, PRT VENT.

( ) Verify closed 1-RC-HCV-1550, PRT NITROGEN SUPPLY.

( ) Verify closed HCV-1936, ACCUMS VNT LINE FLOW SETPT.

( ) Open 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL.

Performed by:

Signature	Initial	Print	Date
Signature	Initial	Print	Date
Signature	Initial	Print	Date
Signature	Initial	Print	Date

5.7 Installing PRT Vent to the Overhead Gas System

NOTE: Unit 2 PRT continuous venting to the Overhead Gas system , if in service, will be secured by performing the following subsection. If Unit 2 PRT is not vented to the Overhead Gas system, enter N/A as required.

______ SS

5.7.1 Have the Shift Supervisor authorize removal of the jumper from the Unit 2 PRT to the Overhead Gas system and authorize alignment of the jumper from the Unit 1 PRT to the Overhead Gas system. Enter N/A for Steps 5.7.1 through 5.7.4 if not installed.

______ 5.7.2 Inform the Unit 2 RO that the continuous vent of the PRT to the Overhead Gas system will be secured.

______ 5.7.3 Inform Chemistry that any sample requiring use of the Gaseous Purge header will not be allowed while the continuous vent of the Unit 2 PRT to the Overhead Gas system is secured. (Ref. 2.3.14)

5.7.4 Secure the Unit 2 PRT continuous vent by performing the following:

______ a. Close 2-SS-131, PRT Gas Space Sample Isol.

______ b. Close 1-SS-80, Gaseous Sample Ret Isol.

______ ______ c. **TM:** Disconnect the flexible hose jumper from 2-SS-131. (Ref 2.3.14)

______ d. Log in the Unit 2 Narrative that the Unit 2 PRT jumper to the Overhead Gas system has been secured.

______ 5.7.5 Align the Unit 1 PRT to the Overhead Gas system by performing the following:

a. Close or verify closed 1-SS-131, PRT Gas Space Sample Isol.

NOTE: Loosening the fitting on 1-SS-80 may be required to allow rotation of the flexible hose jumper into correct alignment.

______ ______ b. **TM:** Connect the flexible hose jumper to 1-SS-131 and tighten all fittings. (Ref 2.3.14)

______ ______ c. **TM:** Connect the flexible hose jumper to 1-SS-80 and tighten all fittings.

______ d. Close or verify closed 1-SS-80A, Flex Hose Sample Isol.

______ e. Open 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

______ f. Open 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

NOTE: Vent/Vent Radiation Monitors 1-RI-VG-109 and 1-RI-VG-110 must be monitored while pressurizing the jumper hose.

______ g. Open 1-SS-131 in a small increment and pressurize the jumper hose.

______ h. Snoop the jumper hose fittings and tighten any leaking fittings as necessary.

______ i. Open 1-SS-80, Gaseous Sample Ret Isol.

______ j. Throttle open 1-SS-131, PRT Gas Space Sample Isol, as required.

______ k. Log in the Unit 1 Narrative that the Unit 1 PRT jumper to the Overhead Gas system is in service.

______ l. Monitor PRT and Overhead Gas system pressure.

Performed by:

Signature	Initial	Print	Date

5.8 Securing the PRT Vent to the Overhead Gas System

______ SS

5.8.1 Have the Shift Supervisor authorize removal of the jumper from the Unit 1 PRT to the Overhead Gas system.

______ 5.8.2 Secure the Unit 1 PRT to the Overhead Gas system by performing the following:

______ a. Close 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

______ b. Close 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

______ c. Close 1-SS-131, PRT Gas Space Sample Isol.

______ d. Close 1-SS-80, Gaseous Sample Ret Isol.

______ e. Log in the Unit 1 Narrative that the Unit 1 PRT jumper to the Overhead Gas system has been secured.

______ ______ f. **TM:** Disconnect the flexible hose jumper from 1-SS-131, PRT GAS SPACE SAMPLE ISOL. (Ref 2.3.14)

______ ______ g. **TM:** Disconnect the flexible hose jumper from 1-SS-80, Gaseous Sample Ret Isol. (Ref 2.3.14)

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

5.9 Venting the PRT through the Sample System to the Process Vent System

* *

CAUTION: HP must be notified prior to the start or reinitiation of a PRT release to Process Vent (Reference 2.4.1).

* *

______ 5.9.1 Verify the following conditions are met before proceeding. (√)

( ) Verify that no unisolated leakage path into the PRT exists. Otherwise, enter N/A for this Subsection and perform Subsection 5.7, Installing PRT Vent to the Overhead Gas System.

( ) Health Physics Count Room has been notified that the Unit 1 PRT will be vented to the Process Vent System and provide the status of the PRZR PORVs. (Reference 2.3.13)

( ) The following process vent radiation monitors are operable.

- RI-GW101, PROCESS VNT PARTIC
- RI-GW102, PROCESS VNT - GAS
- RI-GW-130-1, PROCESS VNT EFFLUENT MON NORM RNG
- RI-GW-130-2, PROCESS VNT EFFLUENT MON HI RNG
- RM-GW-122, PROCESS VNT (GASEOUS WASTE)

( ) The Process Vent System is in operation IAW 1-OP-23.1, Process Vent System.

5.9.2 Adjust PRT level by selecting desired condition and performing the associated substeps.

Desired Condition	Unit Mode	CTMT Vacuum	Actions	Initials
• The PRT needs to be purged or • The PRT needs to be vented due to leakage past the PRZR SVs or PORVs.	Power Ops, HSD, or ISD	NOT Broken	• Raise PRT level to the high level alarm point (1C-G7, PRZ RELIEF TANK HI LEVEL) IAW Subsection 5.2, stopping level increase before PRT pressure exceeds 10 psig.	_______
• The PRT needs to be purged or • The PRT needs to be vented due to leakage past the PRZR SVs or PORVs.	CSD or RSD	Broken or NOT Broken	• Raise PRT level to less than or equal to 95% IAW Subsection 5.2, stopping level increase before PRT pressure exceeds 30 psig.	_______
• The PRT needs to be vented of excess nitrogen after draindown and the PRT lined up to the Process Vent System	ISD, CSD or RSD	Broken	• Verify PRT drained IAW Subsection 5.3 to between 5% and 10% as indicated on LI-2-470, PRZR RELIEF TK LVL.	_______

______ 5.9.3 Adjust PRT pressure by selecting desired condition and performing the associated substeps. IF venting the PRT of excess nitrogen after draindown, THEN enter N/A.

Desired Condition	Unit Mode	CTMT Vacuum	Actions	Initials
• The PRT needs to be purged or • The PRT needs to be vented due to leakage past the PRZR SVs or PORVs.	Power Ops, or HSD	NOT Broken	• Verify or increase PRT pressure less than or equal to 10 psig IAW Subsection 5.4.	______
• The PRT needs to be purged	ISD, CSD or RSD	Broken or NOT Broken	• Verify or increase PRT to between 15 psig and 30 psig IAW Subsection 5.4.	______
• The PRT needs to be vented	ISD, CSD or RSD	Broken or NOT Broken	• Verify or increase PRT pressure less than or equal to 30 psig IAW Subsection 5.4.	______

NOTE: Chemistry Dept. has the capability of using a vacuum pump to sample the PRT at low pressures.

______
HP Count Room

5.9.4 Issue a MISC ELE BATCH Release Permit for venting the PRT to the Process Vent System.

______ 5.9.5 Obtain a MISC ELE BATCH Release Permit for venting the PRT to the Process Vent system.

5.9.6 Verify that Unit 2 is not aligned to the Process Vent System by performing the following.

______ a. Verify closed 2-SI-TV-201A, ACCUM VENT HDR I/S TV.

______ b. Verify closed 2-SI-TV-201B, ACCUM VENT HDR O/S TV.

______ c. Verify closed 2-SS-TV-204A, PRT GAS SPACE SMPL I/S TV.

______ d. Verify closed 2-SS-TV-204B, PRT GAS SPACE SMPL O/S TV.

* *

CAUTION: High pressure N_2 must not be lined up to the Process Vent System.

* *

5.9.7 Verify the following valves are closed.

_____ a. Verify closed 1-SI-TV-100, ACCUM & PRZR RELIEF TK N2 SUP.

_____ b. Verify closed 1-SI-TV-101A, ACCUM VENT HDR I/S TV.

_____ c. Verify closed 1-SI-TV-101B, ACCUM VENT HDR O/S TV.

_____ d. Verify closed HCV-1936, ACCUMS VNT LINE FLOW SETPT.

_____ e. Verify closed HCV-1898, PRZR RELIEF TK N2 ISOL VV.

_____ f. Verify closed HCV-1853A, ACCUM N2 & VNT LINE ISOL VVS, ACCUM A.

_____ g. Verify closed HCV-1853B, ACCUM N2 & VNT LINE ISOL VVS, ACCUM B.

_____ h. Verify closed HCV-1853C, ACCUM N2 & VNT LINE ISOL VVS, ACCUM C.

_____ i. Verify closed 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

_____ j. Verify closed 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

_____ k. Verify closed 2-SS-130, PRT Gas Space Sample Hdr Drain.

_____ l. Verify closed 2-SS-131, PRT Gas Space Sample Throttle Valve.

_____ m. Verify closed 1-SS-130, PRT Gas Space Sample purge to PV system.

_____ n. Verify Closed 1-SS-92, Gaseous Sample Return to Process Vent.

5.9.8 Vent the PRT to the Process Vent System by performing the following substeps.

_____ a. Record the PRT pressure and level on the release form.

_____ b. Open 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

_____ c. Open 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

_____ d. To maintain PROCESS VNT PARTIC and GAS Monitors below the ALERT setpoint, throttle 1-SS-130, PRT Gas Space Sample purge to PV system, as necessary.

NOTE: PRT level can be increased IAW Subsection 5.2 to maximize volume released.

_____ e. Monitor PRT pressure until pressure is approximately at <u>one</u> of the following. (√)

( ) 0 to 2 psig if Containment vacuum has been broken.

( ) Between 6 and 8 psig if Containment vacuum has not been broken.

_____ f. Close the following PRT Sample trip valves and Sample System isolation valve.

( ) Close 1-SS-TV-104A, PRT GAS SPACE SMPL I/S TV.

( ) Close 1-SS-TV-104B, PRT GAS SPACE SMPL O/S TV.

( ) Close 1-SS-130, PRT Gas Space Sample purge to PV system.

_____ g. Record the PRT pressure and level on the release form.

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

ATTACHMENT 1

(Page 1 of 2)

PRT PURGE TO VENT VENT CONTINUATION SHEET

Date								
5.5.11.a Close or verify closed 1-RC-ICV-5025, PRT PT-1472 VENT.								
5.5.11.b.1 Open HCV-1936, ACCUMS VNT LINE FLOW SETPT.								
5.5.11.b.2 Open a Nitrogen source valve IAW Step 5.5.11.b.2.								
5.5.11.b.3 Verify the PRT High Pressure Alarm (1C-F7) at 10 psig.								
5.5.11.b.4 <u>ADJUST</u> PRT pressure IAW Step 5.5.3								
5.5.11.b.4 Close the source valve opened in Substep 5.5.11.b.2.								
5.5.11.b.5 Obtain a MISC GRD BATCH Release Permit for venting the PRT to the Vent Vent System if required by HP.								
5.5.11.b.6 To maintain Rad Monitors below the ALERT setpoint, open 1-RC-ICV-5025, PRT PT-1472 VENT, as necessary.								
5.5.11.b.7 <u>WHEN</u> PRT pressure is approximately 2 psig, <u>THEN</u> close or verify closed 1-RC-ICV-5025.								
Return to Step 5.5.11.b.7.								

ATTACHMENT 1

(Page 2 of 2)

PRT PURGE TO VENT VENT CONTINUATION SHEET

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

ATTACHMENT 2

(Page 1 of 2)

PRT VENT TO PROCESS VENT CONTINUATION SHEET

Date								
Fill the PRT IAW Subsection 5.2, not exceeding a maximum of 10 psig.								
5.6.9.a Record the PRT pressure and level on the release form.								
5.6.9.b Close or verify closed 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL.								
5.6.9.c Open 1-SI-TV-101A, ACCUM VENT HDR I/S TV.								
5.6.9.d Open 1-SI-TV-101B, ACCUM VENT HDR O/S TV..								
5.6.9.e To maintain PROCESS VNT PARTIC and GAS Monitors below the ALERT setpoint, throttle 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL, as necessary.								
5.6.9.f Monitor PRT pressure until pressure is approximately 0 to 2 psig if Containment vacuum has been broken or between 6 and 8 psig if Containment vacuum has not been broken.								
5.6.9.g Close 1-SI-TV-101A, ACCUM VENT HDR I/S TV.								
5.6.9.g Close 1-SI-TV-101B, ACCUM VENT HDR O/S TV.								
5.6.9.g Close 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL.								
5.6.9.h Record the PRT pressure and level on the release form.								
Return to Step 5.6.9.i.								

ATTACHMENT 2

(Page 2 of 2)

PRT VENT TO PROCESS VENT CONTINUATION SHEET

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

ATTACHMENT 3

(Page 1 of 2)

PRT PURGE TO PROCESS VENT CONTINUATION SHEET

Date								
5.6.10.a Close 1-SI-TV-101A, ACCUM VENT HDR I/S TV.								
5.6.10.a Close 1-SI-TV-101B, ACCUM VENT HDR O/S TV.								
5.6.10.a Close 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL.								
5.6.10.b ADJUST PRT pressure IAW Step 5.6.3								
5.6.10.c IF PRT pressure will be increased to 10 psig or greater, THEN verify the PRT High Pressure Alarm (1C-F7) at 10 psig. Otherwise, enter N/A.								
5.6.10.d Obtain a MISC ELE BATCH Release Permit for venting the PRT to the Process Vent System.								
5.6.10.e Open 1-SI-TV-101A and 1-SI-TV-101B.								
5.6.10.f To maintain Rad Monitors below the ALERT setpoint, throttle 1-SI-312, ACCUMS VENT HDR OUTSIDE ISOL, as necessary.								
Return to Step 5.6.10.g.								

ATTACHMENT 3

(Page 2 of 2)

PRT PURGE TO PROCESS VENT CONTINUATION SHEET

Performed by: ______________________ ________ ______________________ ________
Signature Initial Print Date

Performed by: ______________________ ________ ______________________ ________
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Signature Initial Print Date

Performed by: ______________________ ________ ______________________ ________
Signature Initial Print Date

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Facility Walk-Through

NRC-FWT-JPM-08

Title:

LOCALLY ISOLATE SERVICE WATER TO #3 MER DURING FLOODING.

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

LOCALLY ISOLATE SERVICE WATER TO #3 MER DURING FLOODING.

Alternate Path:

Facility JPM #:

LO JPM # 13.04

K/A Rating(s):

SYS076.A2.01 (RO 3.5/SRO 3.7) SYS076.K4.06 (RO 2.8/SRO 2.9)

Task Standard:

0-AP-13.00, Turbine Building or #3 MER Flooding, steps 33 and 34.

Preferred Evaluation Location:

Simulator _____ In-Plant __X__

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

0-AP-13.00, Turbine Building or #3 MER Flooding.
Probabilistic Risk Assessment, SPS Units 1&2 IPE, FDS-1ME2.
VPAP-1405, Independent and Simultaneous Verification
ND-89.5-H/T-2.5, Service Building Service Water Subsystem

Validation Time: 13 min. **Time Critical:** No

===

Candidate: ________________________________ Time Start : ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ________________________ ______________________________/________
NAME SIGNATURE DATE

===

COMMENTS

____

____

Tools/Equipment/Procedures Needed:

0-AP-13.00, Turbine Building or #3 MER Flooding.
Probabilistic Risk Assessment, SPS Units 1&2 IPE, FDS-1ME2.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. 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. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
I am the Shift Supervisor. There is a major Service Water leak in #3 MER with level indicated at 50 inches. Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, steps 33 and 34. 1-SW-P-10B and 2-SW-P-10B have been secured. 1-VS-E-4A, 4B, and 4C have been secured.

INITIATING CUES:

I need you to isolate Service Water to #3 MER in accordance with steps 33 and 34.

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 1: **ACKNOWLEDGES CAUTION PRIOR TO STEP 33.** STANDARD: Acknowledges caution that if both 2-SW-11 and 2-SW-474 are closed, 1-VS-E-4D and 1-VS-E-4E must be secured. *EXAMINER'S CUES: If asked, 1-VS-E-4D is running and 1-VS-E-4E is secured.* COMMENTS:	___ SAT ___ UNSAT
`TEP 2: **(STEP 33a) FAIL 1-SW-263 CLOSED.** STANDARD: (a) Locates lighting panel 2T3 (located north of feed water heater 2-FW-E-2A, North is towards the Containment structures). *(b) Opens circuit 8 on lighting panel 2-EP-LP-2T3. *EXAMINER'S CUES:* If asked, the breaker is initially as you see it (to the left or closed position) When asked (after candidate simulates opening the breaker), breaker 8 is to the right (open position) with a red indicating flag visible. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: **(STEP 33b) CLOSE 2-SW-476, WATERBOX 2C ISOLATION.** STANDARD: (a) Locates 2-SW-476 (in #4 MER 2/3 of the way across the room on the right hand side as you enter). (b) Determines that the valve is closed by valve position indicator. AND/OR (c) Pulls pin from handwheel actuator. (d) Verifies closed 2-SW-476 by rotating the handwheel in the clockwise direction verifying it will not turn. *EXAMINER'S CUES: When asked, 2-SW-476 is as you see it. (this is a normally closed vale).* *When asked, if the candidate attempts to turn the valve handwheel in the clockwise direction, the handwheel will not move.* COMMENTS:	___ SAT ___ UNSAT

STEP 4: **(STEP 33c) CLOSE 2-SW-477, WATER BOX 2A ISOLATION.** STANDARD: (a) Locates 2-SW-477 (in #4 MER 2/3 of the way across the room on the right hand side. (b) Pulls pin from handwheel actuator. (c) Attempts to close 2-SW-477 by rotating the handwheel clockwise. (d) Recognizes that 2-SW-477 will not close & transitions to the step 33c RNO column. *EXAMINER'S CUES: When asked, the valve is as you see it (this is a normally open valve).* *When asked, if the candidate attempts to turn the valve handwheel in the clockwise direction, the handwheel will not move.* *EVALUATOR'S NOTE:* • **Alternate Path Starts with this step.** • ***Safety concern: Trainee does not have to crawl across pipes to check the valve labels at the East end of the #4 MER. They can identify which valve label they are looking at, and the evaluator can state the label reads "2-SW-477" if the correct label is identified. The trainee can then describe the required actions to complete valve manipulation from the west end of #4 MER.*** COMMENTS:	___ SAT ___ UNSAT

STEP 5: **(STEP 33C RNO) CLOSE 2-SW-11.**	CRITICAL STEP
STANDARD: (a) Proceeds to Unit 2 RS HX SW MOV pit. (b) Locates manual valve 2-SW-11 (East side of pit). (c) Pulls pin from handwheel actuator. *(d) Closes 2-SW-11 by rotating valve handwheel in the clockwise direction. *EXAMINER'S CUE:* When asked, the valve is initially as you see it (this is a normally open valve). *When asked, after the handwheel is rotated in the clockwise direction, the position indication pointer rotates from the OPEN to the CLOSED position.* *EVALUATOR'S NOTE:* **Safety concern: Trainee does not have to crawl down into the valve pit to check the valve labels. They can identify which valve label they are looking at, and the evaluator can state the label reads "2-SW-11" if the correct label is identified. The trainee can then describe the required actions to complete valve manipulation from above. A ladder would be required to operate this valve.** COMMENTS:	___ SAT ___ UNSAT

TEP 6: **(STEP 33d) CLOSE 1-SW-500, SW HEADER CROSSTIE.** STANDARD: (a) Proceeds to #4 MER. (b) Locates manual valve 1-SW-500 (halfway across room under smoke detector on the right as you enter). (c) Determines that the valve is closed by valve position indicator. AND/OR (d) Pulls pin from handwheel actuator. (e) Verifies 1-SW-500 closed by rotating valve handwheel in the clockwise direction. *EXAMINER'S CUE: When asked, 1-SW-500 is as you see it (this is a normally closed valve).* *When asked, if the candidate attempts to turn the valve handwheel in the clockwise direction, the handwheel will not move.* COMMENTS:	___ SAT ___ UNSAT

TEP 7: **(STEP 34) CHECK WATER LEVEL IN MER 3 DECREASING.**

___ SAT

___ UNSAT

STANDARD:

(a) Locates MER 3 level gauge 2-PL-LI-201 in MER 4.
(b) Verifies 2-PL-8 open (gage isolation).
(c) Checks that level in MER 3 is NOT decreasing by recalling that the initial water level was 50 inches AND transitions to Step 34 RNO.

EXAMINER'S CUES: When asked, *after the operator locates MER 3 level gauge AND with the isolation valve open (both located in #4 MER), tell candidate that the level in #3 MER is at 75 inches and is slowly increasing.*

COMMENTS:

TEP 8: **(STEP 34 RNO a) SECURE CHG PUMP SW PUMPS.** STANDARD: (a) Calls Unit 1 RO and directs him to secure 1-SW-P-10A. (b) Calls Unit 2 RO and directs him to secure 2-SW-P-10A. *EXAMINER'S CUES:* • *When operator directs the Unit 1 RO to secure 1-SW-P-10A, tell him it is secured.* • *When operator directs the Unit 2 RO to secure 2-SW-P-10A, tell him it is secured.* COMMENTS:	___ SAT ___ UNSAT
STEP 9: **(STEP 34 RNO b) CLOSE 1-SW-499, WATER BOX 1D ISOLATION.** STANDARD: (a) Locates manual valve 1-SW-499 in MER 4. (b) Pulls pin from handwheel actuator. *(c) Closes 1-SW-499 by rotating valve handwheel in the clockwise direction until the valve position indicator points to closed. *EXAMINER'S CUES: When asked, the valve position is as shown (this is a normally open valve). As the handwheel is rotated in the clockwise direction, the position indication pointer rotates from the OPEN to the CLOSED position.* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

TEP 10: **REPORT TO SHIFT SUPERVISOR (EVALUATOR).** STANDARD: Verbal status report that steps 33 and 34 completed. COMMENTS:	___ SAT ___ UNSAT

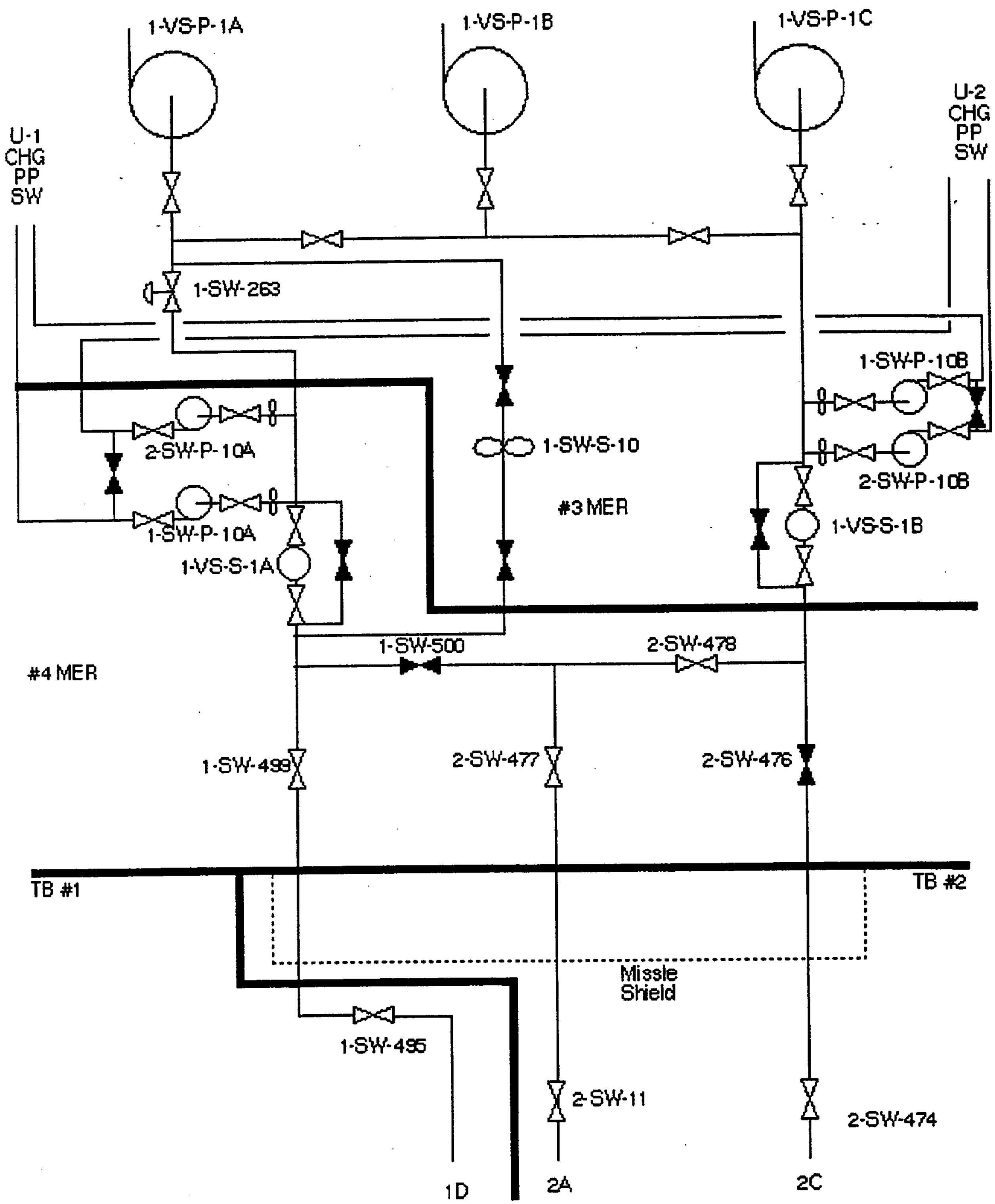
TIME STOP: ________

Critical Step Justification:

- **STEP # 2 - 1-SW-263 must be closed to provide isolation of Unit 1 Service Water to #3 MER.**
- **STEP # 5 - 2-SW-11 must be closed to provide isolation of Unit 2 Service Water to #3 MER.**
- **STEP # 9: 1-SW-499 must be closed to provide isolation of Unit 1 Service Water to #3 MER.**

Critical Step Sequencing:

None



SERVICE BUILDING SERVICE WATER SUBSYSTEM

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
I am the Shift Supervisor. There is a major Service Water leak in #3 MER. Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, steps 33 and 34. 1-SW-P-10B and 2-SW-P-10B have been secured. 1-VS-E-4A, 4B, and 4C have been secured.

INITIATING CUES:

I need you to isolate Service Water to #3 MER in accordance with steps 33 and 34.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: If both 2-SW-11 and 2-SW-474 are closed in the following step, Control Room Chillers 1-VS-E-4D and 1-VS-E-4E must be secured.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33.	__ISOLATE SW TO MER 3:	
	a) Fail 1-SW-263 closed by opening Circuit 8 on Lighting Panel 2T3 (located north of 2-FW-E-2A)	
	b) Close 2-SW-476, Water Box 2C Isol	b) Close 2-SW-474, located in Unit 2 BC HX SW MOV pit.
	c) Close 2-SW-477, Water Box 2A Isol	c) Close 2-SW-11, located in Unit 2 RS HX SW MOV pit.
	d) Close 1-SW-500, SW Header Crosstie	d) Close 2-SW-478, SW Header Crosstie.
34.	__CHECK WATER LEVEL IN MER 3 ON MER 4 GAUGE 2-PL-LI-201 - DECREASING	Do the following: a) Secure CHG Pump SW Pumps: • 1-SW-P-10A • 2-SW-P-10A b) Close 1-SW-499, Water Box 1D Isol.
35.	__VERIFY RUNNING AN MCR CHILLER IN MER 5 IAW 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM: • 1-VS-E-4D • 1-VS-E-4E	Do the following: a) Start 1-VS-E-4D or 1-VS-E-4E. b) <u>IF</u> an MCR Chiller can <u>NOT</u> be started, <u>THEN</u> GO TO 0-FCA-7.02, LOSS OF ESGR COOLING.

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Facility Walk-Through

NRC-FWT-JPM-09

Title:

ALIGN THE AAC DIESEL TO SUPPLY POWER TO THE "D" MCR CHILLER

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

ALIGN THE AAC DIESEL TO SUPPLY POWER TO THE "D" MCR CHILLER.

Alternate Path:

The "A" Station Service Bus cannot be energized from offsite power. The AAC Diesel Generator is used to power the "D" MCR chiller via the "A" Station Service Bus.

Facility JPM #:

LO JPM # 36.05

K/A Rating(s):

APE067.AA1.05 (RO 3.0/SRO 3.1)

Task Standard:

Completion of 0-FCA-19.00, Alternate Power Feed To Mechanical Equipment Room (MER) 5, steps 1-18.

Preferred Evaluation Location: Simulator _____ In-Plant __X____

Preferred Evaluation Method: Perform _____ Simulate __X___

References:

0-FCA-19.00, Alternate Power Feed To MER 5, Rev.0.
ND-90.3-H/T-9.6, Surry Power Station Station Blackout EDG Distribution

Validation Time: 30 min. **Time Critical:** No

==

Candidate: ______________________________ Time Start : ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ______________________________ ______________________________/________
NAME SIGNATURE DATE

==

COMMENTS

____

____

____

Tools/Equipment/Procedures Needed:

0-FCA-19.00, Alternate Power Feed To MER 5, Rev.0.
Appendix "R" Key

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in plant steps, including any required communications **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. 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. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

You are the Outside Service Building Watchstander.

A sustained fire in the Unit 2 Emergency Switchgear Room (ESGR) and subsequent loss of offsite power has caused the loss of all MCR chillers.

Unit 1 is shutdown and offsite power is unavailable, but the AAC Diesel Generator is loaded onto the 1J Emergency Bus.

The "E" MCR Chiller (1-VS-E-4E) is tagged out for extended maintenance.

Here is a copy of 0-FCA-19.00, Alternate Power Feed to MER 5, and an Appendix "R" Key.

INITIATING CUES:

I need you to energize the "D" MCR Chiller (1-VS-E-4D) in accordance with 0-FCA-19.00 steps 1-18. I have personnel standing by to perform steps 13 and 14. When you have completed the task, the Inside Service Building Watchstander will align and start the "D" MCR Chiller.

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 1: **OBSERVES CAUTION PRIOR TO STEP 1.**

STANDARD:

(a) Purpose of the procedure is to provide an alternate power feed to 1-VS-E-4D or 1-VS-E-4E from either the Transfer Bus "D" or the AAC Diesel Generator via the Unit 1 "A" Station Service Bus.

(b) Remembers the "D" Transfer Bus is not recoverable (as described in the directions), since no offsite power is available or contacts the MCR to determine electrical power status.

EXAMINER'S CUES: The "D" Transfer Bus restoration is not possible due to the loss of offsite power.

If asked, the MCR reports that Station Service 1A is de-energized.

COMMENTS:

___ SAT

___ UNSAT

<u>TEP 2</u>: **CHECK UNIT 1 STATION SERVICE BUS A ENERGIZED. (STEP 1 ACTION/EXPECTED RESPONSE)** <u>STANDARD</u>: (a) Identifies "A" Station Service Bus de-energized with Unit 1 shutdown and no offsite power. (b) Reads step 1a RNO column to check if "A" Reserve Station Service Transformer (RSST) available. (c) Identifies RSST "A" not available and proceeds to step 1b RNO column. (d) Goes to step 3. *EXAMINER'S CUES: The "A" Station Service Bus is de-energized and "D" Transfer Bus restoration is not possible due to loss of offsite power. "A" RSST is NOT available with no offsite power.* <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 3</u>: **CHECK AAC DIESEL GENERATOR SUPPLYING EMERGENCY BUS 1J. (STEP 3 and 4 ACTION/EXPECTED RESPONSE)** <u>STANDARD</u>: (a) Identifies 1J Emergency Bus energized from the AAC Diesel Generator (as described in the directions), or contacts the MCR to check on AAC Diesel Generator status. (b) Goes to step 4 then to step 7. *EXAMINER'S CUES: If asked, 1J Emergency Bus is energized from the AAC Diesel Generator.* <u>COMMENTS</u>:	___ SAT ___ UNSAT

TEP 4: **PLACE APPENDIX R KEYSWITCH (1-EP-43-15A1) LOCATED ON BREAKER 15A1 TO THE APPENDIX R POSITION. (STEP 7 ACTION/EXPECTED RESPONSE)**	**CRITICAL STEP**
STANDARD: (a) Proceeds to the Unit 1 Normal Switchgear Room (just off the Turbine Deck). (b) Locates breaker 15A1 (1-EP-BKR-15A1). *(c) Inserts key in APPENDIX R CONTROL SWITCH 1-EP-43-15A1. *(d) Rotates key to the APPENDIX R Position. *EXAMINER'S CUES: The APPENDIX R CONTROL SWITCH rotates to the APPENDIX R Position and remains in APPENDIX R Position.* EVALUATOR'S NOTE: Placing the Appendix R keyswitch to the Appendix R position does the following: • Allows 15A1 to close (stay closed) with 15D1 open. • Allows 05L3 to close (stay closed) even if 15D1 and 15A1 are closed. COMMENTS:	___ SAT ___ UNSAT

STEP 5: **VERIFY OPEN OR OPEN BREAKERS. (STEP 8 ACTION/EXPECTED RESPONSE)**	CRITICAL STEP
STANDARD:	___ SAT
(a) Proceeds to Switchgear 14A1 (West side U-1 Normal Switchgear Room, designated 1A1).	
*(b) Opens breaker 14A1-1 (1-EP-BKR-14A1-1, LOAD CENTER 1A1 INCOMING FDR) by pushing red TRIP pushbutton.	___ UNSAT
(c) Verifies breaker 14A1-1 open by checking breaker green mechanical OPEN indicator flag.	
(d) Verifies breaker 14A1-8 open (1-EP-BKR-14A1-8, LOAD CENTERS 1A1 - 1C2 BUS TIE) by checking mechanical position indicator.	
(e) Proceeds to switchgear 14B1 (Southwest corner U-1 Normal Switchgear Room, designated 1B1).	
(f) Verifies breaker 14B1-8 open (1-EP-BKR-14B1-8, LOAD CENTERS 1B1 - 1A2 BUS TIE) by checking mechanical position indicator.	
EXAMINER'S CUE:	
• *If asked, breaker 14A1-1 opens with a loud sound and the green mechanical OPEN indicator flag is visible.*	
• *If asked, breaker 14A1-8 mechanical indicator flag indicates green OPEN.*	
• *If asked, breaker 14B1-8 mechanical indicator flag indicates green OPEN.*	
COMMENTS:	

STEP 6: **VERIFY CLOSED OR CLOSE SUPPLY BREAKER TO BUS 1A2/MCC 1A2-3. (STEP 9 and 10 ACTION/EXPECTED RESPONSE)** STANDARD: (a) Verifies breaker 14A2-7 closed (1-EP-BKR-14A2-7, LOAD CENTER 1A2 INCOMING FDR) by checking mechanical position indicator. (b) Verifies breaker 14A2-6 closed (1-EP-BKR-14A2-6, MCC 1A2-3 TURB BLDG BASEMENT EAST FDR) by checking mechanical position indicator. *EXAMINER'S CUE:* *If asked, both breakers 14A2-7 and 14A2-6 mechanical position indicator flags show red CLOSED indicators.* COMMENTS:	___ SAT ___ UNSAT

TEP 7: **OPEN ALL BREAKERS ON BUS 1A2 EXCEPT BREAKERS 14A2-6 and 14A2-7. (STEP 11 ACTION/EXPECTED RESPONSE)**	**CRITICAL STEP**
STANDARD: *(a) Opens breaker 14A2-1 (1-EP-BKR-14A2-1, SECURITY CAS BLDG AUTO TRANSFER SWITCH FDR) by pushing red TRIP pushbutton. (b) Verifies breaker 14A2-1 open by checking mechanical position indicator flag shows green OPEN. *(c) Opens breaker 14A2-2 (1-EP-BKR-14A2-2, RAILROAD CARS FDR) by pushing red TRIP pushbutton. (d) Verifies breaker 14A2-2 open by checking mechanical position indicator flag shows green OPEN. *(e) Opens breaker 14A2-3 (1-EP-BKR-14A2-3, MAIN TRANS SOURCE 2 CLRS 3/4/6/7 FDR) by pushing red TRIP pushbutton. (f) Verifies breaker 14A2-3 open by checking mechanical position indicator flag shows green OPEN. *(g) Opens breaker 14A2-4, MCC 1A2-1 (1-EP-BKR-14A2-4, MCC 1A2-1 AUX BLDG WEST FDR) by pushing red TRIP pushbutton. (h) Verifies breaker 14A2-4 open by checking mechanical position indicator flag shows green OPEN. *(i) Opens breaker 14A2-5 (1-EP-BKR-14A2-5, MCC 1A2-2 TURB BLDG MEZZ FDR) by pushing red TRIP pushbutton. (j) Verifies breaker 14A2-5 open by checking mechanical position indicator flag shows green OPEN. *EXAMINER'S CUES:* As breakers are opened, a loud bang can be heard and mechanical position indicator flags show green OPEN indication. EVALUATOR'S NOTE: If either breaker 14A2-6 (MCC 1A2-3 TURB BLDG BASEMENT EAST FDR) or 14A2-7 (LOAD CENTER 1A2 INCOMING FDR) are opened and left open, critical step failure is warranted. COMMENTS:	___ SAT ___ UNSAT

TEP 8: **OPEN ALL BREAKERS ON MCC 1A2-3. (STEP 12 ACTION/EXPECTED RESPONSE)** STANDARD: (a) Proceeds to MCC 1A2-3 (U-1 Turbine Building Basement, East end next to the steam generator blowdown coolers). *(b) Opens ALL breakers on MCC 1A2-3. *EXAMINER'S CUES: As breaker control levers are rotated to the OFF position, a click can be heard and the breaker control lever remains in the OFF position.* *Breaker 1A2-3-7A control lever indicates OFF position.* EVALUATOR'S NOTE: Breakers that are danger tagged OFF can be identified as danger tagged in the OFF position. OMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 9: STRIP ALL LOADS FROM UNIT 1 STATION SERVICE BUS A, EXCEPT BREAKER 15A7. (STEP 13 and 14 ACTION/EXPECTED RESPONSE)

___ SAT

___ UNSAT

STANDARD:

(a) Operator contacts the MCR to place the following pump control switches in pull to lock (PTL) as per step 13a:
1-EP-BKR 15A3, "A" RCP (1-RC-P-1A),
1-EP-BKR-15A4, "A" Condensate Pump (1-CN-P-1A),
1-EP-BKR-15A5 & 15A6, "A" MFP (1-FW-P-1A1 and 1-FW-P-1A2), and
1-EP-BKR 15A10, "A" Low Pressure Heater Drain Pump (1-SD-P-2A).

(b) Operator contacts the MCR to have breakers 15A8 (1-EP-BKR-15A8, TRAINING CENTER FDR) and 15A9 (1-EP-BKR-15A9, CHILLED WATER CHILLER A) opened as per step 13b.

(c) Operator contacts the MCR to synchronize in and close breaker 1-EP-BKR-15A1 in accordance with step 14a through 14d.

EXAMINER'S CUES: When the MCR is contacted to perform step 13a, use TIME COMPRESSION and inform the candidate that the breakers have been placed in the PTL position in accordance with step 13a. When the MCR is contacted they will direct local operations in order to open breakers 15A8 and 15A9, use TIME COMPRESSION and inform the candidate that the breakers have been opened in accordance with step 13b. When the MCR is contacted to perform step 14, use TIME COMPRESSION and inform the candidate that breaker 15A1 is closed if the Appendix R keyswitch was operated properly.

EVALUATOR'S NOTE:

Provided the APPENDIX "R" keyswitch on breaker 15A1 was operated correctly, breaker 15A1 will close when the MCR performs step 14. If the APPENDIX "R" keyswitch was NOT operated properly, the "A" Station Service Bus will not re-energize from the MCR.

COMMENTS:

STEP 10: **ISOLATE NORMAL POWER SUPPLY TO MCC 1H-1B in MER 5. (STEP 15 ACTION/EXPECTED RESPONSE)**	**CRITICAL STEP**
STANDARD: (a) Proceeds to MER 5 Electrical Room (off Unit 2 Turbine Building Basement southside). *(b) Opens breaker 1H-1B-2A (1-EP-BKR-1H-1B-2A, NORMAL SUPPLY to MCC 1H-1B) by rotating breaker control lever CLOCKWISE to the RESET/OFF position (arrow on handle). *(c) Removes the "Kirk" key from main power feed disconnect switch on breaker 1-EP-BKR-1H-1B-2A by rotating the key counterclockwise from the 2 O'clock position to the 12 O'clock position and withdrawing key. *EXAMINER'S CUES: When properly operated, breaker 1H-1B-2A control lever rotates to the RESET/OFF position and the key can now be removed from the keyswitch when rotated counterclockwise to the 12 O'clock position.* *The "Kirk" key will not turn until the breaker is opened. Once the breaker is opened the key may be manually turned counterclockwise from the 2:00 o'clock to the 12:00 o'clock position. The key can now be withdrawn.* COMMENTS:	___ SAT ___ UNSAT

TEP 11: **ALIGN ALTERNATE POWER SUPPLY TO 1-VS-E-4D. (STEP 16 RESPONSE NOT OBTAINED)**

CRITICAL STEP

STANDARD:

___ SAT

___ UNSAT

(a) Identifies 1-VS-E-4E not available for service and transitions to step 16 RNO column.
*(b) Opens breaker 1-EP-BKR-1H-1B-1B, CHILLER 4E SW PUMP 1-VS-P-1E.
*(c) Opens breaker 1-EP-BKR-1H-1B-1C, MER 5 AHU 1-VS-AC-222.
*(d) Opens breaker 1-EP-BKR-1H-1B-1D, CONTROL ROOM CHILLER 1-VS-E-4E.
*(e) Opens breaker 1-EP-BKR-1H-1B-2C, CHILLER 4E CHILLED WATER PUMP 1-VS-P-2E.
(f) Opens cabinet for 1-EP-CS-101, Alternate Power Source throwover switch (located in MER 5 Electrical Room).
*(g) Rotates 1-EP-CS-101 in the clockwise direction to align the alternate power source. (Arrow should point down)
*(h) Closes breaker 1-EP-BKR-1H-1B-2D, CR CHILLER 4D MCC 1K2 ALT FDR.

EXAMINER'S CUES:

- *When breakers are opened properly by rotating the breaker control lever CLOCKWISE to the RESET/OFF position, the breaker control levers remain in the RESET/OFF position.*
- ***SAFETY – do not allow the candidate to go inside 1-EP-CS-101 once its door is opened.***
- *When 1-EP-CS-101 cabinet door is opened and the alternate power source throwover switch is slowly rotated COUNTERCLOCKWISE, the candidate should watch the pointer pass through the star (accompanied by an audible "clunk") to open the NORMAL transfer switch breaker, then through the color division (accompanied by another "clunk") to close the Alternate transfer switch breaker.*
- *When breaker 1-EP-BKR-1H-1B-2D is closed properly by rotating the breaker control lever COUNTERCLOCKWISE to the ON position, the breaker control lever remains in the ON position.*

EVALUATOR'S NOTE:

- Alternate path begins during Step 16 when operator identifies 1-VS-E-4E is not to be placed in service.
- 1-EP-CS-101 consists of two breakers operated through a gear and cam arrangement by a common operating handle. The handle is designed with a ratchet mechanism such that the gear train turns only if the handle is turned counterclockwise. Clockwise rotation will not damage the unit, but will not operate the transfer switch breakers. Furthermore, the transfer switch is designed as a break-before-make to prevent inadvertent cross connect of the normal and alternate power supplies. However, if the transfer switch is operated too quickly, the indicator can travel past the proper location.

COMMENTS:

STEP 12: **CLOSE AUX POWER FEED (APPENDIX R) TO 1-EP-MCC-1H-1B. (STEP 17 ACTION/EXPECTED RESPONSE)** STANDARD: (a) Proceeds to MCC 1A2-3 (U-1 Turbine Building Basement, East end). *(b) Closes breaker 1A2-3-7A (1-EP-BKR-1A2-3-7A, ALTERNATE FEED TO MCC 1H-1B). *EXAMINER'S CUES: When breaker 1-EP-BKR-1A2-3-7A handle is pushed, an audible sound is heard and the ON indication is visible as the breaker handle remains in the ON position.* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 13: **ENERGIZE MCC 1H-1B. (STEP 18 ACTION/EXPECTED RESPONSE)** STANDARD: (a) Proceeds to MER 5 Electrical Room. *(b) Inserts "Kirk" key (previously obtained from breaker 1H-1B-2A, NORMAL SUPPLY TO MCC 1H-1B main power feed disconnect switch) in Aux Power Feed (APPENDIX R) from 1-EP-MCC-1A2-3 disconnect switch at breaker 1H-1B-1A (1-EP-BKR-1H-1B-1A, ALTERNATE/APPENDIX R SUPPLY TO MCC 1H-1B) and rotates key clockwise from the 12 O'clock position to the 2 O'clock position. *(c) Closes breaker 1H-1B-1A (ALTERNATE/APPENDIX R SUPPLY TO MCC 1H-1B) by rotating breaker control lever COUNTERCLOCKWISE to the ON position. *EXAMINER'S CUES: If the "Kirk" key is inserted and rotated properly and the breaker control lever is rotated COUNTERCLOCKWISE, breaker control lever remains in the ON position.* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 14: **REPORT TO SHIFT SUPERVISOR (EVALUATOR)** STANDARD: Verbal status report made of task completion to Shift Supervisor to facilitate the starting of 1-VS-E-4D by the Inside Service Building Watchstander. COMMENTS: **END OF TASK**	___ 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 # 4 - Placing keyswitch to Appendix "R" position defeats interlocks which allow breaker 15A1 closure with Transfer Bus "D" supply breaker 15D1 open. Keyswitch position also allows defeat of breaker 05L3 trip open interlock with breaker 15A1 closure when "D" Transfer Bus is supplied by the AAC DG. With existing plant conditions breaker 15A1 will not close unless keyswitch is in the Appendix "R" position.**

- **STEP # 5 - Stripping Switchgear 14A1 minimizes load placed on the AAC DG. The only load to be energized during this electrical lineup via breaker 15A1 is the "D" MCR Chiller. Any additional loads aligned for supply power via breaker 15A1 will run the risk of overloading the AAC DG.**

- **STEP # 7 - Stripping Bus 1A2 except for the supply breaker (14A2-7) and MCC 1A2-3 feeder breaker (14A2-6) ensures electrical power supply for the "D" MCR Chiller while minimizing loads placed on the AAC DG via breaker 15A1.**

- **STEP #8 - Stripping MCC 1A2-3 minimizes the load placed on the AAC DG via breaker 15A1 and minimizes the possible overloading of the AAC Diesel Generator.**

- **STEP # 10 - Opening breaker 1H-1B-2A isolates the normal power supply to MCC 1H-1B. Opening 1H-1B-2A allows the "Kirk" key to be removed from the main power feed disconnect switch to MCC 1H-1B. This key will be required to align the alternate power source to MCC 1H-1B (this key interlock prevents the inadvertent paralleling of the "A" Station Service Bus and the 1H Emergency Bus power sources).**

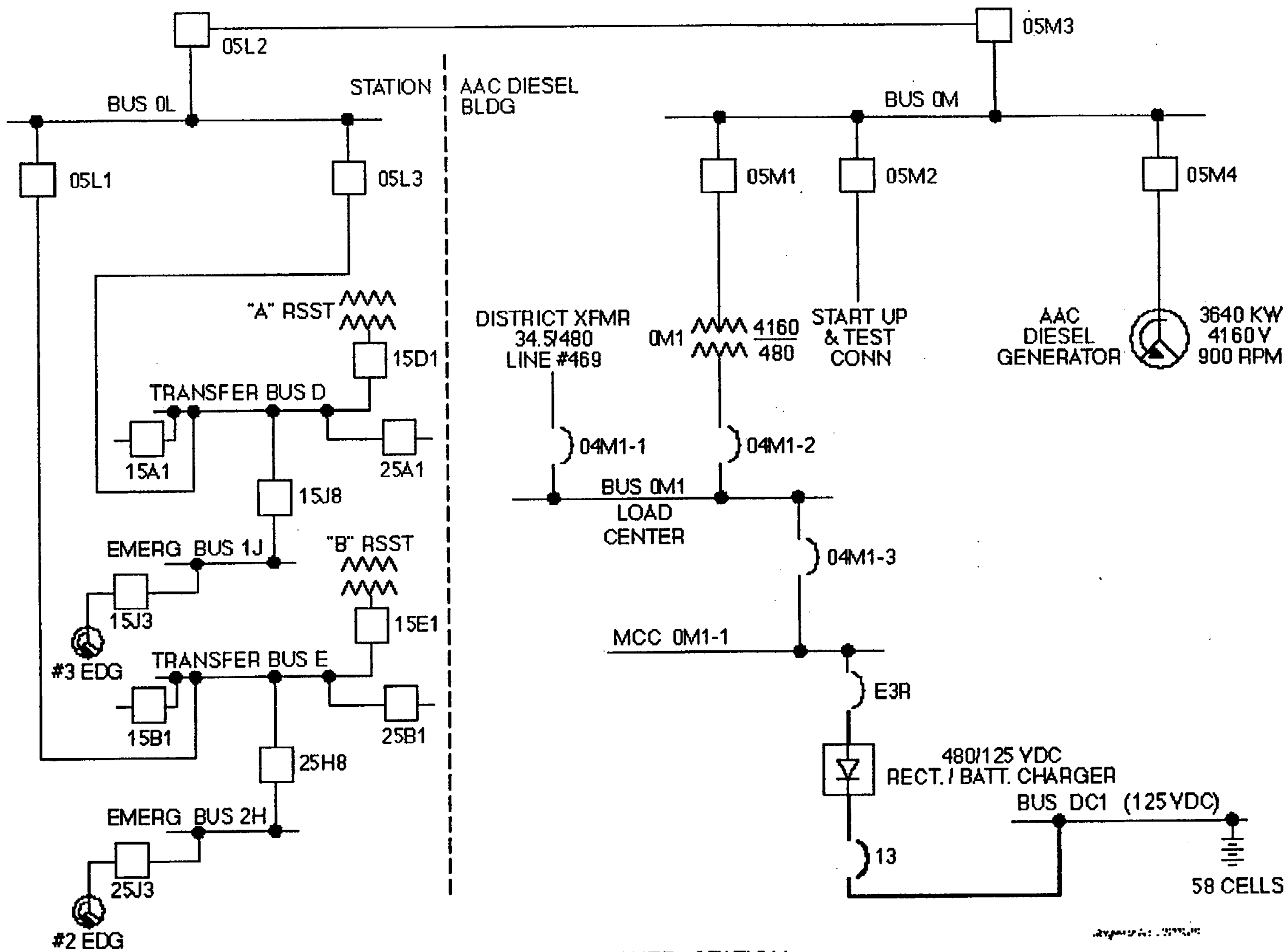
- **STEP # 11 - Stripping MCC 1H-1B of the support components for 1-VS-E-4E minimizes the load placed on the AAC DG via breaker 15A1 and minimizes the possible overloading of the diesel. Closing breaker 1H-1B-2D aligns the alternate power supply to the "D" MCR Chiller.**

- **STEP #12 - Closing breaker 1A2-3-7A aligns the power supply from the AAC Diesel Generator to MCC 1H-1B to power the "D" MCR Chiller.**

- **STEP # 13 - Inserting the "Kirk" key from 1H-1B-2A (normal supply) into breaker 1H-1B-1A allows the closing of breaker 1H-1B-1A which is the alternate feed to MCC 1H-1B. Closing breaker 1H-1B-1A aligns alternate power from the AAC DG to MCC 1H-1B to power the "D" MCR Chiller.**

Critical Step Sequencing:

Steps 4, 5, 7, 8, 9a, and 9b must be performed before step 9c to minimize the load placed on the AAC Diesel Generator via breaker 15A1 to prevent its overloading. Step 11 must be performed before step 13 to minimize the load placed on the AAC Diesel Generator.



SURRY POWER STATION
STATION BLACKOUT EDG DISTRIBUTION

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are the Outside Service Building Watchstander.

A sustained fire in the Unit 2 Emergency Switchgear Room (ESGR) and subsequent loss of offsite power has caused the loss of all MCR chillers.

Unit 1 is shutdown and offsite power is unavailable, but the AAC Diesel Generator is loaded onto the 1J Emergency Bus.

The "E" MCR Chiller (1-VS-E-4E) is tagged out for extended maintenance.

Here is a copy of 0-FCA-19.00, Alternate Power Feed to MER 5, and an Appendix "R" Key.

INITIATING CUES:

I need you to energize the "D" MCR Chiller (1-VS-E-4D) in accordance with 0-FCA-19.00 steps 1-18. I have personnel standing by to perform steps 13 and 14. When you have completed the task, the Inside Service Building Watchstander will align and start the "D" MCR Chiller.

VIRGINIA POWER
SURRY POWER STATION

FIRE CONTINGENCY ACTION

NUMBER	PROCEDURE TITLE	REVISION
0-FCA-19.00	ALTERNATE POWER FEED TO MER 5	0
	(With 3 Attachments)	PAGE 1 of 11

PURPOSE

To provide guidance for establishing an alternate power feed to MCR Chiller 1-VS-E-4D or 1-VS-E-4E during a fire in Unit 2 ESGR.

ENTRY CONDITIONS

Transition from 2-FCA-4.00, LIMITING ESGR NUMBER 2 FIRE.

APPROVAL RECOMMENDED	APPROVED	DATE
[signature]	[signature]	3/24/98
REVIEWED [signature] VAL: D. CURD	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: The purpose of this procedure is to provide an alternate power feed to 1-VS-E-4D or 1-VS-E-4E from Unit 1A Station Service Bus, supplied from either Transfer Bus D or the AAC Diesel Generator.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	___CHECK UNIT 1 STATION SERVICE BUS A - ENERGIZED	Do the following: a) IF RSST A available, THEN do the following: 1) Verify open or open (green flag) Breaker 15A2. 2) Verify open or open Breaker 15A1. 3) At the LW panel, place the Synchronizing Switch for 15D1 in ON. • 0-AAC-1SS-15D1 4) Close RSS Feeder Breaker 15D1. 5) At the LW panel, place the Synchronizing Switch for 15D1 in OFF. • 0-AAC-1SS-15D1 6) Place Sta Serv Res Sup Sync Switch in ON. • Bus 1A/CS-25-15A1 7) Close Breaker 15A1. 8) Place Sta Serv Res Sup Sync Switch in OFF. • Bus 1A/CS-25-15A1 9) IF Unit 1 Station Service Bus A energized, THEN GO TO Step 15. IF NOT, THEN open Breaker 15D1 AND GO TO Step 3. b) IF RSST A NOT available, THEN GO TO Step 3.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	__GO TO STEP 15	
3.	__CHECK AAC DIESEL GENERATOR - SUPPLYING EMERGENCY BUS 1J	GO TO Step 5.
4.	__GO TO STEP 7	
5.	__CHECK AAC DIESEL GENERATOR - AVAILABLE AND RUNNING • Annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D - LIT AND • Annunciator 0-WD-D1, AAC GENERATOR TRIP - NOT LIT	Do the following: a) Perform Annunciator Response procedure(s) as necessary: • 0-WD-D1, AAC GENERATOR TRIP • 0-WD-D2, AAC SYSTEM ALARM • 0-WD-D3, AAC BUS 0L TROUBLE b) WHEN problem corrected, THEN perform Attachment 1. c) WHEN the AAC Diesel Generator supplying Bus 0L, THEN GO TO Step 6.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

*

CAUTION: An overcurrent fault on 15D1 will prevent 0-AAC-BKR-05L3 from closing.

*

NOTE: Annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D, should go out when 0-AAC-BKR-05L3 closes.

6. __ENERGIZE TRANSFER BUS D BY CLOSING 0-AAC-BKR-05L3:

   a) Verify open or open the following breakers:

      - 15D1
      - 15J8
      - 15A1
      - 25A1

   b) At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in AAC position

   c) Check Annunciator 1K-D3, BUS 1D UNDERVOLT - NOT LIT

   RESPONSE NOT OBTAINED:

   c) Do the following:

      1) Locally investigate breakers:

         - 15D1
         - 0-AAC-BKR-05L3

      2) IF breakers normal, THEN locally turn on synch switch AND close (AAC BLDG) 0-AAC-BKR-05L3.

      3) Contact the Electrical Department for assistance as necessary.

      4) WHEN Transfer Bus D energized, THEN GO TO Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

7. __PLACE APPENDIX R KEYSWITCH LOCATED ON BREAKER 15A1 TO THE APPENDIX R POSITION

   - 1-EP-43-15A1

8. __VERIFY OPEN OR OPEN THE FOLLOWING BREAKERS:

   - 14A1-1
   - 14A1-8 (cross-connect)
   - 14B1-8 (cross-connect)

9. __VERIFY CLOSED OR CLOSE SUPPLY BREAKER TO BUS 1A2:

   - 14A2-7

10. __VERIFY CLOSED OR CLOSE SUPPLY BREAKER TO MCC 1A2-3:

    - 14A2-6

11. __OPEN <u>ALL</u> BREAKERS ON BUS 1A2 EXCEPT THE FOLLOWING:

    - 14A2-6
    - 14A2-7

12. __OPEN <u>ALL</u> BREAKERS ON MCC 1A2-3 (TURBINE BLDG BASEMENT - EAST)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

13. __STRIP ALL LOADS FROM UNIT 1 STATION SERVICE BUS A, EXCEPT BREAKER 15A7

    a) Place the following pump control switches in PTL:

    - 15A3, 1-RC-P-1A
    - 15A4, 1-CN-P-1A
    - 15A5, 1-FW-P-1A1
    - 15A6, 1-FW-P-1A2

    - 15A10, 1-SD-P-2A

    b) Locally open the following breakers:

    - 15A8, Training Center
    - 15A9, 1-CD-REF-1A

14. __ENERGIZE MCC 1A2-3

    a) Place Sta Serv Res Sup Sync Switch in ON

    - Bus 1A/CS-25-15A1

    b) Close Sta Serv Res Sup Bkr Bus 1A

    - ACB-15A1

    c) Verify Station Service voltage

    - STA SERV BUS 1A VOLT

    d) Place Sta Serv Res Sup Sync Switch in OFF

    - Bus 1A/CS-25-15A1

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15.	__ISOLATE NORMAL POWER SUPPLY TO MCC 1H-1B IN MER 5 a) Open the Main Power Feed Disconnect switch • 1H-1B-2A, Normal Supply to MCC 1H-1B b) Remove the key from Main Power Feed disconnect switch	
16.	__CHECK MER 5 CHILLER TO BE PLACED IN SERVICE - 1-VS-E-4E	Align alternate power supply to 1-VS-E-4D: a) Verify open or open all breakers on MCC 1H-1B in MER 5. b) Place MCC 1K2 CR Chiller 4D Power Transfer Switch in the ALTERNATE SOURCE MCC 1H-1B position: • 1-EP-CS-101 c) Place MCC 1K2 CR Chiller 4D Alternate Feeder in ON: • 1H-1B-2D
17.	__CLOSE AUX POWER FEED (APPENDIX R) TO 1-EP-MCC-1H-1B • 1A2-3-7A	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18.	__ENERGIZE MCC 1H-1B: a) Insert key in Aux Power Feed (Appendix R) from 1-EP-MCC-1A2-3 disconnect switch • 1H-1B-1A, Alternate/Appendix R Supply to MCC 1H-1B b) Close Aux Power Feed (Appendix R) from 1-EP-MCC-1A2-3 disconnect Switch to energize MCC 1H-1B • 1H-1B-1A	
19.	__VERIFY RUNNING OR START ALL AVAILABLE MCR AND ESGR AHUs ON CHILLED WATER LOOP A • 1-VS-AC-1 • 2-VS-AC-9 • 1-VS-AC-7 • 2-VS-AC-7	
20.	__START 1-VS-E-4E OR 1-VS-E-4D IAW APPLICABLE SUBSECTION OF 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM	
*21.	__CHECK MCR CHILLERS - AT LEAST ONE AVAILABLE FROM NORMAL POWER SUPPLY	Do the following: a) Continue attempts to restore normal power to an MCR Chiller. b) WHEN normal power restored, THEN GO TO Step 22.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

22. __SECURE 1-VS-E-4E OR 1-VS-E-4D IAW APPLICABLE SUBSECTION OF 0-OP-VS-006, CONTROL ROOM AND RELAY ROOM VENTILATION SYSTEM

23. __OPEN STA SERV RES SUP BKR BUS 1A

    - ACB-15A1

24. __PLACE APPENDIX R CONTROL SWITCH LOCATED ON BREAKER 15A1 TO THE NORMAL POSITION

    - 1-EP-43-15A1

25. __RETURN STATION SERVICE BUS A LINEUP TO NORMAL

    a) Verify closed or close supply breaker to Bus 1A1

       - 14A1-1

    b) Close breakers on Bus 1A2 as necessary, IAW Shift Supervisor direction

    c) Close breakers on MCC 1A2-3 as necessary, IAW Shift Supervisor direction

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26.	__RETURN MER 5 CHILLER ELECTRICAL LINEUP TO NORMAL: a) Verify closed or close MCC 1H-1B CR Chiller 4E Normal Feeder Breaker • 14H1-6 b) Open Aux Power Feed (Appendix R) from 1-EP-MCC-1A2-3 disconnect switch • 1H-1B-1A c) Remove key from Aux Power Feed (Appendix R) from 1-EP-MCC-1A2-3 disconnect switch • 1H-1B-1A d) Insert key in Main Power Feed disconnect switch • 1H-1B-2A e) Close Main Power Feed disconnect switch to MCC 1H-1B • 1H-1B-2A f) Align power to MCC 1K2 for 1-VS-E-4D IAW applicable Subsection of 0-OP-VS-006	
27.	__CHECK AAC DIESEL GENERATOR - WAS SUPPLYING MER 5 CHILLER <u>BEFORE</u> BREAKER 15A1 WAS OPENED IN STEP 23	RETURN TO procedure in effect.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28.	__CHECK AAC DIESEL GENERATOR - SUPPLYING EMERGENCY BUS 1J OR 2H	Do the following: a) Initiate Attachment 2 to secure AAC Diesel Generator. b) RETURN TO procedure in effect.
29.	__RETURN TO APPLICABLE STEP OF 0-AP-17.06, AAC DIESEL GENERATOR - EMERGENCY OPERATIONS	

- END -

___ 1. IF neither unit has experienced a blackout AND operation of the AAC Diesel is desired, THEN GO TO Step 16.

___ 2. IF either unit has experienced a blackout AND the AAC Diesel is running, THEN GO TO Step 20. IF the AAC Diesel is NOT running, THEN at 0-AC-MCC-0M1-1, AAC System 480V MCC 0M1-1, verify the following breakers are closed and the HAND-OFF-AUTO switches for the breakers are in AUTO:

- ___ 0-AAC-BKR-0M1-1-B4, AAC System Fuel Oil Cooler Circuit Breaker 0-BFO-F-1
- ___ 0-AAC-BKR-0M1-1-C1, AAC System Radiator Fan Circuit Breaker 0-BCW-F-1A
- ___ 0-AAC-BKR-0M1-1-C2, AAC System Exhaust Fan Circuit Breaker 0-VS-F-700
- ___ 0-AAC-BKR-0M1-1-C3, AAC System Exhaust Fan Circuit Breaker 0-VS-F-702
- ___ 0-AAC-BKR-0M1-1-D1, AAC System Radiator Fan Circuit Breaker 0-BCW-F-1B
- ___ 0-AAC-BKR-0M1-1-D2, AAC System Exhaust Fan Circuit Breaker 0-VS-F-701

* *

CAUTION: If the diesel engine is rolled over while 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve, is closed, damage to engine components may result.

* *

___ 3. Verify 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve, is open as indicated by position arrow on end of valve actuator in OPEN (pointer at 2 o'clock position).

___ 4. Reset 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve, as required using a long handled 3/4 inch box end wrench. Pulling the wrench toward the north about 90 degrees will engage the latch for the valve actuator into the OPEN position.

___ 5. Verify at least one Air Compressor, 0-BSA-C-1A or 0-BSA-C-1B, operable.

- White CONTROL POWER ON light LIT
- AUTO OFF/RESET switch in AUTO
- Blue AUTO OPERATION light LIT
- Lube Oil visible in bulls eye of sight glass (right side of compressor)

___ 6. Verify Starting Air Pressure at 0-BSA-PI-4, AAC Starting Air Tk Press Indicator, (local at tank) is greater than 350 psig.

NOTE: If the Engine Barring Device is engaged, pulling the spring loaded reset knob will cause the drive shaft for the barring device to move slightly to the right about 1/4 inch after a clicking feel is sensed and an unlatching sound is heard.

___ 7. Verify reset or reset Engine Barring Device Reset knob by pulling the spring loaded black knob located on the barring device on the north side generator end of diesel.

___ 8. Verify the following at the Woodward Governor:

- Lube oil level is at the high end mark of the sight glass.
- Extension arm in the Bimba Cylinder (grey air cylinder on the north face of the governor with rod connecting the fuel racks to the governor) is retracted.

NOTE: Verifying the hole in the Overspeed Trip Bar is aligned with the sensor for the Mechanical Overspeed Trip Device can be used in place of climbing up on the engine and resetting the trip device. The reset is located on top of the Overspeed Device on the south side generator end of the diesel. A red band on the Mechanical Overspeed Trip Device is exposed when the device is tripped.

___ 9. Reset the Mechanical Overspeed Trip Device by quickly pushing in the reset device, as necessary.

___10. Reset the Electronic Overspeed reset on the black box inside the Engine Control Panel (lower left corner).

11. Verify the following at the Engine Control Panel.

___ a. Check parameters in the indicated band.

- Lube Oil FM Cooler Temperature - GREATER THAN OR EQUAL TO 80°F
- Jacket Water Outlet Temperature - GREATER THAN OR EQUAL TO 100°F
- Expansion Tank Level - 50% TO 80%
- Fuel Oil Day Tank Level - 75% TO 83%
- Starting Air Pressure - 180 PSIG TO 240 PSIG

___ b. Verify PANEL POWER ON light LIT at the Annunciator Panel.

___ c. Verify or align switches as follows:

- Exhaust Gas - IN 13, 14, 15, or 16
- System Mode: (Selector Key Switch) - STANDBY
- Alarm Control - OFF after RESET
- Generator Heater - AUTO
- Lube Oil Heater - AUTO
- Coolant Heater - AUTO

___12. Verify switches aligned. IF switches NOT aligned, THEN notify the Shift Supervisor for evaluation.

- AAC System Test Switch (0-AAC-43-ESPO) - NORM (AAC Control Panel)
- Sequence Mode Selector Switch AAC System (0-AAC-SSMS-ESPO) - AUTO (AAC Control Panel)
- AAC System Test Switch (0-AAC-43-ESPA) - NORM (next to Network 90 Panel)

___13. Verify or align VOLTMETER switch at the Generator Control Panel to position 1-2.

___14. Verify or align switches inside the Generator Control Panel.

- PCB (Power Circuit Breaker gang switch up) - ON
- FCB (Field Circuit Breaker upside down) - ON
- VOLTAGE CONTROL MODE - AUTO (left position)
- PBLA potentiometer - 8.6
- IDLE/RATED toggle switch - RATED

___15. Verify open or open the following breaker control switches on the AAC Control Panel.

- 0-AAC-1-05M4, ACB 05M4 Generator Breaker
- 0-AAC-1-05M3, ACB 05M3 Bus M Tie to Bus 0L
- 0-AAC-1-05L2, ACB 05L2 Bus 0M Tie to Bus 0L
- 0-AAC-1-05L3, ACB 05L3 Transfer Bus D Tie
- 0-AAC-1-05M1, ACB 05M1 Feed to Xfmr 0M1
- 0-AAC-1-04M1-2, ACB 04M1-2 480V Alternate Feed

<u>NOTE:</u> If power to the AAC Building is being supplied from the Line 469, opening the 04M1-1 breaker will deenergize MCC 0M1-1 resulting in a loss of building lighting.

___ 16. Verify open or open 0-AAC-1-04M1-1, ACB 04M1-1 480V Normal Feed.

*

<u>CAUTION:</u>

- If oil pressure on the LUBE OIL PRESSURE gauge is <u>not</u> <u>on</u> <u>scale</u>, the diesel <u>MUST</u> be stopped using the EMERGENCY STOP on the Engine Control Panel button within 10 seconds after engine start.

- If the AAC Diesel is stopped using the EMERGENCY STOP button, the red EMERGENCY STOP button should <u>NOT</u> be reset until the engine has come to a complete stop. The EMERGENCY STOP button should be reset by turning the button clockwise to release the button latch mechanism after the emergency condition is mitigated.

- If a PLC FAILURE alarm (lower left hand corner) is indicated, the engine should not be operated. If the AAC Diesel is started with this condition, the following additional precautions should be considered:

    1. Automatic trip of the Diesel may not occur.

    2. Engine prelube will not take place.

    3. Automatic disengagement of the start motors will not occur at 170 rpm. As the engine approaches this speed, the Engine Start/Stop switch should be returned to Neutral.

*

___17. Start the AAC Diesel from the Engine Control Panel by placing and holding the ENGINE CONTROL switch in START for at least 5 seconds.

___18. Verify the AAC diesel starts and oil pressure at the LUBE OIL PRESSURE gauge is indicated within 10 seconds.

___19. <u>IF</u> pressure is <u>NOT</u> indicated on the LUBE OIL PRESSURE gauge within 10 seconds, <u>THEN</u> <u>immediately</u> press the EMERGENCY STOP button.

___20. Verify engine speed is approximately 900 rpm as indicated on the ENGINE SPEED meter.

___21. Verify generator voltage is between 4250 and 4350 volts as indicated on the GENERATOR VOLTAGE meter on the Generator Control Panel. Adjust the VOLTAGE CONTROL switch on the AAC Control Panel as required.

___22. Verify generator frequency is between 59.5 and 60.5 hertz as indicated on the GENERATOR FREQUENCY meter on the Generator Control Panel. Adjust the SPEED CONTROL switch on the AAC Control Panel as required.

___23. Check 0-AAC-BKR-05M4, AAC Generator Output Breaker, closed. <u>IF</u> breaker <u>NOT</u> closed, <u>THEN</u> do the following:

- ___ a. Obtain the Sync Switch Key from inside the AAC Generator Control Panel.
- ___ b. Insert Synch Switch Key in receptable for Synchronizing Switch Bus OM to AAC Dsl Gen 0-AAC-1SS-05M4, and place in ON.
- ___ c. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in CLOSE.
- ___ d. Place Synch Switch Key in OFF.

___24. Verify closed or close 0-AAC-BKR-05M1, Bus OM To 0-AAC-TRAN-OM1 Feeder Breaker.

* *

<u>CAUTION:</u> To prevent out of phase circulating currents and damage to equipment powered from 0-AAC-MCC-OM1, 0-AAC-BKR-04M1-1, 480V Bus OM1 Normal Feed Circuit Breaker, and 0-AAC-BKR-04M1-2, 480V Bus OM1 Alternate Feed Circuit Breaker, <u>MUST</u> never be closed at the same time.

* *

___25. Verify closed or close 0-AAC-BKR-04M1-2, 480 Bus OM1 Alternate Feed.

___26. Verify closed or close 0-AAC-BKR-05M3, Bus 0M Tie To Bus 0L.

___27. Verify closed or close 0-AAC-1-05L2, Bus 0M Tie To Bus 0L.

___28. RETURN TO Step in effect.

NOTE: If Line Circuit 469, Transfer Bus D, or Transfer Bus E is NOT energized, the AAC Diesel Generator should remain running as long as possible to keep the AAC BLDG loads energized.

___ 1. Verify Line Circuit 469 - ENERGIZED, and at AAC Control Panel, perform the following to secure the AAC Diesel Generator. IF Line Circuit 469 NOT energized, THEN GO TO Step 2.

___ a. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in TRIP.

___ b. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ c. Place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480 V Normal Feed, in CLOSE.

___ d. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP. Record time ________

___ e. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ f. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ g. Verify or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ h. Verify or place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.

___ i. Verify or place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in TRIP.

___ j. WHEN 5 to 10 minutes have elapsed from Step 1d, THEN perform Step 1k.

___ k. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ l. GO TO Step 5.

___ 2. Verify Transfer Bus D - ENERGIZED, and at the AAC Control Panel, perform the following. IF Transfer Bus D NOT energized, THEN GO TO Step 3.

___ a. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ c. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ d. Place 0-AAC-1SS-05L3, Synchronizing Switch Bus 0L To Bus D, in ON.

___ e. Place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in CLOSE.

___ f. Place 0-AAC-1SS-05L3, Synchronizing Swtich Bus 0L to Bus D, in OFF.

___ g. Verify or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in CLOSE.

___ h. Verify or place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in CLOSE.

___ i. Verify or place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in CLOSE.

___ j. Verify or place in 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in CLOSE.

k. GO TO Step 5. WHEN Line Circuit 469 available, THEN do the following:

___ 1. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in TRIP.

___ 2. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ 3. Place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ 4. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ 5. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ 6. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ 7. Place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.

___ 3. Verify Transfer Bus E - ENERGIZED, and at the AAC Control Panel, perform the following. IF Transfer Bus E NOT energized, THEN GO TO Step 4.

___ a. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ c. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ d. Place 0-AAC-1SS-05L1, Synchronizing Switch Bus 0L To Bus E, in ON.

___ e. Place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in CLOSE.

___ f. Place 0-AAC-1SS-05L1, Synchronizing Swtich Bus 0L to Bus E, in OFF.

___ g. Verify or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in CLOSE.

___ h. Verify or place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in CLOSE.

___ i. Verify or place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in CLOSE.

___ j. Verify or place in 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in CLOSE.

k. GO TO Step 5. WHEN Line Circuit 469 available, THEN do the following:

___ 1. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in TRIP.

___ 2. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ 3. Place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ 4. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ 5. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ 6. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ 7. Place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus D Tie, in TRIP.

___ 4. Verify Line Circuit 469, Transfer Bus D, or Transfer Bus E NOT available. WHEN any source becomes available, THEN complete Step 1, 2, or 3, depending on which source energized. GO TO Step 5.

___ 5. Verify that all AAC Diesel auto-start signals are clear by checking annunciators 1K-D3, 1K-E3, and 1K-F3, BUS 1(D, E, F,) UNDERVOLT - NOT LIT. IF an auto-start signal is present, THEN GO TO Step 6. Perform Step 5 when auto-start signal is clear.

___ 6. IF all AAC Diesel auto-start signals are clear, THEN reset SEQUENCE MODE SELECTOR switch on the AAC Control Panel, by placing the switch in AUTO after OFF/RESET.

___ 7. Place the Synch Switch Key inside SBO Generator Control Panel cubicle.

___ 8. Check Diesel Engine crankcase oil level. Have the Maintenance Department fill if necessary. (Oil level should be between the ADD and FULL marks on the ENGINE STOPPED WITH COLD OIL side of the dipstick.)

___ 9. Order fuel oil to fill the Fuel Oil Day Tank.

___10. RETURN TO procedure in effect.

NUMBER 0-FCA-19.00	ATTACHMENT TITLE	REVISION 0
ATTACHMENT 3	PROBABLE CAUSES AND REFERENCES	PAGE 1 of 1

I. PROBABLE CAUSES:

1. An Appendix R fire in Unit 2 ESGR

II. REFERENCES:

1. DCP 96-024, Appendix R Power Feed for MER 5
2. 0-OP-VS-006, Control Room and Relay Room Ventilation System
3. 0-AP-17.06, AAC Diesel Generator - Emergency Operations
4. UFSAR 7.7.2, Control Room
5. UFSAR Chapter 8, Station Electrical Distribution
6. UFSAR 9.9, Service Water System
7. UFSAR 9.10, Fire Protection
8. UFSAR 9.13, Main Control Ventilation System
9. Tech Spec 3.23
10. 11448-FW-1W, 480V One Line Diagram, MCC's 1K1, 1K2, 1H-1B & 2K1
11. 11448-FE-1AA, Appendix R Evaluation, Electrical One Line Diagram
12. Safety Evaluation No. 97-115
13. UFSAR Change Request FS 97-28

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U.S. Nuclear Regulatory Commission

Region II

Facility Walk-Through

NRC-FWT-JPM-10

Title:

LOCALLY ISOLATE UNIT 1 RCP SEALS AND ESTABLISH CHARGING PUMP CROSSTIE

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II

INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

LOCALLY ISOLATE UNIT 1 RCP SEALS AND ESTABLISH CHARGING PUMP CROSSTIE.

Alternate Path:

N/A

Facility JPM #:

NEW

K/A Rating(s):

SYS006.A2.02 (RO 3.9/SRO 4.3)

Task Standard:

Completion of 1-ECA-0.0 step 11 and Attachment 6, "Establishing Charging Pump Crosstie".

Preferred Evaluation Location:

Simulator ______ In-Plant __X____

Preferred Evaluation Method:

Perform _____ Simulate __X___

References:

1-ECA-0.0 step 11 and Attachment 6, "Establishing Charging Pump Crosstie," Rev. 17.

Validation Time: 20 min. **Time Critical:** No

===

Candidate: ______________________________ Time Start : ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Question Grade ______ Performance Time ______

Examiner: ______________________ ____________________________/________
NAME SIGNATURE DATE

===

COMMENTS

____

____

____

Tools/Equipment/Procedures Needed:

1-ECA-0.0 step 11 and Attachment 6, "Establishing Charging Pump Crosstie," Rev. 17.
Wire cutters/tie wrap cutters.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. 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. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

You are the Auxiliary Building Operator.

We are currently experiencing a loss of all AC power on Unit 1.

Here is a copy of 1-ECA-0.0 step 11 and Attachment 6, "Establishing Charging Pump Crosstie".

INITIATING CUES:

I need you to perform 1-ECA-0.0 step 11 to isolate the Unit 1 RCP seals and then perform Attachment 6 to establish charging pump crosstie to Unit 1.

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 1: **LOCALLY ISOLATE RCP SEALS BY SHUTTING RCP SEAL RETURN. (STEP 11 ACTION/EXPECTED RESPONSE)** STANDARD: (a) Operator proceeds to the Auxiliary Building Basement penetration area on the Unit 1 side and locates 1-CH-MOV-1381 (RCP seal return). (b) Identifies 1-CH-MOV-1381 OPEN (by observing the valve position indicating rod extended upward). *(c) Engages 1-CH-MOV-1381 manual operator by depressing the clutch mechanism (pushes in the direction of the clutch lever arrow). *(d) Manually shuts valve by turning handwheel in the clockwise direction. ***EXAMINER'S CUES: 1-CH-MOV-1381 is initially OPEN as the valve position indicator is extended upward. The manual operator engages as the clutch mechanism is pushed in the direction of the arrow. As the valve handwheel is rotated in the clockwise direction the position indicator rod lowers until it is nearly flush with the motor housing and then the handwheel stops turning.*** EVALUATOR'S NOTE: **1-CH-MOV-1381 is initially OPEN and can be manually shut.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 2: **LOCALLY ISOLATE RCP SEALS BY SHUTTING RCP SEAL INJECTION. (STEP 11 ACTION/EXPECTED RESPONSE)** STANDARD: (a) Operator locates 1-CH-MOV-1370 (RCP seal injection). (b) Identifies 1-CH-MOV-1370 OPEN (by observing the valve position indicating rod extended upward). *(c) Engages 1-CH-MOV-1370 manual operator by depressing the clutch mechanism (pushes in the direction of the clutch lever arrow). *(d) Manually shuts valve by turning handwheel in the clockwise direction. ***EXAMINER'S CUES: 1-CH-MOV-1370 is initially OPEN as the valve position indicator is extended upward. The manual operator engages as the clutch mechanism is pushed in the direction of the arrow. As the valve handwheel is rotated in the clockwise direction the position indicator rod lowers until it is nearly flush with the motor housing and then the handwheel stops turning.*** EVALUATOR'S NOTE: **1-CH-MOV-1370 is initially OPEN and can be manually shut.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: **LOCALLY ISOLATE RCP SEALS BY SHUTTING SEAL INJECTION NEEDLE VALVES. (STEP 11 ACTION/EXPECTED RESPONSE)**	**CRITICAL STEP**
STANDARD: (a) Operator locates 1-CH-294 and cuts the tie wrap. *(b) Shuts 1-CH-294 by rotating the handwheel in the clockwise direction. (c) Operator locates 1-CH-297 and cuts the tie wrap. *(d) Shuts 1-CH-297 by rotating the handwheel in the clockwise direction. (e) Operator locates 1-CH-300 and cuts the tie wrap. *(f) Shuts 1-CH-300 by rotating the handwheel in the clockwise direction. ***EXAMINER'S CUES: As the handwheel on 1-CH-294, 297, or 300 is rotated in the clockwise direction, the valve's handwheel moves and then stops as the valve is closed. The tie wrap must be removed for proper valve operation in the shut direction.***	___ SAT ___ UNSAT
EVALUATOR'S NOTE: **Evaluator will provide wire cutters once the candidate identifies the need for them.** **1-CH-294, 297 and 300 are initially throttled. Once the tie wraps are removed, the valves can be manually shut by rotating the handwheels in the clockwise direction.**	
COMMENTS:	

STEP 4: **LOCALLY ISOLATE RCP SEALS THERMAL BARRIER CC FLOWPATH. (STEP 11 ACTION/EXPECTED RESPONSE)** STANDARD: (a) Operator locates 1-CC-96 and identifies the valve is open. *(b) Shuts 1-CC-96 by rotating the handwheel in the clockwise direction. ***EXAMINER'S CUES: As the handwheel on 1-CC-96 is rotated in the clockwise direction, the valve's handwheel moves and the stem travels inward toward the valve (rising stem valve). The handwheel and valve stem stop as the valve is closed.*** EVALUATOR'S NOTE: **1-CC-96 is initially open. The valve can be manually shut by rotating the handwheel in the clockwise direction.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5: **LOCALLY CLOSE THE CHARGING LINE VALVE. (ATTACHMENT 6, STEP 1)**	___ SAT
STANDARD: (a) Operator locates 1-CH-304 and identifies the valve is open. (b) Shuts 1-CH-304 by rotating the handwheel in the clockwise direction. ***EXAMINER'S CUES: As the handwheel on 1-CH-304 is rotated in the clockwise direction, the valve's handwheel moves and the stem travels inward toward the valve (rising stem valve). The handwheel and valve stem stop as the valve is closed.***	___ UNSAT
EVALUATOR'S NOTE: **1-CH-304 is initially open. The valve can be manually shut by rotating the handwheel in the clockwise direction.**	
COMMENTS:	

STEP 6: **LOCALLY VERIFY HIGH HEAD SAFETY INJECTION MOVs TO UNIT 1 COLD LEGs CLOSED. (ATTACHMENT 6, STEP 2)** STANDARD: (a) Operator locates 1-SI-MOV-1867C and D. (b) Checks 1-SI-MOV-1867C CLOSED (by observing the valve position indicating rod lowered flush with the motor housing). (c) Checks 1-SI-MOV-1867D CLOSED (by observing the valve position indicating rod lowered flush with the motor housing). ***EXAMINER'S CUES: 1-SI-MOV-1867C and D are CLOSED as the valve position indicator rod is lowered flush with the motor housing.*** EVALUATOR'S NOTE: **High head safety injection valves (1-SI-MOV-1867C and D) to the Unit 1 RCS cold legs are closed.** COMMENTS:	___ SAT ___ UNSAT

STEP 7: **LOCALLY VERIFY CHARGING LINE ISOLATION MOVs OPEN. (ATTACHMENT 6, STEP 3)**	___ SAT
STANDARD: (a) Operator locates 1-CH-MOV-1289A and B. (b) Checks 1-CH-MOV-1289A OPEN (by observing the valve position indicating rod extended upward). (c) Checks 1-CH-MOV-1289B OPEN (by observing the valve position indicating rod extended upward). ***EXAMINER'S CUES: 1-CH-MOV-1289A and B are OPEN as the valve position indicator rod is extended upward.***	___ UNSAT
EVALUATOR'S NOTE: **Charging line isolation valves (1-CH-MOV-1289A and B) are open.**	
COMMENTS:	

STEP 8: **LOCALLY VERIFY UNIT 1 "C" CHARGING PUMP DISCHARGE MOVs OPEN. (ATTACHMENT 6, STEP 4)** STANDARD: (a) Operator locates 1-CH-MOV-1286C and 1-CH-MOV-1287C in the Unit 1 "C" Charging Pump Cubicle. (b) Checks 1-CH-MOV-1286C OPEN (by observing the valve position indicating rod extended upward). (c) Checks 1-CH-MOV-1287C OPEN (by observing the valve position indicating rod extended upward). ***EXAMINER'S CUES: 1-CH-MOV-1286C and 1-CH-MOV-1287C are OPEN as the valve position indicator rod is extended upward.*** EVALUATOR'S NOTE: **Unit 1 "C" Charging Pump discharge MOVs (1-CH-MOV-1286C and 1-CH-MOV-1287C) are open.** COMMENTS:	___ SAT ___ UNSAT

STEP 9: **VERIFY UNIT 2 "C" CHARGING PUMP DISCHARGE MOVs OPEN. (ATTACHMENT 6, STEP 5)** STANDARD: Operator contacts the MCR to verify the Unit 2 "C" Charging Pump discharge MOVs (2-CH-MOV-2286C and 2-CH-MOV-2287C) are OPEN. ***EXAMINER'S CUES: If asked, inform the operator as the MCR that 2-CH-MOV-2286C and 2-CH-MOV-2287C are OPEN.*** EVALUATOR'S NOTE: **Unit 2 "C" Charging Pump discharge MOVs (2-CH-MOV-2286C and 2-CH-MOV-2287C) are open.** COMMENTS:	___ SAT ___ UNSAT
STEP 10: **VERIFY UNIT 2 CHARGING PUMP(S) SUCTION ALIGNED TO UNIT 2 REFUELING WATER STORAGE TANK (RWST). (ATTACHMENT 6, STEP 6)** STANDARD: Operator contacts the MCR to verify the Unit 2 charging pump suction is aligned to the Unit 2 RWST. ***EXAMINER'S CUES: If asked, inform the operator as the MCR that the Unit 2 charging pump suction is aligned to the Unit 1 RWST.*** EVALUATOR'S NOTE: **Unit 2 charging pump suction is aligned to the Unit 1 RWST.** COMMENTS:	___ SAT ___ UNSAT

STEP 11: **LOCALLY OPEN 2-CH-447. (ATTACHMENT 6, STEP 7)** STANDARD: (a) Proceeds to the Unit 2 side of Auxiliary Building Basement. (b) Locates 2-CH-447 (in the overhead above the Unit 2 SG "C" Recirculation and Transfer Pump 2-RT-P-1C). *(c) Opens 2-CH-447, CHG PUMPS XCONN TO UNIT 1 ISOL, (by turning valve handwheel in the counter-clockwise direction). ***EXAMINER'S CUE: When correctly operated in the counterclockwise direction, handwheel rotates, stem extends out, then the handwheel stops. System flow noise is heard for a short period of time, then it stops (as pressure equalizes).*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: **LOCALLY VENT CROSSTIE PIPING BY OPENING 1-CH-732. (ATTACHMENT 6, STEP 8)** STANDARD: (a) Locates 1-CH-732 (Auxiliary Building Basement next to Gate 23). (b) Begins venting by opening 1-CH-732, CH SYS XCONN HDR DRAIN, (turning valve in the counter-clockwise direction). (c) Recloses 1-CH-732 by turning valve in the clockwise direction. ***EXAMINER'S CUE: When 1-CH-732 is properly operated, charging crosstie pressure guage, 1-SI-PI-102, indication swings irradically then stabilizes at approximately 2500 psig. Air escaping and "venting" noises can be heard coming from behind Gate 23 (vent path), then the noise abates as pressure in the charging crosstie line steadies.*** COMMENTS:	___ SAT ___ UNSAT

STEP 13: LOCALLY OPEN 1-CH-728. (ATTACHMENT 6, STEP 9)	CRITICAL STEP
STANDARD: (a) Proceeds to Auxiliary Building Basement Unit 1 side. (b) Locates 1-CH-728 (in the overhead above the Unit 1 "C" SG Recirculation and Transfer Pump 1-RT-P-1C). (c) Places the ratchet selector switch in the UP position (rotates selector switch counter-clockwise until top stop is reached). *(d) Opens 1-CH-728, CHG PUMPS XCONN TO UNIT 1 ISOL, by "ratcheting" the valve lever clockwise and then pushing to turn the valve lever in the counter-clockwise direction initiating valve movement. *EXAMINER'S CUE: The valve ratchet selector is as indicated.* • *Tell operator: If operator attempts to reposition valve with ratchet selector in the DOWN position, as he/she pulls down on valve lever, it will not move since valve is closed. If room exists to push up on valve lever, it will "click" (ratchet).* • *Tell operator: AFTER moving ratchet selector switch to UP position, valve lever "clicks" (ratchets) as it is moved down & valve moves counter-clockwise & begins opening as valve lever is pushed up (counter clockwise direction).* • *Tell operator: When 1-CH-728 properly operated, inform operator that flow noise is heard through the line.* • *When properly operated: Valve stem extends, operator ratchets the valve until valve no longer travels in the open direction and flow noise heard.* EVALUATOR'S NOTE: **Ratchet selector switch must be in the up position to allow counter clockwise motion to open the valve.** COMMENTS:	___ SAT ___ UNSAT

STEP 14: **REPORT TO SHIFT SUPERVISOR (EVALUATOR). (ATTACHMENT 6, STEP 10 AND 11)** STANDARD: Verbal status report made that RCP seals are isolated and charging crosstie has been established. Operator is standing by to operate 1-CH-304 as directed. COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

TIME STOP: ________

Critical Step Justification:

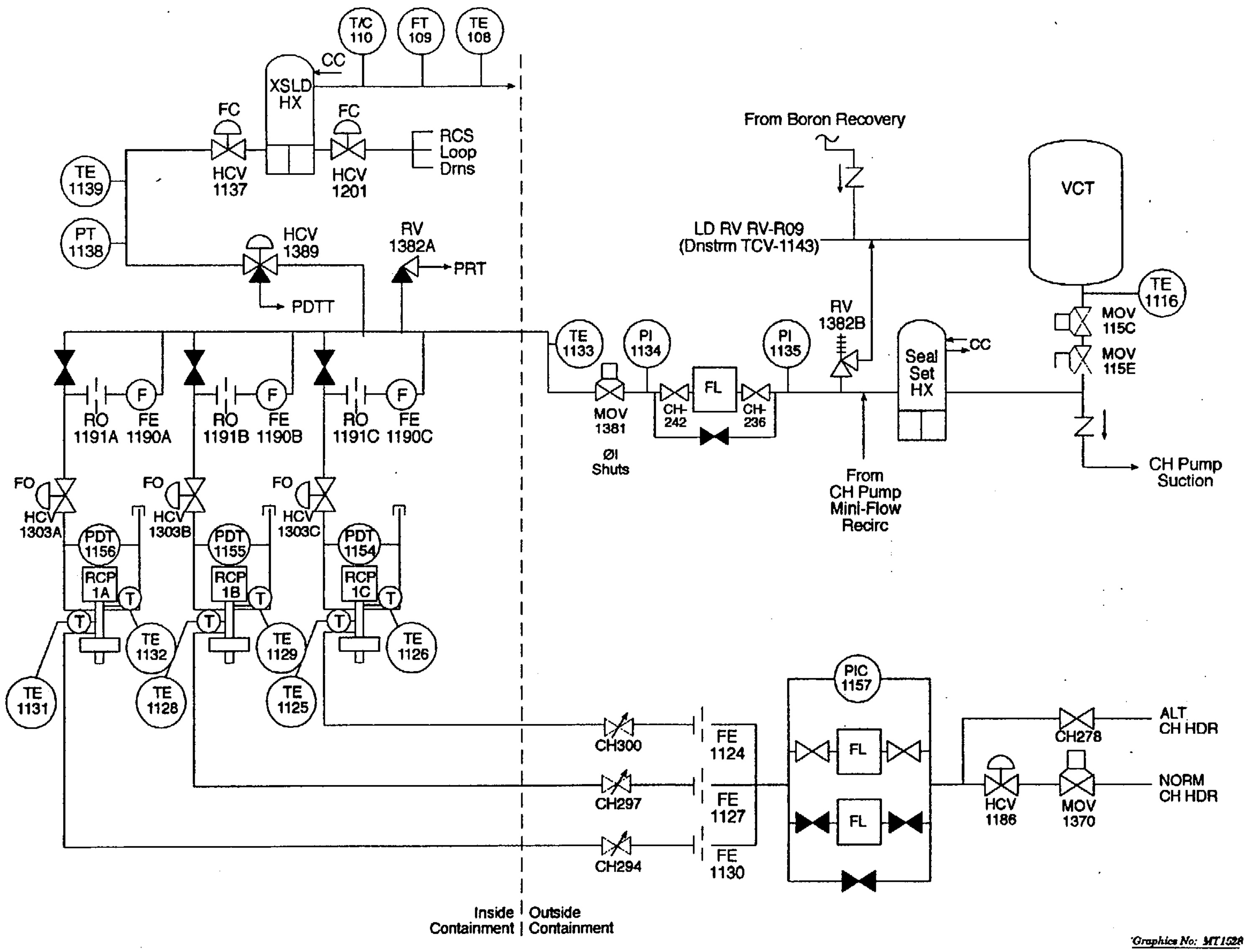
Substeps within the critical step block are designated with an asterisk (critical component of the step) or no asterisk (Not a critical component).

- **STEP # 1 - RCP seal return isolation valve must be manually shut to conserve inventory. Clutch must be depressed to properly operate the valve.**
- **STEP # 2 - RCP seal injection isolation valve must be manually shut to isolate the RCP seals to prevent seal damage when charging cross tie is established. Clutch must be depressed to properly operate the valve.**
- **STEP # 3 - RCP seal injection needle valves must be manually shut to isolate the RCP seals to prevent seal damage when charging cross tie is established.**
- **STEP # 4 - Component Cooling to the RCP thermal barrier must be manually shut to isolate the thermal barriers to prevent seal damage when Component Cooling water flow is established.**
- **STEP # 11 - 2-CH-447 must be opened successfully to establish charging crosstie flow to the core from Unit 2 during a loss of emergency coolant recirculation for long term core cooling. Proper operation of 2-CH-447 is vital to establish a method of long term core heat removal.**
- **STEP # 13 - 1-CH-728 must be opened successfully to establish charging crosstie flow to the core from Unit 2 during a loss of emergency coolant recirculation for long term core cooling. Proper operation of 1-CH-728 is vital to establish a method of long term core heat removal.**

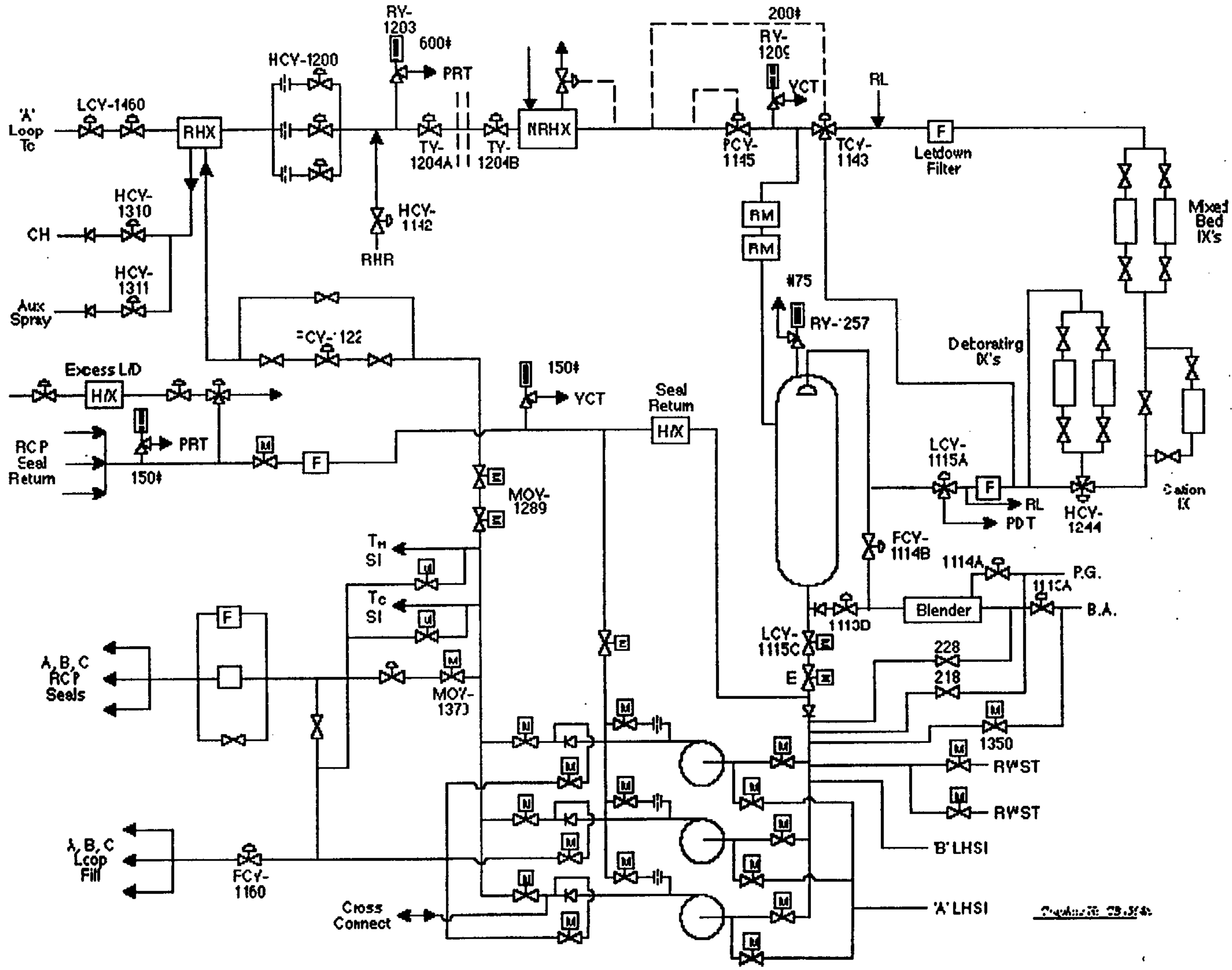
(Critical Step NOTE: Either step 2 or 3 isolates seal injection therefore only 1 <u>MUST</u> be performed.)

Critical Step Justification:

RCP Seals must be isolated prior to establishing Charging Crosstie.



SEAL WATER INSTRUMENTATION AND CONTROL



CHARGING AND LETDOWN SYSTEM DRAWING

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are the Auxiliary Building Operator.

We are currently experiencing a loss of all AC power on Unit 1.

Here is a copy of 1-ECA-0.0 step 11 and Attachment 6, "Establishing Charging Pump Crosstie".

INITIATING CUES:

I need you to perform 1-ECA-0.0 step 11 to isolate the Unit 1 RCP seals and then perform Attachment 6 to establish charging pump crosstie to Unit 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

11. __LOCALLY ISOLATE RCP SEALS:

- RCP seal return:
  - 1-CH-MOV-1381
- RCP seal injection:
  - 1-CH-MOV-1370
- Seal injection needle valves:
  - 1-CH-294
  - 1-CH-297
  - 1-CH-300
- Thermal barrier CC:
  - 1-CC-96

* *

CAUTION:
- When power is restored to either AC emergency bus from an offsite source or the associated EDG, recovery actions should continue, starting with Step 31.
- If the AAC Diesel Generator is supplying only Bus 1J and is not required by Unit 2, recovery actions should continue, starting with Step 31.

* *

12. __TRY TO LOCALLY RESTORE AC POWER:

a) Initiate AP-17 series procedures to restore EDGs

b) Initiate 0-AP-10.08, STATION POWER RESTORATION, to restore power to transfer buses

c) Initiate backfeed alignment

1.__Locally close charging line valve:

- 1-CH-304

2.__Locally verify HHSI to cold leg MOVs closed:

- 1-SI-MOV-1867C
- 1-SI-MOV-1867D

3.__Locally verify CHG line isolation MOVs open:

- 1-CH-MOV-1289A
- 1-CH-MOV-1289B

4.__Locally verify Unit 1 CHG pump C discharge MOVs open:

- 1-CH-MOV-1286C
- 1-CH-MOV-1287C

5.__Verify Unit 2 CHG pump C discharge valves open:

- 2-CH-MOV-2286C
- 2-CH-MOV-2287C

6.__Verify Unit 2 CHG pump(s) suction aligned to RWST.

7.__Locally open 2-CH-447.

8.__Locally vent crosstie piping by operating 1-CH-732.

9.__Locally open 1-CH-728.

10.__Notify Shift Supervisor charging crosstie has been established.

11.__Locally throttle 1-CH-304 to control CHG flow as directed by the Shift Supervisor.

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U. S. Nuclear Regulatory Commission

Region II

A-1 Administrative Section

NRC-ADMIN-JPM-01

Title:

Evaluate Overtime Eligibility

SAFETY CONSIDERATIONS:

NONE:

EVALUATOR NOTES:

1. The applicable procedure section will not be provided to the candidate. Once the candidate identifies the correct procedure and where to get it, hand them a copy of VPAP-0103, Working Hours and Limitations.

2. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG-1021, Appendix E, or similar to the candidate.

Read the following to the Candidate.

TASK CONDITIONS:

1. A startup is planned for the following shift. One Reactor Operator must be held over two hours for startup.

2. The following is the work history (excluding shift turnover time) of the available reactor operators on shift. A break of at least 8 hours occurred between all work periods. All operators began their shift at the same time each day.

TASK CONDITIONS:

1. A startup is planned for the following shift. One Reactor Operator must be held over two hours for startup.

2. The following is the work history (excluding shift turnover time) of the available reactor operators on shift. A break of at least 8 hours occurred between all work periods. All operators began their shift at the same time each day.

DAY	1	2	3	4	5	6	7	8 (Today)
Operator #1	0	0	12	12	12	8	14	10
Operator #2	0	0	12	12	12	12	8	14
Operator #3	0	0	12	12	12	8	8	15
Operator #4	0	8	12	10	10	8	10	12
Operator #5	0	4	12	10	10	14	10	12

INITIATING CUE:

Evaluate the work history for all 5 operators. Determine which operator(s), if any, can be held over for two hours without prior overtime approval, and determine which operators CANNOT be held over for two hours without prior overtime approval.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the Comments.

STEP 1. Obtain a current copy of VPAP-0103, Working Hours and Limitations.

Current Revision of VPAP-0103, *Working Hours and Limitations (Rev. 6) obtained and verified latest revision if applicable.*

SAT/UNSAT*_____

STEP 2. Determine Operator #1 would exceed 24 hours in a 48 hour period.

Determined that Operator #1 would exceed 24 hours in a 48 hour period. (Day 7 and 8 already have 24 hours, if worked 2 more hours it would be 26 hours in a 48 hour period.)

Critical Step .....SAT/UNSAT*_____

STEP 3. Determine Operator #2 would not exceed any overtime restrictions.

Determined Operator #2 would not exceed any overtime restrictions.

SAT/UNSAT*_____

STEP 4. Determine Operator #3 would exceed 16 hours straight.

Determined Operator #3 would exceed 16 hours straight and 24 out of a 48 hour period.

Critical Step .....SAT/UNSAT*_____

STEP 5. Determine Operator #4 would not exceed any overtime restrictions.

Determined Operator #4 would not exceed any overtime restrictions.

SAT/UNSAT*_____

STEP 6. Determine Operator #5 would exceed 72 hours in a 7 day period.

Determined Operator #5 would exceed 72 hours in a 7 day period. (day 2 thru day 8: 72+2=74)

Critical Step .....SAT/UNSAT*_____

TERMINATING CUE:	When the candidate has evaluated overtime restrictions, this JPM is complete.

* Comments required for any step evaluated as unsat.

RELATED TASKS:

Conduct shift turnover and relief

K/A REFERENCE:

GEN 2.1.5

REFERENCES:

VPAP-0103 (Revision 6), Working Hours and Limitations, p. 9

TOOLS AND EQUIPMENT:

None

SAFETY FUNCTION (from NUREG 1123, Rev. 2.)

A-1 Conduct Of Operations

NEW JPM FOR SURRY 2000 EXAMINATION.

Time required for Completion: 10 minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ✓ Actual __✓ Unit _✓__

Setting: Control Room_✓_ Simulator ___ (Not applicable to In-Plant JPMS)

Time Critical: Yes ___ No ✓ Time Limit NA

Alternate Path: Yes___ No ✓

EVALUATION

CANDIDATE's NAME:____

JPM: NRC-ADMIN-JPM-01 PASS ______ FAIL:______

Comments: ____
____
____
____
____
____
____

Examiners Name. ______________________________ Date: ____________

TASK CONDITIONS:

1. A startup is planned for the following shift. One Reactor Operator must be held over two hours for startup.

2. The following is the work history (excluding shift turnover time) of the available reactor operators on shift. A break of at least 8 hours occurred between all work periods. All operators began their shift at the same time each day.

DAY	1	2	3	4	5	6	7	8 (Today)
Operator #1	0	0	12	12	12	8	14	10
Operator #2	0	0	12	12	12	12	8	14
Operator #3	0	0	12	12	12	8	8	15
Operator #4	0	8	12	10	10	8	10	12
Operator #5	0	4	12	10	10	14	10	12

INITIATING CUE:

Evaluate the work history for all 5 operators. Determine which operator(s), if any, can be held over for two hours without prior overtime approval, and determine which operators CANNOT be held over for two hours without prior overtime approval.

mindview

User: mindview,INNS,,

Request: SU_TRNG_OPS_AD-9676 from inncux14

Date Printed: Wed Jul 26 15:22:44 EDT 2000

Procedure: *VPAP-0103*

Rev: *006* PAR: *0*

Title: *WORKING HOURS AND LIMITATIONS*

Effective Date: *07/25/2000*

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.

This leader page is part of the controlled document and must remain with the procedure as a permanent record.

Approval signatures for electronically distributed procedures are maintained on file.

CONTROLLED COPY

VIRGINIA POWER

Station Administrative Procedure

Title: Working Hours and Limitations

Process / Program Owner: Site Vice President

Procedure Number	Revision Number	Effective Date
VPAP-0103	6	On File

Revision Summary

Made the following changes to reflect process change for providing reports to Station Supervisory Staff on overtime hours of Station personnel that perform safety-related functions:

- Changed from "Supervisor Business Systems" to "designated administrative staff personnel" to reflect process change for providing reports to Station Supervisory Staff on overtime hours of Station personnel that perform safety-related functions (changed 5.3 and 6.4.8). Also changed 6.4.8 from "shall provide Station department heads a report showing employees exceeding NRC guidelines on a monthly basis" to "should provide Station department heads a report showing employees exceeding NRC guidelines on a monthly basis".
- Revised 6.4.2.d to have Approval To Exceed Overtime Limits (Attachment 1) transmitted directly to Records Management.

Made the following change to updated International Brotherhood of Electrical Workers (IBEW) Local number:

- Changed 6.3.3 from "Local 1064 President and Business Manager" to "Local 50 President and Business Manager".

Approvals on File

TABLE OF CONTENTS

ATTACHMENTS

1.0 PURPOSE

This procedure establishes work schedules for personnel who work at the Station or in direct support of station activities and defines administrative limits for overtime work.

2.0 SCOPE

This procedure applies to all personnel who perform safety and non-safety related work in support of station activities.

3.0 REFERENCES/COMMITMENT DOCUMENTS

3.1 References

3.1.1 10 CFR 100, Reactor Site Criteria

3.1.2 NUREG-0737, Clarification of TMI Action Plan Requirements

3.1.3 NRC Generic Letter 82-12, Nuclear Power Plant Staff Working Hours, June 15, 1982

3.1.4 NRC Generic Letter 82-16, NUREG-0737 Technical Specifications, September 20, 1982

3.1.5 NRC Generic Letter 83-14, Definition of "Key Maintenance Personnel," (Clarification of Generic Letter 82-12)

3.1.6 NRC IE Circular 80-02, Nuclear Power Plant Staff Working Hours, February 1, 1980

3.1.7 North Anna Units 1 and 2 Technical Specifications, Table 6.2-1

3.1.8 Surry Technical Specifications, Section 6.1.A (10)

3.1.9 INPO Good Practice OP-204, Conduct of Operations

3.1.10 Virginia Power Employee Relations Guide

3.1.11 Agreement between Virginia Electric and Power Company (Virginia Power) and Local Unions of the International Brotherhood of Electrical Workers (IBEW)

3.1.12 J. D. Hegner to W. R. Runner, Subject; NRC Generic Letters on Work Hours, September 7, 1990

3.1.13 Nuclear Oversight Audit Finding 98-05-03NS, Inadequate Procedure Guidance for Overtime

3.1.14 Fair Labor Standards Act (FLSA)

3.2 Commitment Documents

3.2.1 CAR S90-16, Operations Administration Audit Finding S89-08-01

3.2.2 Response to NRC Inspection Report No. 92-13, Personnel Working Hours, Serial No. 92-425, July 8, 1992

4.0 DEFINITIONS

4.1 Key Maintenance Personnel

Individuals who perform or immediately supervise maintenance of safety-related systems.

4.2 Safety-Related Functions

4.2.1 Activities that affect safety-related structures, systems, and components.

4.2.2 Structures, systems, and components that are relied upon to remain functional during and following design basis events to assure any of the following:

- Reactor coolant boundary integrity
- The capability to shut down the reactor and maintain it in a safe shutdown condition
- The capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposures comparable to the guidelines of 10 CFR 100

4.2.3 Safety-related functions typically include the following types of activities when they affect safety-related structures, systems, and components:

- Operating, maintaining, or controlling (e.g., tagging, locking)
- Constructing, modifying, or repairing
- Procuring, storing, shipping, or handling
- Testing or calibrating
- Inspecting or examining
- Designing or evaluating (engineering functions)
- Refueling operations

4.2.4 In addition, certain activities, although not designated as safety related, are sufficiently important to safety to apply to personnel performing or directly supervising activities including but not limited to:

- Emergency Plan implementation
- Security Plan implementation
- Radiation Protection Program implementation
- Fire Protection Program implementation
- Maintenance evolutions important to safety

4.2.5 Personnel who perform safety-related functions include:

- Senior Reactor Operators
- Reactor Operators
- Non-Licensed Operators
- Radiation Protection personnel
- Engineering Testing personnel
- Site Engineering personnel involved in 4.2.3 functions
- Key Maintenance personnel

4.3 Station Management

Site Vice President, Manager Station Operations and Maintenance, or Manager Station Safety and Licensing.

4.4 Supervisory Staff

Heads of individual organizational units, typically identified as Superintendent, Director, Supervisor, or Coordinator.

4.5 Very Unusual Circumstance

An unlikely event is determined by Station Management for supporting evolutions such as critical maintenance activities, outages, or action statements.

4.6 Working Hours

Hours spent working at the Station or in direct support of Station activities. Compensable time not spent working at the Station or in direct support of Station activities (e.g., holiday pay, travel time) are not working hours.

5.0 RESPONSIBILITIES

5.1 Station Management

Station Management is responsible for authorizing deviations from the administrative limits established in 6.4 when very unusual circumstances arise, if the paramount consideration in such authorization is that significant reductions in the effectiveness of personnel would be highly unlikely. **[Commitment 3.2.2**

5.2 Supervisory Staff

The Supervisory Staff is responsible for:

5.2.1 Ensuring that, to the extent practicable, personnel are not assigned to shift duties while in a fatigued condition that could significantly reduce their mental alertness or their decision-making capability. **[Commitment 3.2.2**

5.2.2 Monitoring overtime hours of personnel they supervise on a daily basis.

5.2.3 Determining if safety related work is being performed.

5.2.4 Processing requests to exceed overtime limits.

5.3 Designated Administrative Staff Personnel

Designated administrative staff personnel are responsible for providing reports to the Station Supervisory Staff on overtime hours of Station personnel that perform safety-related functions.

5.4 Nuclear Personnel

Nuclear personnel are responsible for working assigned shift hours and for adhering to administrative requirements established by this procedure.

6.0 INSTRUCTIONS

6.1 Working Schedule

6.1.1 The normal work week consists of approximately 40 hours depending on work schedules.

6.1.2 Work requirements vary from department to department. Management may establish any schedule deemed appropriate to allow work to be performed in a safe, timely, and effective manner.

6.1.3 Schedules should meet the following requirements:

- Be compatible with Station and company work flow and not disruptive to other departments
- Allow work to be performed in a safe, timely, and effective manner
- Comply with applicable laws, regulations, contracts, policies, and procedures
- Be cost effective
- Be consistent with department goals

6.2 Salaried Employee Schedules

6.2.1 The Nuclear Work Schedule consists of four 9 hour days and an 8 hour Friday (or Monday), then four 9 hour days and a Friday (or Monday) off.

6.2.2 Nuclear salaried employees can work five 8 hour days with approval of the respective manager.

6.2.3 10 hour day and 12 hour day schedules may only be established by the applicable Superintendent, Director, or Manager and approved by the cognizant Vice President or Senior Vice President.

6.2.4 Employees on the Nuclear Work Schedule who work extensive overtime during an outage can transition to 10 or 12 hour days. Employees must transition back to the Nuclear Work Schedule as soon as possible.

6.3 Hourly Employee Schedules

6.3.1 IBEW employee schedules shall be consistent with agreements established between Virginia Electric and Power Company and the Local Unions of the International Brotherhood of Electrical Workers (IBEW).

6.3.2 Outage work schedules shall be established with an agreement between Virginia Electric and Power Company and the IBEW.

6.3.3 Modifications to schedules require mutual agreement between the appropriate Manager and the Local 50 President and Business Manager.

6.4 Overtime Requirements

Overtime should not be routinely scheduled to compensate for an insufficient number of Station personnel to support normal facility operations. If overtime must be worked due to unanticipated or unavoidable circumstances, the following guidelines shall apply:

6.4.1 Overtime should be considered on an individual basis. Specific blanket approvals for very unusual circumstances may be authorized by Station Management on a case by case basis.

6.4.2 Station personnel who perform safety-related functions and activities important to safety, as defined in 4.2, shall not exceed the administrative limits established within this subsection without prior approval from Station Management. Personnel performing non-safety related functions and activities shall not exceed the administrative limits established within this subsection without prior approval from their Superintendent, Director, or Manager. Overtime hours required to be worked in excess of these limits shall be documented and approved on Approval To Exceed Overtime Limits (Attachment 1).

a. Deviations may only be requested for very unusual circumstances. The paramount consideration in such authorization shall be that significant reductions in the effectiveness of personnel would be highly unlikely. **[Commitment 3.2.2**

b. Deviations shall be requested only to cover a minimum shift complement *or as* described in paragraph 4.5.

c. The need for the deviation and the name of the individual granting authorization shall be documented on Approval To Exceed Overtime Limits (Attachment 1). Authorization may be obtained verbally and the form signed at a later date.

d. The completed form, Approval To Exceed Overtime Limits (Attachment 1), shall be transmitted to Records Management.

6.4.3 No individual shall be permitted to work more than 16 hours straight, excluding shift turnover time without prior approval (Approval To Exceed Overtime Limits (Attachment 1)).

6.4.4 When an employee must work more than 16 hours straight there shall be a break of at least eight hours between work periods, including shift turnover time.

6.4.5 No individual shall work more than 16 hours in any 24 hour period, more than 24 hours in any 48 hour period, or more than 72 hours in any seven day period, excluding shift turnover time without prior approval (Approval To Exceed Overtime Limits (Attachment 1)).

6.4.6 If an NRC-licensed Operator is required to work more than 12 continuous hours, the Operator should be limited to no more than 12 hours performing duties as operator at the board (OATB).

6.4.7 If an NRC-licensed Operator has been working more than 12 hours during periods of extended shutdown (i.e., at duties away from the Main Control Board), then the Operator shall not be assigned licensed duties without at least a 12 hour break preceding such assignment.

6.4.8 Designated administrative staff personnel should provide Station department heads a report showing employees exceeding NRC guidelines on a monthly basis. The supervisory staff is responsible for monitoring compliance with the requirements of this procedure. **[Commitment 3.2.1]**

6.5 Notification of Absences and Personnel Recall

6.5.1 Notification of Absences

a. Personnel expecting to be late or unable to report for work at the scheduled time shall inform the cognizant department supervision at the earliest possible time.

b. Department supervision shall make the necessary arrangements for obtaining replacements for absent employees. This may include holding personnel over from a previous shift until replacements can be obtained.

6.5.2 Personnel Recall

a. The Shift Supervisor has the authority to call out required personnel regardless of discipline.

b. Other Station supervisors may call out subordinate personnel as necessary.

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**

- Approval to Exceed Overtime Limits

7.1.2 **Record Packages**

None

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

VIRGINIA POWER

Approval To Exceed Overtime Limits

VPAP-0103 - Attachment 1 **Page 1 of 1**

1. The individual(s) listed below are granted approval to exceed the administrative limits established for overtime (attach list, if necessary).

Name	Department

2. Justification

3. Administrative Limits Being Exceeded:

a. ☐ More than 16 hours straight, excluding shift turnover.

b. ☐ More than 16 hours in a 24-hour period, excluding shift turnover.

c. ☐ More than 24 hours in a 48-hour period, excluding shift turnover.

d. ☐ More than 72 hours in a seven day period, excluding shift tumover.

4. Approval for period from: ______________________ to ______________________

Approval

5. Is work Safey-Related or important to safety? ☐ Yes ☐ No Station Management approval required if answered "Yes."		Verbal Approval Date (If Applicable)
Department Title	Department Supervisor (Signature)	Date
Site Vice President, Manager Station O&M, or Manager Station S&L (Signature - If Applicable [See Block 5])		Date

Key: O&M-Operations and Maintenance;
S&L-Safety and Licensing

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U. S. Nuclear Regulatory Commission

Region II

A-1 Administrative Section

NRC-ADMIN-JPM-01A/RO

Title:

Manual Calculation Reactor Power

Calorimetric using Feed Flow and P-250 Computer

Read the following to the candidate.

Initial Conditions:

1. Unit 1 is at 95% power.

2. CALCALC is not operational and 1-OPT-RX-007, Shift Average Power Calculation, will be performed.

3. The plant has been stable for approximately 2 hours and no periodic tests or calibration evolutions are in progress.

4. The pzr heater output is oscillating between 1000 KW and 1100 KW as indicated on P-250 point Q0400A.

Initiating Cues:

Perform 1-OPT-RX-003, Reactor Power Calorimetric using Feed Flow and P-250 Points (Manual).

Reactor Power Calorimetric Using Feed Flow and P-250 Computer	
STEP 1: Review the purpose of the procedure (Section 1.0) STANDARD: _____ Reviews Step 1.1 and identifies purpose is to provide instructions for performing the daily calibration of Nuclear Power Range Instruments against a heat balance standard in accordance with Technical Specification Table 4.1-1, Item 1. _____ Reviews Step 1.2 to determine that the OPT is not required to be performed while the unit is shutdown. And that 1-OPT-RX-001, 1-OPT-RX-002, 1-OPT-RX-003, or 1-OPT–RX-004 must be performed daily after Reactor power exceeds 15 percent power. _____ Reviews Step 1.3 to determine that the procedure will ensure that Unit 1 will not be operated above 2546 MW_{th} Reactor power. COMMENTS:	_____SAT _____UNSAT
STEP 2: Review the References section (Section 2.0) STANDARD: _____ Reviews section 2.1, Source Documents, 2.2 Technical Specifications, 2.3 Technical References, and 2.4 Commitment Documents. COMMENTS:	_____SAT _____UNSAT

STEP 3: Verifies the Initial Conditions are met (Section 3.0) STANDARD: _____ Verifies Unit 1 is operating at a steady state power level of greater than or equal to 15 percent power. (Step 3.1) _____ Verifies that the P-250 computer is operational. (Step 3.2) _____ Verifies that FLOWCALC Program is operational. (Step 3.3) Examiner's Cues: • **If asked: Reactor Power is 95% and stable.** • **If asked: P-250 computer is operational.** • **If asked: FLOWCALC Program is operational.** COMMENTS:	_____SAT _____UNSAT

STEP 4: Reviews the Precautions and Limitations (Section 4.0) STANDARD: _____ Notes that the Shift Supervisor shall be notified immediately if any acceptance criteria is not met or if any malfunction or abnormal condition occurs. (Step 4.1) _____ Notes the Unit power shall be reduced immediately if Reactor power exceeds 100%, as calculated in Attachment 3. (Step 4.2) _____ Notes changes to the NI channel indications will be made by a Licensed Reactor Operator under the supervision of a Senior Reactor Operator. (Step 4.3) _____ Notes that if any computer point has any of the following indications, then the use of that point will make this calculation unreliable. Reactor power must be calculated by using another method, indicator or computer point. (Step 4.4) • * indicates that the point is unreliable. • S indicates that the point is out of scan. _____ Notes that if an adjustment of the power range channels is required, alternate indications of power must be compared before the adjustment. If the difference is greater than 2 percent, the Shift Supervisor must be notified. (Step 4.5) _____ Notes that Unit 1 shall run at a stable power level for a minimum of 5 minutes before performance of this procedure is initiated. (Step 4.6) _____ Notes that the Unit SRO is responsible for maintaining supervisory oversight of the performance of this procedure. (Step 4.7) _____ Notes that this procedure must be performed by a Reactor Operator, Shift Technical Advisor (STA), or Reactor Engineer. (Step 4.8) _____ Notes that if the Operations Computer Calculation Program is used, verify that the procedure and the calculation have the same revision number. (Step 4.9) **Examiner's Cues:** • **If asked: Reactor power has been stable for approximately 2 hours.**	_____SAT _____UNSAT

Examiner's Cues (continued): • **If asked: The Operations Computer Calculation Program will not be used.** <u>COMMENTS:</u>	

<table>
<tr><td>
<u>STEP 5:</u> Reviews Special Tools and Equipment (Section 5).

<u>STANDARD:</u>

_____ Identifies that no special tools or equipment is required.

<u>COMMENTS:</u>
</td><td>
_____SAT

_____UNSAT
</td></tr>
<tr><td>
<u>STEP 6:</u> Follows the Instructions (Section 6.0).

<u>STANDARD:</u>

_____ Observes Data Collection Requirements. (Step 6.1)
NOTE: This calorimetric uses the corrected Steam Generator Feedwater flow as calculated by the FLOWCALC program to calculate reactor power according to the following equation.

Reactor Power = (h_{steam} - h_{feed}) x $Flow_{feed}$ - Added pump Heat
- Added Pressurizer Heat
- Blowdown Heat Loss
+ Insulation Losses
+ Letdown, Charging, and Seal Injection Heat Contributions

Where:
• Pump Heat equals 40.96 x 10^6 BTU/hr.
• Blowdown flow is recorded from the Main Control Room indications.
• Insulation losses equal 1.5 MW_{th}.
• Charging, letdown, and seal water injection heat contributions equal 5.0 MW_{th}.

<u>COMMENTS:</u>
</td><td>
_____SAT

_____UNSAT
</td></tr>
</table>

STEP 7: DATA COLLECTION (cont.) STANDARD: _____ Step 6.1.1 Review Attachment 2 to verify that none of the PTs or Cal procedures are in progress. (IF any of the listed PTs or Cal procedures are in progress, the values calculated in this calorimetric will be unreliable). _____ Step 6.1.2 <u>IF</u> Pressurizer Heater output is <u>not</u> stable, <u>THEN</u> enter 900 KW for Q0400A at Step 6.2.2 and Attachment 3, page 2. Operator enters 900 KW at Step 6.2.2 and Attachment 3, page 2. _____ Step 6.1.3 <u>IF</u> this procedure is being performed because CALCALC is not operational, <u>THEN</u> initiate 1-OPT-RX-007 to determine the shift average power. Otherwise, enter N/A. NOTE: Feed flow transmitter data will be invalid if feed flow is established through the Feed Reg Bypass HCVs. _____ Step 6.1.4 <u>IF</u> Feedwater Flow is <u>not</u> in AUTOMATIC, <u>THEN</u> close the Feed Reg Bypass HCVs to obtain FLOWCALC data in Step 6.1.5. Otherwise, enter N/A. Operator enters N/A. NOTE: Steps 6.1.5 and 6.1.6 are performed to obtain running average values for flow, temperature and pressure. These values will be used in the next sections for calculation of Reactor power. Examiner's Cues: • **If asked: No periodic tests or calibration evolutions are in progress.** • **If asked: Pressurizer heater output is oscillating between 1000 and 1100 KW.** • **If asked: CALCALC is not operational and 1-OPT-RX-007 will be initiated.** • **If asked: Feedwater flow control is in automatic and Feed Reg Bypass HCVs are shut.** COMMENTS:	_____SAT _____UNSAT

<u>* STEP 8:</u> DATA COLLECTION (cont.) <u>STANDARD:</u> _____ * Step 6.1.5 <u>IF</u> the FLOWCALC Program is operational, wait approximately 5 minutes if Step 6.1.4 was performed, <u>THEN</u> start the FLOWCALC program by performing the following. From the P-250 operator's console, enter [ENTER VALUE]: K7018; [ADDRESS]; 1; [VALUE 1]; and [START/ADD]. This program prints out results every 5 minutes in the computer room. Allow the program to run for 15 minutes. <u>IF</u> the FLOWCALC program is not operational, <u>THEN</u> enter N/A for Steps 6.1.5 and 6.1.6. _____ Step 6.1.6 Stop the FLOWCALC program from running by performing the following. From the P-250 operator's console, enter [ENTER VALUE]: K7018; [ADDRESS]; 0; [VALUE 1]; and [START/ADD]. _____ Step 6.1.7 <u>IF</u> Step 6.1.4 was performed, <u>THEN</u> return the Feed Reg Bypass HCVs to desired position. Otherwise, enter N/A. Operator enters N/A. Examiner's Cues: • **If asked: FLOWCALC Program is operational.** • **If the operator does not start the FLOWCALC program IAW the procedure (pushes a wrong button etc.) the INVALID REQUEST light illuminates.** **Once the FLOWCALC Program has been started, inform the operator that a 15 minute time compression has taken place.** <u>COMMENTS:</u>	_____SAT _____UNSAT

* STEP 9: Step 6.2 Calculating Reactor Power Using Manual Method STANDARD: NOTE: A list of alternative or local indications is available in 1-OPT-RX-004, Reactor Power Calorimetric using feed flow with P-250 out of service. _____ * Step 6.2.1 Obtain from the FLOWCALC computer program the running average value for SG Pressure, FW Temperature, and Main Feedwater Flow for each loop. IF the FLOWCALC program is NOT operational, THEN obtain SG Pressure, FW Temperature, and Main Feedwater flow for each loop by using one of the computer points listed below for each parameter. If any of the following P-250 points are unreliable or out of service then use an alternative or local indication. **Record the running averages or the computer points in the appropriate boxes on Attachment 3, page 1.** Examiner's Cues: • **If asked: The FLOWCALC computer program is available and the use of individual computer points or alternative local indication is not required.** COMMENTS:	_____SAT _____UNSAT

STEP 10: Step 6.2 Calculating Reactor Power Using Manual Method (cont.)	
STANDARD:	____SAT
____ Step 6.2.2 Obtain pressurizer heat input by using the computer point listed below. Record this value in the appropriate box on Attachment 3, Page 2.	____UNSAT
Q0400A Pressurizer Heater Power in KW	
Examiner's Cue: Pressurizer heater output is oscillating between 1000 and 1100 KW.	
Examiner NOTE: **In the initial conditions it was given that PZR heaters were operating erratically. The applicant should use a value of 900KW for this value. If the candidate uses actual reading the answer will be correct if it falls within the band.**	
COMMENTS:	

STEP 11: Steps 6.2.3, 6.2.4 and 6.2.5	
STANDARD: NOTE: Blowdown flow must be maintained as constant as possible. The most accurate data will be obtained by isolating blowdown, but isolation is not required. _____ Step 6.2.3 Obtain loop blowdown flow by using the indicators listed below. Record these values in the appropriate boxes on Attachment 3, Page 1. • FI-BD-103A OR FI-BD-104A SG A Blowdown flow _60_ gpm • FI-BD-103B OR FI-BD-104B SG B Blowdown flow _60_ gpm • FI-BD-103C OR FI-BD-104C SG C Blowdown flow _60_ gpm _____ Step 6.2.4 Find the enthalpy of steam, h_s for each loop using Corrected Steam Pressure from Attachment 3 and the **Enthalpy Steam Table (100% Quality)** in 1-DRP-003 or the ASME steam tables. Record values in the appropriate boxes on Attachment 3, Page 1. NOTE: Using FW pressure of 800 psia in the next step will be conservative for all Reactor Power Levels. _____ Step 6.2.5 Find the enthalpy of feedwater, h_f, for each loop using Feedwater Temperature from Attachment 3 and the **Enthalpy Compressed Liquid Table (800 psia)** in 1-DRP-003 or the ASME steam tables. Record values in the appropriate boxes on Attachment 3, Page 1. **Examiner's Cues:** • **If asked: SG Blowdown flow on all 3 SGs is 60 gpm.** COMMENTS:	_____SAT _____UNSAT

STEP 12: Steps 6.2.6, 6.2.7, 6.2.8, 6.2.9, 6.2.10 and 6.2.11 STANDARD: _____ Step 6.2.6 Calculate $\Delta h_1 = h_s - h_f$ for each loop and record results in appropriate boxes on Attachment 3, Page 1. _____ Step 6.2.7 Calculate Blowdown Flow M_{bd} (lbm/hr) = BD (gpm) x 61.9195 (lbm/ft^3) x 8.021. Record values in the appropriate boxes on Attachment 3, Page 1. _____ Step 6.2.8 Find the enthalpy of the blowdown, h_{bd}, for each loop, using the Corrected Steam Pressure from Attachment 3 and the Enthalpy Saturated Liquid Table in 1-DRP-003 or the ASME steam tables. Record values in the appropriate boxes on Attachment 3, Page 1. _____ Step 6.2.9 Calculate $\Delta h_2 = h_s - h_{bd}$ for each loop and record results in appropriate boxes on Attachment 3, Page 1. _____ Step 6.2.10 Perform the following for each loop. 1. Calculate ($M_f \times \Delta h_1$) and ($M_{bd} \times \Delta h_2$) for each loop and record results in appropriate boxes on Attachment 3, Page 1. 2. Calculate $Q_{loop} = (M_f \times \Delta h_1) - (M_{bd} \times \Delta h_2)$ for each loop and record results in appropriate boxes on Attachment 3, Page 1. _____ Step 6.2.11 Convert Pressurizer Heat Input from KW to BTU/hr by multiplying by 3413.0 BTU/hr/KW, and record results in appropriate boxes on Attachment 3, Page 2. COMMENTS:	_____SAT _____UNSAT

* STEP 13: Steps 6.2.12, 6.2.13, 6.2.14 STANDARD: _____ Step 6.2.12 Calculate total heat from Reactor by using Q_{TOTAL} = $Q_{loop\ A}$ + $Q_{loop\ B}$ + $Q_{loop\ C}$ (BTU/hr) - PRZR HTR Input (BTU/hr) - RCP Heat Input (BTU/hr) + Letdown, Seal Injection, and Charging Heat Loss (BTU/hr) + Insulation Loss (BTU/hr). Record the results in approprite box on Attachment 3 Page 2. _____ Step 6.2.13 Divide Q_T by 3.413 E 6 to find Reactor output in MW_{th}. Record results in appropriate box on Attachment 3, Page 2 _____ * Step 6.2.14 Find the percent power level by using % Power = (MW_{th}/2546) x 100. Record results in appropriate box on Attachment 3, Page 2. Examiner NOTE: **Allowable band is 94.75 to 95.25 % power. CALCALC is the most accurate indication of reactor power computed by the P-250. Manual calorimetric using FLOWCALC has built in conservatism that limits FLOWCALC calculation to within .25% of CALCALC output.** COMMENTS:	_____SAT _____UNSAT

STEP 14: Step 6.3 Adjusting NI Channels, Steps 6.3.1, 6.3.2 and 6.3.3 STANDARD: _____ Step 6.3.1 Compare each NI channel percent power indication with the Calorimetric percent power, which is the standard. (Each NI should be within + 2 % and – 0 % of the Calorimetric value if Reactor power is greater than or equal to 90%, OR within +4 % and -0% of the Calorimetric value if Reactor power is less than 90%). CAUTION: Gain potentiometer adjustment can cause average flux deviation alarms as well as high flux rod stop alarms. This should be anticipated when adjusting gain potentiometers. (Reference 2.4.6) _____ Step 6.3.2 IF the NI channel is within tolerance but adjustment will better align it with the calorimetric, THEN obtain Shift Supervisor concurrence and adjust NI Channel IAW Attachment 1 to the Reactor Power value calculated in Attachment 3. Record initials on Attachment 1. IF no NI adjustment is made, OR NI is NOT within tolerance, THEN enter N/A. Operator enters N/A. _____ Step 6.3.3 IF NI channel is NOT within tolerance, THEN obtain Shift Supervisor concurrence and adjust the gain potentiometer on the front panel of each NI Channel IAW Attachment 1 to the Reactor Power value recorded in Attachment 3. Record initials on Attachment 1. IF all NI channels are within tolerance, THEN enter N/A. Operator enters N/A. **Examiner's Cue: RESULTS SHOULD BE APPROXIMATELY 95% WITH NO ADJUSTMENT TO THE NIs REQUIRED.** **If asked: All four NIs read 95.5%.** **If asked: No adjustment to the NIs is necessary as per the procedure if NIs are within –0% to +2% of calculated value. IF OPERATOR IDENTIFIES CALCULATED POWER OUTSIDE THIS BAND, then inform him that another operator is standing by to adjust the NIs.** COMMENTS:	_____SAT _____UNSAT

STEP 15: Steps 6.3.4 .	
STANDARD:	_____SAT
_____ Step 6.3.4 IF the front panel gain adjustment can NOT bring power of any channel within the required tolerance in Step 6.3.1, THEN perform all the following. Otherwise, enter N/A. Operator enters N/A on Steps 6.3.4.a through d.	_____UNSAT
6.3.4.a Obtain concurrence from the Reactor Engineer to adjust Power Range NI channel using the coarse level adjustment potentiometer.	
6.3.4.b Have a qualified Instrument Technician adjust the coarse level adjust potentiometer, R312, and the potentiometer on the front panel, until the front panel potentiometer is near mid-range and the Power Range NI channels are within + 2 % and - 0% of the Calorimetric value if reactor power is greater than or equal to 90%, OR within +4% and – 0% of the Calorimetric value if Reactor power is less than 90%.	
6.3.4.c Note the comment section any Power Range NI channel adjusted using the coarse level adjustment potentiometer.	
6.3.4.d IF the out-of-tolerance NI channel can NOT be properly adjusted, THEN declare the out-of-tolerance NI channel inoperable and comply with Tech Spec Table 3.7-1, Item 2.	
COMMENTS:	

STEP 16: Follow-on (Section 7.0) **STANDARD:** _____ 7.1 Acceptance Criteria _____ Step 7.1.1 Evaluate the test results by reviewing the Acceptance Criteria for the components tested. (X) • __X__ All power range channels are found to be or are adjusted to be within +2, -0% (≥90% power) OR +4, -0% (< 90% power) of the power level determined by the calorimetric. Any adjustment shall be noted below. • NI-41 required adjustment _____YES __X__NO • NI-42 required adjustment _____YES __X__NO • NI-43 required adjustment _____YES __X__NO • NI-44 required adjustment _____YES __X__NO • __X__ Reactor Power is at or less than 100 %. _____ Step 7.1.2 Document the test results (X) __X__ Sat _____Unsat **COMMENTS:**	_____SAT _____UNSAT
STEP 17: Follow-on Tasks (Section 7.2) **STANDARD:** _____ 7.2 Follow on Tasks: Identifies tasks was performed satisfactory and enters N/A for this section. _____ 7.2.2 Identifies a partial operability test was not performed and enters N/A. **COMMENTS:**	_____SAT _____UNSAT

STEP 18: Notification, Documentation, and Procedure Closeout (Section 7.3) **STANDARD:** _____ 7.3.1 Notifies Shift Supervisor the test is complete and fills out the Printed Name Section. **COMMENTS:**	_____SAT _____UNSAT

Read the following to the candidate.

Initial Conditions:

1. Unit 1 is at 95% power.

2. CALCALC is not operational and 1-OPT-RX-007, Shift Average Power Calculation, will be performed.

3. The plant has been stable for approximately 2 hours and no periodic tests or calibration evolutions are in progress.

4. The pzr heater output is oscillating between 1000 KW and 1100 KW as indicated on P-250 point Q0400A.

Initiating Cues:

- Perform 1-OPT-RX-003, Reactor Power Calorimetric using Feed Flow and P-250 Points (Manual).

VIRGINIA POWER

SURRY POWER STATION

PROCEDURE NO: **1-OPT-RX-003**

REVISION NO: **8**

PROCEDURE TYPE: **OPERATIONS PERIODIC TEST**

UNIT NO: **1**

PROCEDURE TITLE:

REACTOR POWER CALORIMETRIC USING FEED FLOW AND P-250 COMPUTER POINTS (MANUAL)

EFFECTIVE DATE: **ON FILE**

EXPIRATION DATE:
(Temporary Procedures Only)
N/A

REVISION SUMMARY:

Revised to incorporate DR S-99-2410, Nis power range gain adjustment

- Added new Step 6.1.2 to enter 900 KW for Pressurizer Heater Power.
- Added Commitment Document Step 2.4.6.
- Added Caution before Step 6.3.2
- Added Step 4.9 in Precautions and Limitations

UNIT ONE

Reactivity Management

PROCEDURE WRITER: J. Redler / S. Mushenheim

VALIDATOR: D. Wirsching / J. Borden

APPROVAL: **APPROVAL ON FILE**

DATE:

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To provide instructions for performing the daily calibration of Nuclear Power Range Instruments against a heat balance standard IAW Technical Specification Table 4.1-1, Item 1.

1.2 This OPT is not required to be performed while the unit is shutdown. 1-OPT-RX-001, 1-OPT-RX-002, 1-OPT-RX-003, or 1-OPT-RX-004 must be performed daily after Reactor power exceeds 15 percent power. **(Reference 2.4.2)**

1.3 This procedure will ensure that Unit 1 will not be operated above 2546 MW_{th} Reactor Power.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR, Section 7.2.1, Reactor Protection System

2.1.2 UFSAR, Section 7.4, Nuclear Instrumentation System

2.2 Technical Specifications Surry Power Station Unit 1 & 2

2.2.1 Technical Specifications, Section 1.A, Rated Power

2.2.2 Technical Specifications, Table 3.7-1, Item 2, Nuclear Flux Power Range

2.2.3 Technical Specifications, Table 4.1-1, Item 1, Nuclear Power Range

2.3 **Technical References**

2.3.1 Phase 1 Results of Surry Unit 1 Efficiency Study

2.3.2 Phase 2 Results of Surry Unit 1 Efficiency Study

2.3.3 Reactor Calorimetric (CALCALC) Program Programmer's Guide for the Execution on the Westinghouse P-250 System

2.3.4 Corrected Steam and Feedwater Flow Calculations (FLOWCALC Program)

2.3.5 1-DRP-003, Curve Book

2.3.6 ASME Steam Tables

2.3.7 DCP 94-007-03, Removal of Turbine Runback on Dropped Rod

2.3.8 Technical Report NE-1076, A Review of the Secondary Calorimetric Calculation in the P250 CALCALC Computer Program for Surry Power Station, Units 1 and 2

2.3.9 Technical Report EE-0108, Basis for the Steam Flow and Feedwater Flow Equations Used in the P250 FLOWCALC Program

2.3.10 Technical Report NE-1084, A Standardized Model for Calculating Power Calorimetric Uncertainty, Surry and North Anna Power Stations, Units 1 and 2

2.3.11 Technical Report NE-1081, Power Calorimetric Task Team, Project Overview and Results, Summary Report for Surry Power Station, Units 1 and 2

2.3.12 Safety Evaluation 96-0102

2.3.13 Technical Report NE-1090, Power Calorimetric Input Notebook, Surry Units 1 and 2

2.3.14 Engineering Transmittal NAF 98-0122, Rev. 0, Recommendations for Manual Calorimetric Procedures

2.4 Commitment Documents

2.4.1 CTS-1080, Unreliable Computer Points

2.4.2 CTS-1438, Revise procedures to require performance prior to applicable mode change (Technical Specifications Change 228B)

2.4.3 CTS-2753, Core Uprate

2.4.4 CTS 3423, Calorimetric Task Team

2.4.5 Station Deviation S-97-2350

2.4.6 DR S-99-2410, NIS Power Range Gain Adjustment

Init **Verif**

3.0 INITIAL CONDITIONS

✓ 3.1 Unit 1 is operating at a steady state power level of greater than or equal to 15 percent power.

✓ 3.2 P-250 Computer is operational.

✓ 3.3 FLOWCALC Program is operational.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 The Shift Supervisor shall be notified immediately if any acceptance criteria is not met or if any malfunction or abnormal condition occurs.

4.2 Unit power shall be reduced immediately if Reactor power exceeds 100%, as calculated in Attachment 3.

4.3 Changes to the NI channel indications will be made by a Licensed Reactor Operator under the supervision of a Senior Reactor Operator.

4.4 If any computer point has any of the following indications, then the use of that point will make this calculation unreliable. Reactor power must be calculated by using another method, indicator or computer point.

- * indicates that the point is unreliable.
- s indicates that the point is out of scan.

4.5 If an adjustment of the power range channels is required, alternate indications of power must be compared before the adjustment. If the difference is greater than 2 percent, the Shift Supervisor must be notified.

4.6 Unit 1 shall run at a stable power level for a minimum of 5 minutes before performance of this procedure is initiated.

4.7 The Unit SRO is responsible for maintaining supervisory oversight of the performance of this procedure.

4.8 This procedure must be performed by a Reactor Operator, Shift Technical Advisor (STA), or Reactor Engineer.

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

5.0 SPECIAL TOOLS AND EQUIPMENT

None

Init **Verif**

6.0 INSTRUCTIONS

6.1 Data Collection

NOTE: This calorimetric uses the corrected Steam Generator Feedwater flow as calculated by the FLOWCALC program to calculate reactor power according to the following equation.

$$\text{Reactor Power} = (h_{steam} - h_{feed}) \times \text{Flow}_{feed} - \text{Added Pump Heat}$$
$$- \text{Added Pressurizer Heat}$$
$$- \text{Blowdown Heat Loss}$$
$$+ \text{Insulation Losses}$$
$$+ \text{Letdown, Charging, and Seal Injection Heat Contributions}$$

Where:

- Pump Heat equals 40.96 x 10^6 BTU/hr.
- Blowdown Flow is recorded from Control Room indications.
- Insulation losses equal 1.5 MW_{th}.
- Charging, letdown, and seal water injection heat contributions equals 5.0 MW_{th}.

✓ 6.1.1 Review Attachment 2 to verify that none of the PTs or Cal procedures are in progress. (If any of the listed PTs or Cal procedures are in progress, the values calculated in this calorimetric will be unreliable.)

✓ 6.1.2 IF Pressurizer Heater output is not stable, THEN enter 900 KW for Q0400A at Step 6.2.2 and Attachment 3, page 2.

✓ 6.1.3 IF this procedure is being performed because CALCALC is not operational, THEN initiate 1-OPT-RX-007 to determine the shift average power. Otherwise, enter N/A.

NOTE: Feed flow transmitter data will be invalid if feed flow is established through the Feed Reg Bypass HCVs.

N/A 6.1.4 IF Feedwater Flow is not in AUTOMATIC, THEN close the Feed Reg Bypass HCVs to obtain FLOWCALC data in Step 6.1.5. Otherwise, enter N/A.

NOTE: Steps 6.1.5 and 6.1.6 are performed to obtain running average values for flow, temperature, and pressure. These values will be used in the next sections for calculation of Reactor power.

6.1.5 IF the FLOWCALC Program is operational wait approximately 5 minutes if Step 6.1.4 was performed, THEN start the FLOWCALC program by performing the following. From the P-250 operator's console, enter [ENTER VALUE]; K7018; [ADDRESS]; 1; [VALUE 1]; and [START/ADD]. This program prints out results every 5 minutes in the computer room. Allow the program to run for 15 minutes. IF the FLOWCALC program is not operational, THEN enter N/A for Steps 6.1.5 and 6.1.6.

6.1.6 Stop the FLOWCALC program from running by performing the following. From the P-250 operator's console, enter [ENTER VALUE]; K7018; [ADDRESS]; 0; [VALUE 1]; and [START/ADD].

N/A 6.1.7 IF Step 6.1.4 was performed, THEN return the Feed Reg Bypass HCVs to desired position. Otherwise, enter N/A.

6.2 Calculating Reactor Power, Using Manual Method

NOTE: A list of alternative or local indications is available in 1-OPT-RX-004, Reactor Power Calorimetric using feed flow with P-250 out of service.

6.2.1 Obtain from the FLOWCALC computer program the running average values for SG Pressure, FW Temperature, and Main Feedwater Flow for each loop. IF the FLOWCALC program is NOT operational, THEN obtain SG Pressure, FW Temperature, and Main Feedwater flow for each loop by using one of the computer points listed below for each parameter. If any of the following P-250 points are unreliable or out of service then use an alternative or local indication Record the running averages or the computer point values in the appropriate boxes on Attachment 3, Page 1.

• U9171	SG A Pressure	______	psia
• U9172	SG B Pressure	______	psia
• U9173	SG C Pressure	______	psia
• T0418A	SG A FW Temp (RTD-111A)	______	°F
• T0438A	SG B FW Temp (RTD-111B)	______	°F
• T0458A	SG C FW Temp (RTD-111C)	______	°F
• F0403A	SG A Feed Flow (F476)	______	x 10^3 lbm/hr
	OR		
F0404A	SG A Feed Flow (F477)	______	x 10^3 lbm/hr
	SG A Feed Flow	______	x 10^3 lbm/hr
• F0423A	SG B Feed Flow (F486)	______	x 10^3 lbm/hr
	OR		
F0424A	SG B Feed Flow (F487)	______	x 10^3 lbm/hr
	SG B Feed Flow	______	x 10^3 lbm/hr
• F0443A	SG C Feed Flow (F496)	______	x 10^3 lbm/hr
	OR		
F0444A	SG C Feed Flow (F497)	______	x 10^3 lbm/hr
	SG C Feed Flow	______	x 10^3 lbm/hr

6.2.2 Obtain pressurizer heat input by using the computer point listed below. Record this value in the appropriate box on Attachment 3, Page 2.

- Q0400A Pressurizer Heater Power 900 KW

NOTE: Blowdown flow must be maintained as constant as possible. The most accurate data will be obtained by isolating blowdown, but isolation is not required.

6.2.3 Obtain loop blowdown flow by using the indicators listed below. Record these values in the appropriate boxes on Attachment 3, Page 1.

- FI-BD-103A or FI-BD-104A SG A Blowdown Flow 60 gpm
- FI-BD-103B or FI-BD-104B SG B Blowdown Flow 60 gpm
- FI-BD-103C or FI-BD-104C SG C Blowdown Flow 60 gpm

6.2.4 Find the enthalpy of steam, h_s, for each loop using Corrected Steam Pressure from Attachment 3 and the Enthalpy Steam Table (100% Quality) in 1-DRP-003 or the ASME steam tables. Record values in the appropriate boxes on Attachment 3, Page 1.

NOTE: Using a FW pressure of 800 psia in the next step will be conservative for all Reactor Power levels.

6.2.5 Find the enthalpy of feedwater, h_f, for each loop, using Feedwater Temperature from Attachment 3 and the Enthalpy Compressed Liquid Table (800 psia) in 1-DRP-003 or the ASME steam tables. Record values in the appropriate boxes on Attachment 3, Page 1.

6.2.6 Calculate $\Delta h_1 = h_s - h_f$ for each loop and record results in appropriate boxes on Attachment 3, Page 1.

6.2.7 Calculate Blowdown Flow M_{bd} (lbm/hr) = BD (gpm) x 61.9195 (lbm/ft^3) x 8.021. Record values in the appropriate boxes on Attachment 3, Page 1.

6.2.8 Find the enthalpy of the blowdown, h_{bd}, for each loop, using the Corrected Steam Pressure from Attachment 3 and the Enthalpy Saturated Liquid Table in 1-DRP-003 or the ASME steam tables. Record values in the appropriate boxes on Attachment 3, Page 1.

6.2.9 Calculate $\Delta h_2 = h_s - h_{bd}$ for each loop and record results in appropriate boxes on Attachment 3, Page 1.

6.2.10 Perform the following for each loop:

a. Calculate ($M_f \times \Delta h_1$) and ($M_{bd} \times \Delta h_2$) for each loop and record results in appropriate boxes on Attachment 3, Page 1.

b. Calculate $Q_{loop} = (M_f \times \Delta h_1) - (M_{bd} \times \Delta h_2)$ for each loop and record results in appropriate boxes on Attachment 3, Page 1.

6.2.11 Convert Pressurizer Heat Input from KW to BTU/hr by multiplying by 3413.0 BTU/hr/KW, and record results in appropriate boxes on Attachment 3, Page 2.

6.2.12 Calculate total heat from Reactor by using $Q_{Total} = Q_{loop\ A} + Q_{loop\ B} + Q_{loop\ C}$ (BTU/hr) − PRZR HTR Input (BTU/hr) − RCP Heat Input (BTU/hr) + Letdown, Seal Injection, and Charging Heat Loss (BTU/hr) + Insulation Loss (BTU/hr). Record results in appropriate box on Attachment 3, Page 2.

6.2.13 Divide Q_T by 3.413×10^6 to find Reactor output in MW_{th}. Record results in appropriate box on Attachment 3, Page 2.

6.2.14 Find the percent power level by using % Power = $(MW_{th}/2546) \times 100$. Record results in appropriate box on Attachment 3, Page 2.

6.3 Adjusting NI Channels

✓ ___

6.3.1 Compare each NI channel percent power indication with the Calorimetric percent power, which is the standard. (Each NI should be within + 2 % and - 0 % of the Calorimetric value if Reactor power is greater than or equal to 90%, OR within + 4 % and - 0 % of the Calorimetric value if Reactor power is less than 90%.)

* *

CAUTION: Gain potentiometer adjustment can cause average flux deviation alarms as well as high flux rod stop alarms. This should be anticipated when adjusting gain potentiometers. **(Reference 2.4.6)**

* *

N/A ___ SS

6.3.2 IF the NI Channel is within tolerance but adjustment will better align it with the calorimetric, THEN obtain Shift Supervisor concurrence and adjust NI Channel IAW Attachment 1 to the Reactor Power value calculated in Attachment 3. Record initials on Attachment 1. IF no NI adjustment is made, OR NI is NOT within tolerance, THEN enter N/A.

N/A ___ SS

6.3.3 IF NI channel is NOT within tolerance, THEN obtain Shift Supervisor concurrence and adjust the gain potentiometer on the front panel of each NI channel IAW Attachment 1 to the Reactor Power value recorded in Attachment 3. Record initials on Attachment 1. IF all NI channels are within tolerance, THEN enter N/A.

6.3.4 IF the front panel gain adjustment can NOT bring power of any channel within the required tolerance in Step 6.3.1, THEN perform all of the following. Otherwise, enter N/A.

N/A

a. Obtain concurrence from the Reactor Engineer to adjust the Power Range NI channel using the coarse level adjustment potentiometer.

N/A

b. Have a qualified Instrument Technician adjust the coarse level adjust potentiometer, R312, and the potentiometer on the front panel, until the front panel potentiometer is near mid-range and the Power Range NI channels are within + 2 % and - 0 % of the Calorimetric value if Reactor power is greater than or equal to 90%, <u>OR</u> within + 4 % and - 0 % of the Calorimetric value if Reactor power is less than 90%.

N/A

c. Note in the comment section any Power Range NI channel adjusted using the coarse level adjustment potentiometer.

N/A

d. <u>IF</u> the out-of-tolerance NI channel can <u>NOT</u> be properly adjusted, <u>THEN</u> declare the out-of-tolerance NI channel inoperable and comply with Tech Spec Table 3.7-1, Item 2.

7.0 FOLLOW-ON

7.1 Acceptance Criteria

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

- √ All power range channels are found to be or are adjusted to be within +2, -0% (≥ 90% power) OR +4, -0% (< 90% power) of the power level determined by the calorimetric. Any adjustment shall be noted below.

N-41 required adjustment	______	Yes	√	No
N-42 required adjustment	______	Yes	√	No
N-43 required adjustment	______	Yes	√	No
N-44 required adjustment	______	Yes	√	No

- √ Reactor Power is at or less than 100 percent.

√ 7.1.2 Document the test results. (√)

√ Satisfactory ___ Unsatisfactory

7.2 Follow-On Tasks

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

N/A

a. Document the reason for the unsatisfactory test in Subsection 7.3, Operator Comments.

N/A

b. Notify the Shift Supervisor and record the name.

Shift Supervisor: ____________________

N/A

c. Declare equipment inoperable.

N/A

d. Notify Reactor Engineering and record the name of the person notified.

Reactor Engineer: ____________________

N/A

e. Initiate a Deviation Report and record the number.

DR Number: ______________

N/A

f. Initiate a Work Request and record the number.

WR Number: ______________

N/A

7.2.2 IF a partial operability test was performed, THEN document the reason for the partial test in Subsection 7.3, Operator Comments. Otherwise, enter N/A.

7.3 Notification, Documentation, and Procedure Closeout

K 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
K	Kevin Mark Spencer or
	Licensed Candidate

Operator Comments: ______________________________

Completed by: Licensed Candidate Date: Today

7.4 Review

Shift Supervisor Comments: ______________________________________

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Reviewed by: ______________________________ Date: ______________
Shift Supervisor

Forward original procedure to Engineering Testing.

Engineering Comments: ______________________________________

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Reviewed by: ______________________________ Date: ______________
Reactor Engineer

ATTACHMENT 1

(Page 1 of 1)

NI CALIBRATION

* *

CAUTION: High Flux Trip and High Flux Rod Stop setpoint changes required by the following step must be completed before any associated Gain Potentiometer adjustments are performed.

* *

______ 1. IF Reactor power is less than 90% AND the Gain Potentiometer on any NI will be decreased, THEN before adjusting NIs, have I & C lower the High Flux Trip and High Flux Rod Stop setpoints on all NIs based on current Reactor power level. Otherwise, enter N/A. **(Reference 2.4.5)**

Reactor Power Level	High Power Trip/Rod Stop Setpoint
≥ 55% < 90%	≤ 100% / ≤ 96%
≥ 35% < 55%	≤ 85% / ≤ 81%
≥ 25% < 35%	≤ 65% / ≤ 61%
< 25%	≤ 40% / ≤ 36%

	NI-41	NI-42	NI-43	NI-44
2) Place rod control to MANUAL. Enter N/A if NI-44 will NOT be adjusted.				
3) Record As Found NI power level for each channel to be adjusted. Enter N/A for channel(s) not being adjusted.				
4) Adjust the Gain Potentiometer on the front panel of each NI channel to the new Reactor Power value and initial appropriate block(s). Enter N/A for channel(s) not being adjusted.				
5) Record As Left NI power level for each channel adjusted. Enter N/A for channel(s) not adjusted.				
6) Allow at least one minute to pass before placing the rod control back to AUTO. Enter N/A if NI-44 was NOT adjusted.				

ATTACHMENT 2

(Page 1 of 2)

COMPUTER POINTS USED BY FLOWCALC

FLOWCALC Core Resident Constant Value Inputs

Computer Point IDs	Description	Value/Units	PT/CAL
K2051	psig to psia conversion constant	14.7 psi	None
K7018	Run FLOWCALC	=1	None
	Stop FLOWCALC	=0	None

FLOWCALC Core Resident Analog Inputs

Computer Point IDs	Description	Value/Units	PT/CAL
F0403Y	Feedwater Flow Ch 4 (F476)	Volts	1-IPT-FT(CC)-FW-F-476
F0404Y	Feedwater Flow Ch 3 (F477)	Volts	1-IPT-FT(CC)-FW-F-477
F0423Y	Feedwater Flow Ch 4 (F486)	Volts	1-IPT-FT(CC)-FW-F-486
F0424Y	Feedwater Flow Ch 3 (F487)	Volts	1-IPT-FT(CC)-FW-F-487
F0443Y	Feedwater Flow Ch 4 (F496)	Volts	1-IPT-FT(CC)-FW-F-496
F0444Y	Feedwater Flow Ch 3 (F497)	Volts	1-IPT-FT(CC)-FW-F-497
P0400A	SG A Steam Pressure Ch 2 (P474)	psig	1-IPT-FT(CC)-MS-P-474
P0401A	SG A Steam Pressure Ch 3 (P475)	psig	1-IPT-FT(CC)-MS-P-475
P0402A	SG A Steam Pressure Ch 4 (P476)	psig	1-IPT-FT(CC)-MS-P-476
P0420A	SG B Steam Pressure Ch 2 (P484)	psig	1-IPT-FT(CC)-MS-P-484
P0421A	SG B Steam Pressure Ch 3 (P485)	psig	1-IPT-FT(CC)-MS-P-485
P0422A	SG B Steam Pressure Ch 4 (P486)	psig	1-IPT-FT(CC)-MS-P-486
P0440A	SG C Steam Pressure Ch 2 (P494)	psig	1-IPT-FT(CC)-MS-P-494
P0441A	SG C Steam Pressure Ch 3 (P495)	psig	1-IPT-FT(CC)-MS-P-495
P0442A	SG C Steam Pressure Ch 4 (P496)	psig	1-IPT-FT(CC)-MS-P-496

ATTACHMENT 2

(Page 2 of 2)

COMPUTER POINTS USED BY FLOWCALC

FLOWCALC Core Resident Analog Inputs

Computer Point IDs	Description	Value/Units	PT/CAL
P0403A	SG A Feedwater Inlet Pressure (P-100A)	psig	1-IPM-FW-P-100
P0423A	SG B Feedwater Inlet Pressure (P-100B)	psig	1-IPM-FW-P-100
P0443A	SG C Feedwater Inlet Pressure (P-100C)	psig	1-IPM-FW-P-100
T0418A	SG A Feed Water Temperature (RTD-111A)	°F	0-IPM-FW-RTD-001
T0438A	SG B Feed Water Temperature (RTD-111B)	°F	0-IPM-FW-RTD-001
T0458A	SG C Feed Water Temperature (RTD-111C)	°F	0-IPM-FW-RTD-001
Q0400A	Pressurizer Heater Power	KW	None
P0480A	Pressurizer Pressure Ch 1 (P-455)	psig	1-IPT-FT(CC)-RC-P-455
F0128A	Charging Header Flow (F-122)	gpm	1-PT-2.13 (F-1-122)
P0142A	Charging Pump Disch Header Pressure (P-121)	psig	1-CAL-286
T0126A	Regen Hx Charging Outlet Temp (T-123)	°F	1-CAL-238
F0134A	NRHX Letdown Flow (F-150)	gpm	1-CAL-519
T0406A	RC Loop A Cold Leg Temp (T-410)	°F	1-IPT-RC-T-410
T0140A	Volume Control Tank Outlet Temp (T-116)	°F	1-CAL-237
T0145A	NRHX Letdown Line Outlet Temp (T-144)	°F	1-CAL-574
P0135A	Low Pressure Letdown Line Press (P-1-145)	psig	1-CAL-324

Manual Inputs

Computer Point IDs	Description	Value/Units	PT/CAL
K0321	SG A Blowdown Flow (Manual Input)	gpm	1-CAL-224 and 1-CAL-227
K0322	SG B Blowdown Flow (Manual Input)	gpm	1-CAL-225 and 1-CAL-228
K0323	SG C Blowdown Flow (Manual Input)	gpm	1-CAL-226 and 1-CAL-229

ATTACHMENT 3

(Page 1 of 2)

CALORIMETRIC DATA SHEET

	LOOP A	LOOP B	LOOP C
Corrected Steam Pressure (psia)	(Run Avg or U9171) 830.50	(Run Avg or U9172) 829.60	(Run Avg or U9173) 827.00
Enthalpy Steam h_s (BTU/lbm)	1198.525	1198.57	1198.63
Feedwater Temp (°F)	440.00 (Run Avg or T0418A)	440.40 (Run Avg or T0438A)	440.70 (Run Avg or T0458A)
Enthalpy FW h_f (BTU/lbm)	419.31	419.75	420.09
$\Delta h_1 = (h_s - h_f)$ BTU/lbm	779.215	778.82	778.54
Blowdown Flow (gpm)	60 (SG A)	60 (SG B)	60 (SG C)
x Density ρ (lbm/ft^3)	x 61.9195	x 61.9195	x 61.9195
x Conversion gpm to ft^3/hr	x 8.021	x 8.021	x 8.021
Blowdown Flow M_{bd} (lbm/hr)	= 29,799.37857	= 29,799.37857	= 29,799.37857
Enthalpy h_{bd} (BTU/lbm)	515.085	514.83	514.49
$\Delta h_2 = (h_s - h_{bd})$ BTU/lbm	683.44	683.74	684.14
$M_{bd} \times \Delta h_2$ (BTU/hr)	= 20,366,087.29	= 20,375,027.1	= 20,386,946.85
Feedwater Flow M_{fw} (lbm/hr)	3695.9×10^3 (Run Avg or SG A Feed Flow)	3568.7001×10^3 (Run Avg or SG B Feed Flow)	3442.7001×10^3 (Run Avg or SG C Feed Flow)
$M_{fw} \times \Delta h_1$ (BTU/hr)	2,879,900,719	2,779,375,012	2,680,279,736
$Q_{loop} = (M_{fw} \times \Delta h_1) - (M_{bd} \times \Delta h_2)$	$Q_{loop\ A}$ =	$Q_{loop\ B}$ =	$Q_{loop\ C}$ =
	2,859,534,632	2,758,999,985	2,659,892,789

ATTACHMENT 3

(Page 2 of 2)

CALORIMETRIC DATA SHEET

Pressurizer Heater Input (KW)	900 (Q0400)
x Conversion KW TO BTU/hr	x 3413
Pressurizer Heater Input (BTU/hr)	= 3,071,700

$Q_{loop\ A} + Q_{loop\ B} + Q_{loop\ C}$ (BTU/hr)	= 8,278,427,406
− RCP Input (BTU/hr)	− 40.96×10^6 BTU/hr
− Pressurizer Heater Input (BTU/hr)	− 3,071,700
+ Letdown, Charging, and Seal Water Injection Losses (BTU/hr) **(Ref. 2.3.14)**	+ 17.06×10^6 BTU/hr
+ Insulation Losses (BTU/hr)	+ 5.12×10^6 BTU/hr
= Q_T (BTU/hr)	= 8,256,575,706
$MW_{th} = \frac{Q_T}{3413000}$	= 2419.154909 MW_{th}
$\% \text{ POWER} = \frac{MW_{th}}{2546} \times 100$	= 95.01786761 % POWER

Completed by: Licensed Candidate Date: Today

Checked by: ______________________

5 MINUTE CORRECTED STEAM & FEED FLOWS (FLOWPRT, VERSION 2)
UNIT 1 DATE: TODAY; TIME: 15 MINUTES AGO

LOOP A

F476	F476	F477	F477	F474	F474	F475	F475	TO418A	PO403A	PO400A	PO401A	PO402A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3693.9001	528.846	3692.9001	528.856	3694.2227	801.771	3693.2227	808.235	440.00	848.27	831.21	832.19	829.20

5 MIN AVERAGE FEED FLOW = 3694.9541 KBH
RUNNING AVERAGE FEED FLOW = 3695.9000 KBH
FILTERED AVERAGE FEED FLOW = 3694.9221 KBH (U9174)

RUNNING AVERAGE FEED TEMP = 440.00 DEGF

5 MIN AVERAGE STEAM PRESS = 830.28 PSIA
RUNNING AVERAGE STEAM PRESS = 830.50 PSIA
U9171
STM GEN PRESS (PSIA)
5 MIN AVE = 831.21
RUNNING AVE = 830.50

LOOP B

F486	F486	F487	F487	F484	F484	F485	F485	TO438A	PO423A	PO420A	PO421A	PO422A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3566.7001	522.459	3569.7201	522.459	3567.4537	804.987	3563.2239	802.887	440.40	859.41	828.20	831.45	829.00

5 MIN AVERAGE FEED FLOW = 3569.7551 KBH
RUNNING AVERAGE FEED FLOW = 3568.7001 KBH
FILTERED AVERAGE FEED FLOW = 3568.7221 KBH (U9175)

RUNNING AVERAGE FEED TEMP = 440.40 DEGF

5 MIN AVERAGE STEAM PRESS = 829.31 PSIA
RUNNING AVERAGE STEAM PRESS = 829.00 PSIA
U9172
STM GEN PRESS (PSIA)
5 MIN AVE = 829.43
RUNNING AVE = 829.00

LOOP C

F496	F496	F497	F497	F494	F494	F495	F495	TO458A	PO443A	PO440A	PO441A	PO442A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3441.3201	520.554	3442.7121	519.664	3441.2227	800.224	3440.2227	801.675	440.70	857.20	828.21	824.32	827.49

5 MIN AVERAGE FEED FLOW = 3442.7111 KBH
RUNNING AVERAGE FEED FLOW = 3442.7001 KBH
FILTERED AVERAGE FEED FLOW = 3440.2801 KBH (U9176)

RUNNING AVERAGE FEED TEMP = 440.70 DEGF

5 MIN AVERAGE STEAM PRESS = 827.42 PSIA
RUNNING AVERAGE STEAM PRESS = 827.00 PSIA
U9173
STM GEN PRESS (PSIA)
5 MIN AVE = 826.26
RUNNING AVE = 827.00

5 MINUTE CORRECTED STEAM & FEED FLOWS (FLOWPRT, VERSION 2)
UNIT 1 DATE: TODAY; TIME: 10 MINUTES AGO

LOOP A

F476	F476	F477	F477	F474	F474	F475	F475	TO418A	PO403A	PO400A	PO401A	PO402A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3695.9331	528.856	3692.2301	528.858	3693.3447	801.771	3692.2567	808.235	440.00	860.20	831.24	830.84	829.21

5 MIN AVERAGE FEED FLOW = 3693.9541 KBH
RUNNING AVERAGE FEED FLOW = 3695.9000 KBH
FILTERED AVERAGE FEED FLOW = 3695.8701 KBH (U9174)

RUNNING AVERAGE FEED TEMP = 440.00 DEGF

5 MIN AVERAGE STEAM PRESS = 830.20 PSIA
RUNNING AVERAGE STEAM PRESS = 830.50 PSIA
U9171
STM GEN PRESS (PSIA)
5 MIN AVE = 830.23
RUNNING AVE = 830.50

LOOP B

F486	F486	F487	F487	F484	F484	F485	F485	TO438A	PO423A	PO420A	PO421A	PO422A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3569.8701	522.459	3567.9991	522.459	3565.2737	804.987	3567.3337	802.887	440.40	869.40	828.46	829.40	832.44

5 MIN AVERAGE FEED FLOW = 3569.7341 KBH
RUNNING AVERAGE FEED FLOW = 3568.7001 KBH
FILTERED AVERAGE FEED FLOW = 3568.7991 KBH (U9175)

RUNNING AVERAGE FEED TEMP = 440.40 DEGF

5 MIN AVERAGE STEAM PRESS = 828.45 PSIA
RUNNING AVERAGE STEAM PRESS = 829.00 PSIA
U9172
STM GEN PRESS (PSIA)
5 MIN AVE = 829.40
RUNNING AVE = 829.00

LOOP C

F496	F496	F497	F497	F494	F494	F495	F495	TO458A	PO443A	PO440A	PO441A	PO442A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3442.2001	520.554	3440.4371	519.664	3441.2227	800.224	3440.3427	801.675	440.70	857.25	827.55	826.26	826.29

5 MIN AVERAGE FEED FLOW = 3440.7441 KBH
RUNNING AVERAGE FEED FLOW = 3442.7001 KBH
FILTERED AVERAGE FEED FLOW = 3440.5661 KBH (U9176)

RUNNING AVERAGE FEED TEMP = 440.70 DEGF

5 MIN AVERAGE STEAM PRESS = 827.20 PSIA
RUNNING AVERAGE STEAM PRESS = 827.00 PSIA
U9173
STM GEN PRESS (PSIA)
5 MIN AVE = 827.24
RUNNING AVE = 827.00

5 MINUTE CORRECTED STEAM & FEED FLOWS (FLOWPRT, VERSION 2)
UNIT 1 DATE: TODAY; TIME: 5 MINUTES AGO

LOOP A

F476	F476	F477	F477	F474	F474	F475	F475	TO418A	PO403A	PO400A	PO401A	PO402A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3693.9033	528.856	3695.3901	528.856	3693.2337	801.771	3692.2097	808.235	440.00	830.20	830.20	830.20	830.20

5 MIN AVERAGE FEED FLOW = 3695.9441 KBH
RUNNING AVERAGE FEED FLOW = 3695.9000 KBH
FILTERED AVERAGE FEED FLOW = 3693.9991 KBH (U9174)

RUNNING AVERAGE FEED TEMP = 440.00 DEGF

5 MIN AVERAGE STEAM PRESS = 830.21 PSIA
RUNNING AVERAGE STEAM PRESS = 830.50 PSIA
U9171
STM GEN PRESS (PSIA)
5 MIN AVE = 831.23
RUNNING AVE = 830.50

LOOP B

F486	F486	F487	F487	F484	F484	F485	F485	TO438A	PO423A	PO420A	PO421A	PO422A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3565.7981	522.459	3569.7761	522.459	3565.2537	804.987	3562.2297	802.887	440.40	859.40	829.40	828.47	831.39

5 MIN AVERAGE FEED FLOW = 3569.2301 KBH
RUNNING AVERAGE FEED FLOW = 3568.7001 KBH
FILTERED AVERAGE FEED FLOW = 3568.4581 KBH (U9175)

RUNNING AVERAGE FEED TEMP = 440.40 DEGF

5 MIN AVERAGE STEAM PRESS = 829.40 PSIA
RUNNING AVERAGE STEAM PRESS = 829.00 PSIA
U9172
STM GEN PRESS (PSIA)
5 MIN AVE = 828.42
RUNNING AVE = 829.00

LOOP C

F496	F496	F497	F497	F494	F494	F495	F495	TO458A	PO443A	PO440A	PO441A	PO442A
FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	FLOW(KBH)	D/P ("H20)	TEMP(DEGF)	PRESS(PISG)	PRESS(PISA)	PRESS(PISA)	PRESS(PISA)
3441.7121	520.554	3442.2301	519.664	3440.2347	800.224	3445.2547	801.675	440.70	854.20	825.29	828.43	827.61

5 MIN AVERAGE FEED FLOW = 3442.7301 KBH
RUNNING AVERAGE FEED FLOW = 3442.7001 KBH
FILTERED AVERAGE FEED FLOW = 3441.7901 KBH (U9176)

RUNNING AVERAGE FEED TEMP = 440.70 DEGF

5 MIN AVERAGE STEAM PRESS = 827.25 PSIA
RUNNING AVERAGE STEAM PRESS = 827.00 PSIA
U9173
STM GEN PRESS (PSIA)
5 MIN AVE = 828.24
RUNNING AVE = 827.00

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U. S. Nuclear Regulatory Commission

Region II

A-1 Administrative Section

NRC-ADMIN-JPM-01A/SRO

Title:

Perform A Shutdown Margin With A Dropped Rod

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Perform an At-Power Shutdown Margin calculation.(1-OP-RX-001)

References:

1-OP-RX-001, "SHUTDOWN MARGIN (CALCULATED AT POWER) Rev. 005
1-DRP-003, "CURVE BOOK" Rev. 050

Validation Time: 15 min. **Time Critical:** No

==

Candidate: ______________________________
NAME

Performance Rating: SAT ______ UNSAT ______

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

==

COMMENTS

____

____

____

Tools/Equipment/Procedures Needed:

1-OP-RX-001, "SHUTDOWN MARGIN (CALCULATED AT POWER) Rev. 005
1-DRP-003, "CURVE BOOK" Rev. 050
Calculator

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed 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:

Unit One is stable at 90% power.
A dropped rod occurred 5 minutes ago.
RCS temperature is stable at 567°F.
Core age is 7521 MWD/MTU.
"D" bank rod height is currently 191 steps.
RCS boron concentration is 900 ppm as measured 2 hours ago, no borations or dilutions have occurred since.

INITIATING CUES:

The Unit One SRO has requested you perform an independent shutdown margin to verify the Shutdown Margin calculated by the shift STA.
Here is a verified current copy of 1-OP-RX-001, SHUTDOWN MARGIN (CALCULATED AT POWER).
You are requested to perform an at-power shutdown margin calculation.

EVALUATOR'S NOTE:

An asterisk (*) within the JPM identifies the critical component(s) of a critical step.

STEP 1: Review the purpose of the procedure (Section 1.0) STANDARD: ____Reviews step 1.1 To verify that a reactor core will be adequately subcritical to meet Technical Specifications and Administrative Limits. ____Reviews step 1.2 This test shall be performed at the following times: ·At the discretion of the Shift Supervisor whenever an at power shutdown margin (SDM) should be calculated to verify Technical Specification compliance. ·Within one hour after a control rod has been determined inoperable, and every twelve hours thereafter until the reactor is shutdown or the rod is declared operable. ·When a Shutdown or Control Bank has been inserted up to 18 steps below its insertion limit and becomes stuck or inoperable during physics testing and control rod assembly surveillance testing. ____Identifies the dropped rod is inoperable and the requirements to perform 1-OP-RX-001 apply. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Review the References Section (Section 2.0) STANDARD: ____Reviews section 2.1, Source Documents, 2.2 Technical Specification sections, 2.3 Technical References, and 2.4 Commitment Documents COMMENTS:	___ SAT ___ UNSAT

STEP 3: Verifies the Initial Conditions are met (Section 3.0) STANDARD: ____Verifies the reactor is still critical and at 90% power. (step 3.1) ____Initials Step 3.1 ____Verifies last boron sample was taken two hours ago. (step 3.2) ____Initials Step 3.2 ____Verifies no large dilutions have performed since the boron sample was taken. (step 3.3) ____Initials Step 3.3 ____ Initials, signs, prints name, and dates procedure. (step 3.4) COMMENTS:	___ SAT ___ UNSAT
STEP 4: Reviews Precautions and Limitations (Section 4.0) STANDARD: ____Notes RCS temperature is greater than 547 degrees, unit at power, and the need to ensure 1,770 pcm of negative reactivity is required. ____Notes the Unit 1 SRO is responsible for maintaining supervisory oversight of the performance of this procedure. ____Notes the procedure must be performed by a RO, STA, or Reactor Engineer. **EVALUATORS NOTE: If the applicant expresses concern over step 4.3, inform him his qualifications are in excess of those listed in the procedure.** COMMENTS:	___ SAT ___ UNSAT

STEP 5.1.1: Record parameters for the SDM calculation (steps 5.1.1.a-5.1.1e) STANDARD: ____Enters current time and date for time/date of SDM in step 5.1.1.a. ____Enters 7521 MWD/MTU for Core burnup in step 5.1.1.b ____Enters 191 steps for "D" bank position in step 5.1.1.c ____Enters 900ppm for boron concentration in step 5.1.1.d ____Enters 90% for reactor power in step 5.1.1.e ____Initials step 5.1.1 COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.2: Determine surveillance testing is not in progress and an single bank of control rods is unaffected. (Step 5.1.2) STANDARD: ____Enters N/A for and initials step 5.1.2 ____Enters 0 for step 5.1.5.c COMMENTS:	___ SAT ___ UNSAT

STEP 5.1.3: Calculates the worth of the stuck rods greater than 20 steps in the core. (step 5.1.3) STANDARD: ____Determines no stuck rods are present. ____Enters "1" in the "Actual No. of Stuck Rods Plus One" blank. ____Identifies Reference 2.3.1.f is the "Stuck Rod Worth vs. Burnup" curve. ____Locates Attachment 40 "SURRY UNIT 1 - CYCLE 17 STUCK ROD WORTH VS. BURNUP" curve in 1-DRP-003 "Curve Book". ____Using 7521 MWD/MTU, determines Stuck rod worth to be 1361 (band 1358.5 to 1363.5). ____Enters 1361 (band 1358.5 to 1363.5) in blank labeled (Ref 2.3.1.f). ____Enters 1361 (band 1358.5 to 1363.5) in final blank of step 5.1.3. ____Initials step 5.1.3 COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.4: Calculates the worth of the dropped rods. (step 5.1.4) STANDARD: ____Enters "1" for the number of dropped rods. ____Enters 1000 in final blank of step 5.1.4 and step 5.1.5.e. ____Initials step 5.1.4 COMMENTS:	___ SAT ___ UNSAT

STEP 5.1.5: Observes CAUTION that positive reactivity values must be entered in Substeps 5.1.5.a -5.1.5.f (Caution prior to Step 5.1.5) STANDARD: ____Observes CAUTION. COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.5: Record the values required in step 5.1.5 STANDARD: ____Initials step 5.1.5 when all data is entered. COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.5a: Determine Power Defect (step 5.1.5a) STANDARD: ____ Identifies Reference 2.3.1.a is the "Power Defect" curve. ____Locates Attachment 31 "SURRY UNIT 1 - CYCLE 17 POWER DEFECT" curve in 1-DRP-003 "Curve Book". ____Using 900 ppm boron, determines Power defect to be 1760 pcm (band 1735 to 1785). ____Enters 1760 (band 1735 to 1785) in step 5.1.5a COMMENTS:	___ SAT ___ UNSAT

STEP 5.1.5.b: Determines Reactivity Redistribution Factor STANDARD: ____ Identifies Reference 2.3.1.b is the "Reactivity Redistribution Factor" curve. ____Locates Attachment 41 "SURRY UNIT 1 - CYCLE 17 REACTIVITY REDISTRIBUTION FACTOR VS. BURNUP" curve in 1-DRP-003 "Curve Book". ____Using 7521 MWD/MTU, determines Reactivity Redistribution factor to be 235 pcm (band 230 to 240). ____Enters 235 (band 230 to 240) in step 5.1.5b COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.5.c: Determines Worth of a Single Bank Inserted Out of Sequence (step 5.1.5.c) STANDARD: ____Enters 0 if not previously inserted. COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.5.d: Determines Stuck Rod Worth (step 5.1.5.d) STANDARD: ____Transcribes value entered in step 5.1.3 (band 1358.5 to 1363.5) COMMENTS:	___ SAT ___ UNSAT

STEP 5.1.5.e: Determines Dropped Rod Worth (step 5.1.5.e) STANDARD: ____Transcribes value entered in step 5.1.4 (1000) COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.5.f: Determines the Worth of Control Banks at Rod Position in step 5.1.1.c (Step 5.1.5.f) STANDARD: ____Determines rod height in step 5.1.1.c is 191 steps. ____ Identifies Reference 2.3.1.d is the "At power Integral Worth Table - Control Banks C&D in overlap" Table. (The At-power Integral Worth of C&D banks curve was not generated for the curve book for cycle 17.) ____Locates Attachment 29 "SURRY UNIT 1 - CYCLE 17 At Power Integral Worth Table - Control Banks C&D in overlap" table in 1-DRP-003 "Curve Book". ____Using 7521 MWD/MTU, determines Rod worth to be 132.1 pcm. ____Enters 132.1 in step 5.1.5.f. COMMENTS:	___ SAT ___ UNSAT

STEP 5.1.5.g: Determines the Total Rod Worth. (step 5.1.5.g) STANDARD: ____ Identifies Reference 2.3.1.e is the "Total Rod Worth " curve ____Locates Attachment 38 "SURRY UNIT 1 - CYCLE 17 Total Rod Worth VS. Burnup" curve in 1-DRP-003 "Curve Book". ____Using 7521 MWD/MTU, determines Total Rod Worth to be 7092 pcm (band 7087 to 7097). ____Enters 7092 (band 7087 t0 7097) in step 5.1.5.g. COMMENTS:	___ SAT ___ UNSAT
STEP 5.1.6: Calculates the Shutdown Margin by adding all values in step 5.1.5 (step 5.1.6) STANDARD: ____Adds steps 5.1.5a through 5.1.5.h (all values are positive except for 5.1.5.g). ____Calculates SDM to be –2453.9 pcm (band –2491.4 to –2416.4). * ____Enters –2453.9 pcm in step 5.1.6 (band –2491.4 to –2416.4). ____Initials step 5.1.6. **Evaluators Note: Band is generated from using maximum deviations which could be calculated using bands listed within JPM substeps.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5.1.7: Determine acceptability of the calculated shutdown margin (step 5.1.7) STANDARD: ____Determines calculated SDM is more negative than -1770 pcm. ____Enters N/A for and initials step 5.1.7. ____Signs in "Completed By:" and Dates. COMMENTS: END OF TASK	___ SAT ___ UNSAT

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit One is stable at 90% power.
A dropped rod occurred 5 minutes ago.
RCS temperature is stable at 567°F.
Core age is 7521 MWD/MTU.
"D" bank rod height is currently 191 steps.
RCS boron concentration is 900 ppm as measured 2 hours ago, no borations or dilutions have occurred since.

INITIATING CUES:

The Unit One SRO has requested you perform an independent shutdown margin to verify the Shut Down Margin calculated by the shift STA.
Here is a verified current copy of 1-OP-RX-001, SHUTDOWN MARGIN (CALCULATED AT POWER).
You are requested to perform an at-power shutdown margin calculation.

VIRGINIA POWER **SURRY POWER STATION**	PROCEDURE NO: **1-OP-RX-001**
	REVISION NO: 5
PROCEDURE TYPE: **OPERATING PROCEDURE**	UNIT NO: 1
PROCEDURE TITLE: **SHUTDOWN MARGIN (CALCULATED AT POWER)**	EFFECTIVE DATE: **On File**
	EXPIRATION DATE: (Temporary Procedures Only) **N/A**

REVISION SUMMARY:

Minor Revision

• Incorporated E-PAR {P1} PAR 980147 R4 P1

Added Precautions and Limitations 4.2 and 4.3. Added verification and SRO review signatures.

• Incorporated Engineering Markup addressing CTS 4358, RCE S-98-1213, Shutdown Margin Calculation Issues - added Reference 2.4.2, CTS 4358; modified Step 5.1.6 to include Substep 5.1.5.h; modified wording in Initial Condition 3.3 and Step 5.1.2. Added Substep 5.1.5.h, Rod Worth Conservatism.

UNIT ONE

Reactivity Management

PROCEDURE WRITER: A. Swander	VALIDATOR: Doug Lawrence

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:

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To verify that a critical reactor core will be adequately subcritical to meet Technical Specifications and Administrative Limits. (Reference 2.2.1)

1.2 This test shall be performed at the following times:

- At the descretion of the Shift Supervisor whenever an at power shutdown margin (SDM) should be calculated to verify Technical Specification compliance. (Reference 2.2.1)
- Within one hour after a control rod has been determined inoperable, and every twelve hours thereafter until the reactor is shutdown or the rod is declared operable. (Reference 2.2.1)
- When a Shutdown or Control Bank has been inserted up to 18 steps below its insertion limit and becomes stuck or inoperable during physics testing and control rod assembly surveillance testing. **(Reference 2.4.1)**

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR Section 3.2, 14.2.5

2.1.2 Nuclear Analysis and Fuel Technical Report NE-630, Revision 1

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specifications 1.C.4, 3.12.A.3.c, 3.12.C.3.b.2, 3.12.A.5, 3.12.A.6, 3.12 Basis

2.3 Technical References

2.3.1 1-DRP-003, Curve Book, Section 1 Attachments-Physics Curves

a. Power Defect

b. Reactivity Redistribution Factor

c. At Power Integral Worth of C & D Banks

d. At Power Integral Worth Table-Control Banks C & D in Overlap

e. Total Rod Worth

f. Stuck Rod Worth vs Burnup

g. Worth of Single Rod Bank Out of Sequence Up to 18 Steps

2.3.2 Engineering Transmittal NAF-980058, Rev. 0, Proposed Operator Response and Shutdown Margin Information for Incomplete Rod Insertion

2.4 Commitment Documents

2.4.1 CTS 2102, Technical Specification Change 269, Control Rod Urgent Failure analysis

2.4.2 CTS 4358, RCE S-98-1213, Shutdown Margin Calculation Issues

Init **Verif**

3.0 INITIAL CONDITIONS

K 3.1 The reactor is critical.

K 3.2 Verify that the RCS boron concentration has been determined in the last 24 hours.

K 3.3 Verify that no large dilutions (i.e., greater than 10 ppm) to the RCS have been performed since the most recently measured boron concentration.

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

Initials	Signature	Printed Name	Date
K	Kevin Mark Spencer	Kevin Mark Spencer	Today

4.0 PRECAUTIONS AND LIMITATIONS

4.1 When the RCS average temperature is greater than or equal to 547°F <u>and</u> the unit is at power, there must be sufficient negative reactivity available to ensure that the reactor can be made subcritical by at least 1,770 pcm.

4.2 The Unit 1 SRO is responsible for maintaining supervisory oversight of the performance of this procedure.

4.3 This procedure must be performed by a Reactor Operator, Shift Technical Advisor (STA), or Reactor Engineer.

Init **Verif**

5.0 INSTRUCTIONS

5.1 Shutdown Margin Determination

√ 5.1.1 Record the following parameters for the SDM calculation.

a. Time/date of SDM calculation NOW / TODAY

b. Core Burnup 7521 MWD/MTU

c. D Control Bank Position 191 Steps

d. Estimate of Current Boron Concentration (± 50 ppm) 900 ppm
(Required for determination of Power Defect)

e. Reactor Power 90 %

N/A √ 5.1.2 IF a single bank of control rods has been inserted up to 18 Steps and cannot be returned to the original position during physics or surveillance testing, THEN record the bank worth at Substep 5.1.5.c. Otherwise, enter N/A for this step and zero pcm at Substep 5.1.5.c.

√ 5.1.3 Calculate the worth of the stuck or declared inoperable rods that are above 20 steps in the core. IF there are no stuck or declared inoperable rods left in the core, THEN enter ONE stuck rod. IF there is a known stuck rod, THEN enter TWO stuck rods. (1358.5 - 1363.5) (1358.5 - 1363.5)

(1) X (+ 1361) = + 1361 pcm

Actual No. of Stuck Rods Plus One; (Ref 2.3.1.f)

√ 5.1.4 Calculate the worth of the dropped rods (rods that are below 20 steps in the core). IF there are no dropped rods in the core, THEN enter N/A for this step AND zero pcm below and at Substep 5.1.5.e.

(1) X (+ 1,000 pcm) = + 1000 pcm

No. of Dropped Rods

* *

CAUTION: Positive reactivity values must be entered in Substeps 5.1.5.a, 5.1.5.b, 5.1.5.c, 5.1.5.d, 5.1.5.e, and 5.1.5.f.

* *

5.1.5 Record the values required to calculate the Shutdown Margin. (Use data recorded in Step 5.1.1 as reference values for recording data from the curves in the Curve Book, Ref 2.3.1.)

a. Power Defect from Ref 2.3.1.a + 1760 (1735 - 1785) pcm

b. Reactivity Redistribution Factor (Ref 2.3.1.b) + 235 (230 - 240) pcm

c. Worth of a Single Bank Inserted Out of Sequence up to 18 Steps (Ref. 2.3.1.g) (Enter zero if all banks are in proper sequence) + 0 pcm

d. Stuck Rod Worth from Step 5.1.3 + 1361 (1358.5 - 1363.5) pcm

e. Dropped Rod Worth from Step 5.1.4 + 1000 pcm

f. Worth of Control Banks at Rod Position in Substep 5.1.1.c (Ref 2.3.1.c or 2.3.1.d) + 132.1 pcm

g. Total Rod Worth (Ref 2.3.1.e) - 7092 (7087 - 7097) pcm

h. Rod Worth Conservatism to account for RPI uncertainity and potential for incomplete rod insertion (Ref. 2.3.2) + 150 pcm

____ 5.1.6 Calculate the Shutdown Margin by adding the values in Substep 5.1.5.a through Substep 5.1.5.h and recording the value below.

At Power Shutdown Margin -2453.9 (-2491.4 - 2416.4) pcm

N/A 5.1.7 IF Step 5.1.6 is less negative than Section 4.0 requirements (-1,770 pcm), THEN reduce plant power in accordance with Technical Specification 3.12 AND satisfy the required SDM (-1,770 pcm). IF Step 5.1.6 is more negative than -1770 pcm, THEN enter N/A for this step.

Completed By: Kevin Ward, Jr. Date: Today

Verified By: __________ Date: ______

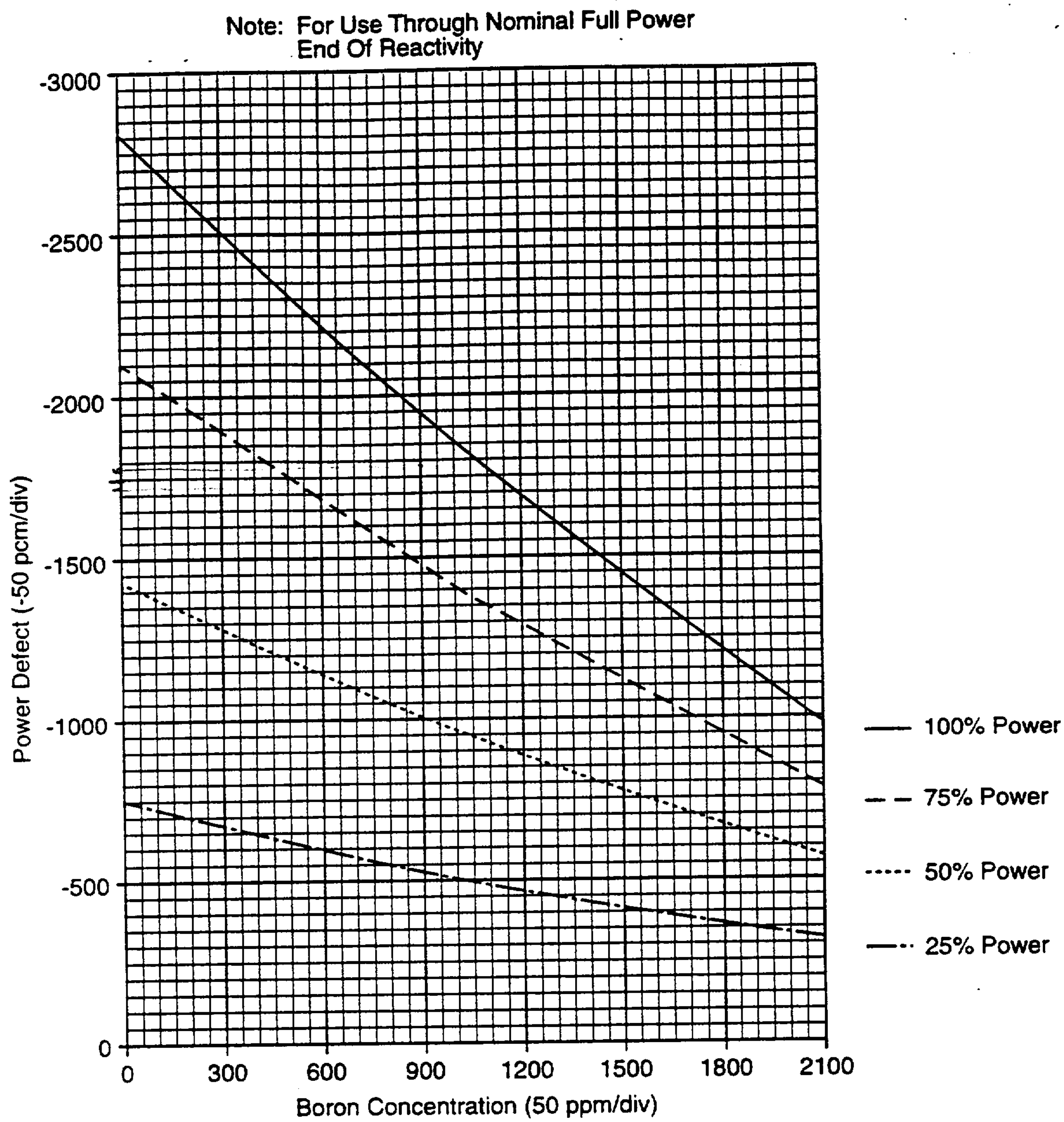
Reviewed By: __________ Date: ______
SRO

ATTACHMENT 31

(Page 1 of 1)

SURRY UNIT 1 - CYCLE 17

POWER DEFECT



Graphics No: LD2490A

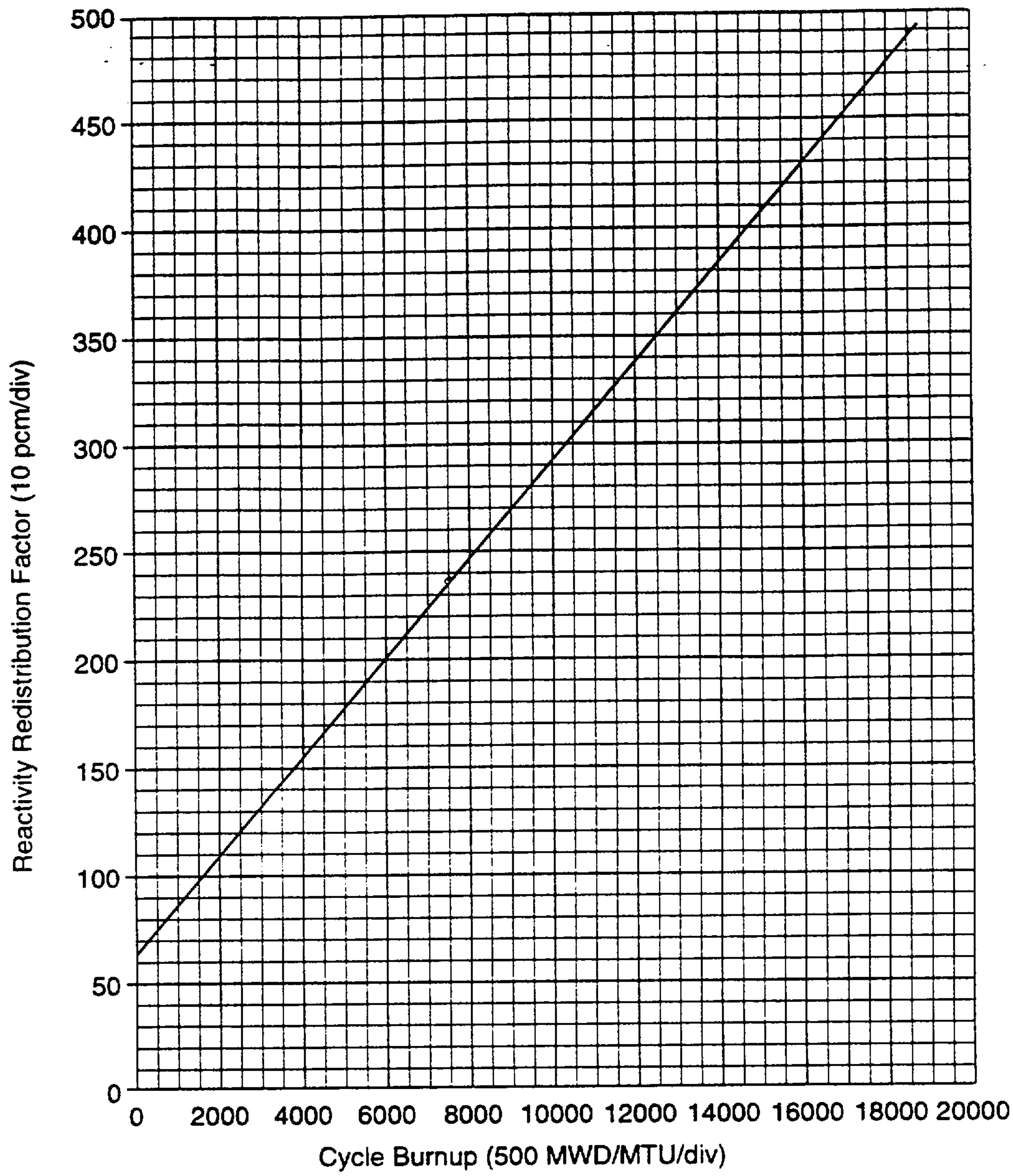
ATTACHMENT 41

(Page 1 of 1)

SURRY UNIT 1 - CYCLE 17

REACTIVITY REDISTRIBUTION FACTOR VS. BURNUP

Note: For Use in Shutdown Margin Calculations Only



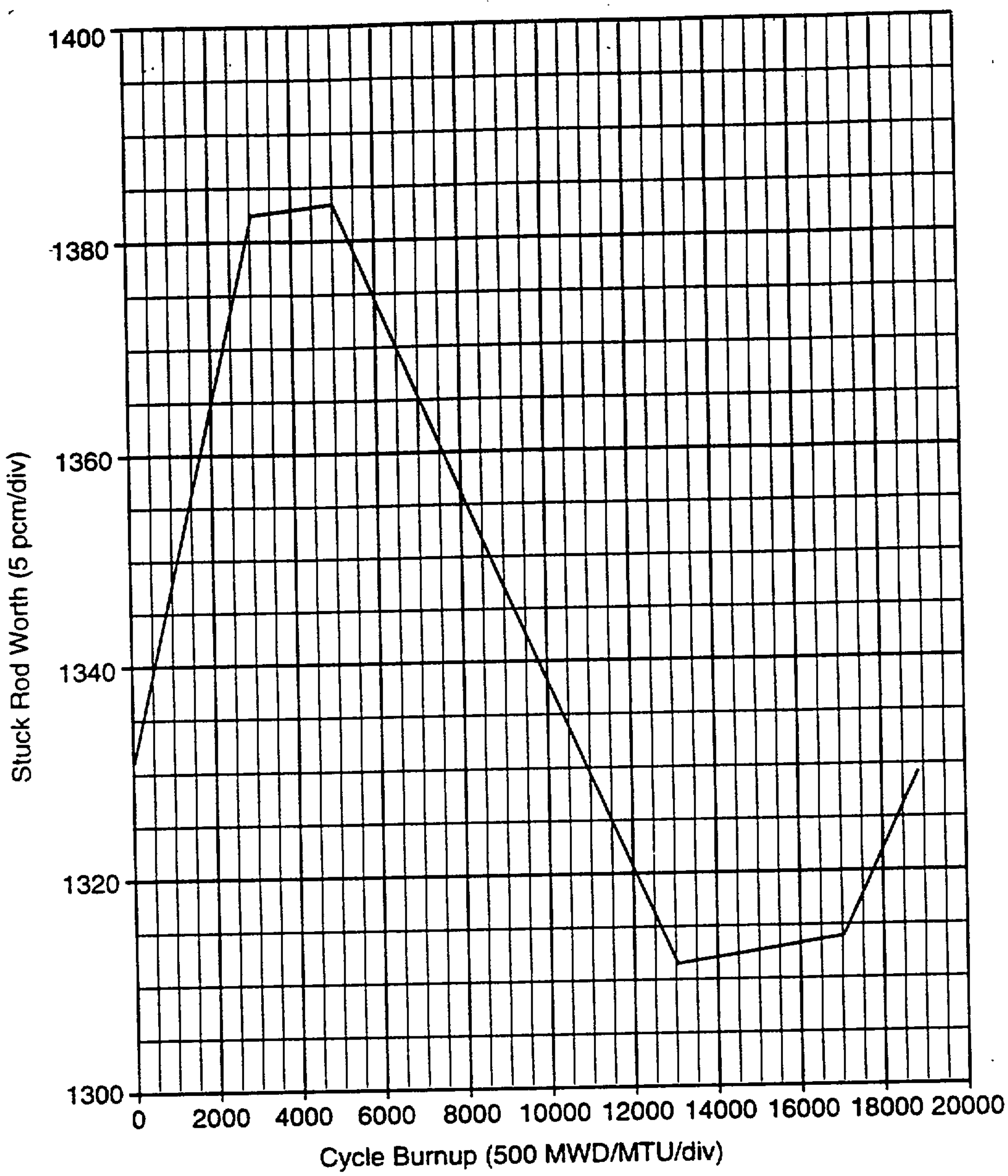
Graphics No: LD2494A

ATTACHMENT 40

(Page 1 of 1)

SURRY UNIT 1 - CYCLE 17
STUCK ROD WORTH VS. BURNUP

Note: For Use in Shutdown Margin Calculations Only



Graphics No: LD2493A

ATTACHMENT 29

(Page 1 of 7)

SURRY UNIT 1 - CYCLE 17

AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)					
D-BANK POS STEPS	C-BANK POS STEPS	0.0 TO 500.0	500.1 TO 2000.0	2000.1 TO 4000.0	4000.1 TO 6000.0	6000.1 TO 8000.0	8000.1 TO 10000.0
226	226	0.0	0.0	0.0	0.0	0.0	0.0
224	226	0.3	0.3	0.3	0.3	0.4	0.4
222	226	1.6	1.7	1.9	2.1	2.3	2.7
220	226	3.9	4.1	4.4	5.0	5.6	6.4
218	226	6.7	7.0	7.7	8.6	9.6	11.0
216	226	10.7	11.1	12.1	13.5	15.1	17.1
214	226	15.3	15.9	17.3	19.3	21.4	24.0
212	226	20.3	21.1	23.0	25.6	28.4	31.5
210	226	25.9	26.9	29.3	32.5	35.9	39.7
208	226	32.3	33.5	36.4	40.3	44.5	48.8
206	226	39.0	40.5	43.9	48.5	53.4	58.5
204	226	46.1	47.8	51.8	57.1	62.8	68.5
202	226	53.6	55.6	60.1	66.2	72.6	79.3
200	226	61.6	63.8	68.9	75.7	82.9	90.7
198	226	69.8	72.3	78.0	85.5	93.4	102.4
196	226	78.3	81.0	87.3	95.6	104.2	114.4
194	226	86.9	90.0	96.8	105.8	115.1	126.4
192	226	95.9	99.2	106.6	116.3	126.4	138.8
190	226	105.1	108.8	116.7	127.0	137.8	151.2

ATTACHMENT 29

(Page 2 of 7)

SURRY UNIT 1 - CYCLE 17
AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)					
D-BANK POS STEPS	C-BANK POS STEPS	0.0 TO 500.0	500.1 TO 2000.0	2000.1 TO 4000.0	4000.1 TO 6000.0	6000.1 TO 8000.0	8000.1 TO 10000.0
188	226	114.6	118.3	127.0	137.8	149.3	163.6
186	226	124.1	128.2	137.3	148.8	160.9	175.7
184	226	133.9	138.2	147.9	159.9	172.6	187.9
182	226	143.9	148.5	158.6	171.3	184.6	200.4
180	226	153.9	158.7	169.4	182.5	196.4	213.0
178	226	164.0	169.0	180.2	193.9	208.3	225.8
176	226	174.3	179.6	191.2	205.4	220.4	238.7
174	226	184.7	190.3	202.4	217.0	232.5	251.6
172	226	195.2	200.9	213.4	228.5	244.4	263.9
170	226	205.8	211.7	224.6	240.1	256.5	276.4
168	226	216.6	222.7	236.0	251.9	268.8	289.0
166	226	227.4	233.7	247.3	263.6	280.9	301.6
164	226	238.2	244.7	258.7	275.2	293.0	314.2
162	226	249.2	255.9	270.2	287.0	305.1	327.2
160	226	260.5	267.2	281.8	299.0	317.5	340.3
158	226	271.5	278.4	293.3	310.7	329.5	352.5
156	226	282.6	289.7	304.8	322.4	341.6	364.9
154	226	294.0	301.2	316.5	334.4	353.9	377.3
152	226	305.4	312.7	328.3	346.4	366.2	389.9

ATTACHMENT 29

(Page 3 of 7)

SURRY UNIT 1 - CYCLE 17

AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)					
D-BANK POS STEPS	C-BANK POS STEPS	0.0 TO 500.0	500.1 TO 2000.0	2000.1 TO 4000.0	4000.1 TO 6000.0	6000.1 TO 8000.0	8000.1 TO 10000.0
150	226	316.7	324.1	339.8	358.0	378.2	402.4
148	226	328.2	335.7	351.6	369.9	390.3	415.1
146	226	339.9	347.5	363.5	382.0	402.7	428.0
144	226	351.5	359.1	375.3	393.9	414.8	440.3
142	226	363.1	370.8	386.9	405.7	426.8	452.4
140	226	374.9	382.6	398.9	417.7	439.0	464.8
138	226	386.8	394.6	411.0	429.8	451.4	477.3
136	226	398.5	406.3	422.7	441.5	463.3	489.2
134	226	410.3	418.1	434.5	453.4	475.3	501.4
132	226	422.3	430.2	446.5	465.5	487.6	513.7
130	226	434.3	442.2	458.5	477.5	499.8	525.9
128	226	446.1	453.9	470.3	489.3	511.7	537.9
126	226	458.2	466.0	482.3	501.2	523.8	550.1
124	226	470.5	478.3	494.5	513.4	536.1	562.4
122	226	482.4	490.2	506.3	525.2	548.0	574.3
120	226	494.5	502.1	518.2	537.0	559.9	586.2
118	226	506.7	514.3	530.2	549.0	572.0	598.4
116	226	519.0	526.5	542.4	561.1	584.2	610.6
114	226	531.0	538.4	554.1	572.7	595.8	622.2

ATTACHMENT 29

(Page 4 of 7)

SURRY UNIT 1 - CYCLE 17

AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)					
D-BANK POS STEPS	C-BANK POS STEPS	0.0 TO 500.0	500.1 TO 2000.0	2000.1 TO 4000.0	4000.1 TO 6000.0	6000.1 TO 8000.0	8000.1 TO 10000.0
112	226	543.1	550.5	566.0	584.5	607.8	634.1
110	226	555.5	562.8	578.1	596.6	620.0	646.3
108	226	567.6	574.8	590.0	608.3	631.8	658.0
106	226	579.6	586.7	601.7	619.9	643.5	669.7
104	226	591.9	598.8	613.6	631.8	655.4	681.6
102	226	604.4	611.2	625.8	643.9	667.6	693.6
100	226	616.2	622.9	637.4	655.3	679.0	705.0
98	226	628.3	634.8	649.1	666.9	690.7	716.6
96	224	640.8	647.2	661.2	679.0	702.9	728.8
94	222	654.0	660.3	674.3	692.1	716.2	742.4
92	220	667.7	674.0	688.0	706.0	730.5	757.3
90	218	682.1	688.3	702.3	720.6	745.6	773.1
88	216	697.4	703.5	717.7	736.4	761.9	789.9
86	214	712.7	718.9	733.3	752.4	778.6	806.8
84	212	728.5	734.7	749.3	768.9	795.8	824.3
82	210	744.8	751.1	765.9	786.1	813.6	842.5
80	208	761.7	768.1	783.1	803.8	832.2	861.4
78	206	778.5	785.0	800.3	821.6	850.7	880.2
76	204	795.9	802.3	818.0	839.9	869.7	899.6

ATTACHMENT 29

(Page 5 of 7)

SURRY UNIT 1 - CYCLE 17
AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)					
D-BANK POS STEPS	C-BANK POS STEPS	0.0 TO 500.0	500.1 TO 2000.0	2000.1 TO 4000.0	4000.1 TO 6000.0	6000.1 TO 8000.0	8000.1 TO 10000.0
74	202	813.6	820.2	836.2	858.7	889.3	920.1
72	200	831.6	838.2	854.6	877.7	909.1	941.1
70	198	849.7	856.4	873.1	896.8	929.0	962.2
68	196	868.3	875.1	892.1	916.5	949.4	983.9
66	194	887.3	894.1	911.4	936.5	969.9	1005.9
64	192	906.0	912.9	930.6	956.2	990.5	1027.7
62	190	925.2	932.2	950.1	976.3	1011.4	1049.7
60	188	944.9	951.9	970.1	997.0	1032.7	1071.9
58	186	964.8	971.8	990.4	1017.7	1054.2	1093.7
56	184	984.7	991.8	1010.7	1038.5	1075.5	1115.2
54	182	1005.1	1012.2	1031.4	1059.7	1097.5	1137.4
52	180	1025.8	1032.9	1052.2	1081.2	1119.5	1160.4
50	178	1046.7	1053.8	1073.4	1102.8	1141.8	1183.7
48	176	1068.1	1075.2	1094.9	1124.9	1164.4	1207.3
46	174	1089.9	1096.9	1116.9	1147.3	1187.3	1231.1
44	172	1112.0	1118.9	1139.1	1169.9	1210.5	1254.5
42	170	1133.9	1140.7	1161.1	1192.2	1233.4	1277.9
40	168	1156.4	1163.1	1183.5	1215.1	1256.7	1301.7
38	166	1179.0	1185.5	1206.0	1238.0	1280.1	1325.9

ATTACHMENT 29

(Page 6 of 7)

SURRY UNIT 1 - CYCLE 17

AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)					
D-BANK POS STEPS	C-BANK POS STEPS	0.0 TO 500.0	500.1 TO 2000.0	2000.1 TO 4000.0	4000.1 TO 6000.0	6000.1 TO 8000.0	8000.1 TO 10000.0
36	164	1201.6	1208.0	1228.5	1260.8	1303.5	1350.4
34	162	1224.5	1230.6	1251.2	1283.8	1326.9	1374.4
32	160	1247.6	1253.5	1274.0	1307.1	1350.6	1398.9
30	158	1270.7	1276.4	1296.9	1330.1	1374.1	1422.5
28	156	1293.8	1299.2	1319.5	1353.0	1397.3	1446.1
26	154	1317.1	1322.2	1342.4	1376.2	1420.9	1469.9
24	152	1340.5	1345.3	1365.3	1399.3	1444.3	1493.9
22	150	1363.7	1368.2	1388.0	1422.1	1467.4	1518.1
20	148	1386.8	1390.8	1410.3	1444.6	1490.2	1541.9
18	146	1410.0	1413.7	1432.8	1467.2	1513.2	1565.7
16	144	1433.0	1436.1	1454.9	1489.5	1535.5	1588.6
14	142	1455.4	1458.1	1476.5	1511.0	1557.3	1610.6
12	140	1477.6	1479.8	1497.7	1532.2	1578.6	1632.1
10	138	1499.6	1501.3	1518.6	1553.1	1599.7	1653.4
8	136	1520.7	1521.9	1538.7	1573.1	1619.7	1673.6
6	134	1539.6	1540.5	1556.7	1591.0	1637.7	1691.9
4	132	1558.3	1558.7	1574.4	1608.7	1655.4	1709.7
2	130	1576.0	1576.0	1591.3	1625.4	1672.2	1726.6
0	128	1592.3	1592.0	1606.9	1640.8	1687.6	1742.1

ATTACHMENT 29

(Page 7 of 7)

SURRY UNIT 1 - CYCLE 17
AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)					
D-BANK POS STEPS	C-BANK POS STEPS	0.0 TO 500.0	500.1 TO 2000.0	2000.1 TO 4000.0	4000.1 TO 6000.0	6000.1 TO 8000.0	8000.1 TO 10000.0
0	126	1602.9	1602.6	1617.3	1651.3	1698.3	1752.7
0	124	1613.8	1613.3	1627.8	1661.7	1708.8	1763.3
0	122	1624.1	1623.6	1637.9	1671.8	1718.9	1773.5
0	120	1634.5	1634.0	1648.1	1681.9	1729.1	1783.7
0	118	1645.1	1644.6	1658.4	1692.1	1739.4	1794.0
0	116	1655.8	1655.2	1668.7	1702.4	1749.7	1804.4
0	114	1666.1	1665.4	1678.7	1712.3	1759.7	1814.3
0	112	1676.7	1675.8	1688.9	1722.3	1769.8	1824.4
0	110	1687.3	1686.4	1699.2	1732.5	1780.0	1834.7
0	108	1697.7	1696.7	1709.2	1742.4	1790.0	1844.6
0	106	1707.9	1706.8	1719.0	1752.2	1799.7	1854.4
0	104	1718.3	1717.0	1729.0	1762.0	1809.6	1864.4
0	102	1728.9	1727.4	1739.1	1772.0	1819.7	1874.5
0	100	1738.9	1737.4	1748.8	1781.6	1829.3	1884.1
0	98	1749.2	1747.5	1758.5	1791.3	1838.9	1893.9

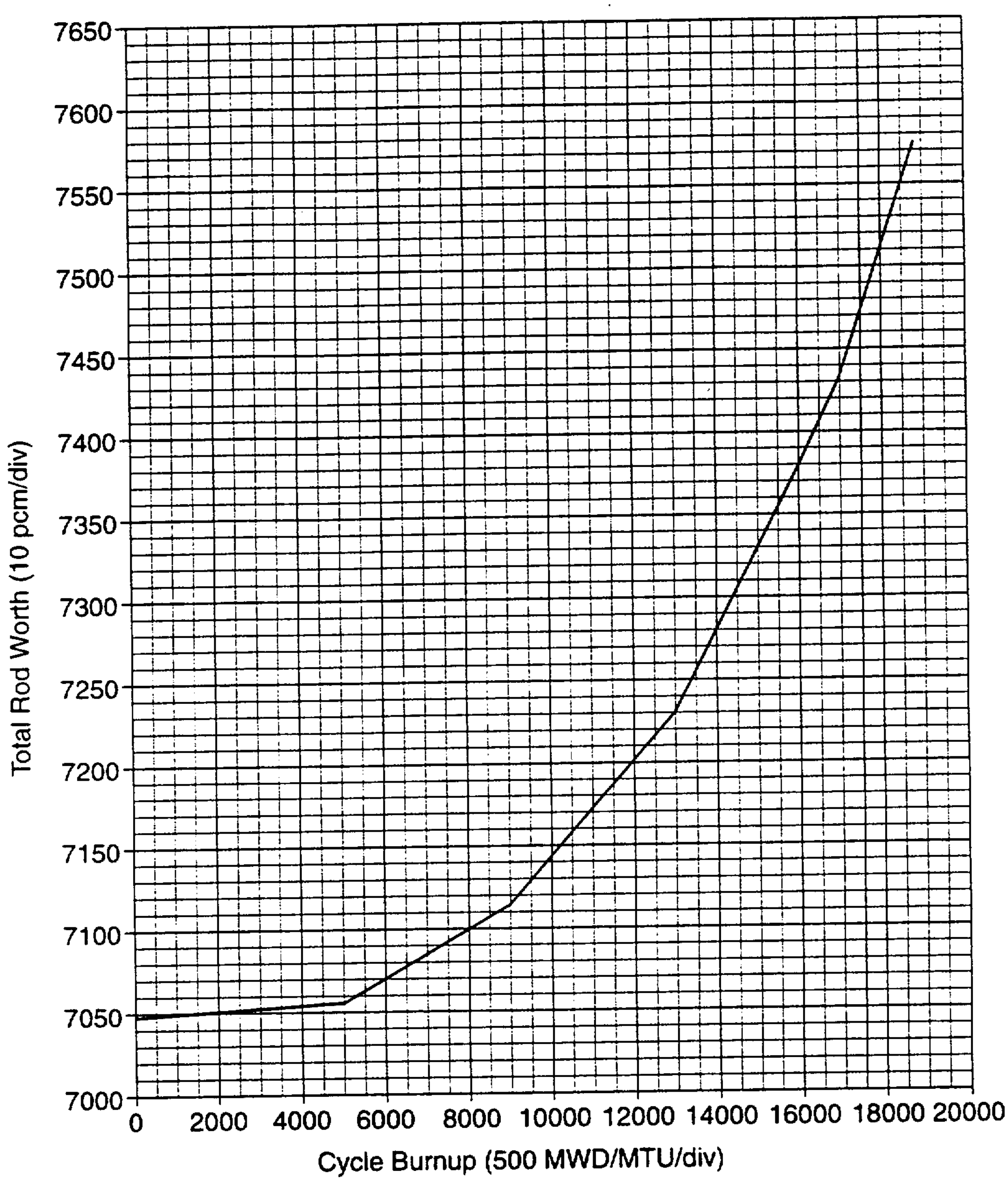
ATTACHMENT 38

(Page 1 of 1)

SURRY UNIT 1 - CYCLE 17

TOTAL ROD WORTH VS. BURNUP

Note: For Use in Shutdown Margin Calculations Only



Graphics No: LD2497A

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U. S. Nuclear Regulatory Commission

Region II

A-2 Administrative Section

NRC-ADMIN-JPM-02

Title:

AUXILIARY FEED WATER MOV TEST REVIEW

Read the following to the candidate.

Initial Conditions:

1. Unit 1 is at 95% power.

2. Two hours ago the plant completed 1-OPT-FW-006 to comply with Section XI ASME Code in accordance with the Inservice Testing Program Plan for pumps and valves.

Initiating Cues:

Review 1-OPT-FW-006, Auxiliary Feedwater MOV Test for completeness and accuracy. Please inform me of any issues.

STEP 1: Review the purpose of the procedure (Section 1.0) STANDARD: _____ Reviews Step 1.1 to identify the procedure provides stroke testing of selected valves to the accident position and measure the stroke time to verify proper valve operation every 92 days as outlined in Section XI ASME Code and IAW the Inservice Testing Program Plan for Pumps and Valves. _____ Reviews Step 1.2 to determine the OPT also provides acceptance criteria for the selected valves following maintenance. _____ Reviews Step 1.3 to determine that the procedure satisfies the requirements of Technical Specifications IAW Reference 2.2.1, Reference. 2.2.2, Reference 2.2.3, and Reference 2.2.4. _____ Reviews Step 1.4 to determine that performance of this procedure satisfies the requirements of VPAP-2401, Fire Protection Program, Subsection 6.5. This requirement applies only to 1-FW-MOV-160A and 1-FW-MOV-160B, AFW XTIE, valves. _____ Reviews Step 1.5 to determine that performance of this procedure satisfies the requirements of 10CFR50, Appendix R. COMMENTS:	_____SAT _____UNSAT
STEP 2: Review the References section (Section 2.0) STANDARD: _____ Reviews section 2.1, Source Documents, 2.2 Technical Specifications, 2.3 Technical References, and 2.4 Commitment Documents. COMMENTS:	_____SAT _____UNSAT

STEP 3: Verifies the Initial Conditions are met (Section 3.0) STANDARD: _____ Reviews Step 3.1. This procedure has PSA significance. IF this procedure is being performed on a day other than its POD scheduled date, THEN notify the Shift Supervisor that a PSA evaluation is required for the performance of this procedure. (Reference 2.4.3) COMMENTS:	_____SAT _____UNSAT
STEP 4: Reviews the Precautions and Limitations (Section 4.0) STANDARD: _____ (Step 4.1) Notes that testing more than one MOV at a time is not permitted. _____ (Step 4.2) MCR valve position lights will be used to determine MOV positions. _____ (Step 4.3) The MOV test is satisfactory if the valve(s) tested travel(s) full stroke within the acceptable range specified in the step. _____ (Step 4.4) Valves that test satisfactory but have stroke times that depart significantly from the reference value specified in the step will be noted on the Operator Comments sheet. _____ (Step 4.5) The individual identification block in Subsection 7.3 must be completed before the procedure is closed out. COMMENTS:	_____SAT _____UNSAT

<u>STEP 5:</u> 5.0 SPECIAL TOOL AND EQUIPMENT <u>STANDARD:</u> _____ (Step 5.1) Needs a stopwatch. <u>COMMENTS:</u>	_____SAT _____UNSAT
<u>STEP 6:</u> 6.0 INSTRUCTIONS <u>STANDARD:</u> _____ 6.1 Work Preparation NOTE: Full stroke time is the interval from switch actuation until the light that was LIT at switch actuation changes to NOT LIT. _____ 6.1.1 <u>IF</u> this procedure is used to prove operability of equipment after maintenance, <u>THEN</u> record the Work Order Number and Mark Number below, <u>AND</u> enter N/A in the subsections of Section 6.0 that will <u>NOT</u> be done. <u>IF</u> used to prove monthly operability, <u>THEN</u> enter N/A. Operator enters N/A. Evaluator's Note: **Maintenance has not been performed, therefore step will be marked N/A and initialed.** <u>COMMENTS:</u>	_____SAT _____UNSAT

STEP 7 : Step 6.2 Testing 1-FW-MOV-151E, SG A AFW FLOW ISOL

STANDARD:

_____ Step 6.2.1 Cycle 1-FW-MOV-151E and verify full stroke. Record the time required to close and open the MOV.

		Stroke Time	Reference	Accept Range
1-FW-MOV-151E	Close	23.1	20.1	17.1 - 23.1
	Open	21.2	20.3	17.3 - 23.3

_____ Step 6.2.2 Verify open 1-FW-MOV-151E.

_____ Step 6.2.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No. ___3697___ Cal Due Date. ___12/29/00___

Evaluator's Note: **The applicant should identify that the close stroke time departs significantly from the reference value and needs a comment on the Operator comment sheet. But there is NO comment in the appropriate section.**

Evaluator's Cue: **If identified that the close time departs significantly from the reference value tell the applicant to continue their review of the procedure.**

COMMENTS:

_____SAT

_____UNSAT

* STEP 8: Step 6.3 Testing 1-FW-MOV-151F, SG A AFW FLOW ISOL	
STANDARD:	____SAT
____ *Step 6.3.1 Cycle 1-FW-MOV-151F and verify full stroke. Record the time required to close and open the MOV.	____UNSAT

	Stroke Time	Reference	Accept Range
1-FW-MOV-151F	Close 23.6	20.5	17.5 - 23.5
	Open 23.3	21.0	17.9 - 23.3

____ Step 6.3.2 Verify open 1-FW-MOV-151F.

____ Step 6.3.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No. ___3697___ Cal Due Date. ___12/29/00___

Evaluator's Note: **Applicant should identify the close time exceeded the accepted range. This requires comment on the Operators Comment Sheet.**

Evaluator's Cue: **If identified that the close time exceeded the accepted range, tell the applicant to continue their review of the procedure.**

COMMENTS:

* indicates critical step

STEP 9: Step 6.4 Testing 1-FW-MOV-151C, SG B AFW FLOW ISOL

STANDARD:

_____ SAT

_____ UNSAT

_____ Step 6.4.1 Cycle 1-FW-MOV-151C and verify full stroke. Record the time required to close and open the MOV.

	Stroke Time	Reference	Accept Range
1-FW-MOV-151C	Close 20.0	20.0	17.0 - 23.0
	Open 20.6	20.1	17.1 - 23.1

_____ Step 6.4.2 Verify open 1-FW-MOV-151C.

_____ Step 6.4.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No. 3697 Cal Due Date. 12/29/00

COMMENTS:

STEP 10: Step 6.5 Testing 1-FW-MOV-151D, SG B AFW FLOW ISOL

STANDARD:

_____SAT

_____UNSAT

_____ Step 6.5.1 Cycle 1-FW-MOV-151D and verify full stroke. Record the time required to close and open the MOV.

	Stroke Time	Reference	Accept Range
1-FW-MOV-151D	Close 21.6	18.9	16.1 - 21.7
	Open 21.9	20.1	16.9 - 22.7

_____ Step 6.5.2 Verify open 1-FW-MOV-151D.

_____ Step 6.5.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No. 3697 Cal Due Date. 12/29/00

Evaluator's Note: **The applicant should identify that the open and close stroke times depart significantly from the reference value. There should be a comment in the Comment section of the procedure. But there is NO comment in the appropriate section.**

Evaluator's Cue: **If identified that the open and close times depart significantly from the reference value, tell the applicant to continue their review of the procedure.**

COMMENTS:

STEP 11: Step 6.6 Testing 1-FW-MOV-151A, SG C AFW FLOW ISOL

STANDARD:

_____ Step 6.6.1 Cycle 1-FW-MOV-151A and verify full stroke. Record the time required to close and open the MOV.

	Stroke Time	Reference	Accept Range
1-FW-MOV-151A	Close 20.6	20.6	17.6 - 23.6
	Open 21.3	20.8	17.7 - 23.9

_____ Step 6.6.2 Verify open 1-FW-MOV-151A.

_____ Step 6.6.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No. 3697 Cal Due Date. 12/29/00

COMMENTS:

_____SAT

_____UNSAT

STEP 12: Step 6.7 Testing 1-FW-MOV-151B, SG C AFW FLOW ISOL

STANDARD:

_____SAT

_____UNSAT

_____ Step 6.7.1 Cycle 1-FW-MOV-151B and verify full stroke. Record the time required to close and open the MOV.

	Stroke Time	Reference	Accept Range
1-FW-MOV-151B	Close 23.7	20.7	17.6 - 23.8
	Open 23.9	20.8	17.7 - 23.9

_____ Step 6.7.2 Verify open 1-FW-MOV-151B.

_____ Step 6.7.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No. 3697 Cal Due Date. 12/29/00

Evaluator's Note: **The applicant should identify that the close and open stroke times depart significantly from the reference value and need a comment on the Operator comment sheet. But there is NO comment in the appropriate section.**

Evaluator's Cue: **If identified that the open and close times depart significantly from the reference value, tell the applicant to continue their review of the procedure.**

COMMENTS:

*** STEP 13:** Step 6.8 Testing 1-FW-MOV-160A, AFW XTIE

STANDARD:

_____ SAT

_____ UNSAT

_____ Step 6.8.1 Notify the Unit 2 CRO that 1-FW-MOV-160A is to be isolated.

_____ Step 6.8.2 Before closing 2-FW-270, Aux Feed Cross-Connect Isolation for 1-FW-MOV-160A, in Step 6.8.3, have the SRO review TS-3.6.

_____ Step 6.8.3 In Unit 2 Safeguards, close 2-FW-270.

_____ *Step 6.8.4 On Unit 2 control board, open 1-FW-MOV-160A and verify full stroke. Record the time required to open the MOV.

	Stroke Time	Reference	Accept Range
1-FW-MOV-160A	Open 53.3	62.8	53.4 - 72.2

_____ Step 6.8.5 Verify open 1-FW-MOV-160A.

_____ Step 6.8.6 Open 2-FW-270.

_____ *Step 6.8.7 Record the stopwatch SQC No. and Cal Due Date.

SQC No. 3696A Cal Due Date. 9/15/00

Evaluator's Note: **The applicant should identify that the stroke time for the valve is below the acceptable range. In addition, the applicant should realize that there is a comment on the Operator Comment Sheet. The applicant should also note that the calibration date for the stopwatch is out of cal.**

Evaluator's Cue: **If identified that the open time exceeded the accepted range, tell the applicant to continue their review of the procedure.**

COMMENTS:

* indicates critical step

* STEP 14: Step 6.9 Testing 1-FW-MOV-160B, AFW XTIE

STANDARD:

____ Step 6.9.1 Notify the Unit 2 CRO that 1-FW-MOV-160B is to be isolated.

____ Step 6.9.2 Before closing 2-FW-271, Aux Feed Cross-Connect Isolation for 1-FW-MOV-160B, in Step 6.9.3, have the SRO review TS-3.6.

____ Step 6.9.3 In Unit 2 Safeguards, close 2-FW-271.

____ Step 6.9.4 On Unit 2 control board, open 1-FW-MOV-160B and verify full stroke. Record the time required to open the MOV.

	Stroke Time	Reference	Accept Range
1-FW-MOV-160B	Open 58.3	60.7	51.6 - 69.8

____ Step 6.9.5 Verify open 1-FW-MOV-160B.

____ Step 6.9.6 Open 2-FW-271.

____ *Step 6.9.7 Record the stopwatch SQC No. and Cal Due Date.

SQC No. 3696A Cal Due Date. 9/15/00

Evaluator's Note: **The applicant should identify that the cal due date is past due.**

Evaluator's Cue: **If identified that the stop watch cal due date is past due, tell the applicant to continue their review of the procedure.**

COMMENTS:

____SAT

____UNSAT

* indicates critical step

* STEP 15: Step 7.0 FOLLOW-ON	
STANDARD:	_____SAT
_____ Step 7.1 Acceptance Criteria	_____UNSAT
_____ Step 7.1.1 Evaluate the tests results by reviewing the Acceptance Criteria for the components tested. • The valve(s) tested travel(s) full stroke within the specified acceptable range.	
_____ *Step 7.1.2 Document the test results (✓) _X_ SAT ____UNSAT	
Evaluator's Note: **The applicant should identify that the test has been incorrectly identified as SAT.**	
Evaluator's Cue: **If incorrect test results identified, tell the applicant to continue their review of the procedure.**	
COMMENTS:	

* STEP 16: Step 7.2 FOLLOW-ON TASKS	
STANDARD:	_____SAT
_____ *Step 7.2.1 IF the test was satisfactory, THEN enter N/A in the following substeps. IF the test was unsatisfactory, THEN do the following: a) Document the reason for the unsatisfactory test in the Operator Comments. b) Notify the System Engineer and record the name. c) Notify the ISI Engineer and record the name. d) Initiate a Deviation Report and record the number. e) Initiate a Work request and record the number.	_____UNSAT
_____ Step 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.	
_____ Step 7.2.3 Verify that an entry has been made or make an entry in the Measuring and Test Equipment Usage Log for each SQC device used in this procedure.	
Evaluator's Note: **The applicant should identify that Step 7.2.1 should not have been N/Aed. And that the indicated people should have been notified.**	
Evaluator's Cue: **If identified that steps should not be N/Aed, tell the applicant to continue their review of the procedure.**	
COMMENTS:	

* indicates critical step

* STEP 16: 7.2 Follow-on Tasks (continued)	
STANDARD:	____SAT
____ * Step 7.2.4 IF the 1-FW-MOV-160A test was unsatisfactory, THEN have the Unit 1 Shift Supervisor review VPAP 2401 Subsection 6.5 of Appendix R Compensatory Measures. If 1-FW-MOV-160A test was satisfactory, THEN enter N/A.	____UNSAT
____ Step 7.2.5 IF the 1-FW-MOV-160B test was unsatisfactory, THEN have the Unit 1 Shift Supervisor review VPAP 2401 Subsection 6.5 of Appendix R Compensatory Measures. If 1-FW-MOV-160B test was satisfactory, THEN enter N/A.	
Evaluator's Note: **The applicant should identify the test in STEP 7.2.4 was unsatisfactory and the step should not be marked N/A, and have the Unit Supervisor review VPAP 2401 Subsection 6.5 of Appendix R Compensatory Measures.** **The applicant should identify that Step 7.2.5 was completed satisfactory.**	
Evaluator's Cue: **If identified that STEP 7.2.4 should not have been N/Aed, tell the applicant to continue their review of the procedure.**	
COMMENTS:	

STEP 17: Step 7.3, Notification, Documentation, and Procedure Closeout. STANDARD: _____ Step 7.3.1 Notify the Unit 1 Shift Supervisor that the test is complete and UNSAT. **Evaluator's Note:** **The candidate should identify that the procedure is complete UNSAT.** **The candidate should identify that HW did not put his initials or print his name in the appropriate box after Step 7.3.1.** **Evaluator's Cue:** **If identified that the procedure is UNSAT and not everyone entered their initials and name in Step 7.3.1, tell the applicant to continue their review of the procedure and inform you when complete.** COMMENTS:	_____SAT _____UNSAT

Read the following to the candidate.

Initial Conditions:

1. Unit 1 is at 95% power.
2. Two hours ago the plant completed 1-OPT-FW-006 to comply with Section XI ASME Code in accordance with the Inservice Testing Program Plan for pumps and valves.

Initiating Cues:

Review 1-OPT-FW-006, Auxiliary Feedwater MOV Test for completeness and accuracy. Please inform me of any issues.

mindview

User: mindview,SPS,,

Request: TRN_HUSKEY-8612 from suncux01

Date Printed: Fri Aug 11 07:44:50 EDT 2000

Procedure: *1-OPT-FW-006*

Rev: *003* PAR: *0*

Title: *AUXILIARY FEEDWATER MOV TEST.*

Effective Date: *07/30/1999*

Station: *Surry* Docbase: *SUMIND*

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

SURRY POWER STATION

PROCEDURE NO: 1-OPT-FW-006	REVISION NO: 3
PROCEDURE TYPE: OPERATIONS PERIODIC TEST	UNIT NO: 1
PROCEDURE TITLE: AUXILIARY FEEDWATER MOV TEST	EFFECTIVE DATE: ON FILE
	EXPIRATION DATE: (Temporary Procedures Only) N/A

REVISION SUMMARY:

Revised in accordance with CTS 4675. Maintenance activity was performed with no prior PSA evaluation.

- Added PSA stamp to cover page.
- Added Initial Condition 3.1.
- Added Commitment Documents Step 2.4.3.

UNIT ONE

Appendix R ISI PSA PMT

PROCEDURE WRITER: J. L. REDLER	VALIDATOR: J. ARAGER
APPROVAL: APPROVAL ON FILE	DATE:

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To provide instructions to stroke selected valves to the accident position and measure the stroke time to verify proper valve operation every 92 days as outlined in Section XI ASME Code and IAW the Inservice Testing Program Plan for Pumps and Valves.

1.2 To provide acceptance criteria for the selected valves following maintenance.

1.3 Performance of this procedure satisfies the requirements of Technical Specifications IAW Reference 2.2.1, Reference 2.2.2, Reference 2.2.3, and Reference 2.2.4.

1.4 Performance of this procedure satisfies the requirements of VPAP-2401, Fire Protection Program, Subsection 6.5. This requirement applies only to 1-FW-MOV-160A and 1-FW-MOV-160B, AFW XTIE, valves.

1.5 Performance of this procedure satisfies the requirements of 10 CFR 50, Appendix R.

2.0 REFERENCES

2.1 Source Documents

None

2.2 Technical Specifications

2.2.1 Technical Specifications 4.0.5, ISI Surveillance Requirements

2.2.2 Technical Specifications 3.6.D, Turbine Cycle

2.2.3 Technical Specifications 4.8.A.2.a, Auxiliary Feedwater System

2.2.3 Technical Specifications 4.8.A.5.b, Auxiliary Feedwater System

2.3 **Technical References**

2.3.1 Procedures needed to support 1-OPT-FW-006:

None

2.3.2 11448-FM-68A, Feedwater System (Sheet 1 of 4)

2.3.3 11548-FM-68A, Feedwater System (Sheet 3 of 4)

2.3.4 11448-ESK-6BY, 480V Circuit Motor Operated Valves (Sheets 1, 2 and 3 of 3)

2.3.5 11548-ESK-6FF, 480V Circuit Motor Operated Valves (Sheet 1 of 4)

2.3.6 QDR-S-3.2, Limitorque Inside Containment MOVs

2.3.7 Equipment Qualification Maintenance Manual, Tab 3.2

2.3.8 VPAP-2401, Fire Protection Program, Subsection 6.5

2.3.9 10 CFR 50, Appendix R

2.3.10 ASME Code, Section XI

2.3.11 Inservice Testing Program Plan for Pumps and Valves

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

2.4 **Commitment Documents**

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

2.4.2 CTS 2378, AFW procedures affected by TSCR 255

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

Init **Verif**

3.0 INITIAL CONDITIONS

3.1 This procedure has PSA significance. IF this procedure is being performed on a day other than its POD scheduled date, THEN notify the Shift Supervisor that a PSA evaluation is required for the performance of this procedure. (**Reference 2.4.3**)

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Testing more than one MOV at a time is **not** permitted.

4.2 MCR valve position lights will be used to determine MOV positions.

4.3 The MOV test is satisfactory if the valve(s) tested travel(s) full stroke within the acceptable range specified in the step.

4.4 Valves that test satisfactory but have stroke times that depart significantly from the reference value specified in the step will be noted on the Operator Comments sheet.

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

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Stopwatch

6.0 INSTRUCTIONS

6.1 Work Preparation

NOTE: Full stroke time is the interval from switch actuation until the light that was LIT at switch actuation changes to NOT LIT.

k

N/A

6.1.1 IF this procedure is used to prove operability of equipment after maintenance, THEN record the Work Order Number and Mark Number below, AND enter N/A in the subsections of Section 6.0 that will NOT be done. IF used to prove monthly operability, THEN enter N/A. **(Reference 2.4.1)**

Work Order No.: ________________ Mark No.: ________________

Work Order No.: ________________ Mark No.: ________________

Work Order No.: ________________ Mark No.: ________________

6.2 Testing 1-FW-MOV-151E, SG A AFW FLOW ISOL

6.2.1 Cycle 1-FW-MOV-151E and verify full stroke. Record the time required to close **and** to open the MOV.

		Stroke Time	Reference	Acceptable Range
•	1-FW-MOV-151E	Close: 23.1	20.1 sec	17.1 - 23.1 sec
		Open: 21.2	20.3 sec	17.3 - 23.3 sec

6.2.2 Verify open 1-FW-MOV-151E.

6.2.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3697 Cal Due Date: 12/29/00

6.3 Testing 1-FW-MOV-151F, SG A AFW FLOW ISOL

6.3.1 Cycle 1-FW-MOV-151F and verify full stroke. Record the time required to close **and** to open the MOV.

		Stroke Time	Reference	Acceptable Range
•	1-FW-MOV-151F	Close: 23.6	20.5 sec	17.5 - 23.5 sec
		Open: 23.3	21.0 sec	17.9 - 24.1 sec

6.3.2 Verify open 1-FW-MOV-151F.

6.3.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3697 Cal Due Date: 12/29/00

6.4 Testing 1-FW-MOV-151C, SG B AFW FLOW ISOL

6.4.1 Cycle 1-FW-MOV-151C and verify full stroke. Record the time required to close **and** to open the MOV.

		Stroke Time	Reference	Acceptable Range
•	1-FW-MOV-151C	Close: 20.0	20.0 sec	17.0 - 23.0 sec
		Open: 20.6	20.1 sec	17.1 - 23.1 sec

KG 6.4.2 Verify open 1-FW-MOV-151C.

6.4.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3697 Cal Due Date: 12/29/00

6.5 Testing 1-FW-MOV-151D, SG B AFW FLOW ISOL

6.5.1 Cycle 1-FW-MOV-151D and verify full stroke. Record the time required to close **and** to open the MOV.

		Stroke Time	Reference	Acceptable Range
•	1-FW-MOV-151D	Close: 21.6	18.9 sec	16.1 - 21.7 sec
		Open: 21.9	19.8 sec	16.9 - 22.7 sec

HW 6.5.2 Verify open 1-FW-MOV-151D.

6.5.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3697 Cal Due Date: 12/29/00

6.6 Testing 1-FW-MOV-151A, SG C AFW FLOW ISOL

✓ 6.6.1 Cycle 1-FW-MOV-151A and verify full stroke. Record the time required to close **and** to open the MOV.

		Stroke Time	Reference	Acceptable Range
•	1-FW-MOV-151A	Close: 20.6	20.6 sec	17.6 - 23.6 sec
		Open: 21.3	20.8 sec	17.7 - 23.9 sec

✓ HW 6.6.2 Verify open 1-FW-MOV-151A.

✓ 6.6.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3697 Cal Due Date: 12/29/00

6.7 Testing 1-FW-MOV-151B, SG C AFW FLOW ISOL

✓ 6.7.1 Cycle 1-FW-MOV-151B and verify full stroke. Record the time required to close **and** to open the MOV.

		Stroke Time	Reference	Acceptable Range
•	1-FW-MOV-151B	Close: 23.7	20.7 sec	17.6 - 23.8 sec
		Open: 23.9	20.8 sec	17.7 - 23.9 sec

✓ HW 6.7.2 Verify open 1-FW-MOV-151B.

✓ 6.7.3 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3697 Cal Due Date: 12/29/00

6.8 Testing 1-FW-MOV-160A, AFW XTIE

___ 6.8.1 Notify the Unit 2 CRO that 1-FW-MOV-160A is to be isolated.

___ 6.8.2 Before closing 2-FW-270, Aux Feed Cross-Connect Isolation for 1-FW-MOV-160A, in Step 6.8.3, have the SRO review TS-3.6.

___ 6.8.3 In Unit 2 Safeguards, close 2-FW-270.

___ 6.8.4 On the Unit 2 control board, open 1-FW-MOV-160A and verify full stroke. Record the time required to open the MOV.

	Stroke Time	Reference	Acceptable Range
• 1-FW-MOV-160A	Open: 53.3	62.8 sec	53.4 - 72.2 sec

___ HW 6.8.5 Close 1-FW-MOV-160A.

___ HW 6.8.6 Open 2-FW-270.

___ 6.8.7 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3696A Cal Due Date: 9/15/00

6.9 Testing 1-FW-MOV-160B, AFW XTIE

✓ 6.9.1 Notify the Unit 2 CRO that 1-FW-MOV-160B is to be isolated.

✓ 6.9.2 Before closing 2-FW-271, Aux Feed Cross-Connect Isolation for 1-FW-MOV-160B, in Step 6.9.3, have the SRO review TS-3.6.

✓ 6.9.3 In Unit **2** Safeguards, close 2-FW-271.

✓ 6.9.4 On the Unit **2** control board, open 1-FW-MOV-160B and verify full stroke. Record the time required to open the MOV.

		Stroke Time	Reference	Acceptable Range
✓	• 1-FW-MOV-160B	Open: 58.3	60.7 sec	51.6 - 69.8 sec

✓ HW 6.9.5 Close 1-FW-MOV-160B.

✓ HW 6.9.6 Open 2-FW-271.

✓ 6.9.7 Record the stopwatch SQC No. and Cal Due Date.

SQC No.: 3696A Cal Due Date: 9/15/00

7.0 FOLLOW-ON

7.1 Acceptance Criteria

EA 7.1.1 Evaluate the test results by reviewing the Acceptance Criteria for the components tested.

- The valve(s) tested travel(s) full stroke within the specified acceptable range.

EA 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 in the following substeps. IF the test was unsatisfactory, THEN do the following:

N/A EA a. Document the reason for the unsatisfactory test in Operator Comments.

N/A EA b. Notify the System Engineer and record the name.

System Engineer: ____________________

N/A EA c. Notify the ISI Engineer and record the name.

ISI Engineer: ____________________

N/A EA d. Initiate a Deviation Report and record the number.

DR Number: ____________

N/A EA e. Initiate a Work Request and record the number.

WR Number: ____________

N/A EA 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.

EA 7.2.3 Verify that an entry has been made or make an entry in the Measuring and Test Equipment Usage Log for each SQC device used in this procedure.

N/A EA 7.2.4 IF the 1-FW-MOV-160A test was unsatisfactory, THEN have the Unit 1 Shift Supervisor review VPAP 2401 Subsection 6.5 Appendix R Compensatory Measures. IF the 1-FW-MOV-160A test was satisfactory, THEN enter N/A.

N/A EA 7.2.5 IF the 1-FW-MOV-160B test was unsatisfactory, THEN have the Unit 1 Shift Supervisor review VPAP 2401 Subsection 6.5 Appendix R Compensatory Measures. IF the 1-FW-MOV-160B test was satisfactory, THEN enter N/A.

7.3 Notification, Documentation, and Procedure Closeout

EN 7.3.1 Notify the Unit 1 Shift Supervisor that the test is complete.

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

Initials	Printed Name
K	Kevin Mark Spencer
KG	Ken Grover
EA	Ed Shore

Operator Comments:

(1) Step 6.3.1 close time for 1-FW-MOV-151 F exceeded the acceptable range.

(2) Step 6.8.4 open time for 1-FW-MOV-160A is below the acceptable range.

Completed by: Ed Shore Date: Today

7.4 **Review**

Shift Supervisor Comments: ____

Reviewed by: ______________________________ Date: ______________
Shift Supervisor

Forward original procedure to Engineering Testing.

Engineering Comments: ____

Reviewed by: ______________________________ Date: ______________
ISI Engineer

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U. S. Nuclear Regulatory Commission

Region II

A-3 Administrative Section

NRC-ADMIN-JPM-03

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:8/26/00

TIME VALIDATION:25 MINUTES

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

PERFORM:__X__ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Determined there is no success path for opening valve without exceeding dose margin limits.

REQUIRED MATERIALS:

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

REFERENCES:

None

VALIDATION TIME: 25 min.

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

TERMINATING CUES:

Determined there is no success path for opening valve.

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-1700 from the Main Control Room.

3. You have been tasked with entering Containment and locally opening 1-RH-MOV-1700.

4. Your allowable dose limit for this job is 1850 mr.

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. 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-1700 can be opened locally by you without exceeding your dose margin limit.

( ) ELEMENT: 1

Calculate exposure at valve.

STANDARDS:

__1. (6 R/HR)(1000 MR/R)(1 HR/60 MIN)(5 MIN)= 500 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)(2 MIN)(2 TRIPS) = 200 MR. (Personnel Hatch to Elevator Door)

__2. (36 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 2400 MR. (Elevator ride to –3'6" and walk to the valve)

__3. (200 MR)+(2400 MR)+(500 MR)= 3100 MR TOTAL DOSE.

EVALUATOR'S NOTES:

Note: Total exposure via this path including time at the valve: 3100 mr.

( ) ELEMENT: 3

Calculate exposure from using stairway.

STANDARDS:

__1. (4 R/HR)(1000 MR/R)(1 HR/60 MIN)(1 MIN)(2 TRIPS) = 133 MR. (Personnel Hatch to Stairway)

__2. (12 R/HR)(1000 MR/R)(1 HR/60 MIN)(7 MIN)(2 TRIPS) = 2800 MR. (Stairway down to –3'6" and walk to valve)

__3. (133 MR)+(2800 MR)+(500 MR)= 3433 MR TOTAL DOSE.

EVALUATOR'S NOTES:

Note: Total exposure via this path including time at the valve: 3433 mr

( ) 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. (16 R/HR)(1000 MR/R)(1 HR/60 MIN)(6 MIN)(2 TRIPS) = 3200 MR. (Spiral Staircase down to –3'6" and walk to valve)

__3. (67 MR)+(3200 MR)+(500 MR) = 3767 MR.

EVALUATOR'S NOTES:

Note: Total exposure via this path including time at the valve: 3767 mr.

(Critical) **ELEMENT: 5**

Determine lowest exposure path.

STANDARDS:

__1. Compared results of three calculations and determined the path using the elevator to be the lowest exposure.

EVALUATOR'S NOTES:

None

(Critical) **ELEMENT: 6**

Compare exposure to dose allowed for the job.

STANDARDS:

__1 Compared exposure to dose allowed for the job and determined alignment could not be made within allowable dose of 1850 mr.

EVALUATOR'S NOTES:

TERMINATE JPM AT THIS POINT

JPM STUDENT IC SHEET

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-1700 from the Main Control Room.
3. You have been tasked with entering Containment and locally opening 1-RH-MOV-1700.
4. Your allowable dose limit for this job is 1850 mr.
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. 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-1700 can be opened locally by you without exceeding your dose margin limit.

SURVEY DATA:

1-RH-MOV-1700 is located at Survey Map Location 'A'.
Estimated time at the valve: 5 minutes.
Dose rate at the valve: 6 R/hr.

Survey Map Area	One Way Travel Time (min.)	Average Dose Rate (R/hr)
B (from personnel hatch to top of spiral staircase)	2	1
C (spiral staircase to -3' 6" & walk to valve)	6	16
D (from personnel hatch to top of stairway)	1	4
E (stairs to -3' 6" & walk to valve)	7	12
F (from personnel hatch to elevator door)	2	3
G (elevator ride to -3' 6" & walk to valve)	2	36

RESULTS:

Identify the Lowest Exposure Path:

ELEVATOR: ____________

STAIRWAY: ____________

SPIRAL STAIRCASE: ____________

Can the Alignment be completed within your Dose Limit?

____ 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
ISD	100

Instrument	Serial #
Installed Rad Monitors throughout CTMT.	

N/A All GA Smears <1000 DPM/100cm² Except as noted on map or smear worksheet.

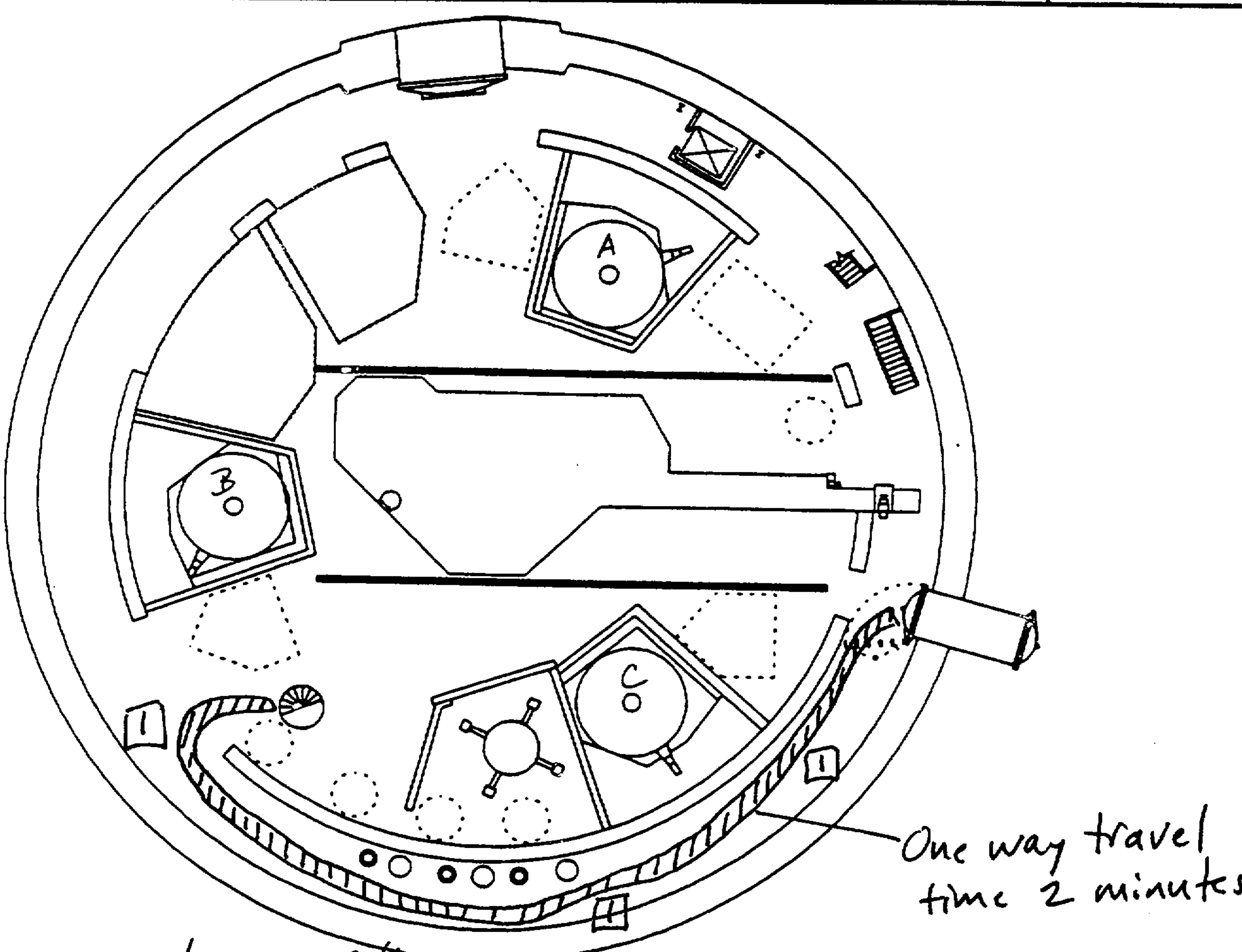
N/A All GA Smears <1000 DPM/100cm²
N/A All LA smears <1000 DPM/ft²
N/A All HP smears <1 HP/smear
N/A Air particulate + I_2 <0.1 DAC
☐
☐

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 Containment radiation monitors. 1000mr = 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 reas
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
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.

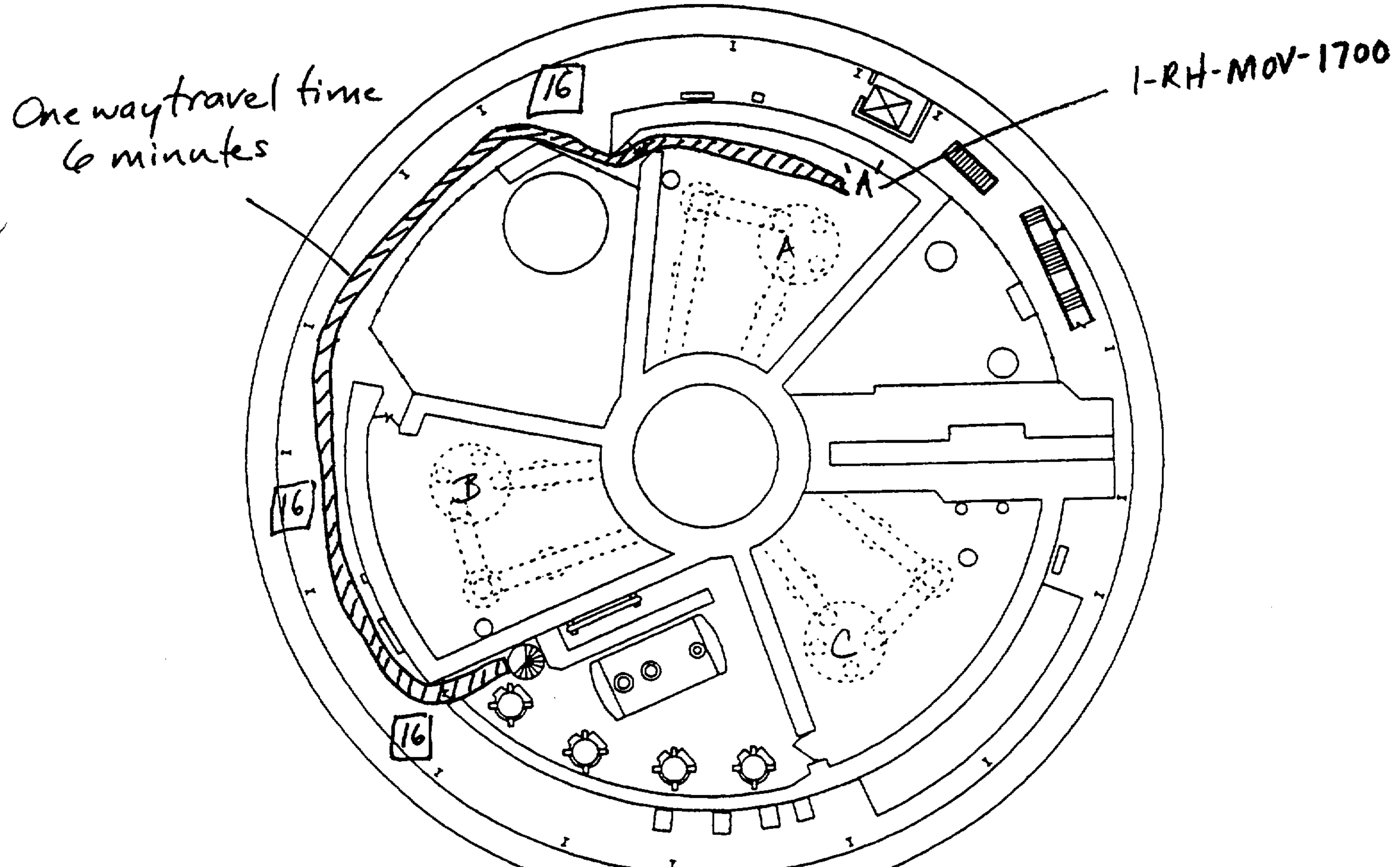
- N/A All GA Smears <1000 DPM/100cm^2
- N/A All LA smears <1000 DPM/ft^2
- N/A All HP smears <1 HP/smear
- N/A Air particulate + I_2 <0.1 DAC
- ☐ ______
- ☐ ______

- 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 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 reas
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

Stairway Pathway

VIRGINIA POWER
NUCLEAR HEALTH PHYSICS PROCEDURE
Version 05/05/00

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.	

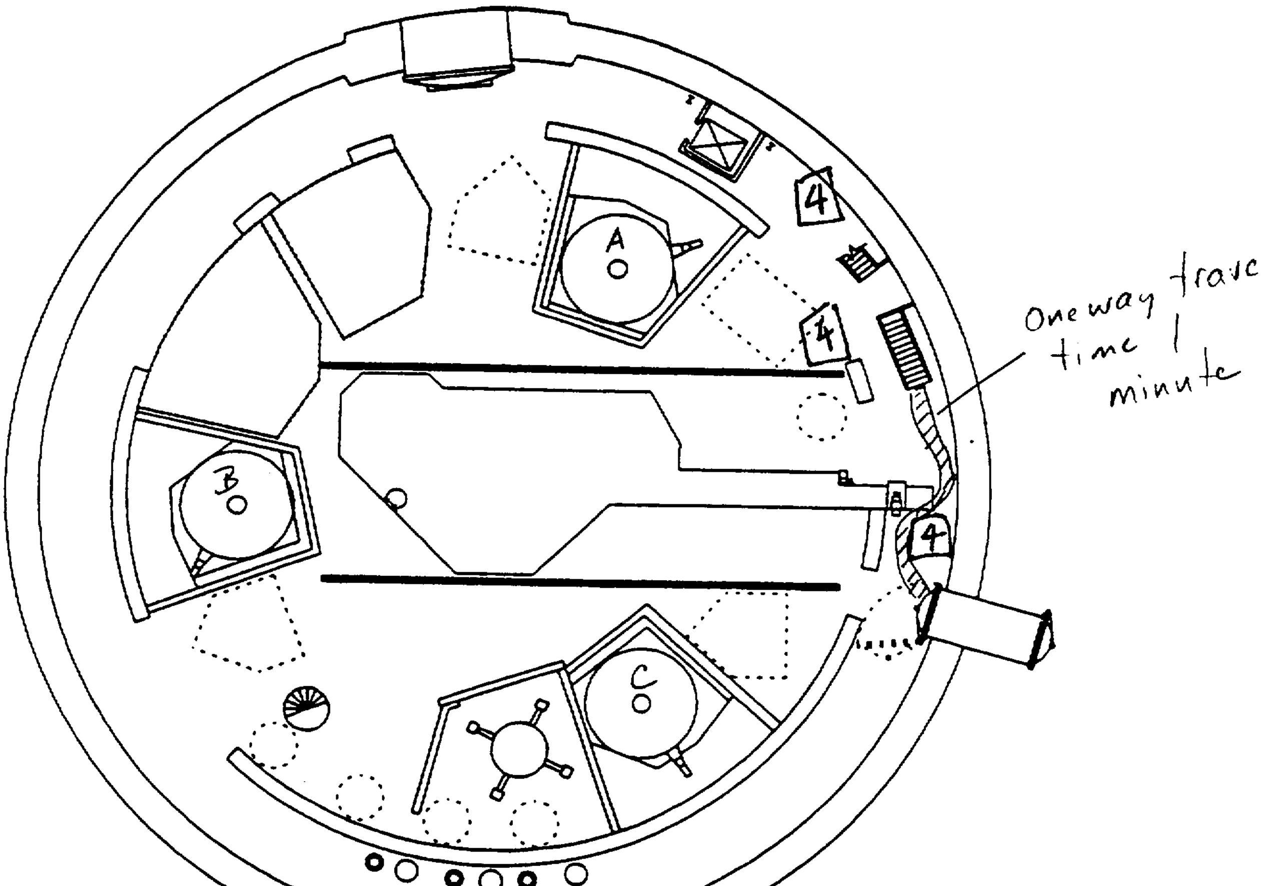
- N/A All GA Smears <1000 DPM/100cm^2 Except as noted on map or smear worksheet.
- N/A All GA Smears <1000 DPM/100cm^2
- N/A All LA smears <1000 DPM/ft^2
- N/A All HP smears <1 HP/smear
- N/A Air particulate + I_2 <0.1 DAC
- ☐
- ☐

- 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 Containment radiation monitors. 1000mr = 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 reas
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

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: ISD; Unit 2: 100

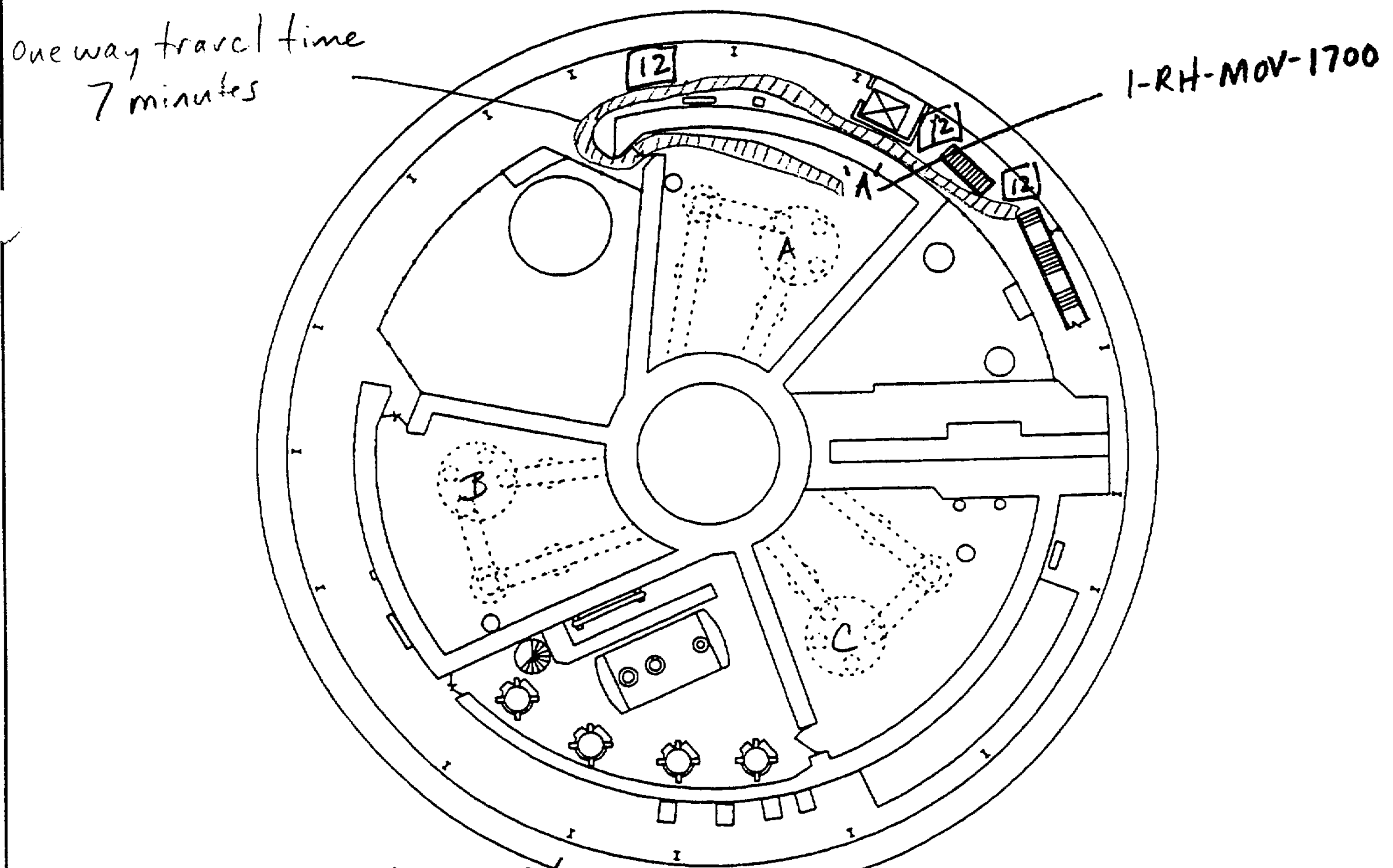
Instrument	Serial #
Installed Rad Monitors throughout CTMT.	

- N/A All GA Smears <1000 DPM/100cm^2 Except as noted on map or smear worksheet.
- N/A All GA Smears <1000 DPM/100cm^2
- N/A All LA smears <1000 DPM/ft^2
- N/A All HP smears <1 HP/smear
- N/A 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 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 reas
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

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.	

N/A All GA Smears <1000 DPM/100cm² Except as noted on map or smear worksheet.

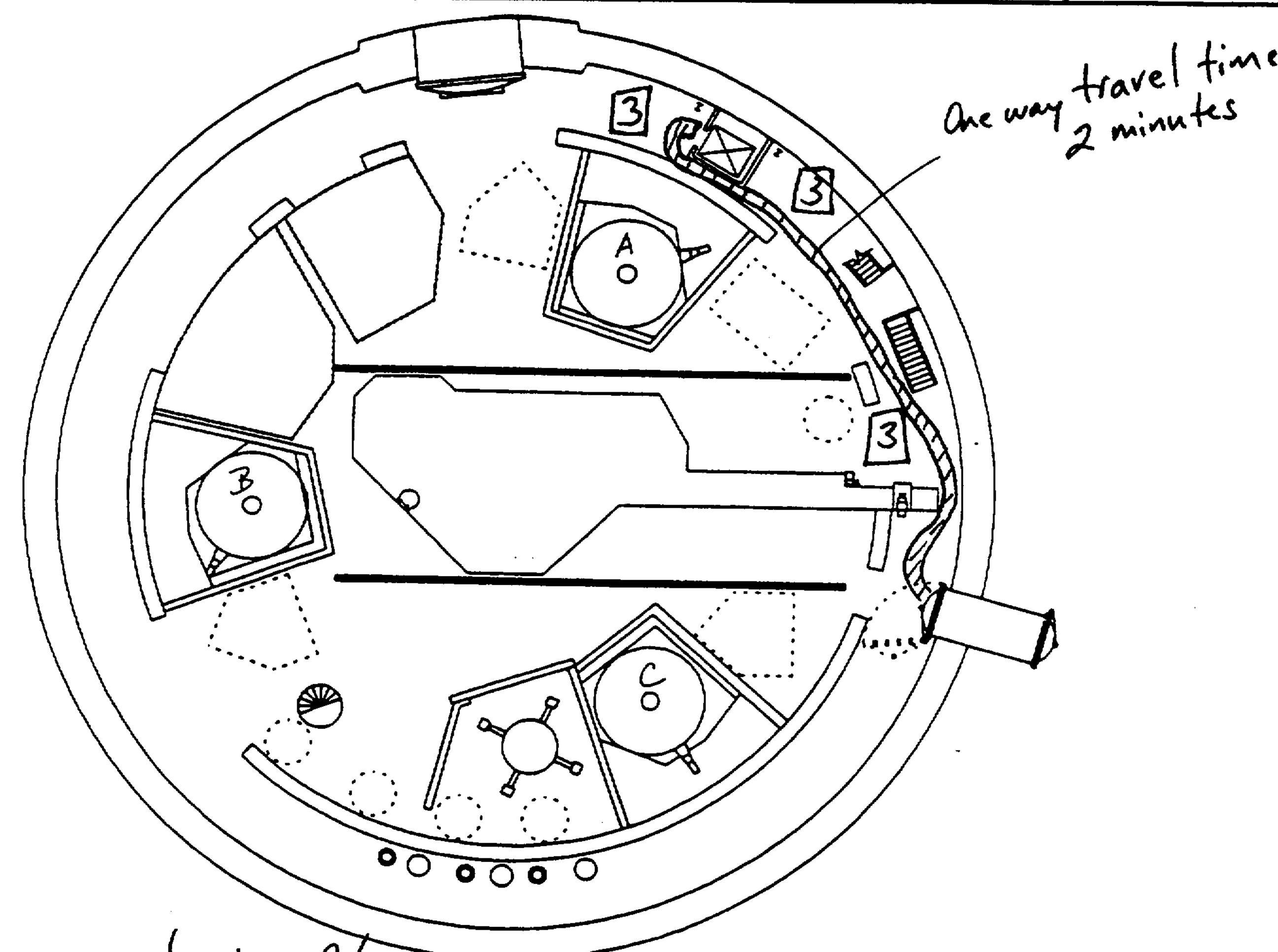
- N/A All GA Smears <1000 DPM/100cm²
- N/A All LA smears <1000 DPM/ft²
- N/A All HP smears <1 HP/smear
- N/A Air particulate + I_2 <0.1 DAC
- ☐
- ☐

- 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 Containment radiation monitors. 1000mr = 1R, [hatched box] 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 reas
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

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.#

REACTOR POWER: Unit 1: ISD; Unit 2: 100

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

Instrument	Serial #
Installed Rad Monitors throughout CTMT.	

N/A All GA Smears <1000 DPM/100cm^2 Except as noted on map or smear worksheet.

- N/A All GA Smears <1000 DPM/100cm^2
- N/A All LA smears <1000 DPM/ft^2
- N/A All HP smears <1 HP/smear
- N/A Air particulate + I_2 <0.1 DAC
- ☐
- ☐

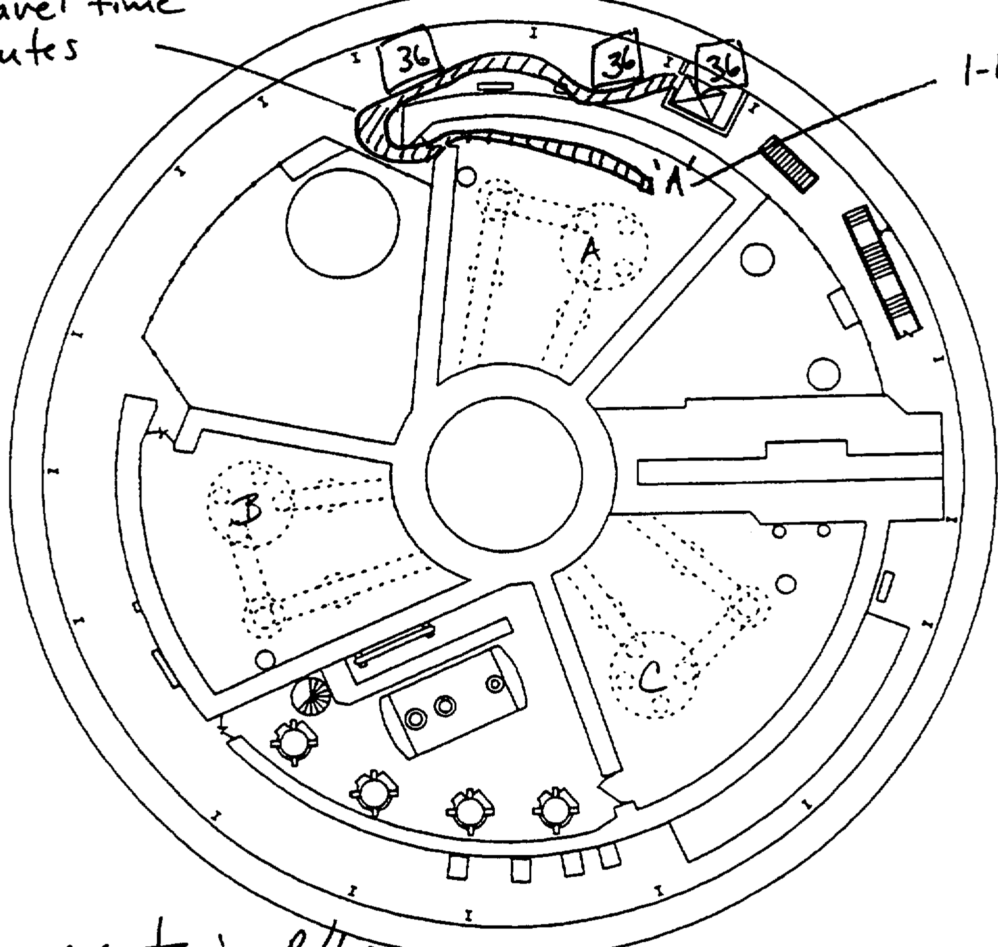
- N/A All GA smears in DPM/100cm2
- N/A All HP smears in HPs/smear
- ☒ All Gamma readings in mrem/hr. or as denoted on survey map.
- N/A All Neutron readings in mrem/hr.
- N/A All Beta readings in mrad/hr.
- ☐

Comments: General area estimates based on Containment radiation monitors. 1000 mr = 1R, [hatched bar] 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

One way travel time 2 minutes



* All measurements in R/hr.

LDWA - Low Dose Waiting reas
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

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

A-4 ADMINISTRATIVE SECTION RO

NRC-ADMIN-JPM-04/RO

Title:

Meteorological and Stability Class Determination

IAW

EPIP-2.01 Notification of State and Local Governments

* - 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:

An ALERT was declared 30 minutes ago due to a Unit 1 SGTR with Safety Injection required based on EAL Tab B-6.

An Initial Report of Emergency to State and Local Governments was completed 15 minutes ago with an update schedule of 30 minutes.

The SG PORV has just lifted on the ruptured SG and will not reseat. A release of radioactive material is presently occurring.

A follow-up message to the State and Local Governments is being prepared using Attachment 2 of EPIP-2.01. Steps 3 through 6 have been completed due to the changing plant conditions.

The Main Tower Lower Level wind direction recorder is OOS. The Main Tower Delta T recorder is OOS. The Main Tower Lower Level Wind Speed recorder is OOS.

INITIATING CUES:

The Unit 1 SRO has requested that you perform steps 7- 12 of EPIP 2.01, "Notification of State and Local Governments," to obtain Meteorological Data from the Met Panel.

Meteorological and Stability Class Determination	
STEP 1: Observes Note prior to Step 7. STANDARD: _____ Wind direction is always given as the compass point the wind blows from. Example: Wind direction is from East North East (ENE). COMMENTS:	_____SAT _____UNSAT
STEP 2: GET METEOROLOGICAL INFORMATION: (Step 7) STANDARD: _____ Determines the Main Tower Lower Level Wind Direction recorder is not in service IAW the Initial Conditions and uses an alternate: Backup Tower, Main Tower Upper Level. (Step 7. a) **Evaluator's Cue:** **Main Tower Lower Level Wind Direction recorder is de-energized and labeled OOS.** COMMENTS:	_____SAT _____UNSAT
*STEP 3: Obtains approximate average wind direction. (Step 7.b) STANDARD: _____ Locates and observes the approximate average wind direction (in degrees) for previous 15 minutes. **Evaluator's Cue:** **Provide wind bouncing between 306 to 316 (average indentified as approximately 311 degrees on the Backup Tower and Main Tower Upper Level).** COMMENTS:	_____SAT _____UNSAT

* - indicates a critical step.

<u>*STEP 4:</u> Determine compass point wind blowing from. (Step 7.c) <u>STANDARD:</u> _____ Uses the table in step 7 to determine the compass point based on the average wind direction found in step 3. (Should read NW.) **Evaluator's Note: Average value is approximately 311 degrees.** <u>COMMENTS:</u>	_____SAT _____UNSAT
<u>STEP 5:</u> Determine wind speed. (Step 7.d) <u>STANDARD:</u> _____ Determines the Main Tower Lower Level Wind Speed recorder is not in service IAW Initial Conditions and uses an alternate: Alternatives: Backup Tower, Main Tower Upper Level. **Evaluator's Cue: Main Tower Lower Level Wind Speed recorder is de-energized and labeled OOS.** <u>COMMENTS:</u>	_____SAT _____UNSAT

<u>*STEP 6:</u> Obtains wind speed. (Step 7 e) <u>STANDARD:</u> _____ Obtains wind speed from either the Backup Tower or Main Tower Upper Level Wind Speed Recorder (alternate indication). Evaluator's Note: **The Main Tower Lower Level Wind Speed recorder is OOS IAW the IC.** Evaluator's Cue: **Provide a wind speed of 10 mph on either the Backup Tower or the Main Tower Upper Level (whichever instrument is used).** <u>COMMENTS:</u>	_____SAT _____UNSAT

<u>STEP 7:</u> Record the following in Item 7 (Step 7.f) • Source of meteorological data (on-site/regional) • Compass point • Wind speed <u>STANDARD:</u> _____ Records meteorological data is based on site measurements, wind direction is from the NW, and wind speed is 10 mph on Item 7 of Attachment 2. <u>COMMENTS:</u>	_____SAT _____UNSAT
<u>STEP 8:</u> Check any of the following information needed: (Step 8) • Downwind sectors • Stability Class • Temperature <u>STANDARD:</u> _____ Determines all above are necessary. **Evaluator's Cue:** **The SEM desires this information.** <u>COMMENTS:</u>	_____SAT _____UNSAT
<u>*STEP 9:</u> Determine Downwind Sectors: (Step 9) <u>STANDARD:</u> _____ Uses table in step 9 to determine FGH as the downwind sectors. <u>COMMENTS:</u>	_____SAT _____UNSAT

* - indicates a critical step.

STEP 10: Observes Note Prior to step 10. STANDARD: _____ NOTE: 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. COMMENTS:	_____SAT _____UNSAT
STEP 11: Determines Stability Class: (Step 10.a) STANDARD: _____ Identifies Main Tower Delta T recorder is OOS IAW Initial Conditions and uses the alternate: Alternate: Backup Tower Sigma Theta Recorder. **Evaluator's Cue: Main Tower Delta T recorder is de-energized and labeled OOS.** COMMENTS:	_____SAT _____UNSAT
*STEP 12: Determines Stability Class (Step 10b) STANDARD: _____ Locates the Backup Tower Sigma Theta recorder. Reads recorder and determines Stability class is E. **Evaluator's Cue: Sigma Theta is 6.8 degrees.** COMMENTS:	_____SAT _____UNSAT

* - indicates a critical step.

STEP 13: Use value closer to "G" (if unable to distinguish Delta T or Sigma Theta Value) (Step 10.c) STANDARD: _____ Determines that this step is not applicable. COMMENTS:	_____SAT _____UNSAT
STEP 14: Determine Temperature (Step 11) STANDARD: _____ Determines Temperature from the Main Tower Temperature Recorder (Step 11.a) _____ Notes the temperature is in °F and does not have to perform the conversion. Evaluator's Cue: **Provide the temperature once applicant has located the appropriate meter. The meter reads 75°F.** COMMENTS:	_____SAT _____UNSAT
*STEP 15: Give Meteorological information to the requestor. STANDARD: _____ Provides the filled out Attachment 2 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:

An ALERT was declared 30 minutes ago due to a Unit 1 SGTR with Safety Injection required based on EAL Tab B-6.

An Initial Report of Emergency to State and Local Governments was completed 15 minutes ago with an update schedule of 30 minutes.

The SG PORV has just lifted on the ruptured SG and will not reseat. A release of radioactive material is presently occurring.

A follow-up message to the State and Local Governments is being prepared using Attachment 2 of EPIP-2.01. Steps 3 through 6 have been completed due to the changing plant conditions.

The Main Tower Lower Level wind direction recorder is OOS. The Main Tower Delta T recorder is OOS. The Main Tower Lower Level Wind Speed recorder is OOS.

INITIATING CUES:

The Unit 1 SRO has requested that you to perform steps 7- 12 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 should be verified and annotated to a controlled source as required to perform work.

VIRGINIA POWER
SURRY POWER STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
EPIP-2.01	NOTIFICATION OF STATE AND LOCAL GOVERNMENTS (With 3 Attachments)	26 PAGE 1 of 20

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.

SIMULAT

APPROVAL RECOMMENDED	SNSOC DATE	APPROVAL	APPROVAL DATE	EFFECTIVE DATE
CHAIRMAN SNSOC	5/27/99	STATION MANAGER	5/28/99	6/4/99

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

1 INITIATE PROCEDURE:

- By: Kevin Spencer

  Date: Today

  Time: 12:30

  Location: Surry Power Station MCR

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 (Attachment 1) must be completed within 15 minutes of declaring the event.

3 GET APPROPRIATE MESSAGE FORM:

• First report of classification • Termination	Attachment 1, Initial Report of Emergency to State and Local Governments
Follow-up message	Attachment 2, Follow-up Report of Emergency to State and Local Governments

4 GET INFORMATION TO COMPLETE ITEMS 1 THROUGH 6 FROM SEM/RM (as applicable for message type)

5 CHECK MESSAGE FORM - ATTACHMENT 2, FOLLOW-UP REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS IN USE

GO TO Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

<u>CAUTION</u>: Efforts to obtain meteorological data from alternative sources should not delay sending emergency messages to offsite agencies.

* *

<u>NOTE</u>:

- 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 grey button labeled LAST), the computer modem or local data logger (described in 0-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).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
✓ 6	CHECK ON-SITE METEOROLOGICAL INFORMATION - AVAILABLE	<u>IF</u> on-site data <u>NOT</u> available, <u>THEN</u> do the following: a) Have HP initiate EPIP-4.10, DETERMINATION OF X/Q, to get regional meteorological information. b) <u>IF</u> waiting for off-site meteorological information will delay scheduled message, <u>THEN</u> do the following: 1) Record NOT AVAILABLE in Attachment 2, Item 7. 2) GO TO Step 8. <u>IF</u> acquiring meteorological information for other reasons, <u>THEN</u> do the following: 1) Notify requestor on-site information <u>NOT</u> available. 2) RETURN TO step in effect. <u>WHEN</u> off-site meteorological information available, <u>THEN</u> GO TO Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Wind direction is always given as the compass point the wind blows from. Example: Wind direction is from East North East (ENE).

_____ 7 GET METEOROLOGICAL INFORMATION:

a) Use Main Tower Lower Level Wind Direction recorder (Alternates: Backup Tower, Main Tower Upper Level)

b) Get approximate average wind direction (in degrees) for previous 15 minutes

c) Determine 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

d) Use Main Tower Lower Level Wind Speed recorder (Alternates: Backup Tower, Main Tower Upper Level)

e) Get wind speed

f) Record the following in Item 7:

- Source of meteorological data (on-site or regional)
- Compass point
- Wind speed

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 8	CHECK ANY OF THE FOLLOWING INFORMATION NEEDED: • Downwind sectors • Stability Class • Temperature	√ IF NO other meteorological information needed, THEN GO TO Step 13.
____ 9	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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: 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.

_____ 10 DETERMINE STABILITY CLASS:

a) Use Main Tower Delta T recorder (Alternate: Backup Tower Sigma Theta recorder)

b) 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	

c) Use value closer to "G" (if unable to distinguish Delta T or Sigma Theta value)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 11	DETERMINE TEMPERATURE:	
	a) Get temperature from Main Tower Temperature Recorder	
	b) Check temperature is in °F	b) IF temperature °C, THEN change scale from °F to °C using the following formula: °F = (°C x 1.8) + 32
____ 12	GIVE METEOROLOGICAL INFORMATION TO REQUESTOR	

NOTE: Information excluded from the initial report form (Attachment 1) such as offsite assistance requested or evacuation of site personnel, may be entered in Item 8. This will supersede the need to initiate a follow-up report form (Attachment 2) immediately after transmitting an initial report to satisfy condition change message criteria.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
✓ 13	RECORD DESCRIPTION OF EVENT AND ANY ADDITIONAL REMARKS IN ITEM 8	
✓ 14	RECORD YOUR NAME IN ITEM 9	
✓ 15	CHECK EMERGENCY - REMAINS IN EFFECT	IF emergency terminated before message sent, THEN do the following:
		a) Record that event has been terminated in Item 8.
		b) Record "N/A" on Page 2 of message attachment.
		c) GO TO Step 23.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 16	CHECK GENERAL EMERGENCY CLASS IN EFFECT (offsite Protective Action Recommendations (PARs) required)	Do the following: a) Record "NONE" in Items 10 and 11. b) GO TO Step 20.

NOTE: The SEM/RM records affected sectors and distances to which evacuation/sheltering is recommended on EPIP-1.06, PROTECTIVE ACTION RECOMMENDATIONS, Attachment 3.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 17	GET PAR FORM FROM SEM/RM	

NOTE: Affected sectors are recorded using alphabetic designations.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 18	RECORD DOWNWIND PRIMARY AND ADJACENT SECTORS IN ITEM 10	
____ 19	RECORD PAR IN ITEM 11	
____ 20	CHECK STATUS OF RADIOLOGICAL CONDITIONS RECORDED ON ITEM 6: • Release has occurred and is now terminated • Release is presently occurring • Release is projected to occur	Do the following: a) Record on Item 12 that a Report of Radiological Conditions will NOT be sent. b) GO TO Step 23.
____ 21	CHECK FOLLOWING CONDITIONS - MET: • LEOF (or CEOF) - RESPONSIBLE FOR STATE NOTIFICATIONS • Department of Emergency Services representative(s) - PRESENT • Department of Health (Radiological Health Programs) representative(s) - PRESENT	Do the following: a) Indicate on Item 12 that a Report of Radiological Conditions will be sent. b) GO TO Step 23.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 22 INDICATE ON ITEM 12 THAT REPORT OF RADIOLOGICAL CONDITIONS WILL BE PROVIDED TO STATE REPRESENTATIVES IN LEOF (CEOF)

<u>NOTE</u>: The Station Emergency Manager (SEM) is the approval authority in the Control Room and TSC. The Recovery Manager (RM) is the approval authority in the LEOF or CEOF.

✓ 23 HAVE SEM/RM APPROVE REPORT (initial at top of attachment)

<u>NOTE</u>: A single numbering sequence should be used for Initial and Follow-up Reports of Emergency to State and Local Governments, Attachments 1 and 2, from initial classification until the Emergency Plan is exited.

✓ 24 RECORD MESSAGE NUMBER AND TIME NOTIFICATION STARTED AT TOP OF ATTACHMENT

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Outbound calls through the PBX system are made by dialing 8-1-(area code)-###-####. Direct outbound calls may be made using unrestricted telephones by dialing 9-1-(area code)-###-#### (area code not required for direct outbound calls within local calling area). No prefix is required when using a commercial telephone.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	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 DES 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 25.b.
	b) Use Instaphone to contact State and local Emergency Operations Centers (EOCs)	b) IF Instaphone NOT operable, THEN GO TO Step 29.
	c) Perform initial roll-call (check boxes as EOC(s) answer)	
	d) Read Items 1 through 9	
	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.
	f) Repeat any items upon request	
	g) Record date and time transmittal of Items 1 through 9 completed	

(STEP 25 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS (i.e., Initial or Follow-up Report, as required): (Continued)	
	h) Check message either of the following: • Initial notification message • Follow-up message	h) GO TO Step 30.
	i) Use DES 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 Items 10 and 11 to local EOCs. 2) Record the following on second page of Attachment: • "Transmitted Items 10 and 11 to local EOCs." • Date and time transmitted to each local EOC. 3) GO TO Step 27.
	j) Read Items 10, 11 and 12	
	k) Consult with State EOC Duty Officer to determine desired update message schedule	
	l) Record following at Item 13: • Update message schedule • State EOC Duty Officer's name	
26	RECORD DATE AND TIME TRANSMITTAL OF ITEMS TO STATE EOC COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	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 11.

d) Record the following on Attachment:

- Method of contact.
- Reason Instaphone failed (if known).
- Date and time of contact.

28 GO TO STEP 30

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Other personnel may assist by making notifications simultaneously using other telephones.

_____ 29. SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS USING ALTERNATIVE MEANS:

a) Call State EOC:

1) Use DES ARD (Alternate: (804) 674-2400, ask for EOC Duty Officer)

2) Read entire Attachment

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

✓ 30 NOTIFY SEM/RM TRANSMITTAL WAS SENT

✓ 31 KEEP ATTACHMENT WITH THIS PROCEDURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 32	CHECK IF ITEM 12 ON REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS (ATTACHMENT 1 or 2) INDICATES REPORT OF RADIOLOGICAL CONDITIONS WILL BE: • Transmitted to State EOC • Provided to State representatives in LEOF (CEOF)	GO TO Step 37.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<u>NOTE</u>:
- 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 when transmittal of a message begins, or if delivered, from the time of delivery.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 33	SEND REPORT OF RADIOLOGICAL CONDITIONS TO THE STATE:	
	a) Check if either of the following Radiological Status reports available: • MIDAS Radiological Status report <u>OR</u> • EPIP-4.03, DOSE ASSESSMENT TEAM CONTROLLING PROCEDURE, Attachment 1, Radiological Status	a) <u>IF</u> NO Radiological Status report available, <u>THEN</u> do the following: 1) Determine from radiological assessment organization when report will be available. 2) Notify SEM/RM about delay. 3) <u>WHEN</u> Radiological Status report becomes available, <u>THEN</u> continue in this procedure.
	b) Get Radiological Status report from radiological assessment organization	
	c) Check report - COMPLETE	c) <u>IF</u> blank items remain on Radiological Status report, <u>THEN</u> return report to radiological assessment organization for completion.
____ 34	CHECK IF REPORT OF RADIOLOGICAL CONDITIONS WILL BE PROVIDED TO STATE REPRESENTATIVES IN LEOF (CEOF)	GO TO Step 36.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 35 GIVE RADIOLOGICAL STATUS REPORT TO STATE REPRESENTATIVES IN LEOF (CEOF):

a) Have 3 copies of Radiological Status report made

b) Give copy of Radiological Status report to each of the following:

- Department of Emergency Services representative
- Departent of Health (Radiological Health Programs) representative

c) Record date/time Radiological Status report delivered on third copy

d) Notify RM Radiological Status report delivered

e) Keep copy of Radiological Status report (with date/time of delivery) with this procedure

f) GO TO Step 37

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 36	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, THEN GO TO Step 36.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 DES ARD (Alternate: (804) 674-2400). 2) Ask State EOC Duty Officer if message received. 3) IF receipt of message verified, THEN GO TO Step 36.f. IF message NOT received, THEN do the following: a) Follow Attachment 3 Part I Item 6 instructions. b) GO TO Step 36.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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<u>NOTE</u>: Follow-up reports of emergency conditions (Attachment 2) 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.

37 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

<u>OR</u>

- Updated Radiological Status report provided by radiological assessment organization

<u>OR</u>

- Follow-up report due IAW schedule established with State EOC Duty Officer

Response Not Obtained:

<u>WHEN</u> Report of Emergency message update conditions satisfied, <u>THEN</u> RETURN TO Step 3.

<u>WHEN</u> Report of Radiological Conditions message update conditions satisfied, <u>THEN</u> RETURN TO Step 33.

<u>IF</u> termination message has been sent, <u>THEN</u> GO TO Step 40.

38 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 33

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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 39	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 1, 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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 40 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-

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-2.01	INITIAL REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS	26
ATTACHMENT 1		PAGE 1 of 2

APPROVAL: (SEM or RM): [signature] : MESSAGE # 1 : TIME NOTIFICATION STARTED: 1211

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 — Declared at 1200 (24-hr time) on Today (date)
[✓] Alert [] General Emergency

[] Emergency Terminated

Items 2 through 5 are NOT required for this report.

Item 6: 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 7 is NOT required for this report.

Item 8: Remarks / Description of event: Unit 1 Steam Generator Tube Rupture with safety Injection actuation

Item 9: This is (name) Kevin Spencer /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 1213 (24-hr time) on Today (date)

(ATTACHMENT 1 CONTINUED ON NEXT PAGE)

NUMBER EPIP-2.01	ATTACHMENT TITLE	REVISION 26
ATTACHMENT 2	FOLLOW-UP REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS	PAGE 1 of 2

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 12:00 (24-hr time) on Today (date)

Item 2: Assistance requested:
[✓] None
____ (#) Fire Units from ______________
____ (#) Rescue Units from ______________
____ (#) Police Units from ______________
[] Other ______________________

Item 3: Emergency response actions underway:
[] None
[✓] Station monitoring teams dispatched offsite
[✓] Station emergency personnel called in
[] Other ______________________

Item 4: Evacuation of onsite personnel: [✓] No; [] Yes, evacuated to: [] Primary Remote Assembly Area
[] Secondary Remote Assembly Area
[] Other

Item 5: Prognosis of situation: [] Improving [] Stable
[✓] Worsening [] Other ______________________

Item 6: Release of radioactive material:
[] Has NOT occurred and is NOT projected
[] Has occurred and is now terminated
[✓] Is presently occurring
[] Is projected to occur

Item 7: Meteorological data is:
[] Based on onsite measurements; [] Based on offsite regional data; [] Not available
[] Wind direction is from the _________; [] Wind speed is _______ mph

Item 8: Remarks / Description of event: ______________________

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 ____________ (24-hr time) on ___________ (date).

(ATTACHMENT 2 CONTINUED ON NEXT PAGE)

PART I. Instructions for Virginia Power/Surry Emergency Communicator:

1. Check name of facility: [ ] Control Room [ ] TSC [ ] Local EOF [ ] Central EOF

2. Record the following information for verification of transmittal:

   Transmittal Number: ________ Name of Emergency Communicator: ______________________
   Commercial call-back number: ( ) - ______________ (in case of ARD failure)

3. Check which of the following Radiological Status reports 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. Notify State EOC that a Report of Radiological Conditions will be sent by facsimile (Use DES ARD or call (804) 674-2400) and request receipt be verified by return call.

6. Ask facsimile machine operator to transmit this message to State EOC.

   IF transmittal of report by facsimile NOT achieveable, THEN do the following:
   a. Notify State EOC using DES 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 Virginia Power Facsimile Machine Operator:

1. Record transmittal information: ______________________ Date/Time Sent: __/__/__ __:__
   Name of Facsimile Operator

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 DES 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.

Developed for the Surry, September 2000, Initial Examination
Examination Report # 2000-301

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

A-4 ADMINISTRATIVE SECTION SRO

NRC-ADMIN-JPM-04/SRO

Title:

PERFORM EPIP-1.06, PROTECTIVE ACTION

RECOMMENDATION/EMERGENCY EVENT CLASSIFICATION

* - 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 and a loss of reactor coolant is in progress.

Equipment malfunctions have rendered the LHSI pumps and the HHSI pumps inoperable.

CHRRMS (Inside) Containment High Range Radiation Monitors RM-RMS-127 reads 5.1 E+4 R/hr and RM-RMS-128 reads 4.2 E+4.

INITIATING CUES:

You are to classify the event IAW EPIP-1.01 EAL Tabs. When you finish the actions necessary to accomplish this, please inform me.

PERFORM EPIP-1.06, PROTECTIVE ACTION RECOMMENDATION/EMERGENCY EVENT CLASSIFICATION

*STEP 1 : Determines EAL IAW EPIP-1.01 EAL Tabs.

STANDARD:

_____ a. Obtains EPIP-1.01 EAL Tabs.
_____ * b. Determine Tab C-4 a General Emergency should be declared.

_____SAT

_____UNSAT

COMMENTS:

Critical Start Time: _______

Evaluator: **If an event classification other than a General Emergency is declared, identify that a General Emergency has been declared based on Tab C-4.**

When General Emergency is declared or provided, provide the candidate with the following information:

- **Wind direction is from 330°.**
- **Personnel Hatch Rad Monitors are normal.**
- **All Containment Radiation Monitors are as provided in the Initial Conditions.**
- **Containment pressure is 18 psia and increasing.**
- **A release path from Containment is possible.**
- **I need you to complete the Protective Action Recommendations in its entirety.**
- **When you finish the actions necessary to accomplish this, please inform me. THIS PART OF THE JPM IS TIME CRITICAL.**

STEP 2: INITIATES EPIP-1.06. STANDARD: _____ (a) Fills in Name, Time and Date on Step 1. _____ (b) Acknowledges note prior to Step 2 that initial notification and PAR must be made to the State within 15 minutes. _____ (c) Determines a General Emergency has been declared. _____ (d) Acknowledges note prior to Step 2 that downwind sectors may be determined from the Emergency Communicator, EPIP-1.06 Attachment 1, or facility maps. COMMENTS:	_____SAT _____UNSAT
*STEP 3: DETERMINE PROTECTIVE ACTION RECOMMENDATION. STANDARD: _____ (a) Determines EAL Tab C-4 used to declare General Emergency. _____ *(b) Determines downwind sectors Golf, Hotel, Juliet. _____ (c) Turns to Attachment 2, PAR Matrix. _____ (d) Locates EAL C-4 in EAL column. _____ *(e) Determines PAR 1 is the appropriate PAR. **Evaluators Cue:** • **If asked: Wind direction is from 330 degrees.** • **If asked: Personnel Hatch Rad Monitors are normal.** • **If asked: All Containment Radiation Monitors are as provided in the Initial Conditions.** • **If asked: Containment Pressure is 18 psia and increasing.** • **If asked: A release path from Containment is possible.** COMMENTS:	_____SAT _____UNSAT

* - indicates a critical step.

*STEP 4: COMPLETES ATTACHMENT 3.

STANDARD:

_____ (a) Fills in Golf, Hotel and Juliet in Step 1.
_____ *(b) Under Item 2 checks box for PAR 1.
_____ *(c) Fills in Golf, Hotel and Juliet in Evacuation Section under PAR 1.
_____ (d) Approves PAR.
_____ (e) Signs and dates PAR.

_____SAT

_____UNSAT

Evaluators Note: Substep (c) is critical if not done prior to this step.

COMMENTS:

STEP 5: DIRECT EMERGENCY COMMUNICATORS TO NOTIFY OFFSITE AUTHORITIES OF PAR.

STANDARD:

_____ *(a) Directs State and Local Emergency Communicator.
_____ *(b) Directs NRC Emergency Communicator.

_____SAT

_____UNSAT

Evaluators Note: This step must be complete within 15 minutes of declaration of General Emergency.

Evaluators Cue: Tell SRO: State and Local EC will transmit PAR.
Tell SRO: NRC EC will notify NRC of PAR.

COMMENTS:

Stop Critical Time _______

* - indicates a critical step.

STEP 6: DIRECTS RAD TO INITIATE EPIP-4.07. STANDARD: _____ Tells Evaluator to Initiate EPIP-4.07. **Evaluators Cue: Tell SRO: EPIP-4.07 has been initiated.** COMMENTS:	_____SAT _____UNSAT
STEP 7: CHECKS IF RADIOLOGICAL PAR IS RECOMMENDED. STANDARD: _____ (a) Consults with RAD to determine if a Radiological PAR is recommended. _____ (b) Transitions to Step 10 **Evaluators Cue: If asked: HP does not recommend a radiological based PAR.** COMMENTS:	_____SAT _____UNSAT

STEP 8: CHECKS IF EMERGENCY TERMINATED. STANDARD: _____ (a) Asks Evaluator if Emergency is terminated. _____ (b) Asks Evaluator if conditions have changed. _____ (c) Determines Procedure is completed until conditions change. **Evaluators Cues: If asked: Emergency has not been terminated.** **Tell SRO: RAD does not recommend a PAR change.** **Tell SRO: Emergency classification is still in effect, conditions on Attachment 2 have not changed.** **Tell SRO: Conditions are stable at this time, primary sectors have not changed.** COMMENTS: Stop Time: _________	_____SAT _____UNSAT
END OF TASK	

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 and a loss of reactor coolant is in progress.

Equipment malfunctions have rendered the LHSI pumps and the HHSI pumps inoperable.

CHRRMS (Inside) Containment High Range Radiation Monitors RM-RMS-127 reads 5.1 E+4 R/hr and RM-RMS-128 reads 4.2 E+4.

INITIATING CUES:

You are to classify the event IAW EPIP-1.01. When you finish the actions necessary to accomplish this, please inform me.

INITIATING CUES:

A General Emergency has been declared based on Tab C-4, I need you to perform EPIP-1.06 to determine Protective Action Recommendations.

INITIAL CONDITIONS:

You are the Shift Supervisor and a loss of reactor coolant is in progress.

Equipment malfunctions have rendered the LHSI pumps and the HHSI pumps inoperable.

CHRRMS (Inside) Containment High Range Radiation Monitors RM-RMS-127 reads 5.1 E+4 R/hr and RM-RMS-128 reads 4.2 E+4.

ADDITIONAL CONDITIONS:

Wind direction is from 330 degrees.

Personnel Hatch Rad Monitors are normal.

All Containment Radiation Monitors are as provided in the Initial Conditions.

Containment Pressure is 18 psia and increasing.

A release path from Containment is possible.

INITIATING CUE:

I need you to complete the Protective Action Recommendations in its entirety. When you finish the actions necessary to accomplish this please inform me. This part of the JPM is TIME CRITICAL.

* - indicates a critical step.

VIRGINIA POWER
SURRY POWER STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
EPIP-1.06	PROTECTIVE ACTION RECOMMENDATIONS (With 3 Attachments)	2 PAGE 1 of 4

PURPOSE

Give guidance to the Station Emergency Manager or Recovery Manager regarding determination of Protective Action Recommendations.

SIMULATOR

ENTRY CONDITIONS

Any one of the following:

1. Activation by EPIP-1.05, RESPONSE TO GENERAL EMERGENCY.
2. As directed by the Station Emergency Manager or Recovery Manager.

ENTERED
FEB - 1 1995
WGS

APPROVAL RECOMMENDED	SNSOC DATE	APPROVAL	APPROVAL DATE	EFFECTIVE DATE
CHAIRMAN SNSOC	1-19-95	STATION MANAGER	1-31-95	2-1-95

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 1 INITIATE PROCEDURE:

- By: ____________________

  Date: ____________

  Time: ____________

NOTE:
- The initial notification of General Emergency and an applicable PAR must be made to the State within 15 minutes following declaration of the General Emergency.
- Downwind sectors (primary plus 2 buffer sectors) may be determined from the State/Local Emergency Communicator, facility maps, or Attachment 1, Sector Map.

_____ 2 DETERMINE PROTECTIVE ACTION RECOMMENDATION (PAR):

a) Determine EAL used to classify the General Emergency

b) Determine downwind sectors

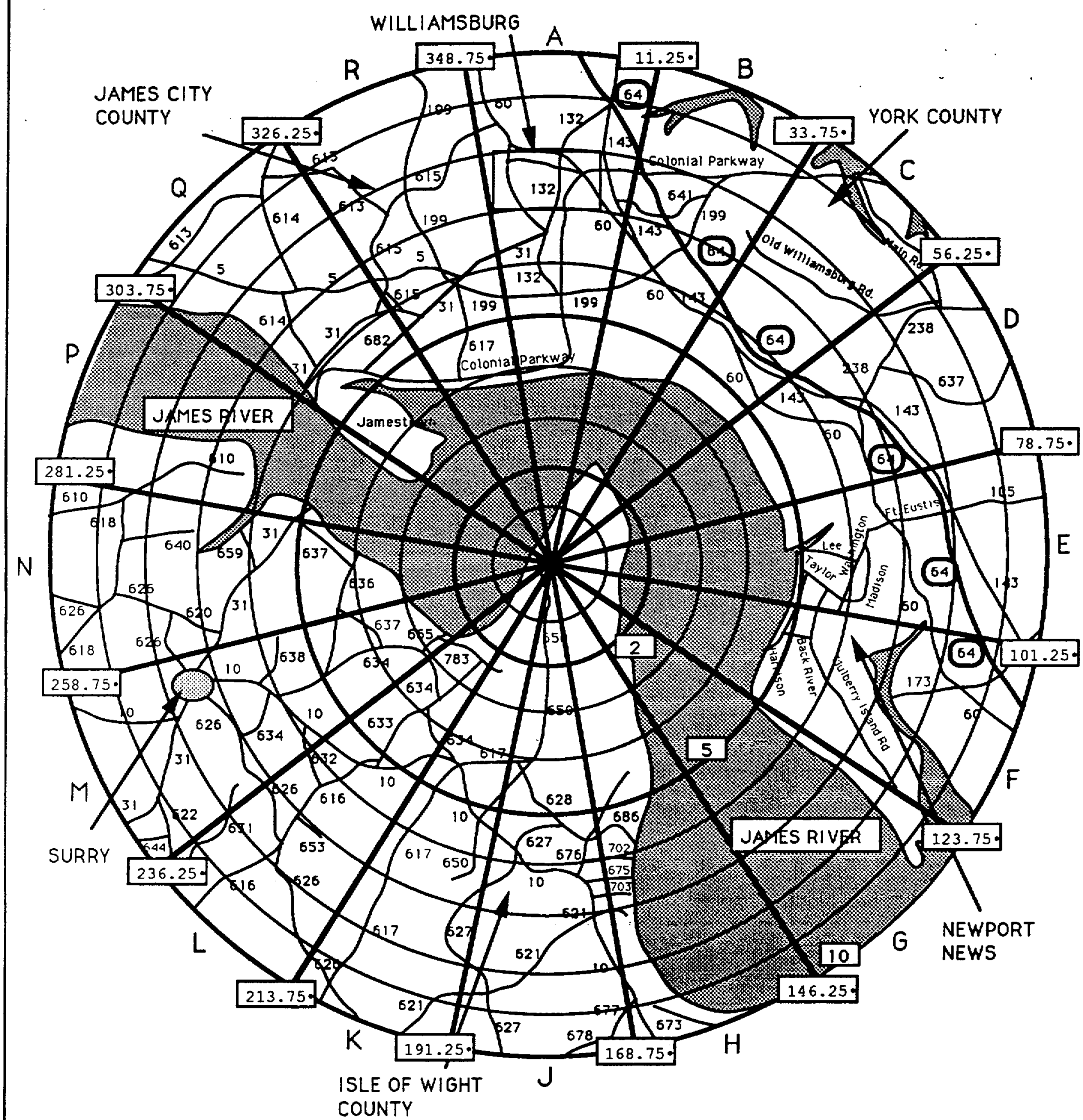
c) Use Attachment 2, Protective Action Recommendation Matrix, to determine Protective Action Recommendation

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 3	COMPLETE ATTACHMENT 3, PROTECTIVE ACTION RECOMMENDATION FORM: a) Fill in Item 1 b) Mark appropriate PAR box in Item 2 AND Fill in spaces for sectors and miles c) Sign and date form	
____ 4	HAVE EMERGENCY COMMUNICATORS NOTIFY OFFSITE AUTHORITIES OF PAR: • State Emergency Operations Center notified IAW EPIP-2.01, NOTIFICATION OF STATE AND LOCAL GOVERNMENTS • NRC notified IAW EPIP-2.02, NOTIFICATION OF NRC (notification made from Control Room or TSC, when activated)	
____ 5	HAVE RADIOLOGICAL ASSESSMENT DIRECTOR (RAD) IMPLEMENT EPIP-4.07, PROTECTIVE MEASURES [RADIOLOGICAL ASSESSMENT COORDINATOR (RAC) IF IN LEOF]	
____ 6	CHECK IF RADIOLOGICAL-BASED PAR IS RECOMMENDED	IF radiological-based PAR NOT REQUIRED, THEN GO TO Step 10.
____ 7	COMPARE RECOMMENDED PAR WITH PAR CURRENTLY IN EFFECT	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
____ 8	DETERMINE IF PAR IN EFFECT IS TO BE MODIFIED: • Use the more conservative PAR (i.e., closest to PAR 1)	IF PAR in effect - UNCHANGED, THEN GO TO Step 10.
____ 9	RETURN TO STEP 3	
____ 10	CHECK EMERGENCY - TERMINATED	Do one of the following: • IF RAD/RAD recommends a PAR change, THEN RETURN TO Step 7 OR • IF conditions on Attachment 2 change, THEN determine PAR and RETURN TO Step 7 OR • IF primary sector changes, THEN RETURN TO Step 3.
____ 11	TERMINATE EPIP-1.06: • Give completed EPIP-1.06, forms, and other applicable records to TSC Emergency Procedures Coordinator or LEOF Services Coordinator • Completed by:________________ Date:________________ Time:________________	

-END-

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-1.06	SECTOR MAP	2
ATTACHMENT		PAGE
1		1 of 1



NUMBER	ATTACHMENT TITLE	REVISION
EPIP-1.06	PROTECTIVE ACTION RECOMMENDATION MATRIX SPS	2
ATTACHMENT 2		PAGE 1 of 1

NOTE:
- For situations involving multiple Emergency Action Levels (EALs), the most conservative PAR (the PAR closest to 1) should be used.
- Downwind sectors are defined as primary plus two (2) buffer sectors.
- PAR 3, a radiologically-based PAR, does not appear on this matrix.

EAL	PROTECTIVE ACTION RECOMMENDATION
B - 7 B - 8 C - 4 C - 5 C - 6 C - 7 C - 8 D - 1 J - 1	Any of the following exist: • Personnel Hatch Monitor: RM-RMS-161 or 261 > 1.5 E+4 mR/hr • Any Cont. Hi Range Monitor: RM-RMS-127 or -227 RM-RMS-128 or -228 > 4.5 E+4 R/hr • Containment pressure: > 60 psia and NOT decreasing • Shift Supv. or SEM judgement that a release path from containment to the environment is likely or has occurred NO → PAR 4: • Evacuate 360° from 0 to 2 miles. • Evacuate downwind sectors from 2 to 5 miles. • Shelter downwind sectors from 5 to 10 miles. • Shelter unaffected sectors from 2 to 10 miles. YES → Is Primary sector R, A, B, E or F NO → PAR 1: • Evacuate 360° from 0 to 5 miles. • Evacuate downwind sectors from 5 to 10 miles. • Shelter unaffected sectors from 5 to 10 miles. YES → PAR 2: • Evacuate 360° from 0 to 5 miles. • Shelter 360° from 5 to 10 miles.
E - 1	PAR 5: • Evacuate 360° from 0 to 2 miles. • Shelter downwind sectors from 2 to 5 miles.
M - 1	PAR 6: • Shelter 360° from 0 to 2 miles. • Shelter downwind sectors from 2 to 5 miles.

NOTE: All possible PARs are listed on this form, i.e., condition-based (derived from EPIP-1.06) and radiologically-based (derived from EPIP-4.07).

1. DOWNWIND SECTORS: ______, ______, ______

2. PROTECTIVE ACTION RECOMMENDATION:

[ ] PAR 1:
Evacuate 360° from _0_ to _5_ miles.
Evacuate downwind sectors ____, ____, ____ from _5_ to _10_ miles.
Shelter unaffected sectors from _5_ to _10_ miles.

[ ] PAR 2:
Evacuate 360° from _0_ to _5_ miles.
Shelter 360° from _5_ to _10_ miles.

[ ] PAR 3:
Evacuate 360° from _0_ to _5_ miles.
Shelter downwind sectors ____, ____, ____ from _5_ to _10_ miles.

[ ] PAR 4:
Evacuate 360° from _0_ to _2_ miles.
Evacuate downwind sectors ____, ____, ____ from _2_ to _5_ miles.
Shelter downwind sectors ____, ____, ____ from _5_ to _10_ miles.
Shelter unaffected sectors from _2_ to _10_ miles.

[ ] PAR 5:
Evacuate 360° from _0_ to _2_ miles.
Shelter downwind sectors ____, ____, ____ from _2_ to _5_ miles.

[ ] PAR 6:
Shelter 360° from _0_ to _2_ miles.
Shelter downwind sectors ____, ____, ____ from _2_ to _5_ miles.

APPROVED BY: ______________________________ ______ / ______

SEM or RM Date / Time