

a

***V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE***

***JPM NO: JPS-036B***

***CONTINUOUS ROD WITHDRAWAL***

***APPROVAL: WRQ APPROVAL DATE: 6/22/2009***

***REVNO: 0***

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

***THIS JPM IS APPROVED***



## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant is at approximately 50% power with all controls in automatic.

***INITIATING CUES:*** The CRS directs you, as the NROATC (and the BOP), to monitor the plant.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP: 1**

**CUES:**

**NOTE: AOP-403.3 Immediate Action.**

**CR SEQ**

No Yes Verify rod motion is NOT required:  
- Tavg is within 1.5°F of Tref.  
AND  
- No load rejection has occurred (C7A OR C7B).

**STEP STANDARD:**

Operator verifies Tavg is within 1.5°F of Tref; C7A and C7B lights are dim.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 2**

**CUES:**

**NOTE: AOP-403.3 Immediate Action.**

**CR SEQ**

Yes Yes Place ROD CNTRL BANK SEL Switch in MAN.

**STEP STANDARD:**

Operator locates and positions Rod Control Bank Selector switch to MANUAL.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 3**

**CUES:**

**NOTE: AOP-403.3 Immediate Action.**

**CR SEQ**

No Yes Verify rod motion is stopped.

**STEP STANDARD:**

Operator verifies rod motion indicates stopped from step demand counters and rod position indication.

**COMMENTS:**

**SAT**

**UNSAT**

**STEP:** 4

**CUES:**

**CR SEQ**

No Yes Stabilize Main Turbine load.

**STEP STANDARD:**

Operator verifies no turbine load change in progress from generator load set, MW indication, or plant computer.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 5

**CUES:**

EVALUATOR CUE: CRS states: "Take whatever action is necessary as directed by your procedures."

**CR SEQ**

Yes Yes Adjust Control Rods to maintain Tavg within 1.0°F of Tref.

**STEP STANDARD:**

Operator locates and positions Control Rod IN/OUT switch as necessary to match Tavg and Tref within 1.0°F.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

Examiner ends JPM at this point.

## JPM SETUP SHEET

**JPM NO:** JPS-036B

**DESCRIPTION:** CONTINUOUS ROD WITHDRAWAL

**IC SET:** 12

**INSTRUCTIONS:**

1. RUN
2. When student is ready, activate:

MAL-CRF006A	SEVERITY = 72	Set on TRIGGER #1 (Uncontrolled Auto Rod Motion)
BST-RC040	ACTUATED	Set on TRIGGER #1 (Auto Rods Out Bistable)
CVC016A	SET = 50	Set on TRIGGER #1 (FCV-122 Failed in Auto)

**COMMENTS:**

## ***JPM BRIEFING SHEET***

***OPERATOR INSTRUCTIONS:***

***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant is at approximately 50% power with all controls in automatic.

***INITIATING CUES:*** The CRS directs you, as the NROATC (and the BOP), to monitor the plant.

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

**NUCLEAR OPERATIONS**

**COPY NO.** \_\_\_\_\_

ABNORMAL OPERATING PROCEDURE

AOP-403.3

CONTINUOUS CONTROL ROD MOTION

REVISION 2

SAFETY RELATED

*Leslie L. Lunde*  
DISCIPLINE SUPERVISOR

9-11-95  
DATE

*Ray E. Williams*  
APPROVAL AUTHORITY

9/13/95  
DATE

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLED DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLED DATE
A	P	5/7/96					

CONTINUOUS USE

Continuous Use of Procedure Required.  
Read Each Step Prior to Performing.

PROCEDURE DEVELOPMENT FORM - A

<b>I. DATE:</b> <u>3/18/96</u> <b>PROC. #</b> <u>AOP-403.3</u> <b>REV. #</b> <u>2</u> <b>CHG.</b> <u>A</u> <b>COMM. #</b> _____ <b>TITLE:</b> <u>CONTINUOUS CONTROL ROD MOTION</u>																																													
<b>NEW PROC</b> _____ <b>CHANGE</b> <input checked="" type="checkbox"/> <b>PERMANENT</b> <input checked="" type="checkbox"/> <b>REVISION</b> _____ <b>RESTRICTED</b> _____ <b>FROM</b> _____ <b>TO</b> _____	<b>SAFETY RELATED</b> <input checked="" type="checkbox"/> <b>QUALITY RELATED</b> _____ <b>NON-SAFETY RELATED</b> _____																																												
<b>II. DESCRIPTION:</b> <u>Changed symptom referring to full rod withdrawal alarm to C-11 status light.</u>  <b>REASON FOR CHANGE:</b> <u>MRF 22769C Replaced the alarm with a status light.</u>  <div style="text-align: right;"><u>Imela</u> Originator</div>																																													
<b>III. WILL THIS REVISION/CHANGE/NEW PROCEDURE:</b> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:70%;"></th> <th style="width:10%;">* YES</th> <th style="width:10%;">NO</th> <th style="width:10%;">N/A</th> </tr> </thead> <tbody> <tr> <td>1. Result in significant increased personnel radiation exposure? (ALARA review)</td> <td style="text-align:center">_____</td> <td style="text-align:center"><input checked="" type="checkbox"/></td> <td style="text-align:center">_____</td> </tr> <tr> <td>2. Result in a release of effluents to the Environment?</td> <td style="text-align:center">_____</td> <td style="text-align:center"><input checked="" type="checkbox"/></td> <td style="text-align:center">_____</td> </tr> <tr> <td>3. Degrade the effectiveness of the Radiation Emergency Plan?</td> <td style="text-align:center">_____</td> <td style="text-align:center">_____</td> <td style="text-align:center"><input checked="" type="checkbox"/></td> </tr> <tr> <td>4. Degrade the safeguards effectiveness of the Physical Security, Safeguards Contingency or Training and Qualification Plans?</td> <td style="text-align:center">_____</td> <td style="text-align:center">_____</td> <td style="text-align:center"><input checked="" type="checkbox"/></td> </tr> </tbody> </table> <p>* If any question 1 through 4 is answered "YES", refer to appropriate section of procedure for direction.</p> <p><b>REQUIRED REVIEW AND COMMENT:</b></p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;"><input type="checkbox"/> OPS</td> <td style="width:15%;"><input type="checkbox"/> NL&amp;OE</td> <td style="width:15%;"><input type="checkbox"/> CHS</td> <td style="width:15%;"><input type="checkbox"/> GMNPO</td> <td style="width:15%;"><input checked="" type="checkbox"/> S.E.</td> <td style="width:15%;"></td> </tr> <tr> <td><input type="checkbox"/> MNTS</td> <td><input type="checkbox"/> P&amp;S</td> <td><input type="checkbox"/> HPS</td> <td><input type="checkbox"/> GMES</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input checked="" type="checkbox"/> QA</td> <td><input type="checkbox"/> NPS</td> <td><input type="checkbox"/> MNT</td> <td><input type="checkbox"/> GMNSS</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> QC</td> <td><input type="checkbox"/> TS</td> <td><input type="checkbox"/> DE</td> <td><input checked="" type="checkbox"/> QR (OPS)</td> <td><input checked="" type="checkbox"/> JOHN Geddings</td> <td></td> </tr> </table> <div style="text-align: right;"><u>[Signature]</u> Discipline Supervisor    Date</div>			* YES	NO	N/A	1. Result in significant increased personnel radiation exposure? (ALARA review)	_____	<input checked="" type="checkbox"/>	_____	2. Result in a release of effluents to the Environment?	_____	<input checked="" type="checkbox"/>	_____	3. Degrade the effectiveness of the Radiation Emergency Plan?	_____	_____	<input checked="" type="checkbox"/>	4. Degrade the safeguards effectiveness of the Physical Security, Safeguards Contingency or Training and Qualification Plans?	_____	_____	<input checked="" type="checkbox"/>	<input type="checkbox"/> OPS	<input type="checkbox"/> NL&OE	<input type="checkbox"/> CHS	<input type="checkbox"/> GMNPO	<input checked="" type="checkbox"/> S.E.		<input type="checkbox"/> MNTS	<input type="checkbox"/> P&S	<input type="checkbox"/> HPS	<input type="checkbox"/> GMES	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> QA	<input type="checkbox"/> NPS	<input type="checkbox"/> MNT	<input type="checkbox"/> GMNSS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> QC	<input type="checkbox"/> TS	<input type="checkbox"/> DE	<input checked="" type="checkbox"/> QR (OPS)	<input checked="" type="checkbox"/> JOHN Geddings	
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<b>IV. 10CFR50.59 SCREENING REVIEW/SAFETY EVALUATION</b> <input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> EXEMPT <input checked="" type="checkbox"/> PSRC <b>SUPPORTING DOCUMENT:</b> <u>MRF 22769C</u> <div style="text-align: right;"><u>[Signature]</u> Discipline Supervisor concurrence</div>																																													
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<b>VI. DISCIPLINE SUPERVISOR FINAL REVIEW:</b> <b>TRAINING REQUIRED?</b> YES <input checked="" type="checkbox"/> NO _____ <b>IF YES, PRIOR TO PROCEDURE IMPLEMENTATION?</b> YES <input checked="" type="checkbox"/> NO _____ <b>P/CAP AFFECTED?</b> YES _____ NO <input checked="" type="checkbox"/> <b>COMMENTS RESOLVED:</b> <u>[Signature]</u> <u>4-24-96</u> <div style="text-align: right;">Discipline Supervisor    Date</div>	<b>VII. P/CAP ACCEPTABLE?</b> <b>C. YES</b> _____ <b>NO</b> _____ <b>NL&amp;OE</b> <u>N/A</u> <b>Date</b> _____ <b>N. YES</b> _____ <b>NO</b> _____ <b>RESP. MGR.</b> _____ <b>Date</b> _____ <b>VIII. FINAL QA REVIEW (As Applicable)</b> <u>J. COOK</u> <u>4-24-96</u> <b>QA Concurrence</b> _____ <b>Date</b> _____ <b>IX. APPROVAL AUTHORITY:</b> <u>[Signature]</u> <u>5/7/96</u> <b>Approval/Concurrence</b> _____ <b>Date</b> _____																																												
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CONTINUOUS CONTROL ROD MOTION

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CONTINUOUS CONTROL ROD MOTION

REFERENCES

1. Tech Specs 3.1.3.1, 3.1.3.5, 3.1.3.6, and 3.2.1.
2. FSAR 7.7.1.1 through 7.7.1.4, and 7.7.2.
3. DBD, Reactor Protection System.
4. SOP-403, Rod Control And Position Indicating System.
5. 108D837, Sheet 9.
6. 108D932, Sheet 21.

REVISION SUMMARY

Converted procedure to two-column format, incorporating contingency actions. Added notification of Rod Control System Engineer as requested.

CONTINUOUS CONTROL ROD MOTION

PURPOSE

This procedure provides instructions for responding to unwarranted Control Rod motion.

SYMPTOMS/ENTRY CONDITIONS

1. Unwarranted Control Rod motion as indicated by Group Step Counters and Digital Rod Position Indicators.
2. Changing Reactor power without an accompanying Turbine load change.
3. Any of the following Main Control Board annunciators in alarm:
  - RCS TAVG-TREF DEV HI/LO (XCP-615 2-5).
  - RCS TAVG DEV HI/LO (XCP-615 1-5).
  - CRB INSRT LMT LO (XCP-621 1-2).
  - CRB INSERT LMT LO-LO (XCP-621 1-1).
  - CMPTR  $\Delta$ FLUX LMT EXCEEDS (XCP-620 2-4).
  - RCS LOOP A(B)(C) TAVG HI (XCP-617(618)(619) 2-5).
  - OP  $\Delta$ T AUTO TURB RUNBCK W/DRWL BLCK (XCP-621 1-4).
  - OT  $\Delta$ T AUTO TURB RUNBCK W/DRWL BLCK (XCP-621 1-5).
  - IR FLUX HI ROD STP (XCP-621 2-5).
  - PR FLUX HI ROD STP (XCP-621 2-4).
4. C-11 status light bright (XCP-6109 1-25).

CONTINUOUS CONTROL ROD MOTION

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<u>OPERATOR ACTIONS</u>	
① Verify rod motion is <u>NOT</u> required: • T <sub>avg</sub> is within 1.5°F of T <sub>ref</sub> . <input type="checkbox"/> <u>AND</u> • <u>No</u> load rejection has occurred (C7A <u>OR</u> C7B). <input type="checkbox"/>	1 GO TO AOP-214.2, RESPONSE TO LOAD REJECTION/RUNBACK. <input type="checkbox"/>
② Place ROD CNTRL BANK SEL Switch in MAN. <input type="checkbox"/>	
③ Verify rod motion is stopped. <input type="checkbox"/>	3 Perform the following: a) Trip the Reactor. <input type="checkbox"/> b) GO TO EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION. <input type="checkbox"/>
4 Stabilize Main Turbine load. <input type="checkbox"/>	
5 Adjust Control Rods to maintain T <sub>avg</sub> within 1.0°F of T <sub>ref</sub> . <input type="checkbox"/>	
6 Verify PZR level is stable at <u>OR</u> trending to program level. <input type="checkbox"/>	6 Control Charging and Letdown flow to restore PZR level to program level. <input type="checkbox"/>
7 Verify PZR pressure is stable at <u>OR</u> trending to 2235 psig (2220 psig to 2250 psig). <input type="checkbox"/>	7 Control PZR Spray and Heaters to maintain normal PZR pressure. <input type="checkbox"/>
8 Notify the following plant personnel: • Management Duty Supervisor. <input type="checkbox"/> • Reactor Engineering. <input type="checkbox"/> • Rod Control System Engineer. <input type="checkbox"/>	

CONTINUOUS CONTROL ROD MOTION

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 9</u></p> <p>Rod control should be maintained in MAN pending results of the event analysis.</p>	
<p>9 Determine and correct the cause of the failure. <input type="checkbox"/></p> <p>10 Proceed as directed by the Shift Supervisor. <input type="checkbox"/></p>	
<p>-----   End of AOP-403.3   -----</p>	

b.

# ***V.C. SUMMER NUCLEAR STATION JOB PERFORMANCE MEASURE***

***JPM NO: JPSF-058A***

**FILL AN ECCS ACCUMULATOR (W/ HIGH  
PRESSURE ALARM & NO FURTHER ACTION)**

***APPROVAL: WRQ APPROVAL DATE: 6/22/2009***

***REV NO: 0***

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

***THIS JPM IS APPROVED***



## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The "ACCUM A LVL HI/LO" annunciator (XCP-611, pt 1-2) is in alarm due to low level.

***INITIATING CUES:*** As the NROATC, you are directed to respond to the annunciator per the ARP and raise 'A' accumulator level to clear the alarm.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP: 1**

**CUES:**

IAW ARP

**CR SEQ**

No No Verifies actual level on LI-920 and LI-922

**STEP STANDARD:**

Determines both indicators indicate level below the lowalarm setpoint

**COMMENTS:**

**SAT** .....

**UNSAT** \_\_\_\_\_

**STEP: 2**

**CUES:**

Both operator reports (as ABLL) that XVT-8932 and 8967 are open. NOTE, XVT-8932, is not modeled on the simulator.

**CR SEQ**

No Yes Directs locally aligning SI Hydro pump

**STEP STANDARD:**

Directs ABAO to open XVT-8932 (suction valve) and XVT-8967 (Discharge Valve)

**COMMENTS:**

**SAT** .....

**UNSAT** \_\_\_\_\_

**STEP: 3**

**CUES:**

**CR SEQ**

No Yes Verifies recirc valve open

**STEP STANDARD:**

Verifies HCV-947 hand controller has 100% demand.

**COMMENTS:**

**SAT** .....

**UNSAT** \_\_\_\_\_

**STEP:** 4

**CUES:**

**CR SEQ**

No Yes Directs racking in Hydro Test Pump breaker.

**STEP STANDARD:**

Directs ABOA to rack in Hydro Test Pump breaker. Hydro Test Pump breaker green light lit on MCB.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 5

**CUES:**

Should request a peer check. Evaluator (as local operator) reports Hydro Test Pump running normally.

**CR SEQ**

Yes Yes Start the Hydro Test Pump.

**STEP STANDARD:**

Indicator lights for the Hydro Test Pump, red light ON and green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 6

**CUES:**

**CR SEQ**

No Yes Open the Hydro Pump discharge valve.

**STEP STANDARD:**

PVT-8860, HYDRO PP DISCH, red light ON, green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 7**

**CUES:**

Should request a peer check

**CR SEQ**

No Yes Align Hydro Test Pump discharge to 'A' accumulator.

**STEP STANDARD:**

PVT-8878A, A FILL FR HYDRO PP, red light ON and green light OFF.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP: 8**

**CUES:**

**CR SEQ**

Yes Yes Commence filling 'A' accumulator.

**STEP STANDARD:**

HCV-947, HYDRO PP RECIRC VLV, slowly closed using positioner. 'A' accumulator level increasing.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP: 9**

**CUES:**

**CR SEQ**

Yes Yes Acknowledge ACCUM A PRESS HI/LO annunciator.

**STEP STANDARD:**

Acknowledges alarm and determines 'A' accumulator pressure is high.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 10

**CUES:**

If Hydro Test pump left running for >15 minutes, this constitutes failure of the JPM.

**CR SEQ**

Yes Yes Secures filling operation.

**STEP STANDARD:**

HCV-947 positioner indicates 100% and Hydro Test pump indicates red light OFF, green light ON or PVT-8860 and 8878A indicate red light OFF, green light ON..

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 11

**CUES:**

**CR SEQ**

No Yes Ensures Accumuator Nitrogen vent is closed.

**STEP STANDARD:**

HCV-936 positioner indicates 0%.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 12

**CUES:**

Evaluator (as CRS) directs the NROATC to reduce 'A' accumulator pressure to 620 psig. Should request a peer check

**CR SEQ**

Yes Yes Reduce 'A' accumulator pressure.

**STEP STANDARD:**

PVT-8875A indicates red light ON, green light OFF; HCV-936 slowly opened to reduce 'A' accumulator pressure.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 13

**CUES:**

**CR SEQ**

Yes Yes Secures venting of 'A' accumulator.

**STEP STANDARD:**

HCV-936 positioner indicates 0%, 'A' accumulator pressure 600-656 psig, PVT-8875A indicates red light OFF, green light ON.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

Examiner ends JPM at this point.

## JPM SETUP SHEET

**JPM NO:** JPSF-058A

**DESCRIPTION:** FILL AN ECCS ACCUMULATOR (W/ HIGH PRESSURE ALARM & NO FURTHER ACTION)

**IC SET:** 10

### INSTRUCTIONS:

1. RUN

2. Drain 'A' ECCS Accumulator by:

LOA-AUX023      SEVERITY=1      (Drain 'A' accumulator to RCDT)

3. When ACCUM A LVL HI/LO annunciator alarms and 'A' accumulator level <65%

LOA-AUX023      SEVERITY=0

4. Increase 'A' Accumulator pressure to 645 psig by:

VLV-SI036P      SEVERITY=100      (XVT-8880 N2 SUP TO ACCUM)  
VLV-SI024P      SEVERITY=100      (XVT-8875A ACCUM A N2 SUP VLV)

When 'A' Accumulator pressure reaches 645 psig:

VLV-SI024P      SEVERITY=0  
VLV-SI036P      SEVERITY=0

Then DELETE these two commands to allow operation on the simulator.

5. FREEZE

6. When student is ready RUN.

7. When requested for filling accumulator, activate:

LOA-AUX009      SEVERITY=1      (Open Hydro Test Pump discharge valve)  
LOA-AUX043      SELECT=RACK IN      (Rack in Hydro Test Pump breaker)

**COMMENTS:**

## ***JPM BRIEFING SHEET***

***OPERATOR INSTRUCTIONS:***

***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The "ACCUM A LVL HI/LO" annunciator (XCP-611, pt 1-2) is in alarm due to low level.

***INITIATING CUES:*** As the NROATC, you are directed to respond to the annunciator per the ARP and raise 'A' accumulator level to clear the alarm.

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

*Monday, June 22, 2009*

PANEL XCP-611  
ANNUNCIATOR POINT 1-2

ACCUM A LVL HI/LO
-------------------------

SETPOINT:  
Hi - 88.6%  
Lo - 65.6%

ORIGIN:  
ILB00920A      ILB00920B  
ILB00922A      ILB00922B

**PROBABLE CAUSE:**

1. Accumulator A over or under filled.
2. Valve leakage or misalignment.
3. Accumulator discharge into RCS.
4. Accumulator leak.
5. Instrument failure.

**AUTOMATIC ACTIONS:**

1. None.

**CORRECTIVE ACTIONS:**

1. Verify Accumulator A level on LI-920 and LI-922, LEVEL %.
2. Refer to SOP-112, for raising or lowering Accumulator water level.
3. Verify proper Accumulator valve alignment per SOP-112.

**SUPPLEMENTAL ACTIONS:**

1. Refer to Technical Specification 3.5.1 for operating limitations.
2. Monitor water level to ensure that the problem does not re-occur.

**REFERENCES:**

1. B-804-611, Sh. 1.
2. B-208-095, SI-80.
3. V.C. Summer Technical Specifications.
4. SOP-112.
5. 1MS-51-161.

#### IV. INFREQUENT OPERATIONS

##### A. RAISING ACCUMULATOR WATER LEVEL

###### 1.0 INITIAL CONDITIONS

- 1.1 A **Pre-Job Brief** has been conducted per OAP-100.3.
- 1.2 The RWST is operable per V.C. Summer Technical Specification 3.5.4.

###### CAUTION 2.0

When raising an Accumulator level, the other Accumulator levels should be monitored to verify that they are not changing.

###### 2.0 INSTRUCTIONS

- 2.1 Open the following (AB-388):
  - a. XVT08932-SI, HYDRO PUMP SUCTION VALVE.
  - b. XVT08967-SI, HYDRO PUMP DISCH VALVE.
- 2.2 Verify HCV-947, HYDRO PP RECIRC VLV, is open.
- 2.3 Rack in XSW1A3 03D, HYDRO TEST PUMP XPP0036-SI.

###### CAUTION 2.4

The Hydro Test Pump should not be operated in the recirculation mode for more than 15 minutes to avoid pump heatup.

- 2.4 Start the HYDRO PUMP. (**PEER ✓**)
- 2.5 Open PVT-8860, HYDRO PP DISCH.

2.6 To raise level in an Accumulator, proceed as follows:

- a. Open PVT-8878A(B)(C), A(B)(C) FILL FR HYDRO PP. (PEER ✓)

**CAUTION 2.6.b**

If Accumulator pressure increases to 656 psig, the filling operation should be secured and pressure reduced per Section IV.

- b. Slowly close HCV-947, HYDRO PP RECIRC VLV, to raise Accumulator level to between 66% and 88%.
- c. When the desired level has been reached, open HCV-947, HYDRO PP RECIRC VLV.
- d. Close PVT-8878A(B)(C), A(B)(C) FILL FR HYDRO PP.
- 2.7 If more than one accumulator is to be filled, return to Step 2.6.
- 2.8 Place PVT-8860, HYDRO PP DISCH, to CLOSE/AUTO.
- 2.9 Stop the HYDRO PUMP.
- 2.10 Rack out XSW1A3 03D, HYDRO TEST PUMP XPP0036-SI.
- 2.11 Close the following (AB-388):
- a. XVT08967-SI, HYDRO PUMP DISCH VALVE.
- b. XVT08932-SI, HYDRO PUMP SUCTION VALVE.

**NOTE 2.12**

If Accumulator level was increased by ten percent or more (of MCB indication), Chemistry must sample and verify the boron concentration within six hours after the volume increase per Technical Specification Surveillance 4.5.1.1.b.

- 2.12 If level is raised ten percent or greater, have Chemistry sample the Accumulator boric acid concentration.

**END OF SECTION**

## D. LOWERING ACCUMULATOR PRESSURE

### 1.0 INITIAL CONDITIONS

- 1.1 None.

#### CAUTION 2.0

When lowering accumulator pressure, the other accumulator pressures should be monitored to verify that they are not changing.

### 2.0 INSTRUCTIONS

- 2.1 Ensure HCV-936, ACCUM N2 VENT, is closed.
- 2.2 Open PVT-8875A(B)(C), N2 TO A(B)(C). (**PEER ✓**)
- 2.3 Slowly open HCV-936, ACCUM N2 VENT, to reduce accumulator pressure to the desired pressure.
- 2.4 When the desired pressure has been reached, close HCV-936, ACCUM N2 VENT.
- 2.5 Close PVT-8875A(B)(C), N2 TO A(B)(C).

**END OF SECTION**

C.

***V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE***

***JPM NO: JPS-068B***

***SHIFT COMPONENT COOLING WATER TRAINS  
(W/O TRANSFER IN-SERVICE CHARGING PUMP)***

***APPROVAL: WRQ APPROVAL DATE: 6/17/2009***

***REV NO: 0***

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

***THIS JPM IS APPROVED***

**TASK:**

008-021-01-01 SWITCH COMPONENT COOLING WATER TRAINS

**TASK STANDARD:**

The 'B' CCW pump is supplying non-essential loads in slow speed. CCW flow to non-essentials is not interrupted. "C" CCW is aligned to "B" Train. 'B' charging pump is running. 'A' Train CCW is aligned to essential loads. The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc) and industrial safety practices meets expectations.

**TERMINATING CUE:** "B" CCW pump running in slow speed supplying non-essential loads.

**PREFERRED EVALUATION LOCATION**

**PREFERRED EVALUATION METHOD**

SIMULATOR

PERFORM

**REFERENCES:** SOP-118 COMPONENT COOLING SYSTEM

<i>INDEX NO.</i>	<i>K/A NO.</i>		<i>RO</i>	<i>SRO</i>
008000A408	A4.08	CCW pump control switch	3.1	2.8

**TOOLS:** SOP-118

**EVALUATION TIME** 15 **TIME CRITICAL** No **10CFR55:** 45(a)8

TIME START: \_\_\_\_\_ TIME FINISH: \_\_\_\_\_ PERFORMANCE TIME: \_\_\_\_\_

**PERFORMANCE RATING:** SAT: \_\_\_\_\_ UNSAT: \_\_\_\_\_

**EXAMINER:** \_\_\_\_\_  
SIGNATURE DATE

## ***INSTRUCTIONS TO OPERATOR***

### **READ TO OPERATOR:**

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant is in Mode 1. "A" Train CCW is the active loop with "A" CCW pump running in slow speed.

***INITIATING CUES:*** CRS directs NROATC to perform an active CCW loop switchover to "B" Train for "A" Train maintenance per SOP-118, Section IIIB.  
Perform only actions up to Step 2.4.h.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP:** 1

**CUES:**

**CR SEQ**

No No Place XPP-58A(B)(C), CCBP A(B)(C), standby pump in OFF.

**STEP STANDARD:**

Places the control switch for XPP-58B, CCBP B, in OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 2

**CUES:**

EVALUATOR NOTE: Note 2.2 is N/A since PUMP C is not the only operable pump in the off-going loop.

EVALUATOR NOTE: Step 2.2.a is N/A since PUMP A is not the standby pump in the off-going loop, it is the running pump.

**CR SEQ**

No Yes Places XPP-001C, PUMP C, TRAIN A and TRAIN B ('C' CCW pump) in PULL-TO-LOCK.

**STEP STANDARD:**

Places 'C' CCW pump Train A and Train B switch in PULL-TO-LOCK.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 3

**CUES:**

Booth operator initiates batch file CCCW2B. After amber "B SELECTED" light comes on for the 'C' CCW pump Transfer Switch on 'B' Train; as the Auxiliary Operator, booth operator reports Attachment VB is complete, except for racking in the 'C' pump breaker on 'B' Train.

**CR SEQ**

No No Align XPP-001C, PUMP C, to Train B per Attachment VB with the exception of racking in XSWIDB-II, CC PUMP C XPP0001C-CC.

**STEP STANDARD:**

Directs AO to align 'C' CCW pump to the 'B' loop. AO completes Attachment VB of SOP-118.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 4**

**CUES:**

EVALUATOR NOTE: Step 2.3 is N/A since Train B is being established as the active loop.

**CR SEQ**

No Yes Ensure MVB-9503B, CC TO RHR HX B, (CCW to the 'B' RHR heat exchanger) is open.

(This is the start of Step 2.4)

**STEP STANDARD:**

Verifies MVB-9503B, CC TO RHR HX B open with indication of red light ON and green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP: 5**

**CUES:**

Examinee should request peer check.

**CR SEQ**

Yes Yes Start the "B" CCW Pump in slow speed: XPP-0001B, PUMP B

**STEP STANDARD:**

Starts 'B' CCW Pump running in slow speed with red indicating light ON and green light OFF. Notes that starting amps decay to normal running current.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP: 6**

**CUES:**

Examinee should request a peer check. Per CAUTION 2.3.c and 2.3.d (SOP-118, III.B): Failure to complete Step 2.3.d in a timely manner after reducing RHR Heat Exchanger Flow will result in a loss of flow through the running CCW Pump or excessive flow perturbations in the CCW non-essential loop.

NOTE TO EVALUATOR: Steps 6 - 8 of this JPM will be performed concurrently in rapid succession.

**CR SEQ**

Yes Yes Start MVB-9503B, CC TO RHR HX B, stroking in the closed direction.

**STEP STANDARD:**

Places control switch for MVB-9503B in CLOSE. Observes valve in mid-position.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP: 7**

**CUES:**

**CR SEQ**

- Yes Yes 1) Open MVB-9687B/9525B, LP B NON-ESSEN LOAD ISOL.  
 2) Open MVB-9524B/9526B, LP B NON-ESSEN LOAD ISOL.

**STEP STANDARD:**

When flow, as indicated on FI-7044, HX B FLOW GPM, is between 5000 gpm and 4000 gpm, perform the following in rapid succession: (Align non-essential loads to 'B' train CCW.) Places control for MVB-9524B/9526B AND MVB-9687B/9525B, LP B NON-ESSEN LOAD ISOL to OPEN, with indication of red light ON and green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 8**

**CUES:**

**CR SEQ**

- Yes Yes 1) Close MVB-9524A/9526A, LP A NON-ESSEN LOAD ISOL.  
 2) Close MVB-9687A/9525A, LP A NON-ESSEN LOAD ISOL.

**STEP STANDARD:**

(Isolate non-essential loads from 'A' train CCW.) Places control switches for MVB-9524A/9526A AND MVB-9687A/9525A, LP A NON-ESSEN LOAD ISOL to CLOSE, with indication of red light OFF and green light ON.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 9**

**CUES:**

**CR SEQ**

- Yes No 1) Open MVB-9503A, CC TO RHR HX A.

**STEP STANDARD:**

(Align CCW TO 'A' RHR heat exchanger.) Places control switch for MVB-9503A, CC TO RHR HX A to OPEN with indication of red light ON and green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 10

**CUES:**

**CR SEQ**

No No Rack in XSW1DB11, CC PUMP C  
XPP0001C-CC CCW PUMP C to complete  
Attachment VB ("C" CCW Pump breaker on  
'B' train).

**STEP STANDARD:**

Racked up in slow speed. Green light  
ON.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP:** 11

**CUES:**

**CR SEQ**

No No Place XPP-0001C, PUMP C, TRAIN B in  
After-Stop.

**STEP STANDARD:**

Places 'C' CCW pump, Train "B" switch  
in After-Stop.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP:** 12

**CUES:**

Booth Operator reports that RML-2B flow is 5.0 gpm.

**CR SEQ**

No No Locally verify greater than 1 gpm sample  
flow on RML-2B, CCW Liquid Monitor.

**STEP STANDARD:**

AO reports greater than 1 gpm flow  
through RML-2B.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP:** 13

**CUES:**

**CR SEQ**

No Yes Ensure the following valves have not automatically closed due to high flow:

- 1) MVG-9625, CC TO RB
- 2) MVG-9626, CC TO RB
- 3) MVG-9583, FROM XS LTDN HX
- 4) MVT-9593A(B)(C), FROM RCP  
A(B)(C)THERM BARR

**COMMENTS:**

**STEP STANDARD:**

The red light is ON and the green light is OFF for all the following:

MVG-9625, MVG-9626, MVG-9583,  
MVG-9593A,B,&C.

**SAT** \_\_\_\_\_

**UNSAT**

Examiner ends JPM at this point.

## JPM SETUP SHEET

**JPM NO:** JPS-068B

**DESCRIPTION:** SHIFT COMPONENT COOLING WATER TRAINS (W/O TRANSFER IN-SERVICE CHARGING PUMP)

**IC SET:** 10 or 324

**INSTRUCTIONS:**

1. INIT 10
2. When student is ready: RUN
3. When AO requested by student to complete Attachment VB of SOP-118, enter the following:  
RUN BATCH FILE CCCW2B
4. When requested to activate trigger #30, RACK UP 'C' CCW PUMP BREAKER ON "B" TRAIN

**COMMENTS:**

## ***JPM BRIEFING SHEET***

### ***OPERATOR INSTRUCTIONS:***

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant is in Mode 1. "A" Train CCW is the active loop with "A" CCW pump running in slow speed.

***INITIATING CUES:*** CRS directs NROATC to perform an active CCW loop switchover to "B" Train for "A" Train maintenance per SOP-118, Section IIIB.  
Perform only actions up to Step 2.4.h.

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

## B. ACTIVE LOOP SWITCHOVER

### 1.0 INITIAL CONDITIONS

- 1.1 A **Pre-Job Brief** has been conducted per OAP-100.3, Human Performance Tools.
- 1.2 Service Water is supplying cooling to the Component Cooling Heat Exchangers per SOP-117.

CAUTION 2.0

- a. If XPP-0001C, PUMP C, is aligned to either loop electrically, the following conditions must be met for automatic start of one of the pumps in the particular loop following an SI or Blackout:
  - 1) For XPP-0001A(B), PUMP A(B), to start:
    - a) XPP-0001A(B), PUMP A(B), Switch must be in After-Start, or
    - b) XPP-0001C, PUMP C, Breaker must be racked down.
  - 2) For XPP-0001C, PUMP C, to start:
    - a) XPP-0001C, PUMP C, Switch must be in After-Start, or
    - b) XPP-0001A(B), PUMP A(B), Breaker must be racked down.
- b. If XPP-0001C, PUMP C, is not operating and is aligned electrically to the non-operating loop, that loop is inoperable.

2.0 INSTRUCTIONS

- 2.1 Place XPP-58A(B)(C), CCBP A(B)(C), standby pump in OFF.

CHG  
C

NOTE 2.2

If XPP-0001C, PUMP C, is the only operable pump in the off going active loop, Step 2.2 should be omitted.

CHG  
D

- 2.2 Align XPP-0001C, PUMP C, to the oncoming active loop as follows:
  - a. If XPP-0001A(B), PUMP A(B), is the standby pump in the off going active loop, perform the following:
    - 1) Start XPP-0001A(B), PUMP A(B). **(PEER ✓)**
    - 2) Stop XPP-0001C, PUMP C, TRAIN A (TRAIN B).
  - b. Place XPP-0001C, PUMP C, TRAIN A and TRAIN B, in PULL TO LOCK.

Step 2.2 continued

- c. Perform one of the following:
  - 1) Align XPP-0001C, PUMP C, to Train A per Attachment VA with the exception of racking in XSW1DA 07, CC PUMP C XPP0001C-CC.
  - 2) Align XPP-0001C, PUMP C, to Train B per Attachment VB with the exception of racking in XSW1DB 11, CC PUMP C XPP0001C-CC.

2.3 Establish Train A as the active loop as follows:

- a. Ensure MVB-9503A, CC TO RHR HX A, is open.
- b. Start one of the following in slow speed: **(PEER ✓)**
  - 1) XPP-0001A, PUMP A.
  - 2) XPP-0001C, PUMP C TRAIN A.

CAUTION 2.3.c and 2.3.d

Failure to complete Step 2.3.d in a timely manner after reducing RHR Heat Exchanger flow will result in a loss of flow through the running CCW Pump or excessive flow perturbations in the CCW non-essential loop.

- c. Start MVB-9503A, CC TO RHR HX A, stroking in the closed direction. **(PEER ✓)**
- d. When flow, as indicated on FI-7034, HX A FLOW GPM, is between 5000 gpm and 4000 gpm, perform the following in rapid succession:
  - 1) Open MVB-9687A/9525A, LP A NON-ESSEN LOAD ISOL.
  - 2) Open MVB-9524A/9526A, LP A NON-ESSEN LOAD ISOL.
  - 3) Close MVB-9524B/9526B, LP B NON-ESSEN LOAD ISOL.
  - 4) Close MVB-9687B/9525B, LP B NON-ESSEN LOAD ISOL.
  - 5) Open MVB-9503B, CC TO RHR HX B.

Step 2.3 continued

- e. If XPP-0001C, PUMP C, is the standby pump on Train A, perform the following:
  - 1) Rack in XSW1DA 07, CC PUMP C XPP0001C-CC to complete Attachment VA.
  - 2) Place XPP-0001C, PUMP C, TRAIN A, in After-Stop.
- f.  Locally verify greater than 1 gpm sample flow on RML0002A, LIQUID RAD MON COMPONENT COOLING (IB-412).
- g. Ensure the following valves have not automatically closed due to high flow:
  - 1) MVG-9625, CC TO RB.
  - 2) MVG-9626, CC TO RB.
  - 3) MVG-9583, FROM XS LTDN HX.
  - 4) MVT-9593A(B)(C), FROM RCP A(B)(C) THERM BARR.
- h.  Transfer the inservice Charging Pump to Train A per SOP-102.
- i.  Stop the running Train B Component Cooling Water Pump in the off going active loop:
  - 1) XPP-0001B, PUMP B.
  - 2) XPP-0001C, PUMP C TRAIN B.
- j. Ensure XPP-58A(B)(C), CCBP A(B)(C) are aligned as follows (MCB):
  - 1) One pump is in AUTO and operating.
  - 2) One pump is in AUTO and not operating.
  - 3) One pump is in OFF.

2.4 Establish Train B as the active loop as follows:

- a. Ensure MVB-9503B, CC TO RHR HX B, is open.
- b. Start one of the following in slow speed: **(PEER ✓)**
  - 1) XPP-0001B, PUMP B.
  - 2) XPP-0001C, PUMP C TRAIN B.

CAUTION 2.4.c and 2.4.d

Failure to complete Step 2.4.d in a timely manner after reducing RHR Heat Exchanger flow will result in a loss of flow through the running CCW Pump or excessive flow perturbations in the CCW non-essential loop.

- c. Start MVB-9503B, CC TO RHR HX B, stroking in the closed direction. **(PEER ✓)**
- d. When flow, as indicated on FI-7044, HX B FLOW GPM, is between 5000 gpm and 4000 gpm, perform the following in rapid succession:
  - 1) Open MVB-9687B/9525B, LP B NON-ESSEN LOAD ISOL.
  - 2) Open MVB-9524B/9526B, LP B NON-ESSEN LOAD ISOL.
  - 3) Close MVB-9524A/9526A, LP A NON-ESSEN LOAD ISOL.
  - 4) Close MVB-9687A/9525A, LP A NON-ESSEN LOAD ISOL.
  - 5) Open MVB-9503A, CC TO RHR HX A.
- e. If XPP-0001C, PUMP C, is the standby pump on Train B, perform the following:
  - 1) Rack in XSW1DB 11, CC PUMP C XPP0001C-CC CCW PUMP C to complete Attachment VB.
  - 2) Place XPP-0001C, PUMP C, TRAIN B in After-Stop.
- f. Locally verify greater than 1 gpm sample flow on RML0002B, LIQUID RAD MON COMPONENT COOLING (IB-412).

Step 2.4 continued

g. Ensure the following valves have not automatically closed due to high flow:

- 1) MVG-9625, CC TO RB.
- 2) MVG-9626, CC TO RB.
- 3) MVG-9583, FROM XS LTDN HX.
- 4) MVT-9593A(B)(C), FROM RCP A(B)(C) THERM BARR.

h. Transfer the inservice Charging Pump to Train B per SOP-102.

i. Stop the running Train A Component Cooling Water Pump in the off going active loop:

- 1) XPP-0001A, PUMP A.
- 2) XPP-0001C, PUMP C TRAIN A.

j. Ensure XPP-58A(B)(C), CCBP A(B)(C) are aligned as follows (MCB):

- 1) One pump is in AUTO and operating.
- 2) One pump is in AUTO and not operating.
- 3) One pump is in OFF.

OA 9741  2.5 Place the CCW/CHG pump warning tag on the running Component Cooling Water Pump Switch.

CHG  
E

**END OF SECTION**

Persons completing checklist (print) _____ _____ _____ _____	Initials _____ _____ _____ _____	<b>COMPONENT COOLING          PUMP C TO TRAIN B</b>  <b>LINEUP</b>
Reviewed by SS/CRS _____	Date/Time _____ / _____	Date/Time started _____ / _____  Date/Time completed _____ / _____

Component Cooling Pump C to Train B Lineup Initial Conditions				
Positioning the following components to the REQUIRED POSITION prepares Component Cooling Water Pump C for service aligned to Train B.				
COMPONENT	DESCRIPTION	REQUIRED POSITION	INITIALS	VERIFIERS INITIALS
412' INTERMEDIATE BUILDING				
XVB09523A-CC	LOOP A CC XCONN INLET HEADER VALVE	CLOSED		
XVB09523D-CC	LOOP A CC XCONN INLET HEADER ISOL VALVE	CLOSED		
XVB09521-CC	LOOP A CC PUMP C SUCTION XCONN VALVE	CLOSED		
XVB09522-CC	LOOP A CC PUMP C SUCTION XCONN VALVE	CLOSED		
XVB09519-CC	LOOP B CC PUMP C SUCTION XCONN VALVE	OPEN		
XVB09520-CC	LOOP B CC PUMP C SUCTION XCONN VALVE	OPEN		
XVB09523B-CC	LOOP B CC XCONN INLET HEADER VALVE	OPEN		
XVB09523C-CC	LOOP B CC XCONN INLET HEADER ISOL VALVE	OPEN		

Component Cooling Pump C To Train B Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	INITIALS	VERIFIERS INITIALS
XSW1DA (463' INTERMEDIATE BUILDING)				
XSW1DA 07	CC PUMP C XPP0001C-CC	RACKED OUT		
XSW1DA 07 CCP	CLOSING CNTRL POWER XPP0001C-CC (RRP)	OFF		
XSW1DA 07 TCP	TRIPPING CNTRL POWER XPP0001C-CC (RRT)	OFF		
XET2001C (436' INTERMEDIATE BUILDING)				
XET2001C	COMP COOLING PUMP "C" TRANSFER SWITCHES "A" ("B") CHANNEL SOURCE XSW1DA (1DB)	SAFETY LOCKS REMOVED NOTE 2		<b>N/A</b>
XET2001C	COMP COOLING PUMP "C" TRANSFER SWITCH "A" CHANNEL SOURCE XSW1DA	OPEN NOTE 1		
XET2001C	COMP COOLING PUMP "C" TRANSFER SWITCH "B" CHANNEL SOURCE XSW1DB	CLOSED NOTE 1		
XET2001C	COMP COOLING PUMP "C" TRANSFER SWITCHES "A" ("B") CHANNEL SOURCE XSW1DA (1DB)	SAFETY LOCKS INSTALLED NOTE 2		
XSW1DB (436' INTERMEDIATE BUILDING)				
XSW1DB 11	CC PUMP C XPP0001C-CC	RACKED IN		
XSW1DB 11 CCP	CLOSING CNTRL POWER XPP0001C-CC (RRP)	ON		
XSW1DB 11 TCP	TRIPPING CNTRL POWER XPP0001C-CC (RRT)	ON		

CHG  
E

CHG  
E

OA  
9224

NOTE 1: When transferring XET-2001C between trains, both Pump C switches should be in PULL-TO-LOCK.

NOTE 2: Operations Safety Lock Keys are located as follows:

- 1) CRS Keybox (CB-463).
- 2) FEP Keybox (IB-436).

d.

# ***V.C. SUMMER NUCLEAR STATION JOB PERFORMANCE MEASURE***

***JPM NO: JPSF-065***

***ESTABLISH HOT LEG INJECTION DURING LOSS  
OF RHR AT MID-LOOP CONDITIONS***

***APPROVAL: WRQ APPROVAL DATE: 6/12/2009***

***REV NO: 6***

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

***THIS JPM IS APPROVED***

**TASK:**

000-083-05-01

RESPOND TO LOSS OF RESIDUAL HEAT REMOVAL SYSTEM WHILE AT MID-LOOP CONDITIONS

**TASK STANDARD:**

SI flow verified on FI-940, CHG LOOP A CLD/HOT LG FLOW.

**TERMINATING CUE:** SI flow verified on FI-940.

**PREFERRED EVALUATION LOCATION**

**PREFERRED EVALUATION METHOD**

SIMULATOR

PERFORM

**REFERENCES:** AOP-115.5

LOSS OF RESIDUAL HEAT REMOVAL SYSTEM W LOOP CONDITIONS

<i>INDEX NO.</i>	<i>K/A NO.</i>		<i>RO</i>	<i>SRO</i>
000025A120	AA1.20	HPI pump control switch, indicators, ammeter running lights, and flow meter	2.6	2.5

**TOOLS:** AOP-115.5

**EVALUATION TIME** 10 **TIME CRITICAL** No **10CFR55:** 45(a)7; 41(

TIME START: \_\_\_\_\_ TIME FINISH: \_\_\_\_\_ PERFORMANCE TIME: \_\_\_\_\_

**PERFORMANCE RATING:** SAT: \_\_\_\_\_ UNSAT: \_\_\_\_\_

**EXAMINER:** \_\_\_\_\_  
SIGNATURE DATE

## ***INSTRUCTIONS TO OPERATOR***

### **READ TO OPERATOR:**

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant is in Mode 5 with RCS at mid-loop conditions and RHR Loop "B" as the inservice loop. Due to lowering hot leg level, the Crew entered AOP-115.1 and transitioned to AOP-115.5.

Present conditions are:

- RCS hot leg level is low.
- Core Exit TC temperatures are > 200°F and increasing.

***INITIATING CUES:*** The CRS directs the NROATC to establish hot leg injection in accordance with AOP-115.5, Attachment 2.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP:** 1

**CUES:**

**CR SEQ**

No Yes Check if a Charging Pump is available.

**STEP STANDARD:**

Operator locates and determines Charging Pump "B" running; red light ON and green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 2

**CUES:**

**CR SEQ**

Yes Yes Stop any running Charging Pump.

**STEP STANDARD:**

Operator locates and places Charging Pump "B" control switch in STOP; verifies green light ON and red light OFF

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 3

**CUES:**

**NOTE:** Only one of the valves must be closed to satisfy step.

**CR SEQ**

Yes Yes Close MVG-8107 and MVG-8108, CHG LINE ISOL.

**STEP STANDARD:**

Operator locates and places MVG-8107 and/or MVG- 8108 control switches in CLOSE; verifies green lights ON and red lights OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 4

**CUES:**

**CR SEQ**

No Yes Align Charging Loop A to the RCS Hot Legs:  
a. Ensure all of the following are closed:  
- MVG-8885, CHG LP A ALT TO COLD LEGS.

**STEP STANDARD:**

Operator locates and checks MVG-8885 closed; green light ON and red light OFF

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 5

**CUES:**

**CR SEQ**

No Yes Align Charging Loop A to the RCS Hot Legs:  
a. Ensure all of the following are closed:  
- MVG-8801A(B), HI HEAD TO COLD LEG INJ.

**STEP STANDARD:**

Operator locates and checks MVG-8801A & B closed; verifies green lights ON and red lights OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 6

**CUES:**

**CR SEQ**

Yes Yes Open MVG-8884, CHG LP A TO HOT LEGS.

**STEP STANDARD:**

Operator locates and places TRN A PWR LCKOUT switch to ON.

Operator locates and places MVG-8884 control switch to OPEN; verifies red light ON and green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 7**

**CUES:**

**CR SEQ**

Yes Yes Close MVG-8106, CHG PP, Miniflow Isolation.

**STEP STANDARD:**

Operator locates and places MVG-8106 in CLOSE; verifies green light ON and red light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 8**

**CUES:**

**CR SEQ**

Yes Yes Close MVT-8105, SEAL WTR INJ ISOL.

**STEP STANDARD:**

Operator locates and places MVT-8105 control switch in CLOSE; verifies green light ON and red light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 9**

**CUES:**

**CR SEQ**

Yes Yes Start one Charging Pump.

**STEP STANDARD:**

Operator locates and places Charging Pump "B" control switch in START; verifies red light ON and green light OFF; verifies pump amps normal.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 10

**CUES:**

**NOTE:** JPM may be terminated any time after SI flow is verified.

**CR SEQ**

No Yes Verify SI flow on FI-940, CHG LOOP A  
CLD/HOT LG FLOW GPM.

**STEP STANDARD:**

Operator locates and verifies SI flow  
indicated on FI-940.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

Examiner ends JPM at this point.

## JPM SETUP SHEET

**JPM NO:** JPSF-065

**DESCRIPTION:** ESTABLISH HOT LEG INJECTION DURING LOSS OF RHR AT MID-LOOP CONDITIONS

**IC SET:** 20

**INSTRUCTIONS:**

1. Activate

MAL-RHR (???) RHR Pump Recirc Leak Leak SEVERITY = ????

OVR-AA028 SELECT = TRUE ???

2. RUN

3. Perform actions of AOP-115.1, Step 1.

4. Perform actions of AOP-115.5, Step 1 and Steps 11 - 17.

5. When Core Exit TC temperature is > 200°F, then

6. FREEZE

7. When student is ready: RUN

**COMMENTS:**

## *JPM BRIEFING SHEET*

### *OPERATOR INSTRUCTIONS:*

### *SAFETY CONSIDERATIONS:*

*INITIAL CONDITION:* The plant is in Mode 5 with RCS at mid-loop conditions and RHR Loop "B" as the inservice loop. Due to lowering hot leg level, the Crew entered AOP-115.1 and transitioned to AOP-115.5.

Present conditions are:

- RCS hot leg level is low.
- Core Exit TC temperatures are > 200°F and increasing.

*INITIATING CUES:* The CRS directs the NROATC to establish hot leg injection in accordance with AOP-115.5, Attachment 2.

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

ESTABLISHING HOT LEG INJECTION

AOP-115.5  
 REVISION 5  
 ATTACHMENT 2  
 PAGE 1 OF 3

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 Check if a Charging Pump is available. <input type="checkbox"/>	1 <u>IF no</u> Charging Pump is available, <input type="checkbox"/> <u>THEN GO TO Step 13.</u>
2 Stop <u>any</u> running Charging Pump. <input type="checkbox"/>	
3 Close MVG-8107 and MVG-8108, CHG LINE ISOL. <input type="checkbox"/>	
4 Align Charging Loop A to the RCS Hot Legs: a. Ensure <u>all</u> of the following are closed: • MVG-8885, CHG LP A ALT TO COLD LEGS. <input type="checkbox"/> • MVG-8801A(B), HI HEAD TO COLD LEG INJ. <input type="checkbox"/> b. Open MVG-8884, CHG LP A TO HOT LEGS. <input type="checkbox"/> c. Close MVG-8106, CHG PP, Miniflow Isolation. <input type="checkbox"/> d. Close MVT-8105, SEAL WTR INJ ISOL. <input type="checkbox"/>	
5 Start <u>one</u> Charging Pump. <input type="checkbox"/>	5 GO TO Step 13. <input type="checkbox"/>
6 Verify SI flow on FI-940, CHG LOOP A CLD/HOT LG FLOW GPM. <input type="checkbox"/>	6 GO TO Step 8. <input type="checkbox"/>
7 GO TO Step 15. <input type="checkbox"/>	
8 Stop <u>any</u> running Charging Pump. <input type="checkbox"/>	

ESTABLISHING HOT LEG INJECTION

AOP-115.5  
 REVISION 5  
 ATTACHMENT 2  
 PAGE 2 OF 3

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>9 <b>Establish Hot Leg Injection flow Loop B to the RCS:</b></p> <p>a. Close MVG-8884, CHG LP A TO HOT LEGS. <input type="checkbox"/></p> <p>b. Open MVG-8886, CHG LP B TO HOT LEGS. <input type="checkbox"/></p>	
<p>10 <b>Start <u>one</u> Charging Pump.</b> <input type="checkbox"/></p>	<p>10 <b>GO TO Step 13.</b> <input type="checkbox"/></p>
<p>11 <b>Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.</b> <input type="checkbox"/></p>	<p>11 Stop <u>any</u> running Charging Pump. <input type="checkbox"/>  <b>GO TO Step 13.</b> <input type="checkbox"/></p>
<p>12 <b>GO TO Step 15.</b> <input type="checkbox"/></p>	
<p>13 <b>Align RHR Loop A for gravity feed from the RWST to the RCS Hot Legs:</b></p> <p>a. Close MVG-8886, CHG LP B TO HOT LEGS. <input type="checkbox"/></p> <p>b. Close MVG-8701A and MVG-8702A, RCS LP A TO PUMP A. <input type="checkbox"/></p> <p>c. Close MVG-8888A, RHR LP A TO COLD LEGS. <input type="checkbox"/></p> <p>d. Close MVG-8887B, RHR LP B TO HOT LEGS. <input type="checkbox"/></p> <p>e. Open MVG-8809A, RWST TO RHR PP A. <input type="checkbox"/></p> <p>f. Open MVG-8889, RHR LP A&amp;B TO HOT LEGS. <input type="checkbox"/></p> <p>g. Ensure HCV-603A, A OUTLET, is open. <input type="checkbox"/></p> <p>h. Ensure FCV-605A, A BYP, is open. <input type="checkbox"/></p>	<p>13 <b>Align RHR Loop B for gravity feed from the RWST to the RCS Hot Legs:</b></p> <p>a) Close MVG-8886, CHG LP B TO HOT LEGS. <input type="checkbox"/></p> <p>b) Close MVG-8701B and MVG-8702B, RCS LP C TO PUMP B. <input type="checkbox"/></p> <p>c) Close MVG-8888B, RHR LP B TO COLD LEGS. <input type="checkbox"/></p> <p>d) Close MVG-8887A, RHR LP A TO HOT LEGS. <input type="checkbox"/></p> <p>e) Open MVG-8809B, RWST TO RHR PP B. <input type="checkbox"/></p> <p>f) Open MVG-8889, RHR LP A&amp;B TO HOT LEGS. <input type="checkbox"/></p> <p>g) Ensure HCV-603B, B OUTLET, is open. <input type="checkbox"/></p> <p>h) Ensure FCV-605B, B BYP, is open. <input type="checkbox"/></p>

ESTABLISHING HOT LEG INJECTION

AOP-115.5  
 REVISION 5  
 ATTACHMENT 2  
 PAGE 3 OF 3

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>14 <b>Monitor RCS MIDLOOP LEVEL MONITORING:</b></p> <ul style="list-style-type: none"> <li>• LR-1330, LP A LVL INCHES (L-1330). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331). <input type="checkbox"/></li> </ul> <p>15 Restore RCS Hot Leg level to <b><u>GREATER THAN OR EQUAL TO</u></b> 15.5 inches. <input type="checkbox"/></p> <p>16 <b>RETURN TO Procedure Steps, Step 19.</b> <input type="checkbox"/></p>	<p>14 Monitor RCS Hot Leg level:</p> <ul style="list-style-type: none"> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• Video monitor. <input type="checkbox"/></li> </ul>

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

**NUCLEAR OPERATIONS**

**COPY NO.** \_\_\_\_\_

ABNORMAL OPERATING PROCEDURE

AOP-115.5

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

REVISION 5

SAFETY RELATED

Original signed by Baker                      10/06/03  
DISCIPLINE SUPERVISOR                      DATE

Original signed by Lippard                      10/06/03  
APPROVAL AUTHORITY                      DATE

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLED DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLED DATE
A	P	01/09/07					

CONTINUOUS USE

Continuous Use of Procedure Required.  
Read Each Step Prior to Performing.

**DOCUMENT REVIEW FORM**

Page 1 of \_\_\_\_

Document Identification							
Originators Name: LATHREN		Ext: 55547		Mail Code: 410			
Date: 11/13/06		Document No.: AOP-115.5		Revision No.: 5		Change Letter: A	
Title: LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)						X SR <input type="checkbox"/> QR <input type="checkbox"/> NNS	
Development Process: Permanent: (check one) <input checked="" type="checkbox"/> Normal Rev/Chg or <input type="checkbox"/> Editorial Correction <input type="checkbox"/> Temporary Approval							
Description: INCORPORATED MODE 6 INTO TITLE FOR CORRECT APPLICABILITY; ADDED STEP 13.d TO STOP WORK ON SECONDARY SYSTEMS THAT ARE PROTECTED BY RCS TEMPERATURE PARAMETER TAGS; CHANGED ORDER OF STEP 17 ALTERNATIVE ACTION TO ESTABLISH HOT LEG INJECTION PRIOR TO COLD LEG INJECTION; ADDED ALTERNATIVE ACTION TO STEP 22.c TO ESTABLISH HOT LEG INJECTION AND THEN COLD LEG INJECTION WHEN CORE EXIT IS ABOVE 200°F; DELETED ALTERNATIVE ACTION FOR STEP 27 AND ADDED ALTERNATIVE ACTIONS TO RETURN TO STEP 23.j FOR CORE EXIT ABOVE 200°F AND RETURN TO STEP 23.d FOR RCS HOT LEG LEVEL DECREASING.							
Reason/Basis for Change: ERG MAINTENANCE DW-02-004 AND PROCEDURE FEEDBACKS. Is the SCOPE of the procedure affected by this change? NO <input type="checkbox"/> YES <input checked="" type="checkbox"/> 1-15-7							
Temporary Approval				Final approval required by: (30 days)			
QR		DC&R (Person Notified)		SS		Date	
Document Reviewers (Enclosure C)							
Required	Position	Type/Print Name	Comments Yes/No	*Additional	Position	Type/Print Name	Comments Yes/No
	QR (OPS)						
		iv...	<input type="checkbox"/> <input checked="" type="checkbox"/>				<input type="checkbox"/> <input type="checkbox"/>
	SE	CHRISTOPHER	<input type="checkbox"/> <input checked="" type="checkbox"/>				<input type="checkbox"/> <input type="checkbox"/>
	NT	Quirk	<input type="checkbox"/> <input checked="" type="checkbox"/>				<input type="checkbox"/> <input type="checkbox"/>
			<input type="checkbox"/> <input type="checkbox"/>				<input type="checkbox"/> <input type="checkbox"/>
			<input type="checkbox"/> <input type="checkbox"/>				<input type="checkbox"/> <input type="checkbox"/>
Concurrence: <u>Tastan</u> 11/15/06				Comment Due Date: 11/30/06			
Supervisor/Date							
Pre-implementation Actions							
All Comments Resolved		<input checked="" type="checkbox"/> Yes		Originator/Date: <u>11/28/06</u>			
Commitments Addressed per SAP-0630		<input checked="" type="checkbox"/> NA		<input type="checkbox"/> Yes, P/CAP # _____		<input type="checkbox"/> MLSA _____	
50.59 Applicability/Review Completed (SAP-0107)		<input checked="" type="checkbox"/> NA		<input type="checkbox"/> Yes, Attached		Initial/Date	
Pre-implementation Training Completed		<input checked="" type="checkbox"/> NA		<input type="checkbox"/> Yes			
Training required after implementation		<input checked="" type="checkbox"/> NA		<input type="checkbox"/> Yes, CER # _____			
PSRC Review Completed		<input checked="" type="checkbox"/> NA		<input type="checkbox"/> Yes, Mtg. No. _____			
NSRC Review Completed		<input checked="" type="checkbox"/> NA		<input type="checkbox"/> Yes, Mtg. No. _____			
Other:		<input checked="" type="checkbox"/> NA		<input type="checkbox"/> Yes			
Supervisor/Date: <u>11/29/06</u>				Approval Authority/Date: <u>1-9-07</u>			

\* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

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LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

REFERENCES

1. Tech Specs 3.9.7.1 and 3.9.7.2.
2. FSAR 5.5.7.
3. DBD, Residual Heat Removal System.
4. SOP-115, Residual Heat Removal.
5. E-302-641.
6. Abnormal Response Guideline ARG-1, Loss Of RHR At Mid-Loop Conditions.
7. TWR-DG10894, Tab M43, D.Gatlin.

COMMITMENTS

1. C01 - NRC Generic Letter 88-17 (Recommended Actions): Step 15.

REVISION SUMMARY

Incorporated the use of the Mansell Level Monitoring System and its use of RCS Hot Leg Level Elevation. Added Scope.

Change A incorporates Mode 6 into title for correct applicability. Added Step 13.d to stop work on secondary systems that are protected by RCS Temperature Parameter Tags. Per ERG Maintenance DW-02-004: In Step 17, Alternative Action, changed the order to establish Hot Leg Injection prior to Cold Leg Injection; In Step 22.c, added Alternative Action to establish Hot Leg Injection and then Cold Leg Injection when Core Exit is above 200°F; In Step 27, deleted Alternative Action for Step 27 and: Added Alternative Actions to return to Step 23.j for Core Exit above 200°F and return to Step 23.d for RCS Hot Leg level decreasing.

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

PURPOSE

This procedure provides actions for maintaining core cooling and protecting the Reactor core during a loss of Residual Heat Removal capability while the RCS is NOT intact.

SCOPE

The regulatory processes 10CFR50 Appendix B, 10CFR50.59, and SAP-630 apply to this procedure.

SYMPTOMS/ENTRY CONDITIONS

1. No RHR Pump is running.
2. Air-binding of the operating RHR Pump occurring as indicated by any of the following:
  - Erratic RHR PUMP A(B) amps.
  - Erratic RHR flow indicated on FI-605A(B), PUMP A(B) FLOW GPM.
  - Erratic RHR Pump A(B) discharge pressure indicated on PI-600A(B), PUMP A(B) PRESS PSIG.
  - Excessive RHR Pump noise.
  - RHR Pump cavitation.
3. RCS hot leg level elevation has decreased into the Region Of Unacceptable Operation of Attachment 6.
4. Increasing RCS temperature as indicated on core exit thermocouples.
5. Uncontrolled and significant loss of Reactor Coolant System inventory.
6. Attempts to restore RHR utilizing AOP-115.1, RHR PUMP VORTEXING, have been unsuccessful.
7. Other conditions exist that require tripping the RHR Pumps.
8. Any of the following Main Control Board annunciators in alarm:
  - RHR LOOP A FLO LO (XCP-610 1-2).
  - RHR LOOP B FLO LO (XCP-610 2-2).
  - RHR PP A TRIP (XCP-610 1-1).
  - RHR PP B TRIP (XCP-610 2-1).
9. Entered from the EOPs.

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<u>OPERATOR ACTIONS</u>	
<p><u>NOTE</u></p> <ul style="list-style-type: none"> <li>• Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.</li> <li>• RCS pressure changes could result in erroneous RCS level indication when monitoring RCS level elevation with the Sight Glass. If PZR Surgeline Flooding occurs, Sight Glass <u>AND</u> PZR may indicate level while the core uncovers.</li> <li>• Correlation between the Mansell Level Monitoring System, Sight Glass, RVLIS indication, and Midloop Monitoring, including important corresponding RCS elevations, is provided in Attachment 5. This Attachment should be used when monitoring RCS Hot Leg level using the Sight Glass or RVLIS.</li> </ul>	
<p>① Stop <u>any</u> RCS boron dilution in progress. <input type="checkbox"/></p> <p>* 2 Monitor RCS heatup/cooldown:</p> <ul style="list-style-type: none"> <li>• Monitor TR-413, HOT LEG °F WIDE RNG. <input type="checkbox"/></li> <li>• Implement STP-103.001, REACTOR COOLANT SYSTEM AND PRESSURIZER HEATUP/COOLDOWN SURVEILLANCE. <input type="checkbox"/></li> </ul> <p>3 Determine and correct the cause of <u>any</u> RHR Pump trip. <input type="checkbox"/></p>	

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 4</u></p> <ul style="list-style-type: none"> <li>• Previously operating RHR Pump A(B) should only be started after the cause of pump trip has been determined and corrected.</li> <li>• Starting an RHR Pump may result in an RCS level decrease due to shrink or void collapse.</li> </ul>	
<p>4 Start <u>any</u> available RHR Pump A(B):</p> <p>a. Verify RCS Hot Leg level elevation is GREATER THAN <u>OR</u> EQUAL TO 430' 10" as indicated on the following:</p> <ul style="list-style-type: none"> <li>• Mansell Level Monitoring System. <input type="checkbox"/></li> <li>• Video Monitor. <input type="checkbox"/></li> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). <input type="checkbox"/></li> </ul> <p>b. Check if RHR Loop A(B) is aligned to the RCS:</p> <ul style="list-style-type: none"> <li>• MVG-8701A(B), RCS LP A(C) TO PUMP A(B), is open. <input type="checkbox"/></li> <li>• MVG-8702A(B), RCS LP A(C) TO PUMP A(B), is open. <input type="checkbox"/></li> <li>• MVG-8888A(B), RHR LP A(B) TO COLD LEGS, is open. <input type="checkbox"/></li> </ul> <p>c. Close HCV-603A(B), A(B) OUTLET. <input type="checkbox"/></p> <p>d. Throttle FCV-605A(B), A(B) BYP, to 40%. <input type="checkbox"/></p> <p>e. Place PCV-145, LO PRESS LTDN, in MAN. <input type="checkbox"/></p> <p>f. Ensure Component Cooling Water is supplied to RHR Loop A(B). <input type="checkbox"/></p> <p>g. Start XPP-0031A(B), PUMP A(B). <input type="checkbox"/></p> <p>(Step 4 continued on next page)</p>	<p>4 GO TO Step 11. <input type="checkbox"/></p> <p>(Step 4 continued on next page)</p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>(Step 4 continued)</p> <p>h. Ensure XPP-0031A(B), PUMP A(B), amps decay to between 260 amps and 300 amps within <u>one</u> minute. <input type="checkbox"/></p> <p>i. Maintain RHR Pump flow within Mid-Loop operating limits. REFER TO Attachment 6, REQUIRED RCS HOT LEG LEVEL ELEVATION VS RHR FLOW. <input type="checkbox"/></p> <p>j. Operate RHR Loop A(B). REFER TO SOP-115, RESIDUAL HEAT REMOVAL. <input type="checkbox"/></p> <p>5 Verify at least <u>one</u> RHR Pump is running. <input type="checkbox"/></p> <p>6 Verify core exit TC temperatures are stable <u>OR</u> decreasing. <input type="checkbox"/></p>	<p>(Step 4 continued)</p> <p>h. Perform the following:</p> <p>1) Stop XPP-0031A(B), PUMP A(B). <input type="checkbox"/></p> <p>2) <u>IF</u> the other RHR loop is available, <u>THEN RETURN TO Step 4.a.</u> <input type="checkbox"/></p> <p><u>IF</u> the other RHR loop is <u>NOT</u> available, <u>THEN GO TO Step 11.</u> <input type="checkbox"/></p> <p>5 <u>IF no</u> RHR Pump can be started, <u>THEN GO TO Step 11.</u> <input type="checkbox"/></p> <p>6 REFER TO SOP-115, RESIDUAL HEAT REMOVAL, to establish RCS cooldown:</p> <p>a) Control the operating RHR loop to establish desired RCS cooldown. <input type="checkbox"/></p> <p>b) Maintain RCS cooldown rate LESS THAN 50°F/hr. <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 7</u></p> <p>If the standby RHR train has been started, the Letdown return header from the standby RHR train will need to be aligned.</p>	
<p><b>7 Establish RHR Letdown:</b></p> <p>a. Locally align the Letdown return header (AB-412):</p> <p>1) Ensure XVT08720A(B)-RH, LETDOWN HDR RH RETURN HDR A(B) INLET VALVE, for the operating RHR train is open. <input type="checkbox"/></p> <p>2) Ensure XVT08720B(A)-RH, LETDOWN HDR RH RETURN HDR B(A) INLET VALVE, for the standby RHR train is closed. <input type="checkbox"/></p> <p>b. Close PCV-145, LO PRESS LTDN. <input type="checkbox"/></p> <p>c. Open HCV-142, LTDN FROM RHR. <input type="checkbox"/></p> <p>d. Monitor FI-150, LO PRESS LTDN FLOW GPM. <input type="checkbox"/></p> <p>e. Adjust PCV-145, LO PRESS LTDN, to obtain desired Letdown flow. <input type="checkbox"/></p> <p><b>8 Restore RCS level to the desired level for plant conditions.</b> <input type="checkbox"/></p> <p><b>9 Restore RCS temperature:</b></p> <p>a. Maintain RCS cooldown rate LESS THAN 50° F/hr. <input type="checkbox"/></p> <p>b. Decrease RCS temperature to the pre-event value. <input type="checkbox"/></p> <p><b>10 RETURN TO the Procedure and Step in effect.</b> <input type="checkbox"/></p>	<p><b>7 Establish CVCS Letdown. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.</b> <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><b>11 Isolate RCS Letdown and drainage paths:</b></p> <p>a. Close PVT-8149A(B)(C), LTDN ORIFICE A(B)(C) ISOL Valves. <input type="checkbox"/></p> <p>b. Close LCV-459 and LCV-460, LTDN LINE ISOL. <input type="checkbox"/></p> <p>c. Close PVT-8153 and PVT-8154, XS LTDN ISOL. <input type="checkbox"/></p> <p>d. Close HCV-142, LTDN FROM RHR. <input type="checkbox"/></p> <p>e. Close <u>any</u> known RCS drain path which can be closed from the Main Control Board. <input type="checkbox"/></p>	
<p><b>12 Align Charging Pump suction to the RWST:</b></p> <p>a. Open LCV-115B, RWST TO CHG PP SUCT. <input type="checkbox"/></p> <p>b. Open LCV-115D, RWST TO CHG PP SUCT. <input type="checkbox"/></p> <p>c. Close LCV-115C(E), VCT OUTLET ISOL. <input type="checkbox"/></p>	

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 13</u></p> <p>Reactor Building supervisory personnel must remain in the vicinity of the RB airlock to assist with containment closure.</p>	
<p>13 <b>Alert plant personnel:</b></p> <p>a. Announce plant conditions over the page system. <input type="checkbox"/></p> <p>b. Depress <u>both</u> REACTOR BLDG EVACUATION Pushbuttons. <input type="checkbox"/></p> <p>c. Repeat the announcement. <input type="checkbox"/></p> <p>d. Notify Outage Management and Operations Tagging Desk to stop <u>all</u> work on secondary systems that are protected by RCS Temperature Parameter Tags. <input type="checkbox"/></p> <p>*14 <b>Monitor Reactor Building radiation levels.</b> <input type="checkbox"/></p> <p>15 <b>Establish Containment Integrity within <u>two</u> hours:</b></p> <p>a. REFER TO STP-147.001, REACTOR BUILDING PENETRATION TEST. <input type="checkbox"/></p> <p>b. Close <u>all</u> RB penetrations providing direct access from the RB atmosphere to the outside atmosphere. <input type="checkbox"/></p> <p>16 <b>Start <u>all</u> available RBCUs. REFER TO SOP-114, REACTOR BUILDING VENTILATION SYSTEM.</b> <input type="checkbox"/></p>	

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p style="text-align: center;"><u>CAUTION - Step 17</u></p> <ul style="list-style-type: none"> <li>• Failure to warn personnel in the RB working on or near RCS openings prior to refilling the RCS may cause contamination of personnel.</li> <li>• To ensure adequate Shutdown Margin is maintained, only borated water sources should be used for RCS makeup.</li> </ul>	
<p style="text-align: center;"><u>NOTE - Step 17</u></p> <p>Step 17 should be used for re-diagnosis if core exit TC temperature increases during the performance of this procedure.</p>	
<p>*17 Check core exit TC temperatures LESS THAN 200°F. <input type="checkbox"/></p>	<p>*17 GO TO ATTACHMENT 2, ESTABLISHING HOT LEG INJECTION. <input type="checkbox"/></p> <p>IF core exit TC temperatures continue to increase, THEN GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION. <input type="checkbox"/></p> <p>GO TO Step 19. <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 18</u></p> <p>Step 18 should <u>NOT</u> be performed with core exit TC temperatures GREATER THAN 200°F.</p>	
<p>18 Check RCS level:</p> <p>a. Verify RCS Hot Leg level elevation is GREATER THAN <u>OR</u> EQUAL TO 430' 0" as indicated on the following:</p> <ul style="list-style-type: none"> <li>• Mansell Level Monitoring System. <input type="checkbox"/></li> <li>• Video Monitor. <input type="checkbox"/></li> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• LR-1330, LP A LVL INCHES (L-1330) (5.5 inches). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331) (5.5 inches). <input type="checkbox"/></li> </ul> <p>b. Verify RCS Hot Leg level elevation is GREATER THAN <u>OR</u> EQUAL TO 430' 10" as indicated on the following:</p> <ul style="list-style-type: none"> <li>• Mansell Level Monitoring System. <input type="checkbox"/></li> <li>• Video Monitor. <input type="checkbox"/></li> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). <input type="checkbox"/></li> </ul> <p>19 Identify and isolate <u>any</u> RCS leakage paths. <input type="checkbox"/></p>	<p>a. GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION. <input type="checkbox"/></p> <p>b. GO TO ATTACHMENT 3, ESTABLISHING RCS MAKEUP. <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 20</u></p> <p>To maintain RCS pressure low enough for gravity feed, at least <u>two</u> Steam Generators must be refilled and utilized.</p>	
<p>20 <b>Check if a secondary heat sink is available:</b></p> <p>a. Check if the RCS pressure boundary is intact. <input type="checkbox"/></p> <p>b. Check if at least <u>two</u> Steam Generators are available:</p> <ul style="list-style-type: none"> <li>• Steam Generators are <u>NOT</u> isolated by nozzle dams. <input type="checkbox"/></li> <li>• Steam Generator levels are maintained <u>GREATER THAN OR EQUAL TO 15% Wide Range.</u> <input type="checkbox"/></li> </ul> <p>21 <b>Establish a secondary heat sink:</b></p> <p>a. Establish Emergency Feedwater flow. <b>REFER TO SOP-211, EMERGENCY FEEDWATER SYSTEM.</b> <input type="checkbox"/></p> <p>b. Maintain SG Narrow Range levels between 30% and 60%. <input type="checkbox"/></p> <p>c. Fully open available SG Steamline Power Relief Valves. <input type="checkbox"/></p>	<p>20 <b>GO TO Step 22.</b> <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>*22 <b>Check if RHR can be restored:</b></p> <p>a. Verify RCS Hot Leg level elevation is <u>GREATER THAN OR EQUAL TO 430' 10"</u> as indicated on the following:</p> <ul style="list-style-type: none"> <li>• Mansell Level Monitoring System. <input type="checkbox"/></li> <li>• Video Monitor. <input type="checkbox"/></li> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). <input type="checkbox"/></li> </ul> <p>b. An RHR Pump is available for operation. <input type="checkbox"/></p> <p>c. Core exit TCs are <u>LESS THAN 200°F</u>. <input type="checkbox"/></p>	<p>*22 <u>WHEN</u> conditions are met to restore an RHR loop to service, <u>THEN CONTINUE WITH Step 23</u>. Observe the <u>NOTE</u> prior to <u>Step 23</u>.</p> <p><u>IF</u> RHR can <u>NOT</u> be restored, <u>THEN</u> perform the following:</p> <p>a) Start trending core exit TCs. <input type="checkbox"/></p> <p>b) <b>GO TO Step 25</b>. Observe the <b>NOTE</b> prior to <b>Step 25</b>. <input type="checkbox"/></p> <p>c. <b>GO TO ATTACHMENT 2, ESTABLISHING HOT LEG INJECTION</b>. <input type="checkbox"/></p> <p><u>IF</u> core exit TC temperatures continue to increase, <u>THEN GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION</u>. <input type="checkbox"/></p> <p><b>GO TO Step 24</b>. <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 23</u></p> <p>Starting an RHR Pump may result in an RCS level decrease due to shrink or void collapse.</p>	
<p>23 <b>Attempt to restore <u>one</u> RHR Loop A(B) to service:</b></p> <p>a. Verify <u>both</u> of the following:</p> <ul style="list-style-type: none"> <li>• XPP-0031A(B), PUMP A(B), is available. <input type="checkbox"/></li> <li>• RHR Loop A(B) is <u>NOT</u> being used for gravity feed to the RCS. <input type="checkbox"/></li> </ul> <p>b. Ensure Component Cooling Water is supplied to RHR Loop A(B). <input type="checkbox"/></p> <p>c. Align RHR Loop A(B) flow path:</p> <ol style="list-style-type: none"> <li>1) Open MVG-8888A(B), RHR LP A(B) TO COLD LEGS. <input type="checkbox"/></li> <li>2) Open MVG-8701A(B), RCS LP A(C) TO PUMP A(B). <input type="checkbox"/></li> <li>3) Open MVG-8702A(B), RCS LP A(C) TO PUMP A(B). <input type="checkbox"/></li> <li>4) Close HCV-603A(B), A(B) OUTLET. <input type="checkbox"/></li> <li>5) Close FCV-605A(B), A(B) BYP. <input type="checkbox"/></li> </ol> <p>(Step 23 continued on next page)</p>	<p>a. <b>GO TO Step 25.</b> Observe the <b>NOTE</b> prior to <b>Step 25.</b> <input type="checkbox"/></p> <p>(Step 23 continued on next page)</p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
(Step 23 continued)	(Step 23 continued)
<p><u>NOTE - Step 23.d</u></p> <ul style="list-style-type: none"> <li>• If venting is required, RCS Hot Leg level elevation should be maintained <b>GREATER THAN OR EQUAL TO 430' 10"</b> (15.5 inches) while venting RHR.</li> <li>• If venting is required and time is <b>NOT</b> available to completely vent the RHR Loop, air may be swept from the RHR lines by filling the RCS Hot Legs to <b>GREATER THAN 431' 10 1/2"</b> (28 inches) and increasing RHR flow to <b>GREATER THAN 2600 gpm</b>.</li> </ul>	
<p>d. Verify the RHR RCS Hot Leg level elevation is <b>GREATER THAN OR EQUAL TO 430' 10"</b> as indicated on the following:</p> <ul style="list-style-type: none"> <li>• Mansell Level Monitoring System. <input type="checkbox"/></li> <li>• Video Monitor. <input type="checkbox"/></li> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). <input type="checkbox"/></li> </ul> <p>e. Throttle FCV-605A(B), A(B) BYP. to 40%. <input type="checkbox"/></p> <p>f. Start XPP-0031A(B), PUMP A(B). <input type="checkbox"/></p> <p>(Step 23 continued on next page)</p>	<p>d. Vent RHR Loop A(B). <b>REFER TO STP-105.006, SAFETY INJECTION/RESIDUAL HEAT REMOVAL MONTHLY FLOWPATH VERIFICATION TEST.</b> <input type="checkbox"/></p> <p>(Step 23 continued on next page)</p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>(Step 23 continued)</p> <p>g. Ensure XPP-0031A(B) PUMP A(B) <input type="checkbox"/>            amps decay to between 260 amps            and 300 amps within <u>one</u> minute.</p> <p>h. Maintain RHR Pump flow within <input type="checkbox"/>            Mid-Loop operating limits.  <b>REFER TO ATTACHMENT 6, REQUIRED            RCS HOT LEG LEVEL VS RHR FLOW.</b></p> <p>i. Gradually increase RHR bypass <input type="checkbox"/>            flow by throttling FCV-605A(B),            A(B) BYP, to the desired flow.</p> <p>j. Operate RHR Loop A(B). <input type="checkbox"/> <b>REFER            TO SOP-115, RESIDUAL HEAT            REMOVAL</b>, to establish desired            RCS cooldown.</p>	<p>(Step 23 continued)</p> <p>g. Perform the following:</p> <p>1) Stop XPP-0031A(B), PUMP <input type="checkbox"/>            A(B).</p> <p>2) <u>IF</u> the other RHR loop is <input type="checkbox"/>  <u>available, THEN RETURN TO</u>  <b>Step 22</b> to restore the other            RHR loop.</p> <p><u>IF</u> the other RHR loop is <u>NOT</u>  <u>available, THEN</u> perform the            following:</p> <p>a) Start trending core exit <input type="checkbox"/>            TCs.</p> <p>b) <b>GO TO Step 25.</b> Observe <input type="checkbox"/>            the <b>NOTE</b> prior to  <b>Step 25.</b></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 24</u></p> <p>If the standby RHR train was started in <b>Step 23</b>, the Letdown return header from the standby RHR train will need to be aligned.</p>	
<p>24 <b>Establish RHR Letdown:</b></p> <p>a. Locally align the Letdown return header (AB-412):</p> <p>1) Ensure XVT08720A(B)-RH, LETDOWN HDR RH RETURN HDR A(B) INLET VALVE, for the operating RHR train is open. <input type="checkbox"/></p> <p>2) Ensure XVT08720B(A)-RH, LETDOWN HDR RH RETURN HDR B(A) INLET VALVE, for the standby RHR train is closed. <input type="checkbox"/></p> <p>b. Close PCV-145, LO PRESS LTDN. <input type="checkbox"/></p> <p>c. Open HCV-142, LTDN FROM RHR. <input type="checkbox"/></p> <p>d. Monitor FI-150, LO PRESS LTDN FLOW GPM. <input type="checkbox"/></p> <p>e. Adjust PCV-145, LO PRESS LTDN, to obtain desired Letdown flow. <input type="checkbox"/></p>	<p>24 Establish CVCS Letdown. REFER TO <input type="checkbox"/>  <b>SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.</b></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE - Step 25</u></p> <p>Overflow from RCS openings into the Reactor Building may be returned to the RWST by utilizing the RB Spray System.</p>	
<p>*25 <b>Transfer RB Sump water to the RWST:</b></p> <p>a. Check if RWST level is LESS THAN 18%. <input type="checkbox"/></p> <p>b. Monitor RHR Sump levels to maintain GREATER THAN 413 ft:</p> <ul style="list-style-type: none"> <li>• LI-1969, RHR A LEVEL FEET. <input type="checkbox"/></li> <li>• LI-1970, RHR B LEVEL FEET. <input type="checkbox"/></li> </ul> <p>c. Transfer RB Sump water to the RWST using RB Spray Train A:</p> <ol style="list-style-type: none"> <li>1) Place XPP0038A, PUMP A, in PULL TO LK NON-A. <input type="checkbox"/></li> <li>2) Locally rack in XSW1DA 11, RB SPRAY PUMP XPP0038A-SP (IB-463). <input type="checkbox"/></li> <li>3) Close MVG-3001A, RWST TO SPRAY PUMP A SUCT. <input type="checkbox"/></li> <li>4) Close MVG-3002A, NAOH TO SPRAY PUMP A SUCT. <input type="checkbox"/></li> <li>5) Close MVG-3003A, SPRAY HDR ISOL LOOP A. <input type="checkbox"/></li> <li>6) Locally unlock and open XVT03010A-SP, RB SPRAY PUMP A TEST HEADER DISCH VALVE (AB-374). <input type="checkbox"/></li> <li>7) Locally open XVG03011-SP, RB SPRAY PUMP FULL FLOW TEST ISOL VALVE (AB-374). <input type="checkbox"/></li> </ol> <p>(Step 25 continued on next page)</p>	<p>a. <u>IF</u> RWST level decreases to LESS THAN 18%, <u>THEN COMPLETE</u> Steps 25 and 26. <input type="checkbox"/></p> <p><b>GO TO Step 27.</b> <input type="checkbox"/></p> <p>c. Transfer RB Sump water to the RWST using RB Spray Train B:</p> <ol style="list-style-type: none"> <li>1) Place XPP0038B, PUMP B, in PULL TO LK NON-A. <input type="checkbox"/></li> <li>2) Locally rack in XSW1DB 06, RB SPRAY PUMP XPP0038B-SP (IB-436). <input type="checkbox"/></li> <li>3) Close MVG-3001B, RWST TO SPRAY PUMP B SUCT. <input type="checkbox"/></li> <li>4) Close MVG-3002B, NAOH TO SPRAY PUMP B SUCT. <input type="checkbox"/></li> <li>5) Close MVG-3003B, SPRAY HDR ISOL LOOP B. <input type="checkbox"/></li> <li>6) Locally unlock and open XVT03010B-SP, RB SPRAY PUMP B TEST HEADER DISCH VALVE (AB-374). <input type="checkbox"/></li> <li>7) Locally open XVG03011-SP, RB SPRAY PUMP FULL FLOW TEST ISOL VALVE (AB-374). <input type="checkbox"/></li> </ol> <p>(Step 25 continued on next page)</p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>(Step 25 continued)</p> <p>8) Transfer water as follows:</p> <p>a) Open <u>both</u> MVG-3004A and MVG-3005A, SUMP ISOL LOOP A. <input type="checkbox"/></p> <p>b) Start XPP0038A, PUMP A. <input type="checkbox"/></p> <p>c) <u>WHEN</u> RHR Sump level is <u>LESS THAN 413 ft.</u> <u>THEN</u> stop RB Sump water transfer:</p> <p>(1) Place XPP0038A, PUMP A, in PULL TO LK NON-A. <input type="checkbox"/></p> <p>(2) Close MVG-3004A and MVG-3005A, SUMP ISOL LOOP A. <input type="checkbox"/></p> <p>d. <b>REPEAT Step 25.c.8)</b> as necessary to maintain RHR Sump level at 413 ft. <input type="checkbox"/></p>	<p>(Step 25 continued)</p> <p>8) Transfer water as follows:</p> <p>a) Open <u>both</u> MVG-3004B and MVG-3005B, SUMP ISOL LOOP B. <input type="checkbox"/></p> <p>b) Start XPP0038B, PUMP B. <input type="checkbox"/></p> <p>c) <u>WHEN</u> RHR Sump level is <u>LESS THAN 413 ft.</u> <u>THEN</u> stop RB Sump water transfer:</p> <p>(1) Place XPP0038B, PUMP B, in PULL TO LK NON-A. <input type="checkbox"/></p> <p>(2) Close MVG-3004B and MVG-3005B, SUMP ISOL LOOP B. <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>26 <b>Maintain RWST temperature LESS THAN 140°F:</b></p> <p>a. Monitor RWST temperature:</p> <ul style="list-style-type: none"> <li>• TI-7505, TEMP °F. <input type="checkbox"/></li> <li>• TI-7507, TEMP °F. <input type="checkbox"/></li> </ul> <p>b. Locally align Spent Fuel Cooling to maintain RWST temperature LESS THAN 140°F:</p> <p>1) Verify XPP0032B-SF, SPENT FUEL PIT COOLING PUMP B (AB-412), is stopped. <input type="checkbox"/></p> <p>2) Verify XPP0014, Spent Fuel Purification Pump (AB-412), is stopped. <input type="checkbox"/></p> <p>3) Close the following:</p> <ul style="list-style-type: none"> <li>• XVG06661-SF, SF COOLING PUMP B SF POOL HDR ISOL VLV (AB-388). <input type="checkbox"/></li> <li>• XVG06667-SF, SF HDR B CASK LOADING AREA ISOL VALVE (AB-388). <input type="checkbox"/></li> <li>• XVG06663-SF, SPENT FUEL HEADER B DISCH ISOL VALVE (AB-388). <input type="checkbox"/></li> <li>• XVG06660-SF, SPENT FUEL POOL OUTLET HDR ISOL VALVE (AB-412). <input type="checkbox"/></li> <li>• XVG06665-SF, SPENT FUEL COOLING PUMP B SUCT ISOL VLV (AB-412). <input type="checkbox"/></li> <li>• XVD06690-SF, SPENT FUEL PURIFICATION HDR ISOL VALVE (AB-436). <input type="checkbox"/></li> <li>• XVG06668-SF, FUEL TRANSFER CANAL SF HDR ISOL VALVE (FB-436). <input type="checkbox"/></li> </ul> <p>(Step 26 continued on next page)</p>	<p>1) Stop XPP0032B-SF, SPENT FUEL PIT COOLING PUMP B. REFER TO SOP-123, SPENT FUEL COOLING SYSTEM. <input type="checkbox"/></p> <p>2) Stop XPP0014, Spent Fuel Purification Pump. REFER TO SOP-123, SPENT FUEL COOLING SYSTEM. <input type="checkbox"/></p> <p>(Step 26 continued on next page)</p>



LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>(Step 26 continued)</p> <p>7) Ensure Spent Fuel Cooling Loop A is aligned to cool the Spent Fuel Pool. <b>REFER TO SOP-123, SPENT FUEL COOLING SYSTEM.</b> <input type="checkbox"/></p> <p>27 <b>Check if RCS makeup flow can be reduced:</b></p> <p>a. Verify core exit thermocouples temperatures are LESS THAN 200°F. <input type="checkbox"/></p> <p>b. Ensure RCS Hot Leg level elevation is stable or increasing. <input type="checkbox"/></p> <p>c. Verify RHR cooling is restored. <input type="checkbox"/></p> <p>28 <b>Reduce RCS makeup:</b></p> <p>a. <b>REFER TO ATTACHMENT 4, REDUCING RCS MAKEUP.</b> <input type="checkbox"/></p> <p>b. Verify RCS Hot Leg level elevation is stable or increasing. <input type="checkbox"/></p>	<p>(Step 26 continued)</p> <p>a. Continue cooling with RHR. <b>RETURN TO Step 23.j.</b> <input type="checkbox"/></p> <p>b. <b>RETURN TO Step 23.d.</b> <input type="checkbox"/></p> <p>b. Perform the following:</p> <p>1) Establish RCS makeup flow. <b>REFER TO ATTACHMENT 3, ESTABLISHING RCS MAKEUP.</b> <input type="checkbox"/></p> <p>2) <b>GO TO Step 32.</b> <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>29 <b>Secure RWST Cooling:</b></p> <p>a. Verify RWST temperature is LESS THAN 100°F. <input type="checkbox"/></p> <p>b. Locally stop XPP0032B-SF, SPENT FUEL PIT COOLING PUMP B (AB-412). <input type="checkbox"/></p> <p>c. Locally close the following:</p> <ul style="list-style-type: none"> <li>• XVG06662-SF, REFUEL WTR STG TK SPENT FUEL ISOL VALVE (RWST PIT). <input type="checkbox"/></li> <li>• XVT06691-SF, SF PURIFICATION HEADER THROTTLE VALVE (RWST PIT). <input type="checkbox"/></li> <li>• XVD06694-SF, SF PUR HDR HYDRO TEST HEADER ISOL VALVE (RWST PIT). <input type="checkbox"/></li> <li>• XVG06664-SF, REFUEL WTR STG TK SF HDR B SUCT ISOL (AB-412). <input type="checkbox"/></li> <li>• XVG06651-SF, SPENT FUEL COOLING PUMP B SUCTION VALVE (AB-412). <input type="checkbox"/></li> <li>• XVD06692-SF, SF PUR HDR SF HEADER B SUP ISOL VALVE (AB-388). <input type="checkbox"/></li> </ul>	<p>a. <u>WHEN</u> RWST temperature is LESS THAN 100°F, <u>THEN COMPLETE</u> Steps 29 and 30. <input type="checkbox"/></p> <p><b>RETURN TO Step 5.</b> <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>30 <b>Ensure <u>both</u> trains of RB Spray are realigned to normal:</b></p> <p>a. Verify RB Sump level is LESS THAN 413 ft. <input type="checkbox"/></p> <p>b. Realign RB Spray Train A to normal:</p> <p>1) Place XPP0038A, PUMP A, in PULL TO LK NON-A. <input type="checkbox"/></p> <p>2) Close MVG-3004A and MVG-3005A, SUMP ISOL LOOP A. <input type="checkbox"/></p> <p>3) Locally close XVG03011-SP, RB SPRAY PUMP FULL FLOW TEST ISOL VALVE (AB-374). <input type="checkbox"/></p> <p>4) Locally close and lock XVT03010A-SP, RB SPRAY PUMP A TEST HEADER DISCH VALVE (AB-374). <input type="checkbox"/></p> <p>5) Open MVG-3001A, RWST TO SPRAY PUMP A SUCT. <input type="checkbox"/></p> <p>6) Locally rack out XSW1DA 11, RB SPRAY PUMP XPP0038A-SP (IB-463). <input type="checkbox"/></p>	<p>a. <u>WHEN</u> RB Sump level is LESS THAN 413 ft, <u>THEN COMPLETE Step 32.</u> <input type="checkbox"/></p> <p><b>RETURN TO Step 5.</b> <input type="checkbox"/></p> <p>b. Realign RB Spray Train B to normal:</p> <p>1) Place XPP0038B, PUMP B, in PULL TO LK NON-A. <input type="checkbox"/></p> <p>2) Close MVG-3004B and MVG-3005B, SUMP ISOL LOOP B. <input type="checkbox"/></p> <p>3) Locally close XVG03011-SP, RB SPRAY PUMP FULL FLOW TEST ISOL VALVE (AB-374). <input type="checkbox"/></p> <p>4) Locally close and lock XVT03010B-SP, RB SPRAY PUMP B TEST HEADER DISCH VALVE (AB-374). <input type="checkbox"/></p> <p>5) Open MVG-3001B, RWST TO SPRAY PUMP B SUCT. <input type="checkbox"/></p> <p>6) Locally rack out XSW1DB 06, RB SPRAY PUMP XPP0038B-SP (IB-436). <input type="checkbox"/></p>
<p>31 <b>RETURN TO Step 5.</b> <input type="checkbox"/></p>	
<p>32 <b>Verify core exit TC temperatures are stable <u>OR</u> decreasing.</b> <input type="checkbox"/></p>	<p>32 Establish RCS cooldown:</p> <p>a) Operate an RHR loop. <b>REFER TO SOP-115, RESIDUAL HEAT REMOVAL.</b> <input type="checkbox"/></p> <p>b) Maintain RCS cooldown rate LESS THAN 50°F/hr. <input type="checkbox"/></p>

LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>33 <b>Restore RCS temperature to LESS THAN 140°F:</b></p> <p>a. Maintain RCS cooldown rate LESS THAN 50°F/hr. <input type="checkbox"/></p> <p>b. Operate an RHR loop to continue RCS cooldown. REFER TO SOP-115, RESIDUAL HEAT REMOVAL. <input type="checkbox"/></p> <p>c. Cool down the RCS to LESS THAN 140°F. <input type="checkbox"/></p>	
<p>34 <b>Maintain RCS Hot Leg level elevation GREATER THAN OR EQUAL TO 430' 10" as indicated on the following:</b></p> <ul style="list-style-type: none"> <li>• Mansell Level Monitoring System. <input type="checkbox"/></li> <li>• Video Monitor. <input type="checkbox"/></li> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). <input type="checkbox"/></li> </ul>	
<p>35 <b>Maintain injection flow until <u>either</u> of the following conditions exist:</b></p> <ul style="list-style-type: none"> <li>• Cause for loss of RCS inventory has been determined and corrected. <input type="checkbox"/></li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• Pressurizer level is GREATER THAN OR EQUAL TO 50% on LI-462, COLD CAL LEVEL %. <input type="checkbox"/></li> </ul>	
<p>36 <b>Consult with TSC personnel to determine further actions.</b> <input type="checkbox"/></p>	
<p>-----   End of AOP-115.5   -----</p>	

ESTABLISHING COLD LEG INJECTION

AOP-115.5  
 REVISION 5  
 ATTACHMENT 1  
 PAGE 1 OF 2

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 Check if a Charging Pump is running. <input type="checkbox"/>	1 Start <u>one</u> Charging Pump. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM. <input type="checkbox"/>  IF a Charging Pump can <u>NOT</u> be started, <u>THEN GO TO Step 7.</u> <input type="checkbox"/>
2 Close MVG-8107 and MVG-8108, CHG LINE ISOL. <input type="checkbox"/>	
3 Align Charging to the RCS Cold Legs: a. Open MVG-8801A(B), HIGH HEAD TO COLD LEG INJ. <input type="checkbox"/> b. Verify Cold Leg Injection flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. <input type="checkbox"/> c. Close MVG-8106, CHG PP, Miniflow Isolation. <input type="checkbox"/>	3 Align Alternate Charging to the RCS Cold Legs: a) Stop <u>any</u> running Charging Pump. <input type="checkbox"/> b) Ensure <u>both</u> MVG-8801A(B), HIGH HEAD TO COLD LEG INJ, are closed. <input type="checkbox"/> c) Open MVG-8885, CHG LP A ALT TO COLD LEGS. <input type="checkbox"/> d) Close MVG-8106, CHG PP, Miniflow Isolation. <input type="checkbox"/> e) Close MVT-8105, SEAL WTR INJ ISOL. <input type="checkbox"/> f) Start <u>one</u> Charging Pump. <input type="checkbox"/>
4 Verify Cold Leg Injection flow: • FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. <input type="checkbox"/> <p style="text-align: center;"><u>OR</u></p> • FI-940, CHG LOOP A CLD/HOT LG FLOW GPM. <input type="checkbox"/>	4 Stop <u>any</u> running Charging Pump. <input type="checkbox"/> GO TO Step 7. <input type="checkbox"/>
5 Restore RCS Hot Leg level to <u>GREATER THAN OR EQUAL TO</u> 15.5 inches. <input type="checkbox"/>	
6 RETURN TO Procedure Steps, Step 17. <input type="checkbox"/>	

ESTABLISHING COLD LEG INJECTION

AOP-115.5  
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ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>7 <b>Align RHR Loop A for gravity feed from the RWST to the RCS Cold Legs:</b></p> <p>a. Close MVG-8701A and MVG-8702A, RCS LP A TO PUMP A. <input type="checkbox"/></p> <p>b. Close MVG-8887B, RHR LP B TO HOT LEGS. <input type="checkbox"/></p> <p>c. Open MVG-8809A, RWST TO RHR PP A. <input type="checkbox"/></p> <p>d. Open MVG-8888A, RHR LP A TO COLD LEGS. <input type="checkbox"/></p> <p>e. Ensure HCV-603A, A OUTLET, is open. <input type="checkbox"/></p> <p>f. Ensure FCV-605A, A BYP, is open. <input type="checkbox"/></p>	<p>7 Align RHR Loop B for gravity feed from the RWST to the RCS Cold Legs:</p> <p>a) Close MVG-8701B and MVG-8702B, RCS LP C TO PUMP B. <input type="checkbox"/></p> <p>b) Close MVG-8887A, RHR LP A TO HOT LEGS. <input type="checkbox"/></p> <p>c) Open MVG-8809B, RWST TO RHR PP B. <input type="checkbox"/></p> <p>d) Open MVG-8888B, RHR LP B TO COLD LEGS. <input type="checkbox"/></p> <p>e) Ensure HCV-603B, B OUTLET, is open. <input type="checkbox"/></p> <p>f) Ensure FCV-605B, B BYP, is open. <input type="checkbox"/></p>
<p>8 <b>Monitor RCS MIDLOOP LEVEL MONITORING:</b></p> <ul style="list-style-type: none"> <li>• LR-1330, LP A LVL INCHES (L-1330). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331). <input type="checkbox"/></li> </ul>	<p>8 Monitor RCS Hot Leg level:</p> <ul style="list-style-type: none"> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• Video monitor. <input type="checkbox"/></li> </ul>
<p>9 <b>Restore RCS Hot Leg level to GREATER THAN <u>OR</u> EQUAL TO 15.5 inches.</b> <input type="checkbox"/></p>	
<p>10 <b>RETURN TO Procedure Steps, Step 17.</b> <input type="checkbox"/></p>	

ESTABLISHING RCS MAKEUP

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 REVISION 5  
 ATTACHMENT 3  
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ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 Check if a Charging Pump is running. <input type="checkbox"/>	1 Start <u>one</u> Charging Pump. REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM. <input type="checkbox"/>  IF a Charging Pump can <u>NOT</u> be started, <u>THEN GO TO Step 7.</u> <input type="checkbox"/>
2 Throttle open FCV-122, CHG FLOW, to increase RCS Hot Leg level. <input type="checkbox"/>	
3 Monitor RCS MIDLOOP LEVEL MONITORING: • LR-1330, LP A LVL INCHES (L-1330). <input type="checkbox"/> • LR-1331, LP C LVL INCHES (L-1331). <input type="checkbox"/>	3 Monitor RCS Hot Leg level: • Sight Glass (local). <input type="checkbox"/> • Video monitor. <input type="checkbox"/>
4 Verify RCS Hot Leg level is increasing. <input type="checkbox"/>	4 GO TO Step 7. <input type="checkbox"/>
5 Restore RCS Hot Leg level to GREATER THAN <u>OR EQUAL TO</u> 15.5 inches. <input type="checkbox"/>	
6 RETURN TO Procedure Steps, Step 19. <input type="checkbox"/>	

ESTABLISHING RCS MAKEUP

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ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>7 <b>Align RHR Loop A for gravity feed from the RWST to the RCS Cold Legs:</b></p> <p>a. Close MVG-8701A and MVG-8702A, RCS LP A TO PUMP A. <input type="checkbox"/></p> <p>b. Close MVG-8887B, RHR LP B TO HOT LEGS. <input type="checkbox"/></p> <p>c. Open MVG-8809A, RWST TO RHR PP A. <input type="checkbox"/></p> <p>d. Open MVG-8888A, RHR LP A TO COLD LEGS. <input type="checkbox"/></p> <p>e. Ensure HCV-603A, A OUTLET, is open. <input type="checkbox"/></p> <p>f. Ensure FCV-605A, A BYP, is open. <input type="checkbox"/></p>	<p>7 Align RHR Loop B for gravity feed from the RWST to the RCS Cold Legs:</p> <p>a) Close MVG-8701B and MVG-8702B, RCS LP C TO PUMP B. <input type="checkbox"/></p> <p>b) Close MVG-8887A, RHR LP A TO HOT LEGS. <input type="checkbox"/></p> <p>c) Open MVG-8809B, RWST TO RHR PP B. <input type="checkbox"/></p> <p>d) Open MVG-8888B, RHR LP B TO COLD LEGS. <input type="checkbox"/></p> <p>e) Ensure HCV-603B, B OUTLET, is open. <input type="checkbox"/></p> <p>f) Ensure FCV-605B, B BYP, is open. <input type="checkbox"/></p>
<p>8 <b>Monitor RCS MIDLOOP LEVEL MONITORING:</b></p> <ul style="list-style-type: none"> <li>• LR-1330, LP A LVL INCHES (L-1330). <input type="checkbox"/></li> <li>• LR-1331, LP C LVL INCHES (L-1331). <input type="checkbox"/></li> </ul>	<p>8 Monitor RCS Hot Leg level:</p> <ul style="list-style-type: none"> <li>• Sight Glass (local). <input type="checkbox"/></li> <li>• Video monitor. <input type="checkbox"/></li> </ul>
<p>9 <b>Restore RCS Hot Leg level to GREATER THAN <u>OR</u> EQUAL TO 15.5 inches.</b> <input type="checkbox"/></p>	
<p>10 <b>RETURN TO Procedure Steps, Step 19.</b> <input type="checkbox"/></p>	

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 Check if a Charging Pump is running. <input type="checkbox"/>	1 GO TO Step 9. <input type="checkbox"/>
2 Check if Charging is aligned for Hot Leg Injection: <input type="checkbox"/> <ul style="list-style-type: none"> <li>• MVG-8884 or MVG-8886, CHG LP A(B) TO HOT LEGS, is open. <input type="checkbox"/></li> <li>• SI flow is indicated on FI-940 or FI-943, CHG LOOP A(B) CLD/HOT LG FLOW GPM. <input type="checkbox"/></li> </ul>	2 GO TO Step 7. <input type="checkbox"/>
3 Terminate Hot Leg Injection: <ul style="list-style-type: none"> <li>a. Stop <u>any</u> running Charging Pump. <input type="checkbox"/></li> <li>b. Open <u>both</u> LCV-115C(E), VCT OUTLET ISOL. <input type="checkbox"/></li> <li>c. Close <u>both</u> LCV-115B(D), RWST TO CHG PP SUCT. <input type="checkbox"/></li> <li>d. Close FCV-122, CHG FLOW. <input type="checkbox"/></li> <li>e. Open <u>both</u> MVG-8107 and MVG-8108, CHG LINE ISOL. <input type="checkbox"/></li> <li>f. Open MVG-8106, CHG PP, Miniflow Isolation. <input type="checkbox"/></li> <li>g. Close MVG-8884, CHG LP A TO HOT LEGS. <input type="checkbox"/></li> <li>h. Close MVG-8886, CHG LP B TO HOT LEGS. <input type="checkbox"/></li> <li>i. Start <u>one</u> Charging Pump. <input type="checkbox"/></li> <li>j. Adjust FCV-122, CHG FLOW, to obtain 60 gpm Charging flow. <input type="checkbox"/></li> </ul>	
4 Monitor RCS level. <input type="checkbox"/>	
5 Verify RCS level is stable or increasing. <input type="checkbox"/>	5 GO TO ATTACHMENT 2, ESTABLISHING HOT LEG INJECTION. <input type="checkbox"/>

REDUCING RCS MAKEUP

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ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>6 RETURN TO Procedure Steps, Step 28. <input type="checkbox"/></p> <p>7 Check if Charging is aligned for Cold Leg Injection:</p> <p>a. <u>One</u> of the following valves is open:</p> <ul style="list-style-type: none"> <li>• MVG-8801A(B), HIGH HEAD TO COLD LEG INJ. <input type="checkbox"/></li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• MVG-8885, CHG LP A ALT TO COLD LEGS. <input type="checkbox"/></li> </ul> <p>b. SI flow is indicated on FI-940 or FI-943, CHG LOOP A(B) CLD/HOT LG FLOW GPM. <input type="checkbox"/></p>	<p>7 GO TO Step 12. <input type="checkbox"/></p>

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><b>8 Terminate Cold Leg Injection:</b></p> <p>a. Stop <u>any</u> running Charging Pump. <input type="checkbox"/></p> <p>b. Open <u>both</u> LCV-115C(E), VCT OUTLET ISOL. <input type="checkbox"/></p> <p>c. Close <u>both</u> LCV-115B(D), RWST TO CHG PP SUCT. <input type="checkbox"/></p> <p>d. Close FCV-122, CHG FLOW. <input type="checkbox"/></p> <p>e. Open <u>both</u> MVG-8107 and MVG-8108, CHG LINE ISOL. <input type="checkbox"/></p> <p>f. Open MVG-8106, CHG PP, Miniflow Isolation. <input type="checkbox"/></p> <p>g. Ensure <u>all</u> of the following are closed:</p> <ul style="list-style-type: none"> <li>• MVG-8801A(B), HIGH HEAD TO COLD LEG INJ. <input type="checkbox"/></li> <li>• MVG-8885, CHG LP A ALT TO COLD LEGS. <input type="checkbox"/></li> </ul> <p>h. Start <u>one</u> Charging Pump. <input type="checkbox"/></p> <p>i. Adjust FCV-122, CHG FLOW, to obtain 60 gpm Charging flow. <input type="checkbox"/></p>	
<p><b>9 Monitor RCS level.</b> <input type="checkbox"/></p>	
<p><b>10 Verify RCS level is stable or increasing.</b> <input type="checkbox"/></p>	<p><b>10 GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION.</b> <input type="checkbox"/></p>
<p><b>11 RETURN TO Procedure Steps, Step 28.</b> <input type="checkbox"/></p>	

REDUCING RCS MAKEUP

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ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>12 <b>Check if RHR Loop A is aligned for gravity feed to the RCS:</b></p> <p>a. XPP-0031A, PUMP A, is secured. <input type="checkbox"/></p> <p>b. MVG-8809A, RWST TO RHR PP A, is open. <input type="checkbox"/></p> <p>c. MVG-8701A and MVG-8702A, RCS LP A TO PUMP A, are closed. <input type="checkbox"/></p> <p>d. <u>One</u> of the following is open:</p> <ul style="list-style-type: none"> <li>• MVG-8888A, RHR LP A TO COLD LEGS. <input type="checkbox"/></li> <li>• MVG-8889, RHR LP A&amp;B TO HOT LEGS. <input type="checkbox"/></li> </ul>	<p>12 <b>GO TO Step 15.</b> <input type="checkbox"/></p>

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>13 <b>Realign RHR Loop A:</b></p> <p>a. Close <u>both</u> of the following:</p> <ul style="list-style-type: none"> <li>• MVG-8888A, RHR LP A TO COLD LEGS. <input type="checkbox"/></li> <li>• MVG-8889, RHR LP A&amp;B TO HOT LEGS. <input type="checkbox"/></li> </ul> <p>b. Monitor RCS level. <input type="checkbox"/></p> <p>c. Verify RCS level is stable or increasing. <input type="checkbox"/></p> <p>d. Close MVG-8809A, RWST TO RHR PP A. <input type="checkbox"/></p> <p>e. Open <u>both</u> MVG-8701A and MVG-8702A, RCS LP A TO PUMP A. <input type="checkbox"/></p> <p>f. Open MVG-8887B, RHR LP B TO HOT LEGS. <input type="checkbox"/></p> <p>g. Open MVG-8888A, RHR LP A TO COLD LEGS. <input type="checkbox"/></p> <p>h. Set FCV-605A, A BYP, to 40%. <input type="checkbox"/></p> <p>i. Open HCV-603A, A OUTLET. <input type="checkbox"/></p> <p>14 <b>RETURN TO Procedure Steps, Step 28.</b> <input type="checkbox"/></p>	<p>c. Perform the following:</p> <p>1) Open <u>one</u> of the following to reestablish gravity feed:</p> <ul style="list-style-type: none"> <li>• MVG-8888A, RHR LP A TO COLD LEGS. <input type="checkbox"/></li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• MVG-8889, RHR LP A&amp;B TO HOT LEGS. <input type="checkbox"/></li> </ul> <p>2) <b>RETURN TO Procedure Steps, Step 28.</b> <input type="checkbox"/></p>

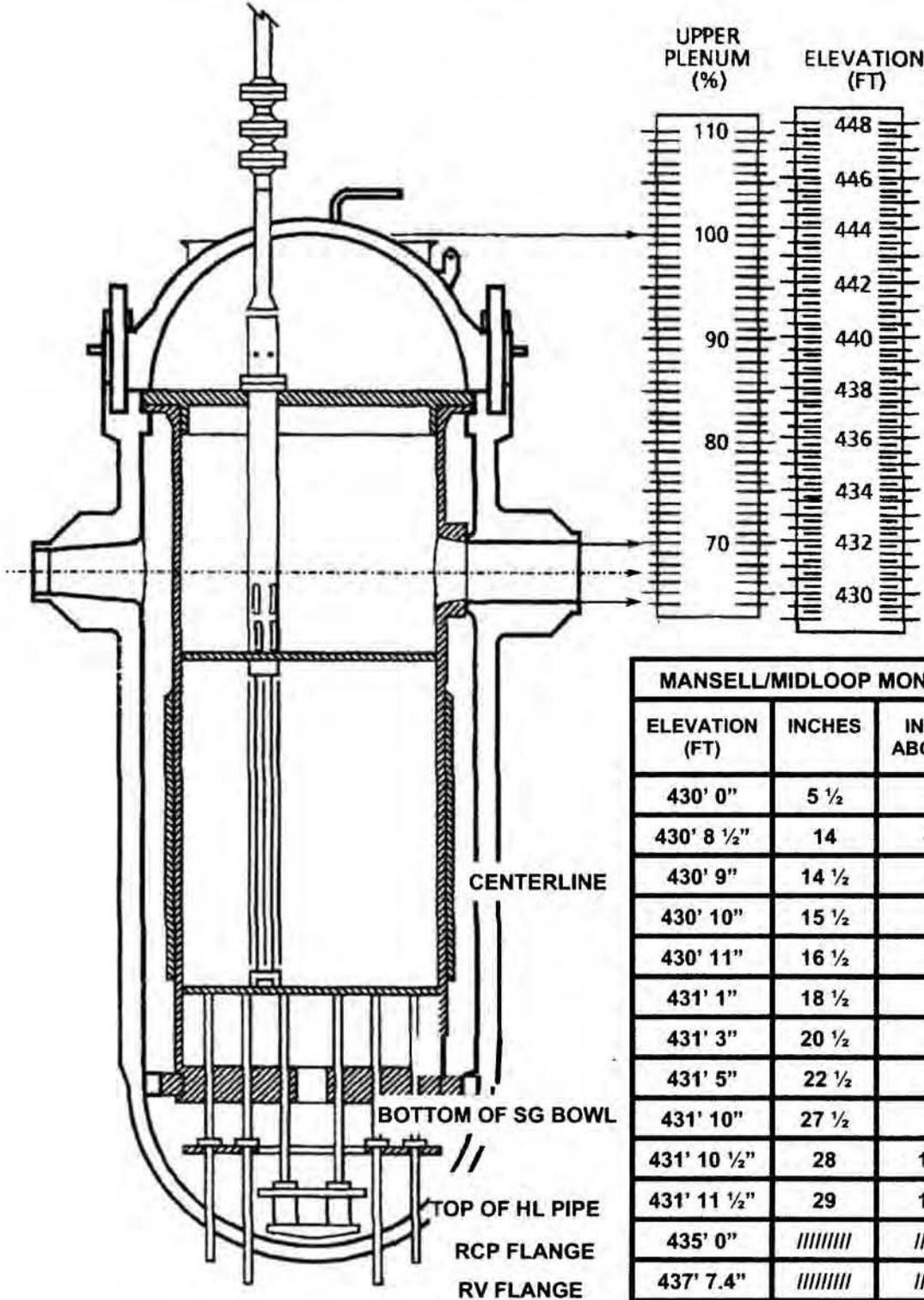
REDUCING RCS MAKEUP

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ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>15 <b>Check if RHR Loop B is aligned for gravity feed to the RCS:</b></p> <p>a. XPP-0031B, PUMP B, is OFF. <input type="checkbox"/></p> <p>b. MVG-8809B, RWST TO RHR PP B, is open. <input type="checkbox"/></p> <p>c. MVG-8701B and MVG-8702B, RCS LP C TO PUMP B, are closed. <input type="checkbox"/></p> <p>d. <u>One</u> of the following is open:</p> <ul style="list-style-type: none"> <li>• MVG-8888B, RHR LP B TO COLD LEGS. <input type="checkbox"/></li> <li>• MVG-8889, RHR LP A&amp;B TO HOT LEGS. <input type="checkbox"/></li> </ul>	<p>15 <b>RETURN TO Procedure Steps, Step 28.</b> <input type="checkbox"/></p>

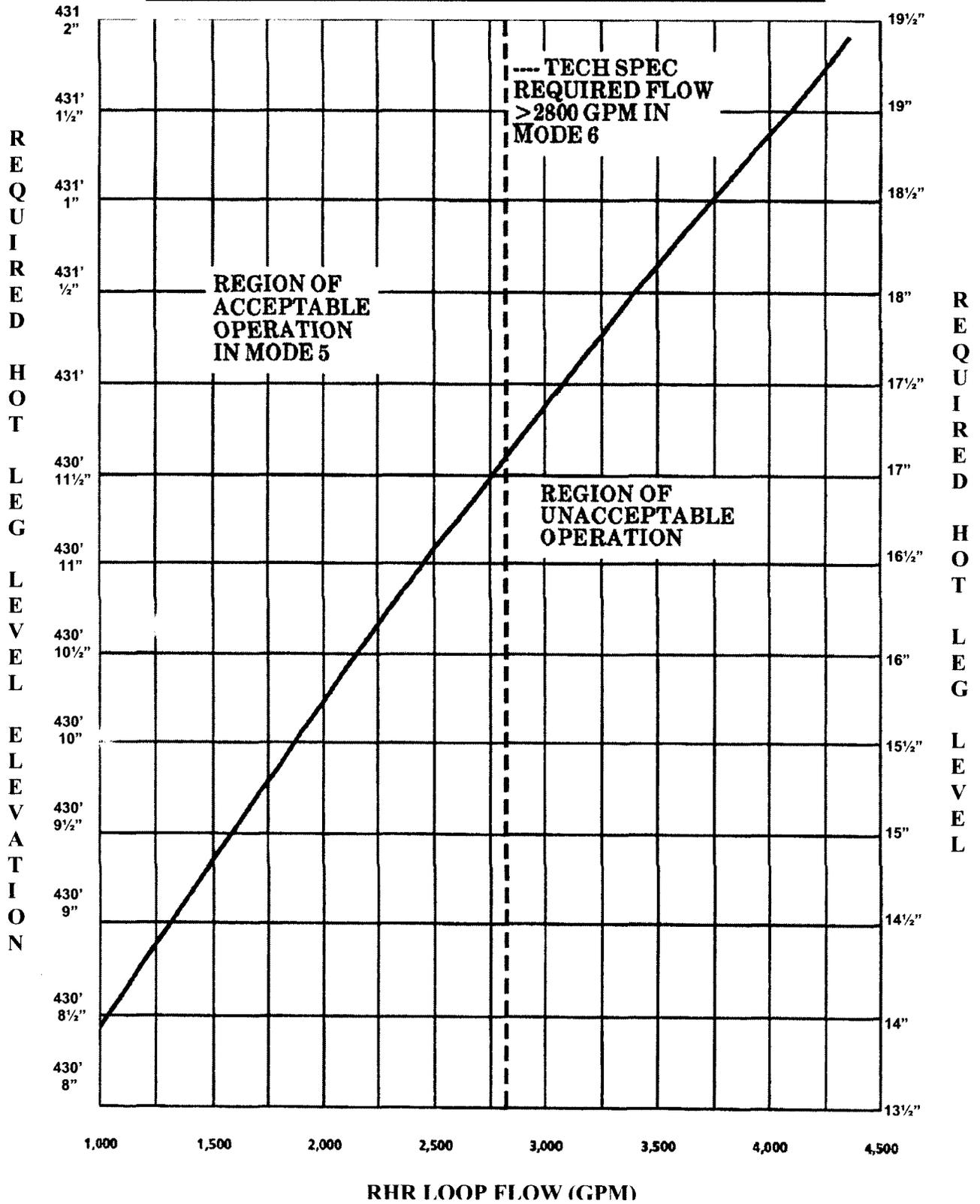
ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>16 <b>Realign RHR Loop B:</b></p> <p>a. Ensure <u>both</u> of the following are closed:</p> <p>1) MVG-8888B, <input type="checkbox"/>                      RHR LP B TO COLD LEGS.</p> <p>2) MVG-8889, <input type="checkbox"/>                      RHR LP A&amp;B TO HOT LEGS.</p> <p>b. Monitor RCS level. <input type="checkbox"/></p> <p>c. Verify RCS level is stable or increasing. <input type="checkbox"/></p> <p>d. Close MVG-8809B, <input type="checkbox"/>                      RWST TO RHR PP B.</p> <p>e. Open <u>both</u> MVG-8701B and <input type="checkbox"/>                      MVG-8702B, RCS LP C TO PUMP B.</p> <p>f. Open MVG-8887A, <input type="checkbox"/>                      RHR LP A TO HOT LEGS.</p> <p>g. Open MVG-8888B, <input type="checkbox"/>                      RHR LP B TO COLD LEGS.</p> <p>h. Set FCV-605B, B BYP, to 40%. <input type="checkbox"/></p> <p>i. Open HCV-603B, B OUTLET. <input type="checkbox"/></p> <p>17 <b>RETURN TO Procedure Steps, Step 28.</b> <input type="checkbox"/></p>	<p>c. Perform the following:</p> <p>1) Open <u>one</u> of the following to reestablish gravity feed:</p> <ul style="list-style-type: none"> <li>• MVG-8888B, <input type="checkbox"/>                      RHR LP B TO COLD LEGS.</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• MVG-8889, <input type="checkbox"/>                      RHR LP A&amp;B TO HOT LEGS.</li> </ul> <p>2) <b>RETURN TO Procedure Steps, Step 28.</b> <input type="checkbox"/></p>

RVLIS INDICATIONS



MANSELL/MIDLOOP MONITOR			RVLIS
ELEVATION (FT)	INCHES	INCHES ABOVE CL	UPPER PLENUM (%)
430' 0"	5 1/2	-9	65.3
430' 8 1/2"	14	-1/2	66.9
430' 9"	14 1/2	0	67.0
430' 10"	15 1/2	1	67.2
430' 11"	16 1/2	2	67.4
431' 1"	18 1/2	4	67.8
431' 3"	20 1/2	6	68.2
431' 5"	22 1/2	8	68.7
431' 10"	27 1/2	13	69.7
431' 10 1/2"	28	13 1/2	69.8
431' 11 1/2"	29	14 1/2	70.0
435' 0"	///////	///////	77.7
437' 7.4"	///////	///////	84.3

**REQUIRED RCS HOT LEG LEVEL ELEVATION VS RHR FLOW**



e.

**V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE**

**JPM NO: JPSF-022B**

**RESPOND TO TURBINE TRIP FAILURE (WITH SI  
REQUIRED)**

**APPROVAL: WRQ APPROVAL DATE: 6/12/2009**

**REVNO: 1**

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

**THIS JPM IS APPROVED**



## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant is at 25% power, steady state conditions.

***INITIATING CUES:*** You are the NROATC. The BOP is outside the Control Room. You are instructed to monitor the plant.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP: 1**

**CUES:**

**NOTE: All JPM steps are Immediate Operator Actions.**

**CR SEQ**

No Yes Verify Turbine/Generator Trip:  
a. Verify all Turbine STM STOP VLVs are closed.

**STEP STANDARD:**

Operator determines main turbine has NOT tripped; XCP-6114, Turbine STM STOP VLV status lights and/or LVDT current indicates stop valves still open.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP: 2**

**CUES:**

**CR SEQ**

No Yes Trip the turbine.

**STEP STANDARD:**

Operator locates and depresses TURBINE TRIP pushbutton; determines stop valves remain open and turbine is NOT tripped.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP: 3**

**CUES:**

**CR SEQ**

Yes Yes IF the Turbine will NOT trip, THEN:  
Set LOAD LMT SET fully Counterclockwise.

**STEP STANDARD:**

Operator locates and turns LOAD LMT SET fully counterclockwise.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP: 4**

**CUES:**

**NOTE:** Turbine trip is delayed until EHC pressure decreases below trip setpoint.

**CR SEQ**

Yes Yes IF the Turbine will NOT trip, THEN:  
Place EHC Pumps A and B in PULL TO LK  
NON-A.

**STEP STANDARD:**

Operator locates and places both EHC  
pump control switches in PULL TO LK  
NON-A; verifies green lights ON and red  
lights OFF.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP: 5**

**CUES:**

**CR SEQ**

Yes Yes IF the Turbine will NOT trip, THEN:  
Locally trip the Main Turbine from the  
Turbine Front Standard (TB-463).

**STEP STANDARD:**

Operator contacts and directs TB  
Operator to trip turbine locally; verifies  
main turbine trip indication via XCP-  
6114, Turbine STM STOP VLV closed  
status lights lit and/or LVDT meter  
readings.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP: 6**

**CUES:**

**NOTE:** If greater than 30 seconds, Operator may choose to open generator breakers manually  
from MCB.

**CR SEQ**

Yes Yes Ensure Generator Trip (after 30 second  
delay):  
1) Ensure the GEN BKR is open.  
2) Ensure the GEN FIELD BKR is open.  
3) Ensure the EXC FIELD CNTRL is tripped.

**STEP STANDARD:**

Operator locates and verifies GEN BKR  
and GEN FIELD BKR indicate OPEN;  
green light ON and red light OFF.  
Operator verifies EXC FIELD CNTRL is  
tripped; green light ON and red light  
OFF.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 7

**CUES:**

**CR SEQ**

No Yes Verify both ESF busses are energized.

**STEP STANDARD:**

Operator locates and verifies ESF busses 1DA & 1DB energized; verifies red lights ON and amps normal.

**COMMENTS:**

**SAT** .....

**UNSAT** \_\_\_\_\_

**STEP:** 8

**CUES:**

**CR SEQ**

Yes Yes Check if SI is actuated:

Check if either:

SI ACT status light is bright on XCP-6107 1-1.

OR

Any red first-out SI annunciator is lit on XCP-626 top row.

**STEP STANDARD:**

Operator checks SI ACT status light on XCP-6107 1-1 and determines it is NOT lit.

AND

checks XCP-626 top row and determines that a red first-out SI annunciator IS lit.

Operator determines that SI is NOT actuated and actuates SI using either SI ACTUATION Switch.

**COMMENTS:**

**SAT**

**UNSAT** .....

**STEP:** 9

**CUES:**

**CR SEQ**

No Yes Check if SI is required:

- Check if any of the following conditions exist:
- PZR pressure LESS THAN 1850 psig.
  - RB pressure GREATER THAN 3.6 psig.
  - Steamline pressure LESS THAN 675 psig.
  - Steamline differential pressure GREATER THAN 97 psid.

**STEP STANDARD:**

Operator determines SI is required based on PZR pressure less than 1850 psig.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP:** 10

**CUES:**

This should be accomplished by the end of Step 5 of EOP-1.0 if PZR pressure is already < 1850 psig. If >1850 psig at Step 5 of EOP-1.0, operator will transition to EOP-1.1, where the Reference Page SI criteria may be applied OR SI must be initiated by the end of Step 8 of EOP-1.1 if PZR pressure is < 1850 psig.

**CR SEQ**

Yes Yes Actuate SI using either SI ACTUATION Switch.

**STEP STANDARD:**

Operator locates and places either SI ACTUATION switch in Actuate; verifies SI actuated indicated on XCP-6107 1-1, SI ACT status light lit.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

Examiner ends JPM at this point.

## JPM SETUP SHEET

**JPM NO:** JPSF-022B

**DESCRIPTION:** RESPOND TO TURBINE TRIP FAILURE (WITH SI REQUIRED)

**IC SET:** 13

### **INSTRUCTIONS:**

1. RUN

2. Activate:

MAL-TUR020    SELECT= BOTH    (Turbine Trip Failure in auto and manual)

MAL-RCS006C    SET =    (???)    (RCS Cold Leg Loop 3)

MALF MSS006A    SET = Fail to Close    (MSIV 'A')

MALF MSS006B    SET = Fail to Close    (MSIV 'B')

MALF MSS006C    SET = Fail to Close    (MSIV 'C')

MALF PCS005A    SET = Fail to Initiate    (SI Train 'A')

MALF PCS005B    SET = Fail to Initiate    (SI Train 'B')

3. When student ready:

RUN

4. When requested, activate:

LOA-TUR011    SELECT=TRIP    (Local Turbine Trip at Front Standard)  
Set Trigger #1.

**COMMENTS:**

## *JPM BRIEFING SHEET*

### *OPERATOR INSTRUCTIONS:*

### *SAFETY CONSIDERATIONS:*

*INITIAL CONDITION:* The plant is at 25% power, steady state conditions.

*INITIATING CUES:* You are the NROATC. The BOP is outside the Control Room. You are instructed to monitor the plant.

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

f.

***V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE***

***JPM NO: JPSF-019B***

***MANUALLY INITIATE REACTOR BUILDING SPRAY  
(W/ FAILURE OF TRAIN 'A' & TRAIN 'B' SWITCHES)***

***APPROVAL: WRQ APPROVAL DATE: 6/22/2009***

***REV NO: 0***

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

***THIS JPM IS APPROVED***

**TASK:**

026-005-01-01                      MANUALLY INITIATE REACTOR BUILDING SPRAY

**TASK STANDARD:**

At least one train of Containment Spray is manually actuated with greater than 2500 gpm and RCP's are secured due to Phase B actuation when directed by procedure. The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc.) and industrial safety practices meets expectations.

**TERMINATING CUE:**    RB spray pumps started with flow indicated on FI-7368 and FI-7378 and RCP's secured.

**PREFERRED EVALUATION LOCATION**

**PREFERRED EVALUATION METHOD**

SIMULATOR

PERFORM

**REFERENCES:**    EOP-1.0

REACTOR TRIP/SAFETY INJECTION ACTUATION

<i>INDEX NO.</i>	<i>K/A NO.</i>		<i>RO</i>	<i>SRO</i>
026000A401	A4.01	CSS controls	4.5	4.3
000011A104	EA1.04	ESF actuation system in manual	4.4	4.4
026000A203	A2.03	Failure of ESF	4.1	4.4

**TOOLS:**            EOP-1.0

**EVALUATION TIME**                      5                      **TIME CRITICAL**    NO    **10CFR55:** 45(a)8

TIME START: \_\_\_\_\_ TIME FINISH: \_\_\_\_\_ PERFORMANCE TIME: \_\_\_\_\_

**PERFORMANCE RATING:**    SAT:                      UNSAT:                      .....

**EXAMINER:** \_\_\_\_\_

SIGNATURE

DATE

## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant was operating at 100% power when a reactor trip and safety injection occurred.

***INITIATING CUES:*** As the NROATC, you are directed to perform Step 8 of EOP-1.0, Reactor Trip/Safety Injection Actuation.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP:** 1

**CUES:**

**CR SEQ**

No Yes Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen.

**STEP STANDARD:**

Operator locates PR-951, determines RB pressure > 12 psig and goes to Alternative Action.

**COMMENTS:**

**SAT** \_\_\_\_\_  
**UNSAT** \_\_\_\_\_

**STEP:** 2

**CUES:**

**CR SEQ**

No Yes Verify both of the following annunciators are lit:  
  
- XCP-612 3-2 (RB SPR ACT).  
- XCP-612 4-2 (PHASE B ISOL).

**STEP STANDARD:**

Operator locates and verifies XCP-612 3 2 and XCP-612 4-2 are NOT lit.

**COMMENTS:**

**SAT** \_\_\_\_\_  
**UNSAT** \_\_\_\_\_

**STEP:** 3

**CUES:**

EVALUATOR CUE: If Examinee attempts to operate the two Train "A" switches (top pair), failure of spray to actuate should prompt Operator to use Train "B" (bottom pair) switches, which will not work.

**CR SEQ**

Yes Yes IF either annunciator is NOT lit, THEN actuate RB Spray by placing the following switches to ACTUATE:  
- Both CS-SGA1 and CS-SGA2.  
OR  
- Both CS-SGB1 and CS-SGB2.

**STEP STANDARD:**

Operator locates and places CS-SGB1 AND CS-SGB2 switches in ACTUATE position.

**COMMENTS:**

**SAT** \_\_\_\_\_  
**UNSAT** \_\_\_\_\_

**STEP:** 4

**CUES:**

**CR SEQ**

No Yes Verify Phase B Isolation by ensuring RB SPRAY/PHASE B ISOL monitor lights are bright on XCP-6105.

**STEP STANDARD:**

Operator checks XCP-6105 and notes the following lits are NOT lit:

MS LOOP A ISOL 2801A CLSD  
MS LOOP B ISOL 2801B CLSD  
MS LOOP C ISOL 2801C CLSD  
CC TO RC CNTMT ISOL 9568 CLSD  
RCP THERM BAR ISOL 9600 CLSD  
RCP THERM BAR ISOL 9605 CLSD  
RCP THERM BAR ISOL 9606 CLSD  
CHEM FEED CNTMT ISOL 1633A  
CLSD  
CHEM FEED CNTMT ISOL 1633C  
CLSD  
CHEM FEED CNTMT ISOL 1633B  
CLSD  
RB SPR PP A 38A RUN  
RB SPR PP B 38B RUN

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 5

**CUES:**

EVALUATOR NOTE: Steps 5-8 are critical for at least one train.

**CR SEQ**

Yes Yes Ensure the following are open:  
- MVG-3001A(B), RWST TO SPRAY PUMP  
A(B) SUCT.

**STEP STANDARD:**

Operator locates control switches and momentarily places switches for MVG-3001A and MVG-3001B in OPEN. Verifies red lights ON and green lights OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 6

**CUES:**

**CR SEQ**

Yes Yes Ensure the following are open:  
- MVG-3002A(B), NAOH TO SPRAY PUMP  
A(B) SUCT.

**STEP STANDARD:**

Operator locates control switches and momentarily places switches for MVG-3002A and MVG-3002B in OPEN. Verifies red lights ON and green lights OFF.

**COMMENTS:**

**SAT** .....

**UNSAT** \_\_\_\_\_

**STEP:** 7

**CUES:**

NOTE: MVG-3003A failed to open on RB Spray/Phase B Isol. Signal.

**CR SEQ**

Yes Yes Ensure the following are open:  
- MVG-3003A(B), SPRAY HDR ISOL LOOP  
A(B).

**STEP STANDARD:**

Operator locates control switches and momentarily places switches for MVG-3003A and MVG-3003B in OPEN. Verifies red lights ON and green lights OFF.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 8

**CUES:**

**CR SEQ**

Yes Yes Ensure both RB Spray Pumps are running.

**STEP STANDARD:**

Operator locates control switches and places switches for both RB Spray Pumps A and B in NORMAL-AFTER-START. Verifies red lights ON, green lights OFF, and normal amps.

**COMMENTS:**

**SAT** .....

**UNSAT** \_\_\_\_\_

**STEP:** 9

**CUES:**

**CR SEQ**

No Yes Verify RB Spray flow is GREATER THAN 2500 gpm for each operating train on:  
- FI-7368, SPR PP A DISCH FLOW GPM.  
- FI-7378, SPR PP B DISCH FLOW GPM.

**STEP STANDARD:**

Operator locates FI-7368 and FI-7378 and verifies RB Spray flow is greater than 2500 gpm.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 10

**CUES:**

NOTE: RCPs may be stopped any time following RB Spray/Phase B Isolation actuation, but must be stopped by at least this step in the procedure.

**CR SEQ**

Yes Yes Stop all RCPs.

**STEP STANDARD:**

Operator locates and places RCP A, B, and C control switches in OFF. Verifies green lights ON, red lights OFF, and zero amps.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

Examiner ends JPM at this point.

## JPM SETUP SHEET

**JPM NO:** JPSF-019B

**DESCRIPTION:** MANUALLY INITIATE REACTOR BUILDING SPRAY (W/ FAILURE OF TRAIN 'A' & TRAIN 'B' SWITCHES)

**IC SET:** IC-10

### **INSTRUCTIONS:**

1. Activate:

BST-SP009???, SELECT=AS IS, (HI-3 Channel 1 [950A] fail as is) - change to bistable operation

BST-SP010???, SELECT= AS IS, (HI-3 Channel 2 [951A] fail as is) - change to bistable operation

BST-SP016???, SELECT = AS IS, (HI-3 Channel 4 [953A] fail as is) - change to bistable operation

OVR-SG011, SELECT=FALSE (TRUE???), (Fail RB Spray actuation switch)  
CS-SGA1 (Train A)

OVR-SG012, SELECT=FALSE (TRUE???), (Fail RB Spray actuation switch)  
CS-SGA2 (Train A)

NEED TO ADD 'B' TRAIN SWITCHES????

2. RUN until RB pressure > 12 psig and ESF loading sequencer is complete (approximately 60 seconds). Leave RCPs running.

3. Perform actions of EOP-1.0.

3. FREEZE

4. When student is ready: RUN

### **COMMENTS:**

Failing 1/2 switches in a train will disable that function.

***JPM BRIEFING SHEET***

***OPERATOR INSTRUCTIONS:***

***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant was operating at 100% power when a reactor trip and safety injection occurred.

***INITIATING CUES:*** As the NROATC, you are directed to perform Step 8 of EOP-1.0, Reactor Trip/Safety Injection Actuation.

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

*Monday, June 22, 2009*

REACTOR TRIP/SAFETY INJECTION ACTUATION

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>* 8 Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen. <input type="checkbox"/></p>	<p>* 8 Perform the following:</p> <p>a) Verify <u>both</u> the following annunciators are lit:</p> <ul style="list-style-type: none"> <li>• XCP-612 3-2 (RB SPR ACT). <input type="checkbox"/></li> <li>• XCP-612 4-2 (PHASE B ISOL). <input type="checkbox"/></li> </ul> <p>IF <u>either</u> annunciator is <u>NOT</u> lit, <u>THEN</u> actuate RB Spray by placing the following switches to ACTUATE:</p> <ul style="list-style-type: none"> <li>• <u>Both</u> CS-SGA1 and CS-SGA2. <input type="checkbox"/></li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• <u>Both</u> CS-SGB1 and CS-SGB2. <input type="checkbox"/></li> </ul> <p>b) Verify Phase B Isolation by ensuring RB SPRAY/PHASE B ISOL monitor lights are bright on XCP-6105. <input type="checkbox"/></p> <p>c) Ensure the following are open:</p> <ul style="list-style-type: none"> <li>• MVG-3001A(B), RWST TO SPRAY PUMP A(B) SUCT. <input type="checkbox"/></li> <li>• MVG-3002A(B), NAOH TO SPRAY PUMP A(B) SUCT. <input type="checkbox"/></li> <li>• MVG-3003A(B), SPRAY HDR ISOL LOOP A(B). <input type="checkbox"/></li> </ul> <p>d) Ensure <u>both</u> RB Spray Pumps are running. <input type="checkbox"/></p> <p>e) Verify RB Spray flow is GREATER THAN 2500 gpm for <u>each</u> operating train on:</p> <ul style="list-style-type: none"> <li>• FI-7368, SPR PP A DISCH FLOW GPM. <input type="checkbox"/></li> <li>• FI-7378, SPR PP B DISCH FLOW GPM. <input type="checkbox"/></li> </ul> <p>f) Stop <u>all</u> RCPs. <input type="checkbox"/></p>

9.

**V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE**

**JPM NO: JPSF-150A**

DEPRESSURIZE RCS TO REFILL THE  
PRESSURIZER

**APPROVAL: WRQ APPROVAL DATE: 6/12/2009**

**REV NO: 0**

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

**THIS JPM IS APPROVED**

**TASK:**

**TASK STANDARD:**

RCS depressurized to allow SI flow to refill the PZR to > 30% (50%) and PZR PORV block valve is closed to isolate the failed open PORV.

**TERMINATING CUE:** RCS depressurization complete when task standard met and the block valve for the failed PORV is closed.

**PREFERRED EVALUATION LOCATION**

**PREFERRED EVALUATION METHOD**

SIMULATOR

PERFORM

**REFERENCES:**

<i>INDEX NO.</i>	<i>K/A NO.</i>		<i>RO</i>	<i>SRO</i>
000038A104	EA1.04	PZR spray, to reduce coolant system pressure	4.3	4.1
0000092123	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	4.4
00WE03A101	EA1.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	4.0	4.0

**TOOLS:** EOP-2.1

**EVALUATION TIME** 10 **TIME CRITICAL** No **10CFR55:** 45(a)6

TIME START: \_\_\_\_\_ TIME FINISH: \_\_\_\_\_ PERFORMANCE TIME: \_\_\_\_\_

**PERFORMANCE RATING:** SAT: \_\_\_\_\_ UNSAT: \_\_\_\_\_

**EXAMINER:** \_\_\_\_\_  
SIGNATURE DATE

## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** A LOCA is in progress. The operating crew has taken the appropriate EOP actions and is now performing EOP- 2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION.

***INITIATING CUES:*** The CRS directs you as the NROATC to depressurize the RCS in accordance with EOP-2.1, Step 8.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP: 1**

**CUES:**

EVALUATOR NOTE: Operator may, or may not, use PZR Spray Valves. Because no RCPs are in operation, if the operator attempts to use PZR Spray Valves, ask a follow-up question.

**CR SEQ**

Yes Yes Depressurize the RCS to refill the PZR:  
a. Establish Normal PZR Spray:  
- Using RCP A:  
1) Open PCV-444D, PZR SPRAY.  
2) Close PCV-444C, PZR SPRAY.  
OR  
- Using RCP B:  
1) Open PCV-444C, PZR SPRAY.  
2) Close PCV-444D, PZR SPRAY.

**STEP STANDARD:**

Operator selects PZR Spray valves to operate.  
Locates and depresses OPEN button on PCV-444D controller; notes red light OFF and green light ON.  
Locates and depresses CLOSED button on PCV-444C controller; notes red light OFF and green light ON.  
Identifies that PZR Spray valves do NOT operate and goes to the Alternative Action.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 2**

**CUES:**

NOTE: Booth Operator to see which PORV is opened and initiate the appropriate trigger for associated block valve.

**CR SEQ**

Yes Yes Cycle one PZR PORV as necessary to depressurize the RCS.

**STEP STANDARD:**

Operator locates and places control switch for PCV-445A (444B or 445B) in OPEN; verifies red light ON and green light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 3**

**CUES:**

Evaluator Note: Adverse conditions will apply.

**CR SEQ**

No Yes Verify PZR level is GREATER THAN 30% [50%].

**STEP STANDARD:**

Operator locates and verifies PZR level indicates greater than 30% (50% for adverse containment value).

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 4**

**CUES:**

**CR SEQ**

Yes Yes Stop RCS depressurization.

**STEP STANDARD:**

After PZR level is above 50%, operator locates and places PVC-445A (444B or 445B) control switch in CLOSE. Recognizes that PVC-445A (444B or 445B) does NOT close. Operator locates and places MVG-8000A (8000B or 8000C) control switch in CLOSE; verifies green light ON and red light OFF.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

Examiner ends JPM at this point.

## JPM SETUP SHEET

**JPM NO:** JPSF-150A

**DESCRIPTION:** DEPRESSURIZE RCS TO REFILL THE PRESSURIZER

**IC SET:** 10

### INSTRUCTIONS:

1. Activate

MAL-RCS006B SEVERITY=700 RAMP=0  
VLV-RC002P Set = 0% (PCV-444D, Spray Valve Closed)  
VLV-RC003P Set = 0% (PCV-444C, Spray Valve Closed)

2. RUN

3. Actuate Manual SI and perform actions of EOP-1.0, Attachment 3, EOP-2.0, and EOP-2.1 through Step 7.

4. LOA CCW 52 "C" CCW FAST  
LOA CCW 50 "A" CCW FAST

6. FREEZE

7. When examinee is ready, RUN.

8. When examinee opens PORV, activate the applicable malfunction:

PCV-445A MALF -PRS004C PZR RELIEF VALVE FAILURE (INTERLOCK NOT FUNCTIONAL)  
SEVERITY VALUE = 100; RAMP = 0; TD = 0

PCV-444B MALF -PRS003A PZR RELIEF VALVE FAILURE (INTERLOCK NOT FUNCTIONAL)  
SEVERITY VALUE = 100; RAMP = 0; TD = 0

PCV-445B MALF -PRS003B PZR RELIEF VALVE FAILURE (INTERLOCK NOT FUNCTIONAL)  
SEVERITY VALUE = 100; RAMP = 0; TD = 0

9. FREEZE upon direction of examiner.

### COMMENTS:

## *JPM BRIEFING SHEET*

*OPERATOR INSTRUCTIONS:*

*SAFETY CONSIDERATIONS:*

*INITIAL CONDITION:* A LOCA is in progress. The operating crew has taken the appropriate EOP actions and is now performing EOP- 2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION.

*INITIATING CUES:* The CRS directs you as the NROATC to depressurize the RCS in accordance with EOP-2.1, Step 8.

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

*Monday, June 22, 2009*

POST-LOCA COOLDOWN AND DEPRESSURIZATION

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p>7 <b>Check if the SI System is in service:</b></p> <ul style="list-style-type: none"> <li>• Any Charging Pump is running with flow indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. <input type="checkbox"/></li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• Any RHR Pump is running in the SI Mode. <input type="checkbox"/></li> </ul>	<p>7 <u>IF</u> SI has been terminated, <u>THEN</u> <input type="checkbox"/>  <b>GO TO Step 13.</b></p>
<p><u>NOTE - Step 8</u></p> <p>If <u>no</u> RCP is running, the Reactor Vessel Head Upper Plenum may void during depressurization resulting in a rapidly increasing PZR level.</p>	
<p>8 <b>Depressurize the RCS to refill the PZR:</b></p> <p>a. Establish Normal PZR Spray:</p> <ul style="list-style-type: none"> <li>• Using RCP A:           <ul style="list-style-type: none"> <li>1) Open PCV-444D, PZR SPRAY. <input type="checkbox"/></li> <li>2) Close PCV-444C, PZR SPRAY. <input type="checkbox"/></li> </ul> </li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• Using RCPs B <u>AND</u> C:           <ul style="list-style-type: none"> <li>1) Open PCV-444C, PZR SPRAY. <input type="checkbox"/></li> <li>2) Close PCV-444D, PZR SPRAY. <input type="checkbox"/></li> </ul> </li> </ul> <p>b. Verify PZR level is GREATER THAN 30% [50%]. <input type="checkbox"/></p> <p>c. Stop RCS depressurization. <input type="checkbox"/></p>	<p>a. Cycle <u>one</u> PZR PORV as necessary to depressurize the RCS. <input type="checkbox"/></p> <p>b. <u>WHEN</u> PZR level is GREATER THAN 30% [50%], <u>THEN COMPLETE Step 8.</u> <input type="checkbox"/></p> <p><b>CONTINUE WITH Step 9.</b> Observe the <b>CAUTION</b> and <b>NOTE</b> prior to <b>Step 9.</b> <input type="checkbox"/></p>

<sup>h</sup>  
(RO Only)

**V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE**

**JPM NO: JPS-157**

INTERMEDIATE RANGE ANALOG CHANNEL  
OPERATIONAL TEST

**APPROVAL: WRQ APPROVAL DATE: 6/12/2009**

**REV NO: 0**

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

**THIS JPM IS APPROVED**

**TASK:**

**TASK STANDARD:**

Attachment I complete and examinee determines that Acceptance Criteria of Section 8.0 are satisfied.

**TERMINATING CUE:** Section 6.2 , and Attachment I, of STP-102.003 is complete.

<b>PREFERRED EVALUATION LOCATION</b>	<b>PREFERRED EVALUATION METHOD</b>
SIMULATOR	PERFORM

**REFERENCES:**

<b>INDEX NO.</b>	<b>K/A NO.</b>		<b>RO</b>	<b>SRO</b>
015000A303	A3.03	Verification of proper functioning/operability	3.9	3.9
015000A402	A4.02	NIS indicators	3.9	3.9

**TOOLS:** STP-102.003

**EVALUATION TIME** 25 **TIME CRITICAL** NO **10CFR55:** 10CFR55.4

TIME START: \_\_\_\_\_ TIME FINISH: \_\_\_\_\_ PERFORMANCE TIME: \_\_\_\_\_

**PERFORMANCE RATING:** SAT: \_\_\_\_\_ UNSAT: \_\_\_\_\_

**EXAMINER:** \_\_\_\_\_  
SIGNATURE DATE

## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

***SAFETY CONSIDERATIONS:***     None

***INITIAL CONDITION:***    Mode 3, steady state conditions.

***INITIATING CUES:***    The CRS directs you to perform STP-102.003, Intermediate Range Analog Channel Operational Test, for N-35.

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP: 1**

**CUES:**

**EVALUATOR NOTE:** Since on N-35 is to be performed, Attachment II will not be used.

**CR SEQ**

No Yes Record Reactor power on Attachments I and II.

**STEP STANDARD:**

Operator records approximately 60 cps on Attachment I.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP: 2**

**CUES:**

**CR SEQ**

Yes Yes Place the LEVEL TRIP switch to BYPASS.

**STEP STANDARD:**

Operator places the LEVEL TRIP switch to BYPASS.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP: 3**

**CUES:**

**CR SEQ**

No Yes Verify the following:  
1) LEVEL TRIP BYPASS drawer light is lit.  
2) IR & SR TRIP BYP annunciator (XCP-620 4-5) alarms.  
3) CHAN I IR TRIP BYP monitor light is lit.

**STEP STANDARD:**

Operator verifies LEVEL TRIP BYPASS drawer light on N35 drawer is lit, the MCB IR & SR TRIP BYP annunciator (XCP-620 4-5) alarms, and the MCB CHAN I IR TRIP BYP monitor light is lit.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP:** 4

**CUES:**

**CR SEQ**

No Yes Turn the OPERATIONAL SELECTOR switch to LEVEL ADJUST.

**STEP STANDARD:**

Operator turns the OPERATIONAL SELECTOR switch to LEVEL ADJUST.

**COMMENTS:**

*SAT*

*UNSAT*

**STEP:** 5

**CUES:**

**CR SEQ**

No Yes Verify the following:  
1) CHANNEL ON TEST drawer light is lit.  
2) NIS CHAN TEST annunciator (XCP-620 3-4) alarms.

**STEP STANDARD:**

Operator verifies the CHANNEL ON TEST drawer light on drawer N-35 is lit and the MCB NIS CHAN TEST annunciator (XCP-620 3-4) alarms.

**COMMENTS:**

*SAT*

*UNSAT*

**STEP:** 6

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL ADJUST potentiometer clockwise until the POWER ABOVE PERMISSIVE P6 drawer light is lit.

**STEP STANDARD:**

Operator turns the LEVEL ADJUST potentiometer on drawer N-35 clockwise until the POWER ABOVE PERMISSIVE P6 drawer light is lit.

**COMMENTS:**

*SAT*

*UNSAT*

**STEP:** 7

**CUES:**

**CR SEQ**

No Yes Verify the following:  
1) P6 monitor light is lit.  
2) CHAN I P6 monitor light is lit.

**STEP STANDARD:**

Operator verifies the P6 and CHAN I P6 monitor lights on the MCB are lit.

**COMMENTS:**

**SAT** .....

**UNSAT**

**STEP:** 8

**CUES:**

**CR SEQ**

Yes Yes Record the P6 Permissive trip setpoint on Attachment I.

**STEP STANDARD:**

Operator records approximately 7.5 (+/- 0.5) E-6 in the AS FOUND % PWR column of Attachment I.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP:** 9

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL ROD STOP drawer light is lit.

**STEP STANDARD:**

Operator turns the LEVEL ADJUST potentiometer on drawer N-35 clockwise until the HIGH LEVEL ROD STOP drawer light is lit.

**COMMENTS:**

**SAT** .....

**UNSAT**

**STEP:** 10

**CUES:**

**CR SEQ**

Yes Yes Record the HIGH LEVEL ROD STOP trip setpoint on Attachment I.

**STEP STANDARD:**

Operator records approximately 20 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 11

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL TRIP drawer light is lit.

**STEP STANDARD:**

Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL TRIP drawer light on drawer N-35 is lit.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 12

**CUES:**

**CR SEQ**

No Yes Verify the CHAN I IR FLUX HI monitor light is lit.

**STEP STANDARD:**

Operator verifies the CHAN I IR FLUX HI monitor light on the MCB is lit.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP:** 13

**CUES:**

**CR SEQ**

Yes Yes Record the HIGH LEVEL TRIP trip setpoint on Attachment I.

**STEP STANDARD:**

Operator records approximately 25 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 14

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL TRIP drawer light extinguishes.

**STEP STANDARD:**

Operator turns the LEVEL ADJUST potentiometer on drawer N-35 counterclockwise until the HIGH LEVEL TRIP drawer light extinguishes.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 15

**CUES:**

**CR SEQ**

No Yes Verify the CHAN I IR FLUX HI monitor light is off.

**STEP STANDARD:**

Operator verifies the CHAN I IR FLUX HI monitor light on the MCB is off.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 16

**CUES:**

**CR SEQ**

Yes Yes Record the HIGH LEVEL TRIP reset setpoint on Attachment I.

**STEP STANDARD:**

Operator records approximately 20 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

**COMMENTS:**

*SAT* .....

*UNSAT* \_\_\_\_\_

**STEP:** 17

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL ROD STOP drawer light extinguishes.

**STEP STANDARD:**

Operator turns the LEVEL ADJUST potentiometer on drawer N-35 counterclockwise until the HIGH LEVEL ROD STOP drawer light extinguishes.

**COMMENTS:**

*SAT*

*UNSAT* \_\_\_\_\_

**STEP:** 18

**CUES:**

**CR SEQ**

Yes Yes Record the HIGH LEVEL ROD STOP reset setpoint on Attachment I.

**STEP STANDARD:**

Operator records approximately 19 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

**COMMENTS:**

*SAT*

*UNSAT* \_\_\_\_\_

**STEP:** 19

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL ADJUST potentiometer counterclockwise until the POWER ABOVE PERMISSIVE P6 drawer light is off.

**STEP STANDARD:**

Operator turns the LEVEL ADJUST potentiometer on drawer N-35 counterclockwise until the POWER ABOVE PERMISSIVE P6 drawer light is off.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 20

**CUES:**

**CR SEQ**

No Yes Verify the following:  
1) P6 monitor light is off.  
2) CHAN I P6 monitor light is off.

**STEP STANDARD:**

Operator verifies the P6 and CHAN I P6 monitor lights on the MCB are off.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 21

**CUES:**

**CR SEQ**

Yes Yes Record the P6 Permissive reset setpoint on Attachment I.

**STEP STANDARD:**

Operator records approximately 7(+/- 0.5) E-6 in the AS FOUND % PWR column of Attachment I.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 22

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL ADJUST potentiometer fully counterclockwise.

**STEP STANDARD:**

Operator turns the LEVEL ADJUST potentiometer on drawer N-35 fully counterclockwise.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP:** 23

**CUES:**

**CR SEQ**

No Yes Turn the OPERATOR SELECTOR switch through all positions, recording the indication for each position on Attachment I.

**STEP STANDARD:**

Operator turns the OPERATOR SELECTOR switch through all positions, recording the indication for each position in the METER INDICATION column on Attachment I. The following are the approximate readings for each position:

TRIP 1:	25 (+/- 5.0)
TRIP 2:	19 (+/- 5.0)
TRIP 3:	7.5 (+/- 0.5 )E-6
TRIP 4:	N/A
12.2 CPS:	N/A
200K CPS (5x10-3%):	4.5 (+/- 0.5) E-5
10-2%:	8 (+/- 0.5) E-3
100%:	100 (- 5.0)

**COMMENTS:**

**SAT**

**UNSAT**

**STEP:** 24

**CUES:**

**CR SEQ**

Yes Yes Turn the OPERATOR SELECTOR switch to NORMAL.

**STEP STANDARD:**

Operator turns the OPERATOR SELECTOR switch on drawer N-35 to NORMAL.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP:** 25

**CUES:**

**CR SEQ**

No Yes Verify the following:  
1) CHANNEL ON TEST drawer light is off.  
2) NIS CHAN TEST annunciator (XCP-620 3-4) clears.

**STEP STANDARD:**

Operator verifies the CHANNEL ON TEST drawer light on drawer N-35 is off and the NIS CHAN TEST annunciator (XCP-620 3-4) on the MCB clears.

**COMMENTS:**

**SAT** ....

**UNSAT** \_\_\_\_\_

**STEP:** 26

**CUES:**

**CR SEQ**

Yes Yes Turn the LEVEL TRIP switch to NORMAL.

**STEP STANDARD:**

Operator turns the LEVEL TRIP switch to NORMAL.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP:** 27

**CUES:**

**CR SEQ**

No Yes Verify the following:  
1) LEVEL TRIP BYPASS drawer light is off  
2) IR & SR TRIP BYP annunciator (XCP-620 4-5) clears.  
3) CHAN I IR TRIP BYP monitor light is off.

**STEP STANDARD:**

Operator verifies the LEVEL TRIP BYPASS drawer light on drawer N-35 is off, the MCB IR & SR TRIP BYP annunciator (XCP-620 4-5) clears, and the CHAN I IR TRIP BYP monitor light on the MCB is off.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP:** 28

**CUES:**

**CR SEQ**

Yes Yes Verify channel restoration by a second operator.

**STEP STANDARD:**

Operator enters "NORMAL" in the blanks for OPERATION SELECTION SWITCH POSITION and LEVEL TRIP SWITCH POSITION in Section 5., CHANNEL RESTORATION, on Attachment I. Indicates that he/she would have another operator check the position of the OPERATION SELECTOR switch and the LEVEL TRIP switch.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

**STEP:** 29

**CUES:**

**CR SEQ**

Yes Yes Determines if Acceptance Criteria is met.

**STEP STANDARD:**

Operator compares as found data to Technical Specification to ensure consistency. Recorded values should be within tolerances identified on Attachment II.

**COMMENTS:**

**SAT** .....

**UNSAT** .....

Examiner ends JPM at this point.

**JPM SETUP SHEET**

**JPM NO:** JPS-157

**DESCRIPTION:** INTERMEDIATE RANGE ANALOG CHANNEL OPERATIONAL TEST

**IC SET:**

**INSTRUCTIONS:**

**COMMENTS:**



***JPM BRIEFING SHEET***

***OPERATOR INSTRUCTIONS:***

***SAFETY CONSIDERATIONS:***     None

***INITIAL CONDITION:***   Mode 3, steady state conditions.

***INITIATING CUES:***   The CRS directs you to perform STP-102.003, Intermediate Range Analog Channel Operational Test, for N-35.



**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**



*Monday, June 22, 2009*



SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

**NUCLEAR OPERATIONS**

**COPY NO.** \_\_\_\_\_

SURVEILLANCE TEST PROCEDURE

STP-102.003

INTERMEDIATE RANGE ANALOG CHANNEL OPERATIONAL TEST  
N-35, N-36

REVISION 4

SAFETY RELATED

Original Signed By: D. Baker  
DISCIPLINE SUPERVISOR

11/06/98  
DATE

Original Signed By: G. Williams  
APPROVAL AUTHORITY

11/09/98  
DATE

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE

CONTINUOUS USE

Continuous Use of Procedure Required.  
Read Each Step Prior to Performing.

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ATTACHMENTS

- Attachment I - Intermediate Range N-35 Operational Test Data
- Attachment II - Intermediate Range N-36 Operational Test Data

**1.0 PURPOSE**

- 1.1 This procedure verifies the Trip Actuating Devices for N-35 and N-36 are Operable at the setpoints per Technical Specification Table 2.2-1 as required by Technical Specification Table 4.3-1.

**2.0 PRECAUTIONS**

- 2.1 Do not test more than one channel of nuclear instrumentation at a time.
- 2.2 Testing a channel when the other channel is in a trip condition will result in a Reactor Trip.

**3.0 TEST EQUIPMENT**

- 3.1 None.

**4.0 TEST FREQUENCY**

- 4.1 This test is required to be performed prior to entering Mode 2 if not performed in the previous 31 days.

**5.0 INITIAL CONDITIONS**

- 5.1 None.

**6.0 PROCEDURE**

Note 6.1

When testing N-35 or N-36, the meter is additive and will not indicate lower than the actual power.

- 6.1 Record Reactor power on Attachments I and II.

6.2 Test Intermediate Range Channel N-35 as follows:

- a. Place the LEVEL TRIP switch to BYPASS.
- b. Verify the following:
  - 1) LEVEL TRIP BYPASS drawer light is lit.
  - 2) IR & SR TRIP BYP annunciator (XCP-620 4-5) alarms.
  - 3) CHAN I IR TRIP BYP monitor light is lit.
- c. Turn the OPERATION SELECTOR switch to LEVEL ADJUST.
- d. Verify the following:
  - 1) CHANNEL ON TEST drawer light is lit.
  - 2) NIS CHAN TEST annunciator (XCP-620 3-4) alarms.
- e. Turn the LEVEL ADJUST potentiometer clockwise until the POWER ABOVE PERMISSIVE P6 drawer light is lit.
- f. Verify the following:
  - 1) P6 monitor light is lit.
  - 2) CHAN I P6 monitor light is lit.
- g. Record the P6 Permissive trip setpoint on Attachment I.
- h. Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL ROD STOP drawer light is lit.
- i. Record the HIGH LEVEL ROD STOP trip setpoint on Attachment I.
- j. Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL TRIP drawer light is lit.
- k. Verify the CHAN I IR FLUX HI monitor light is lit.
- l. Record the HIGH LEVEL TRIP trip setpoint on Attachment I.
- m. Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL TRIP drawer light extinguishes.

- n. Verify the CHAN I IR FLUX HI monitor light is off.
- o. Record the HIGH LEVEL TRIP reset setpoint on Attachment I.
- p. Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL ROD STOP drawer light is off.
- q. Record the HIGH LEVEL ROD STOP reset setpoint on Attachment I.
- r. Turn the LEVEL ADJUST potentiometer counterclockwise until the POWER ABOVE PERMISSIVE P6 drawer light is off.
- s. Verify the following:
  - 1) P6 monitor light is off.
  - 2) CHAN I P6 monitor light is off.
- t. Record the P6 Permissive reset setpoint on Attachment I.
- u. Turn the LEVEL ADJUST potentiometer fully counterclockwise.
- v. Turn the OPERATION SELECTOR switch through all positions, recording the indication for each position on Attachment I.
- w. Turn the OPERATION SELECTOR switch to NORMAL.
- x. Verify the following:
  - 1) CHANNEL ON TEST drawer light is off.
  - 2) NIS CHAN TEST annunciator (XCP-620 3-4) clears.
- y. Turn the LEVEL TRIP switch to NORMAL.
- z. Verify the following:
  - 1) LEVEL TRIP BYPASS drawer light is off.
  - 2) IR & SR TRIP BYP annunciator (XCP-620 4-5) clears.
  - 3) CHAN I IR TRIP BYP monitor light is off.
- aa. Verify channel restoration by a second operator.

6.3 Test Intermediate Range Channel N-36 as follows:

- a. Place the LEVEL TRIP switch to BYPASS.
- b. Verify the following:
  - 1) LEVEL TRIP BYPASS drawer light is lit.
  - 2) IR & SR TRIP BYP annunciator (XCP-620 4-5) alarms.
  - 3) CHAN II IR TRIP BYP monitor light is lit.
- c. Turn the OPERATION SELECTOR switch to LEVEL ADJUST.
- d. Verify the following:
  - 1) CHANNEL ON TEST drawer light is lit.
  - 2) NIS CHAN TEST annunciator (XCP-620 3-4) alarms.
- e. Turn the LEVEL ADJUST potentiometer clockwise until the POWER ABOVE PERMISSIVE P6 drawer light is lit.
- f. Verify the following:
  - 1) P6 monitor light is lit.
  - 2) CHAN II P6 monitor light is lit.
- g. Record the P6 Permissive trip setpoint on Attachment II.
- h. Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL ROD STOP drawer light is lit.
- i. Record the HIGH LEVEL ROD STOP trip setpoint on Attachment II.
- j. Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL TRIP drawer light is lit.
- k. Verify the CHAN II IR FLUX HI monitor light is lit.
- l. Record the HIGH LEVEL TRIP trip setpoint on Attachment II.
- m. Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL TRIP drawer light extinguishes.

- n. Verify the CHAN II IR FLUX HI monitor light is off.
- o. Record the HIGH LEVEL TRIP reset setpoint on Attachment II.
- p. Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL ROD STOP drawer light is off.
- q. Record the HIGH LEVEL ROD STOP reset setpoint on Attachment II.
- r. Turn the LEVEL ADJUST potentiometer counterclockwise until the POWER ABOVE PERMISSIVE P6 drawer light is off.
- s. Verify the following:
  - 1) P6 monitor light is off.
  - 2) CHAN II P6 monitor light is off.
- t. Record the P6 Permissive reset setpoint on Attachment II.
- u. Turn the LEVEL ADJUST potentiometer fully counterclockwise.
- v. Turn the OPERATION SELECTOR switch through all positions, recording the indication for each position on Attachment II.
- w. Turn the OPERATION SELECTOR switch to NORMAL.
- x. Verify the following:
  - 1) CHANNEL ON TEST drawer light is off.
  - 2) NIS CHAN TEST annunciator (XCP-620 3-4) clears.
- y. Turn the LEVEL TRIP switch to NORMAL.
- z. Verify the following:
  - 1) LEVEL TRIP BYPASS drawer light is off.
  - 2) IR & SR TRIP BYP annunciator (XCP-620 4-5) clears.
  - 3) CHAN II IR TRIP BYP monitor light is off.
- aa. Verify channel restoration by a second operator.

- 6.4 Notify I&C to perform applicable STP's for any deviations recorded.

**7.0 DATA REQUIREMENTS**

- 7.1 All required data shall be recorded on Attachments I and II.

**8.0 ACCEPTANCE CRITERIA**

- 8.1 The Reactor Trip and Permissive Setpoints are consistent with the Technical Specification setpoints.

**9.0 REFERENCES**

- 9.1 V. C. Summer Technical Specification 3.3.1.  
9.2 1MS-94B-016, Nuclear Instrumentation System Technical Manual.

**10.0 ENCLOSURES**

- 10.1 None.

INTERMEDIATE RANGE N-35  
 OPERATIONAL TEST DATA

1. REACTOR POWER: \_\_\_\_\_  
 2. BISTABLE TRIP VERIFICATION

BISTABLE	BISTABLE ACTION	TECH SPEC SETPOINT	TECH SPEC ALLOWABLE	EXPECTED % PWR	AS FOUND % PWR
POWER ABOVE PERMISSIVE P6	TRIP	$\geq 7.5 \times 10^{-6}\%$	$\geq 4.5 \times 10^{-6}\%$	$7.5 \times 10^{-6}\%$	
POWER ABOVE PERMISSIVE P6	RESET	N/A	N/A	$6.7 \times 10^{-6}\%$	
HI LEVEL ROD STOP	TRIP	N/A	N/A	20%	
HI LEVEL ROD STOP	RESET	N/A	N/A	N/A	
HI LEVEL TRIP	TRIP	$\leq 25\%$	$\leq 31\%$	25%	
HI LEVEL TRIP	RESET	N/A	N/A	N/A	

3. MONITOR LIGHTS AND ANNUNCIATORS ALARMS SAT/UNSAT  
 4. OPERATION SELECTOR OPERATION

SWITCH POSITION	METER INDICATION
TRIP 1	
TRIP 2	
TRIP 3	
TRIP 4	N/A
12.2 CPS	N/A
200K CPS ( $5 \times 10^{-3}\%$ )	
$10^{-2}\%$	
100%	

5. CHANNEL RESTORATION  
 OPERATION SELECTOR SWITCH POSITION \_\_\_\_\_  
 LEVEL TRIP SWITCH POSITION \_\_\_\_\_  
 RESTORATION VERIFIED BY: \_\_\_\_\_

INTERMEDIATE RANGE N-36  
 OPERATIONAL TEST DATA

1. REACTOR POWER: \_\_\_\_\_

2. BISTABLE TRIP VERIFICATION

BISTABLE	BISTABLE ACTION	TECH SPEC SETPOINT	TECH SPEC ALLOWABLE	EXPECTED % PWR	AS FOUND % PWR
POWER ABOVE PERMISSIVE P6	TRIP	$\geq 7.5 \times 10^{-6}\%$	$\geq 4.5 \times 10^{-6}\%$	$7.5 \times 10^{-6}\%$	
POWER ABOVE PERMISSIVE P6	RESET	N/A	N/A	$6.7 \times 10^{-6}\%$	
HI LEVEL ROD STOP	TRIP	N/A	N/A	20%	
HI LEVEL ROD STOP	RESET	N/A	N/A	N/A	
HI LEVEL TRIP	TRIP	$\leq 25\%$	$\leq 31\%$	25%	
HI LEVEL TRIP	RESET	N/A	N/A	N/A	

3. MONITOR LIGHTS AND ANNUNCIATORS ALARMS SAT/UNSAT

4. OPERATION SELECTOR OPERATION

SWITCH POSITION	METER INDICATION
TRIP 1	
TRIP 2	
TRIP 3	
TRIP 4	N/A
12.2 CPS	N/A
200K CPS ( $5 \times 10^{-3}\%$ )	
$10^{-2}\%$	
100%	

5. CHANNEL RESTORATION

OPERATION SELECTOR SWITCH POSITION \_\_\_\_\_

LEVEL TRIP SWITCH POSITION \_\_\_\_\_

RESTORATION VERIFIED BY: \_\_\_\_\_

***V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE***

***JPM NO: JPPF-096A***

***LOCALLY TRIP THE REACTOR***

***APPROVAL: WRQ APPROVAL DATE: 6/17/2009***

***REV NO: 0***

CANDIDATE:

EXAMINER: \_\_\_\_\_

***THIS JPM IS APPROVED***

**TASK:**

000-117-05-04      RESPOND TO ABNORMAL NUCLEAR POWER GENERATION

**TASK STANDARD:**

The Reactor has been tripped by opening breaker XSW1C1 05D (TB-412) and Breaker XSW1B1 06C (TB-436). The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc) and industrial safety practices meets expectations. This JPM is related to PRA event PXOPMANUALR THE "Operator fails to manually initiate a reactor trip".

**TERMINATING CUE:** The Reactor has been tripped by opening Breaker XSW1C1 05D (TB-412) and Breaker XSW1B1 06C (TB-436).

**PREFERRED EVALUATION LOCATION      PREFERRED EVALUATION METHOD**

PLANT      SIMULATE

**REFERENCES:**      EOP-13.0      RESPONSE TO ABNORMAL NUCLEAR POWER G

<i>INDEX NO.</i>	<i>K/A NO.</i>		<i>RO</i>	<i>SRO</i>
000029A112	EA1.12	M/G set power supply and reactor trip breakers	4.1	4.0
000029A111	EA1.11	Manual opening of the CRDS breakers	3.9	4.1
0000292130	2.1.30	Ability to locate and operate components, including local controls.	4.4	4.0

**TOOLS:**      EOP-13.0 ATT. 1  
RADIO HEADSETS IF AVAILABLE

**EVALUATION TIME**      10      **TIME CRITICAL**      No      **10CFR55:** 45(a)8

TIME START: \_\_\_\_\_ TIME FINISH: \_\_\_\_\_ PERFORMANCE TIME: \_\_\_\_\_

**PERFORMANCE RATING:**      SAT:      UNSAT:

**EXAMINER:** \_\_\_\_\_  
SIGNATURE      DATE

## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

***SAFETY CONSIDERATIONS:*** High Noise Area.

***INITIAL CONDITION:*** A manual Reactor Trip has been attempted due to exceeding a Limiting Safety System Setting. The NROATC inserted a manual trip, but the reactor trip breakers did NOT open. EOP-13.0 has been implemented for the ATWS.

***INITIATING CUES:*** Control Room Supervisor directs locally tripping the reactor in accordance with EOP-13.0, Attachment 1.

***AT NO TIME ARE YOU TO OPERATE  
ANY PLANT EQUIPMENT!***

***FOR ELECTRICAL MANIPULATIONS,  
AT NO TIME ARE YOU TO BREAK THE  
PLANE OF THE ELECTRICAL PANEL!***

*HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!*

**STEPS**

**STEP: 1**

**CUES:**

EVALUATOR NOTE: Examiner should either use a photograph of a RTB or go to the electric shop and use the spare RTB to deliver prompts for RTB indications.

EVALUATOR CUE: Inform operator that both RTBs have a closed flag after he attempts to trip them.

EVALUATOR NOTE: Shift Supervisor may waive ISP-027 requirements during Emergency Operations. Hazard Level 1: Hard hat (as posted); safety glasses, hearing protection (as posted); voltage rated gloves, long sleeve FR shirt, FR long pants or 12 oz denim cotton pants. FR coveralls may replace the shirt and pants.

**CR SEQ**

No Yes Locally open both reactor trip breakers.

**STEP STANDARD:**

Operator attempts to locally open reactor trip breakers by depressing RX TRIP BKR A(B) MECH TRIP pushbuttons on local reactor trip breakers.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP: 2**

**CUES:**

EVALUATOR CUE: Both bypass breakers have open flags indicated.

**CR SEQ**

No Yes Verify open reactor trip bypass breakers

**STEP STANDARD:**

Operator locally checks reactor trip bypass breakers by observing OPEN breaker flags.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

**STEP: 3**

**CUES:**

EVALUATOR CUE: Point to the red light and say "This light is OFF" and point to the green light and say "This light is ON" after they operate each of the pistol grips.

**CR SEQ**

Yes Yes OPEN Generator No. 1 GENERATOR breaker.

**STEP STANDARD:**

Operator opens MG set generator breaker by turning pistol grip counterclockwise to the TRIP position.

**COMMENTS:**

*SAT* \_\_\_\_\_

*UNSAT*

**STEP: 4**

**CUES:**

EVALUATOR CUE: Point to the red light and say "This light is OFF" and point to the green light and say "This light is LIT" after they operate each of the pistol grips.

**CR SEQ**

Yes Yes OPEN Generator No. 1 MOTOR breaker.

**STEP STANDARD:**

Operator opens MG set motor breaker by turning pistol grip counterclockwise to the TRIP position.

**COMMENTS:**

*SAT* \_\_\_\_\_

*UNSAT* \_\_\_\_\_

**STEP: 5**

**CUES:**

EVALUATOR CUE: Point to the red light and say "This light is LIT" and point to the green light and say "This light is OFF" after they operate each of the pistol grips.

**CR SEQ**

No Yes OPEN Generator No. 2 GENERATOR breaker.

**STEP STANDARD:**

Operator attempts to open MG set generator breaker by turning pistol grip counterclockwise to the TRIP position.

**COMMENTS:**

*SAT*

*UNSAT*

**STEP: 6**

**CUES:**

EVALUATOR CUE: Point to the red light and say "This light is LIT" and point to the green light and say "This light is OFF" after they operate each of the pistol grips.

**CR SEQ**

No Yes OPEN Generator No. 2 MOTOR breaker.

**STEP STANDARD:**

Operator attempts to open MG set motor breaker by turning pistol grip controller counterclockwise to the TRIP position.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP: 7**

**CUES:**

EVALUATOR CUE: Point to the red light and say "This light is OFF" and point to the green light and say "This light is LIT" Also cue that a green OPEN flag is showing.

EVALUATOR CUE: After the Operator explains expected conditions for the action taken, If Operator pushes the TRIP button on the right side of the breaker, point to the red light and say "This light is LIT" and point to the green light and say "This light is OFF." Also cue that the red "CLOSED" flag is showing.

EVALUATOR NOTE: Shift Supervisor may waive ISP-027 requirements. ISP-027 would require Hazard Level 1.

**CR SEQ**

Yes Yes OPEN breaker XSW 1B1 06C, ROD DRIVE  
MG SET B XMG0001B-CR (TB-436)

**STEP STANDARD:**

Operator opens the breaker by pushing in the TRIP button on the left side of the breaker. Verifies a green "OPEN" flag results.

**COMMENTS:**

**SAT**

**UNSAT** \_\_\_\_\_

STEP: 8

CUES:

EXAMINER CUE: Point to the red light and say "This light is OFF" and point to the green light and say "This light is LIT" Also cue that a green OPEN flag is showing.

EVALUATOR NOTE: After the Operator explains expected conditions for the action taken, if Operator pushes the TRIP button on the right side of the breaker, point to the red light and say "This light is LIT" and point to the green light and say "This light is OFF." Also cue that the red "CLOSED" flag is showing.

EVALUATOR NOTE: Shift Supervisor may waive ISP-027 requirements. ISP-027 would require Hazard Level 1.

CR SEQ

No Yes OPEN breaker XSW1C1 05D, ROD DRIVE  
MG SET A XMG0001A-CR (TB-412)

STEP STANDARD:

Operator opens the breaker by pushing in the TRIP button on the left side of the breaker. Verified a green "OPEN" flag results.

COMMENTS:

SAT \_\_\_\_\_

UNSAT

Examiner ends JPM at this point.

## JPM SETUP SHEET

*JPM NO:* JPPF-096A

*DESCRIPTION:* LOCALLY TRIP THE REACTOR

*IC SET:*

*INSTRUCTIONS:*

*COMMENTS:*

*Monday, June 22, 2009*

*Page 9 of 9*

***JPM BRIEFING SHEET***

***OPERATOR INSTRUCTIONS:***

***SAFETY CONSIDERATIONS:*** High Noise Area.

***INITIAL CONDITION:*** A manual Reactor Trip has been attempted due to exceeding a Limiting Safety System Setting. The NROATC inserted a manual trip, but the reactor trip breakers did NOT open. EOP-13.0 has been implemented for the ATWS.

***INITIATING CUES:*** Control Room Supervisor directs locally tripping the reactor in accordance with EOP-13.0, Attachment 1.

***AT NO TIME ARE YOU TO OPERATE ANY  
PLANT EQUIPMENT!***

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

*Monday, June 22, 2009*

TRIPPING THE REACTOR LOCALLY

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
<p><u>NOTE</u></p> <p>The following steps should be performed as necessary until the Reactor is tripped.</p>	
<p>1 <b>Open all the following breakers at XSW0001-CR, Reactor Trip Breaker Switchgear (IB-463):</b></p> <ul style="list-style-type: none"> <li>• XSW0001-RT-A, REACTOR TRIP BREAKER A. <input type="checkbox"/></li> <li>• XSW0001-RT-B, REACTOR TRIP BREAKER B. <input type="checkbox"/></li> <li>• XSW0001-BY-A, REACTOR TRIP BYPASS BREAKER A. <input type="checkbox"/></li> <li>• XSW0001-BY-B, REACTOR TRIP BYPASS BREAKER B. <input type="checkbox"/></li> </ul> <p>2 <b>Notify the Control Room when actions are complete.</b> <input type="checkbox"/></p>	<p>1 Open <u>all</u> the following breakers at XCA0005-CR, Rod Drive MG Control Cabinet (IB-463):</p> <ul style="list-style-type: none"> <li>• Generator No. 1 GENERATOR. <input type="checkbox"/></li> <li>• Generator No. 1 MOTOR. <input type="checkbox"/></li> <li>• Generator No. 2 GENERATOR. <input type="checkbox"/></li> <li>• Generator No. 2 MOTOR. <input type="checkbox"/></li> </ul> <p><u>IF</u> the Reactor is <u>NOI</u> tripped, <u>THEN</u> open the following breakers:</p> <ul style="list-style-type: none"> <li>• XSW1B1 06C, ROD DRIVE MG SET B XMG0001B-CR (TB-436). <input type="checkbox"/></li> <li>• XSW1C1 05D, ROD DRIVE MG SET A XMG0001A-CR (TB-412). <input type="checkbox"/></li> </ul>

**V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE**

j  
(SRO-V)  
en/su

**JPM NO: JPP-068**

**RESET THE TURBINE DRIVEN EMERGENCY  
FEED PUMP**

**APPROVAL: JAL APPROVAL DATE: 6/25/2007**

**REV NO: 5**

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

**THIS JPM IS APPROVED**



## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

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### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The TDEFP was being tested and tripped on overspeed. The governor has been readjusted by Mechanical Maintenance.

***INITIATING CUES:*** The CRS directs resetting the TDEFP in accordance with SOP-211, IV.D, Step 2.1.

***AT NO TIME ARE YOU TO OPERATE  
ANY PLANT EQUIPMENT!  
FOR ELECTRICAL MANIPULATIONS,  
AT NO TIME ARE YOU TO BREAK THE  
PLANE OF THE ELECTRICAL PANEL!***

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP: 1**

**CUES:**

**CR SEQ**

Yes Yes Reset and open XVT02865-MS, EF PUMP  
TURB MAIN STEAM THROTTLE  
VALVE (IB-412), as follows:  
a. Turn the trip valve handwheel fully  
clockwise to raise the trip latch.

**STEP STANDARD:**

Operator locates and rotates trip valve  
manual handwheel fully clockwise to  
raise the trip latch.

**COMMENTS:**

**SAT**

**UNSAT**

**STEP: 2**

**CUES:**

NOTE: Operator may describe pushing down on the tappet for the overspeed trip mechanism  
button and ensuring that the manual trip lever is engaged.

**CR SEQ**

Yes Yes Reset the overspeed/manual trip linkage.

**STEP STANDARD:**

Operator locates and pulls trip lever rod  
toward the trip valve to manually reset  
the overspeed trip linkage.

**COMMENTS:**

**SAT**

**UNSAT**

**STEP: 3**

**CUES:**

**CR SEQ**

Yes Yes Disengage the low oil pressure trip linkage  
from the trip latch lever.

**STEP STANDARD:**

Operator locates and manually pulls trip  
latch lever to the right (toward the  
governor valve) to disengage the low oil  
pressure trip linkage.

**COMMENTS:**

**SAT**

**UNSAT**

**STEP: 4**

**CUES:**

**NOTE:** The upper limit switch should be engaged by the circular collar around the rod connected to the valve stem.

**CR SEQ**

Yes Yes Turn the trip valve handwheel fully counter clockwise and back-off one quarter turn.

**STEP STANDARD:**

Operator locates and turns trip valve handwheel fully counterclockwise and backs off one quarter turn to open the trip valve.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

**STEP: 5**

**CUES:**

**CR SEQ**

Yes Yes Reset the EF PUMP TURBINE SPEED CONTROL GOVERNOR VLV as follows:

- 1) Rotate the manual adjustment knob fully counterclockwise.
- 2) Rotate the manual adjustment knob fully clockwise.

**STEP STANDARD:**

Operator locates and rotates the manual adjustment knob in the "MIN" direction (fully counter clockwise).

Operator rotates the manual adjustment knob in the "MAX" direction (fully clockwise).

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT**

Examiner ends JPM at this point.

## JPM SETUP SHEET

*JPM NO:* JPP-068

*DESCRIPTION:* RESET THE TURBINE DRIVEN EMERGENCY FEED PUMP

*IC SET:*

*INSTRUCTIONS:*

*COMMENTS:*

*Monday, June 22, 2009*

*Page 7 of 7*

***JPM BRIEFING SHEET***

***OPERATOR INSTRUCTIONS:***

***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The TDEFP was being tested and tripped on overspeed. The governor has been readjusted by Mechanical Maintenance.

***INITIATING CUES:*** The CRS directs resetting the TDEFP in accordance with SOP-211, IV.D, Step 2.1.

***AT NO TIME ARE YOU TO OPERATE ANY  
PLANT EQUIPMENT!***

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

*Monday, June 22, 2009*

## D. RESETTING THE TURBINE DRIVEN EMERGENCY FEEDWATER PUMP

### 1.0 INITIAL CONDITIONS

- 1.1 The Turbine Driven Emergency Feedwater Pump is not reset.

### 2.0 INSTRUCTIONS

- 2.1 Reset and open XVT02865-MS, EF PUMP TURB MAIN STEAM THROTTLE VALVE (IB-412), as follows:

- a. Turn the trip valve handwheel fully clockwise to raise the trip latch.
- b. Reset the overspeed/manual trip linkage.
- c. Disengage the low oil pressure trip linkage from the trip latch lever.
- d. Turn the trip valve handwheel fully counterclockwise and back-off one quarter turn.

CAUTION 2.1.e

The EF PUMP TURBINE SPEED CONTROL GOVERNOR VLV must be reset after shutdown or the turbine may trip on overspeed if restarted within 30 minutes.

- e. Reset the EF PUMP TURBINE SPEED CONTROL GOVERNOR VLV as follows:
  - 1) Rotate the manual adjustment knob fully counterclockwise.
  - 2) Rotate the manual adjustment knob fully clockwise.

**END OF SECTION**

**V.C. SUMMER NUCLEAR STATION  
JOB PERFORMANCE MEASURE**

K  
(SRU-U)  
also

**JPM NO: JPP-207**

RETURN ALTERNATE SOURCE FOR INVERTER  
XIT-5901

**APPROVAL: WRQ APPROVAL DATE: 6/12/2009**

**REV NO: 0**

CANDIDATE: \_\_\_\_\_

EXAMINER: \_\_\_\_\_

**THIS JPM IS APPROVED**

**TASK:**

**TASK STANDARD:**

Alternate source 1FA is available to Inverter XIT-5901. The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc.) and industrial safety practices meets expectations.

**TERMINATING CUE:** Examinee returns SOP-310 to Examiner.

**PREFERRED EVALUATION LOCATION                      PREFERRED EVALUATION METHOD**

PLANT

SIMULATE

**REFERENCES:**      SOP-310                      120 VAC INSTRUMENT AND CONTROL SYSTEM

<i>INDEX NO.</i>	<i>K/A NO.</i>		<i>RO</i>	<i>SRO</i>
062000A103	A1.03	Effect on instrumentation and controls of switching power supplies	2.5	2.8
062000A303	A3.03	Adequate transformer/inverter operation	2.3	2.3
062000A304	A3.04	Operation of inverter (e.g., precharging synchronizing light, static transfer)	2.7	2.9

**TOOLS:**      SOP-310, Section IV.AD

**EVALUATION TIME**              10              **TIME CRITICAL**    No              **10CFR55:** 45(a)6

TIME START:

TIME FINISH:

PERFORMANCE TIME:

**PERFORMANCE RATING:**      SAT:              UNSAT:

**EXAMINER:** \_\_\_\_\_

SIGNATURE

DATE

## ***INSTRUCTIONS TO OPERATOR***

### ***READ TO OPERATOR:***

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THE OBJECTIVE FOR THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

### ***SAFETY CONSIDERATIONS:***

***INITIAL CONDITION:*** The plant is at 100% power. APN5901, 120V VITAL AC DISTR is currently being supplied from the normal AC source. The alternate AC source breaker is open.

***INITIATING CUES:*** The Shift Supervisor directs that XIT-5901 alternate power be returned in accordance with SOP-310, Section IV.AD, beginning with Step 1.3.

***AT NO TIME ARE YOU TO OPERATE  
ANY PLANT EQUIPMENT!  
FOR ELECTRICAL MANIPULATIONS,  
AT NO TIME ARE YOU TO BREAK THE  
PLANE OF THE ELECTRICAL PANEL!***

***HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!***

**STEPS**

**STEP: 1**

**CUES:**

EVALUATOR CUE: Point to the CENTER position and say "The TEST TRANSFER Switch is in this position."

**CR SEQ**

No Yes The TEST TRANSFER Switch is in the CENTER position.

**STEP STANDARD:**

Locates and verifies the TEST TRANSFER Switch is in CENTER position.

**COMMENTS:**

*SAT*

*UNSAT* \_\_\_\_\_

**STEP: 2**

**CUES:**

EVALUATOR CUE: Point to the BYP TO PREF ISOLATE position and say "The MAN. BYPASS Switch is in this (southwest) position."

**CR SEQ**

No Yes The MAN. BYPASS Switch is in the BYP TO PREF ISOLATE position.

**STEP STANDARD:**

Locates and verifies MAN. BYPASS Switch is in BYP TO PREF ISOLATE position.

**COMMENTS:**

*SAT*

*UNSAT* \_\_\_\_\_

**STEP: 3**

**CUES:**

EVALUATOR CUE: Point to APN1FA, breaker 19, and say "Breaker 19 is in the "closed (to the right)" position."

EVALUATOR NOTE: APN1FA breaker 19 is ALT SOURCE FOR APN5901 VIA XIT5901.

**CR SEQ**

No Yes APN1FA 19, ALT SOURCE FOR APN5901 VIA XIT5901 is closed.

**STEP STANDARD:**

Locates and verifies APN1FA 19, ALT SOURCE FOR APN5901 VIA XIT5901 is closed.

**COMMENTS:**

*SAT*

*UNSAT* \_\_\_\_\_

**STEP: 4**

**CUES:**

EVALUATOR CUE: Point to the ALT AC SOURCE Breaker and say "The ALT AC SOURCE Breaker is in the "closed (upper)" position."

**CR SEQ**

**STEP STANDARD:**

Yes Yes Close the ALT AC SOURCE Breaker, on the inverter front.

Locates and places ALT AC SOURCE Breaker on the Inverter front in the closed (Up) position.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 5**

**CUES:**

EVALUATOR CUE: Say "1 minute has passed." Point to the LINE position and say "The SOURCE SELECTOR Switch is in this position."

**CR SEQ**

**STEP STANDARD:**

Yes Yes After the one minute regulator logic warm-up period, place the SOURCE SELECTOR Switch, to the LINE position.

After one minute, locates and places SOURCE SELECTOR Switch to the LINE position.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 6**

**CUES:**

EVALUATOR CUE: Point to the BYP TO PREF (northwest) position and say "The MAN. BYPASS Switch is in this position."

**CR SEQ**

**STEP STANDARD:**

Yes Yes Place the MAN. BYPASS Switch, to the BYP TO PREF position.

Locates and rotates MAN. BYPASS Switch to BYP TO PREF position.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 7**

**CUES:**

EVALUATOR CUE: Point to the 120V increment on the AC OUTPUT voltage meter and say "This is what the meter reads." Point to the 60 Hz increment on the AC OUTPUT frequency meter and say "This is what the meter reads."

**CR SEQ**

- No Yes Verify the following:  
a. AC OUTPUT voltage is 120 volts.  
b. AC OUTPUT frequency is 60 hertz.

**STEP STANDARD:**

Verifies AC OUTPUT voltage at 120 volts and frequency at 60 Hz.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 8**

**CUES:**

EVALUATOR CUE: Point to the NORMAL position on the MAN. BYPASS Switch and say "The MAN. BYPASS Switch is in this position."

**CR SEQ**

- Yes Yes Place the MAN. BYPASS Switch, to the NORMAL position.

**STEP STANDARD:**

Locates and rotates MAN. BYPASS Switch to NORMAL position.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

**STEP: 9**

**CUES:**

EVALUATOR CUE: Point to the OUTPUT position on the SOURCE SELECTOR Switch and say "The SOURCE SELECTOR Switch is in this position."

**CR SEQ**

- Yes Yes Place the SOURCE SELECTOR Switch, to the OUTPUT position.

**STEP STANDARD:**

Locates and places SOURCE SELECTOR Switch to OUTPUT position.

**COMMENTS:**

**SAT** \_\_\_\_\_

**UNSAT** \_\_\_\_\_

Examiner ends JPM at this point.

## JPM SETUP SHEET

*JPM NO:* JPP-207

*DESCRIPTION:* RETURN ALTERNATE SOURCE FOR INVERTER XIT-5901

*IC SET:*

*INSTRUCTIONS:*

*COMMENTS:*

*Monday, June 22, 2009*

*Page 8 of 8*

*JPM BRIEFING SHEET*

*OPERATOR INSTRUCTIONS:*

*SAFETY CONSIDERATIONS:*

*INITIAL CONDITION:* The plant is at 100% power. APN5901, 120V VITAL AC DISTR is currently being supplied from the normal AC source. The alternate AC source breaker is open.

*INITIATING CUES:* The Shift Supervisor directs that XIT-5901 alternate power be returned in accordance with SOP-310, Section IV.AD, beginning with Step 1.3.

**AT NO TIME ARE YOU TO OPERATE ANY  
PLANT EQUIPMENT!**

**HAND THIS PAPER BACK TO YOUR  
EVALUATOR WHEN YOU FEEL THAT YOU  
HAVE SATISFACTORILY COMPLETED THE  
ASSIGNED TASK.**

*Monday, June 22, 2009*

**AD. RETURN OF ALTERNATE SOURCE FOR INVERTER XIT5901**

1.0 INITIAL CONDITIONS

- 1.1 A **Pre-Job Brief** has been conducted per OAP-100.3.
- 1.2 XMC 1DA2Y or DPN 1HA is providing power to APN5901, 120V VITAL AC DISTR PNL 1 NSSS through the NORMAL AC SOURCE Breaker on the inverter front.
- 1.3 The TEST TRANSFER Switch is in the CENTER position.
- 1.4 The MAN. BYPASS Switch is in the BYP TO PREF ISOLATE position.
- 1.5 APN1FA 19, ALT SOURCE FOR APN5901 VIA XIT5901 is closed.

2.0 INSTRUCTIONS

- 2.1 Close the ALT AC SOURCE Breaker, on the inverter front.
- 2.2 After the one minute regulator logic warm-up period, place the SOURCE SELECTOR Switch, to the LINE position.
- 2.3 Place the MAN. BYPASS Switch, to the BYP TO PREF position.
- 2.4 Verify the following:
  - a. AC OUTPUT voltage is 120 volts.
  - b. AC OUTPUT frequency is 60 hertz.
- 2.5 Place the MAN. BYPASS Switch, to the NORMAL position.
- 2.6 Place the SOURCE SELECTOR Switch, to the OUTPUT position.

**END OF SECTION**