a

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **JPS-036B**

CONTINUOUS ROD WITHDRAWAL

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

REV NO: 0

CANDIDATE: _____

EXAMINER: _____

THIS JPM IS APPROVED

TASK:

000-001-05-01 RESPOND TO CONTINUOUS ROD WITHDRAWAL

TASK STANDARD:

Outward rod motion is stopped with the reactor critical. Tavg is restored to within 1.0°F of Tref and stable, FCV-122 control in Manual with 75 gpm minimum charging flow. 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: Rod Control System in Manual, Tavg within 1.0°F of Tref and charging flow at a minimum of 75 gpm.

PREFERRED EVALUATION LOCATION *PREFERRED EVALUATION METHOD*

SIMULATOR PERFORM

REFERENCES:

AOP-403.3 CONTINUOUS CONTROL ROD MOTION

INDEX NO.	*K/A NO.*		*RO*	*SRO*
000001A205	AA2.05	Uncontrolled rod withdrawal, from available indications	4.4	4.6
000001A101	AA1.01	Bank select switch	3.5	3.2
000001A102	AA1.02	Rod in-out-hold switch	3.6	3.4

TOOLS: AOP-403.3
XCP-614:5-1

EVALUATION TIME 15 *TIME CRITICAL* No *10CFR55:* 45(a)3

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 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*		*STEP STANDARD:*
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).	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*		*STEP STANDARD:*
Yes	Yes	Place ROD CNTRL BANK SEL Switch in MAN.	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*		*STEP STANDARD:*
No	Yes	Verify rod motion is stopped.	Operator verifies rod motion indicates stopped from step demand counters and rod position indication.

COMMENTS:

SAT

UNSAT

STEP: 4

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Stabilize Main Turbine load.	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*		*STEP STANDARD:*
Yes	Yes	Adjust Control Rods to maintain Tavg within 1.0°F of Tref.	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

Gerald L Lindler — DISCIPLINE SUPERVISOR — 9-11-95 — DATE

Gary 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

I. DATE: 3/18/96 PROC. # AOP-403.3 REV. # 2 CHG. A COMM. # _____
TITLE: CONTINUOUS CONTROL ROD MOTION

NEW PROC ___ CHANGE X PERMANENT X SAFETY RELATED X
REVISION ___ RESTRICTED ___ FROM _____ TO _____ QUALITY RELATED ___
NON-SAFETY RELATED ___

II. **DESCRIPTION:** Changed sympton referring to full rod withdrawal alarm to C-11 status light.

REASON FOR CHANGE:

MRF 22769C Replaced the alarm with a status light.

Originator

III. **WILL THIS REVISION/CHANGE/NEW PROCEDURE:**

	* YES	NO	N/A
1. Result in significant increased personnel radiation exposure? (ALARA review)	___	X	
2. Result in a release of effluents to the Environment?	___	X	
3. Degrade the effectiveness of the Radiation Emergency Plan?	___	___	X
4. Degrade the safeguards effectiveness of the Physical Security, Safeguards Contingency or Training and Qualification Plans?	___	___	X

* If any question 1 through 4 is answered "YES", refer to appropriate section of procedure for direction.

REQUIRED REVIEW AND COMMENT:

() OPS () NL&OE () CHS () GMNPO X S.E.
() MNTS () P&S () HPS () GMES ()
X QA () NPS () MNT () GMNSS ()
() QC () TS () DE X QR (OPS) X JOHN Geddings

Discipline Supervisor Date

IV. **10CFR50.59 SCREENING REVIEW/SAFETY EVALUATION**

X REQUIRED ☐ EXEMPT X PSRC SUPPORTING DOCUMENT: MRF 22769C

Discipline Supervisor concurrence

V. **TEMPORARY APPROVAL:**

QUALIFIED REVIEWER _____ DATE _____ QA REVIEW _____ DATE _____
TELECON BY _____ TELECON BY _____
SHIFT SUPERVISOR _____ DATE _____ FINAL APPROVAL REQUIRED BY: DATE _____

VI. **DISCIPLINE SUPERVISOR FINAL REVIEW:**

TRAINING REQUIRED? YES ✓ NO ___
IF YES, PRIOR TO PROCEDURE IMPLEMENTATION? YES ✓ NO ___
P/CAP AFFECTED? YES ___ NO ✓
COMMENTS RESOLVED: 4-24-96
Discipline Supervisor Date

VII. **P/CAP ACCEPTABLE?**

C. YES ___ NO ___ NL&OE N/A Date
N. YES ___ NO ___ RESP. MGR. Date

VIII. **FINAL QA REVIEW (As Applicable)**

J. Cook 4-24-96
QA Concurrence Date

IX. **APPROVAL AUTHORITY:**

5/7/96
Approval/Concurrence Date

X. **PSRC REVIEW:**

A. REVIEWED BY:

PSRC Chairman Date

COMMENTS: YES ___ NO ___

B. PSRC COMMENTS RESOLVED:

Responsible Manager Date

PSRC Chairman Date

CONTINUOUS CONTROL ROD MOTION

TABLE OF CONTENTS

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 ΔFLUX LMT EXCEEDS (XCP-620 2-4).
   - RCS LOOP A(B)(C) TAVG HI (XCP-617(618)(619) 2-5).
   - OP ΔT AUTO TURB RUNBCK W/DRWL BLCK (XCP-621 1-4).
   - OT ΔT 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
OPERATOR ACTIONS	
(1) **Verify rod motion is NOT required:** • Tavg is within 1.5°F of Tref. ☐ AND • No load rejection has occurred (C7A OR C7B). ☐	1 **GO TO AOP-214.2, RESPONSE TO LOAD REJECTION/RUNBACK.** ☐
(2) **Place ROD CNTRL BANK SEL Switch in MAN.** ☐	
(3) **Verify rod motion is stopped.** ☐	3 Perform the following: a) Trip the Reactor. ☐ b) **GO TO EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION.** ☐
4 **Stabilize Main Turbine load.** ☐	
5 **Adjust Control Rods to maintain T_{avg} within 1.0°F of T_{ref}.** ☐	
6 **Verify PZR level is stable at OR trending to program level.** ☐	6 Control Charging and Letdown flow to restore PZR level to program level. ☐
7 **Verify PZR pressure is stable at OR trending to 2235 psig (2220 psig to 2250 psig).** ☐	7 Control PZR Spray and Heaters to maintain normal PZR pressure. ☐
8 **Notify the following plant personnel:** • Management Duty Supervisor. ☐ • Reactor Engineering. ☐ • Rod Control System Engineer. ☐	

CONTINUOUS CONTROL ROD MOTION

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
NOTE - Step 9 Rod control should be maintained in MAN pending results of the event analysis.	
9 **Determine and correct the cause of the failure.** ☐	
10 **Proceed as directed by the Shift Supervisor.** ☐	
End of AOP-403.3	

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

TASK:

006-003-01-01 FILL THE ACCUMULATORS

TASK STANDARD:

The "A" Accumulator is refilled (alarm clear). The 'A' Accumulator pressure and level are within limits. 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: Hydro Test Pump is secured. Fill lineup secured.

PREFERRED EVALUATION LOCATION	*PREFERRED EVALUATION METHOD*
SIMULATOR	PERFORM

REFERENCES:

SOP-112	SAFETY INJECTION SYSTEM
ARP-001-XCP-611	PANEL XCP-611

INDEX NO.	*K/A NO.*		*RO*	*SRO*
006000A113	A1.13	Accumulator pressure (level, boron concentration)	3.5	3.7

TOOLS: SOP-112
ARP-001-XCP-611 1-2

EVALUATION TIME 30 *TIME CRITICAL* NO *10CFR55:* 41(b)3

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 "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*		*STEP STANDARD:*
No	No	Verifies actual level on LI-920 and LI-922	Determines both indicators indicate level below the lowalarm setpoint

COMMENTS:

SAT ____

UNSAT ____

STEP: 2

CUES:

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

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Directs locally aligning SI Hydro pump	Directs ABAO to open XVT-8932 (suction valve) and XVT-8967 (Discharge Valve)

COMMENTS:

SAT ____

UNSAT ____

STEP: 3

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Verifies recirc valve open	Verifies HCV-947 hand controller has 100% demand.

COMMENTS:

SAT ____

UNSAT

STEP: 4

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Directs racking in Hydro Test Pump breaker.	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*		*STEP STANDARD:*
Yes	Yes	Start the Hydro Test Pump.	Indicator lights for the Hydro Test Pump, red light ON and green light OFF.

COMMENTS:

SAT _____

UNSAT _____

STEP: 6

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Open the Hydro Pump discharge valve.	PVT-8860, HYDRO PP DISCH, red light ON, green light OFF.

COMMENTS:

SAT _____

UNSAT _____

STEP: 7

CUES:

Should request a peer check

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Align Hydro Test Pump discharge to 'A' accumulator.	PVT-8878A, A FILL FR HYDRO PP, red light ON and green light OFF.

COMMENTS:

SAT _____

UNSAT _____

STEP: 8

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Commence filling 'A' accumulator.	HCV-947, HYDRO PP RECIRC VLV, slowly closed using positioner. 'A' accumulator level increasing.

COMMENTS:

SAT _____

UNSAT

STEP: 9

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Acknowledge ACCUM A PRESS HI/LO annunciator.	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*		*STEP STANDARD:*
Yes	Yes	Secures filling operation.	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*		*STEP STANDARD:*
No	Yes	Ensures Accumuator Nitrogen vent is closed.	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*		*STEP STANDARD:*
Yes	Yes	Reduce 'A' accumulator pressure.	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***		***STEP STANDARD:***
Yes	Yes	Secures venting of 'A' accumulator.	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 accumuator, 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.

PANEL XCP-611
ANNUNCIATOR POINT 1-2

ACCUM A LVL HI/LO	SETPOINT: Hi - 88.6% Lo - 65.6%	ORIGIN: ILB00920A ILB00922A	ILB00920B 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

INDEX NO.	*K/A NO.*		*RO*	*SRO*
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*		*STEP STANDARD:*
No	No	Place XPP-58A(B)(C), CCBP A(B)(C), standby pump in OFF.	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*		*STEP STANDARD:*
No	Yes	Places XPP-001C, PUMP C, TRAIN A and TRAIN B ('C' CCW pump) in PULL-TO-LOCK.	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*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
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)	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*		*STEP STANDARD:*
Yes	Yes	Start the "B" CCW Pump in slow speed: XPP-0001B, PUMP B	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*		*STEP STANDARD:*
Yes	Yes	Start MVB-9503B, CC TO RHR HX B, stroking in the closed direction.	Places control switch for MVB-9503B in CLOSE. Observes valve in mid-position.

COMMENTS:

SAT

UNSAT _____

STEP: 7

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	1) Open MVB-9687B/9525B, LP B NON-ESSEN LOAD ISOL. 2) Open MVB-9524B/9526B, LP B NON-ESSEN LOAD ISOL.	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*		*STEP STANDARD:*
Yes	Yes	1) Close MVB-9524A/9526A, LP A NON-ESSEN LOAD ISOL. 2) Close MVB-9687A/9525A, LP A NON-ESSEN LOAD ISOL.	(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*		*STEP STANDARD:*
Yes	No	1) Open MVB-9503A, CC TO RHR HX A.	(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*		*STEP STANDARD:*
No	No	Rack in XSW1DB11, CC PUMP C XPP0001C-CC CCW PUMP C to complete Attachment VB ("C" CCW Pump breaker on 'B' train).	Racked up in slow speed. Green light ON.

COMMENTS:

SAT _____

UNSAT

STEP: 11

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	No	Place XPP-0001C, PUMP C, TRAIN B in After-Stop.	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*		*STEP STANDARD:*
No	No	Locally verify greater than 1 gpm sample flow on RML-2B, CCW Liquid Monitor.	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

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.

COMMENTS:

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	COMPONENT COOLING PUMP C TO TRAIN B LINEUP
_____	_____	
_____	_____	
_____	_____	
_____	_____	

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		**N/A**	CHG E
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			CHG E
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			

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

INDEX NO.	*K/A NO.*		*RO*	*SRO*
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*		*STEP STANDARD:*
No	Yes	Check if a Charging Pump is available.	Operator locates and determines Charging Pump "B" running; red light ON and green light OFF.

COMMENTS:

SAT ____

UNSAT ____

STEP: 2

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Stop any running Charging Pump.	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*		*STEP STANDARD:*
Yes	Yes	Close MVG-8107 and MVG-8108, CHG LINE ISOL.	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*		*STEP STANDARD:*
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.	Operator locates and checks MVG-8885 closed; green light ON and red light OFF

COMMENTS:

SAT _____

UNSAT _____

STEP: 5

CUES:

CR	*SEQ*		*STEP STANDARD:*
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.	Operator locates and checks MVG-8801A & B closed; verifies green lights ON and red lights OFF.

COMMENTS:

SAT _____

UNSAT _____

STEP: 6

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Open MVG-8884, CHG LP A TO HOT LEGS.	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*		*STEP STANDARD:*
Yes	Yes	Close MVG-8106, CHG PP, Miniflow Isolation.	Operator locates and places MVG-8106 in CLOSE; verifies green light ON and red light OFF.

COMMENTS:

SAT _____

UNSAT _____

STEP: 8

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Close MVT-8105, SEAL WTR INJ ISOL.	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*		*STEP STANDARD:*
Yes	Yes	Start one Charging Pump.	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***		***STEP STANDARD:***
No	Yes	Verify SI flow on FI-940, CHG LOOP A CLD/HOT LG FLOW GPM.	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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 **Check if a Charging Pump is available.** ☐	1 IF no Charging Pump is available, THEN **GO TO Step 13.** ☐
2 **Stop any running Charging Pump.** ☐	
3 **Close MVG-8107 and MVG-8108, CHG LINE ISOL.** ☐	
4 **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. ☐	
• MVG-8801A(B), HI HEAD TO COLD LEG INJ. ☐	
b. Open MVG-8884, CHG LP A TO HOT LEGS. ☐	
c. Close MVG-8106, CHG PP, Miniflow Isolation. ☐	
d. Close MVT-8105, SEAL WTR INJ ISOL. ☐	
5 **Start one Charging Pump.** ☐	5 **GO TO Step 13.** ☐
6 **Verify SI flow on FI-940, CHG LOOP A CLD/HOT LG FLOW GPM.** ☐	6 **GO TO Step 8.** ☐
7 **GO TO Step 15.** ☐	
8 **Stop any running Charging Pump.** ☐	

ESTABLISHING HOT LEG INJECTION

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
14 **Monitor RCS MIDLOOP LEVEL MONITORING:** • LR-1330, LP A LVL INCHES (L-1330). ☐ • LR-1331, LP C LVL INCHES (L-1331). ☐	14 Monitor RCS Hot Leg level: • Sight Glass (local). ☐ • Video monitor. ☐
15 **Restore RCS Hot Leg level to GREATER THAN OR EQUAL TO 15.5 inches.** ☐	
16 **RETURN TO Procedure Steps, Step 19.** ☐	

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** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) X Normal Rev/Chg or ☐ Editorial Correction
☐ 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 ☒ YES ☐ 1-15-7

Temporary Approval — **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required	QR (OPS)	[illegible]	☐ ☒	*Additional			☐ ☐
	SE	[illegible]	☐ ☒				☐ ☐
	NT	[illegible]	☐ ☒				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

Concurrence [illegible] 11/15/06
Supervisor/Date

Comment Due Date 11/30/06

Pre- implementation Actions

All Comments Resolved	☒ Yes	[illegible] 11/28/06 Originator/Date	
Commitments Addressed per SAP-0630	☒ NA	☐ Yes, P/CAP # ___	☐ MLSA ___ Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☒ NA	☐ Yes, Attached	
Pre-implementation Training Completed	☒ NA	☐ Yes	
Training required after implementation	☒ NA	☐ Yes, CER # ___	
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ___	
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ___	
Other:	☒ NA	☐ Yes	

[illegible] 11/29/06
Supervisor/Date

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Approval Authority/Date 1-9-07

* 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)

TABLE OF CONTENTS

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

OPERATOR ACTIONS

NOTE

- Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.
- 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 AND PZR may indicate level while the core uncovers.
- 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.

(1) **Stop any RCS boron dilution in progress.** ☐

* 2 **Monitor RCS heatup/cooldown:**

- Monitor TR-413, HOT LEG °F WIDE RNG. ☐
- **Implement STP-103.001, REACTOR COOLANT SYSTEM AND PRESSURIZER HEATUP/COOLDOWN SURVEILLANCE.** ☐

3 **Determine and correct the cause of any RHR Pump trip.** ☐

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION

NOTE - Step 4

- Previously operating RHR Pump A(B) should only be started after the cause of pump trip has been determined and corrected.
- Starting an RHR Pump may result in an RCS level decrease due to shrink or void collapse.

4 Start any available RHR Pump A(B):

a. Verify RCS Hot Leg level elevation is GREATER THAN OR EQUAL TO 430' 10" as indicated on the following:

- Mansell Level Monitoring System. ☐
- Video Monitor. ☐
- Sight Glass (local). ☐
- LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). ☐
- LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). ☐

b. Check if RHR Loop A(B) is aligned to the RCS:

- MVG-8701A(B), RCS LP A(C) TO PUMP A(B), is open. ☐
- MVG-8702A(B), RCS LP A(C) TO PUMP A(B), is open. ☐
- MVG-8888A(B), RHR LP A(B) TO COLD LEGS, is open. ☐

c. Close HCV-603A(B), A(B) OUTLET. ☐

d. Throttle FCV-605A(B), A(B) BYP, to 40%. ☐

e. Place PCV-145, LO PRESS LTDN, in MAN. ☐

f. Ensure Component Cooling Water is supplied to RHR Loop A(B). ☐

g. Start XPP-0031A(B), PUMP A(B). ☐

(Step 4 continued on next page)

4 GO TO Step 11. ☐

(Step 4 continued on next page)

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

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

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

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

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

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

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION

NOTE - Step 13

Reactor Building supervisory personnel must remain in the vicinity of the RB airlock to assist with containment closure.

13 **Alert plant personnel:**

a. Announce plant conditions over the page system. ☐

b. Depress both REACTOR BLDG EVACUATION Pushbuttons. ☐

c. Repeat the announcement. ☐

d. Notify Outage Management and Operatons Tagging Desk to stop all work on secondary systems that are protected by RCS Temperature Parameter Tags. ☐

*14 **Monitor Reactor Building radiation levels.** ☐

15 **Establish Containment Integrity within two hours:**

a. **REFER TO STP-147.001, REACTOR BUILDING PENETRATION TEST.** ☐

b. Close all RB penetrations providing direct access from the RB atmosphere to the outside atmosphere. ☐

16 **Start all available RBCUs. REFER TO SOP-114, REACTOR BUILDING VENTILATION SYSTEM.** ☐

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION

CAUTION - Step 17

- Failure to warn personnel in the RB working on or near RCS openings prior to refilling the RCS may cause contamination of personnel.
- To ensure adequate Shutdown Margin is maintained, only borated water sources should be used for RCS makeup.

NOTE - Step 17

Step 17 should be used for re-diagnosis if core exit TC temperature increases during the performance of this procedure.

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
*17 **Check core exit TC temperatures LESS THAN 200°F.** ☐	*17 **GO TO ATTACHMENT 2, ESTABLISHING HOT LEG INJECTION.** ☐ IF core exit TC temperatures continue to increase, THEN **GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION.** ☐ **GO TO Step 19.** ☐

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
NOTE - Step 18 **Step 18** should NOT be performed with core exit TC temperatures GREATER THAN 200°F.	
18 **Check RCS level:**	
a. Verify RCS Hot Leg level elevation is GREATER THAN OR EQUAL TO 430' 0" as indicated on the following: • Mansell Level Monitoring System. ☐ • Video Monitor. ☐ • Sight Glass (local). ☐ • LR-1330, LP A LVL INCHES (L-1330) (5.5 inches). ☐ • LR-1331, LP C LVL INCHES (L-1331) (5.5 inches). ☐	a. **GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION.** ☐
b. Verify RCS Hot Leg level elevation is GREATER THAN OR EQUAL TO 430' 10" as indicated on the following: • Mansell Level Monitoring System. ☐ • Video Monitor. ☐ • Sight Glass (local). ☐ • LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). ☐ • LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). ☐	b. **GO TO ATTACHMENT 3, ESTABLISHING RCS MAKEUP.** ☐
19 **Identify and isolate any RCS leakage paths.** ☐	

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
NOTE - Step 20 To maintain RCS pressure low enough for gravity feed, at least two Steam Generators must be refilled and utilized.	
20 **Check if a secondary heat sink is available:** a. Check if the RCS pressure boundary is intact. ☐ b. Check if at least two Steam Generators are available: • Steam Generators are NOT isolated by nozzle dams. ☐ • Steam Generator levels are maintained GREATER THAN OR EQUAL TO 15% Wide Range. ☐	20 **GO TO Step 22.** ☐
21 **Establish a secondary heat sink:** a. Establish Emergency Feedwater flow. **REFER TO SOP-211, EMERGENCY FEEDWATER SYSTEM.** ☐ b. Maintain SG Narrow Range levels between 30% and 60%. ☐ c. Fully open available SG Steamline Power Relief Valves. ☐	

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
*22 **Check if RHR can be restored:** a. Verify RCS Hot Leg level elevation is GREATER THAN OR EQUAL TO 430' 10" as indicated on the following: • Mansell Level Monitoring System. ☐ • Video Monitor. ☐ • Sight Glass (local). ☐ • LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). ☐ • LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). ☐ b. An RHR Pump is available for operation. ☐ c. Core exit TCs are LESS THAN 200°F. ☐	*22 WHEN conditions are met to restore an RHR loop to service, THEN **CONTINUE WITH Step 23.** Observe the **NOTE** prior to **Step 23.** ☐ IF RHR can NOT be restored, THEN perform the following: a) Start trending core exit TCs. ☐ b) **GO TO Step 25.** Observe the **NOTE** prior to **Step 25.** ☐ c. **GO TO ATTACHMENT 2, ESTABLISHING HOT LEG INJECTION.** ☐ IF core exit TC temperatures continue to increase, THEN **GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION.** ☐ **GO TO Step 24.** ☐

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
NOTE - Step 23 Starting an RHR Pump may result in an RCS level decrease due to shrink or void collapse.	
23 **Attempt to restore <u>one</u> RHR Loop A(B) to service:**	
a. Verify <u>both</u> of the following:	a. **GO TO Step 25.** Observe the **NOTE** prior to **Step 25.** ☐
• XPP-0031A(B), PUMP A(B), is available. ☐	
• RHR Loop A(B) is <u>NOT</u> being used for gravity feed to the RCS. ☐	
b. Ensure Component Cooling Water is supplied to RHR Loop A(B). ☐	
c. Align RHR Loop A(B) flow path:	
1) Open MVG-8888A(B), RHR LP A(B) TO COLD LEGS. ☐	
2) Open MVG-8701A(B), RCS LP A(C) TO PUMP A(B). ☐	
3) Open MVG-8702A(B), RCS LP A(C) TO PUMP A(B). ☐	
4) Close HCV-603A(B), A(B) OUTLET. ☐	
5) Close FCV-605A(B), A(B) BYP. ☐	
(Step 23 continued on next page)	(Step 23 continued on next page)

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
(Step 23 continued)	(Step 23 continued)

NOTE - Step 23.d

- If venting is required, RCS Hot Leg level elevation should be maintained GREATER THAN OR EQUAL TO 430' 10" (15.5 inches) while venting RHR.
- If venting is required and time is NOT available to completely vent the RHR Loop, air may be swept from the RHR lines by filling the RCS Hot Legs to GREATER THAN 431' 10 1/2" (28 inches) and increasing RHR flow to GREATER THAN 2600 gpm.

d. Verify the RHR RCS Hot Leg level elevation is GREATER THAN OR EQUAL TO 430' 10" as indicated on the following: • Mansell Level Monitoring System. ☐ • Video Monitor. ☐ • Sight Glass (local). ☐ • LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). ☐ • LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). ☐	d. Vent RHR Loop A(B). **REFER TO STP-105.006, SAFETY INJECTION/RESIDUAL HEAT REMOVAL MONTHLY FLOWPATH VERIFICATION TEST.** ☐
e. Throttle FCV-605A(B), A(B) BYP, to 40%. ☐	
f. Start XPP-0031A(B), PUMP A(B). ☐	
(Step 23 continued on next page)	(Step 23 continued on next page)

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

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

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION

NOTE - Step 24

If the standby RHR train was started in **Step 23**, the Letdown return header from the standby RHR train will need to be aligned.

24 **Establish RHR Letdown:**

a. Locally align the Letdown return header (AB-412):

1) Ensure XVT08720A(B)-RH, LETDOWN HDR RH RETURN HDR A(B) INLET VALVE, for the operating RHR train is open. ☐

2) Ensure XVT08720B(A)-RH, LETDOWN HDR RH RETURN HDR B(A) INLET VALVE, for the standby RHR train is closed. ☐

b. Close PCV-145, LO PRESS LTDN. ☐

c. Open HCV-142, LTDN FROM RHR. ☐

d. Monitor FI-150, LO PRESS LTDN FLOW GPM. ☐

e. Adjust PCV-145, LO PRESS LTDN, to obtain desired Letdown flow. ☐

24 Establish CVCS Letdown. **REFER TO SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.** ☐

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
NOTE - Step 25 Overflow from RCS openings into the Reactor Building may be returned to the RWST by utilizing the RB Spray System.	
*25 **Transfer RB Sump water to the RWST:**	
a. Check if RWST level is LESS THAN 18%. ☐	a. IF RWST level decreases to LESS THAN 18%, THEN **COMPLETE Steps 25 and 26.** ☐ **GO TO Step 27.** ☐
b. Monitor RHR Sump levels to maintain GREATER THAN 413 ft: • LI-1969, RHR A LEVEL FEET. ☐ • LI-1970, RHR B LEVEL FEET. ☐	
c. Transfer RB Sump water to the RWST using RB Spray Train A:	c. Transfer RB Sump water to the RWST using RB Spray Train B:
1) Place XPP0038A, PUMP A, in PULL TO LK NON-A. ☐	1) Place XPP0038B, PUMP B, in PULL TO LK NON-A. ☐
2) Locally rack in XSW1DA 11, RB SPRAY PUMP XPP0038A-SP (IB-463). ☐	2) Locally rack in XSW1DB 06, RB SPRAY PUMP XPP0038B-SP (IB-436). ☐
3) Close MVG-3001A, RWST TO SPRAY PUMP A SUCT. ☐	3) Close MVG-3001B, RWST TO SPRAY PUMP B SUCT. ☐
4) Close MVG-3002A, NAOH TO SPRAY PUMP A SUCT. ☐	4) Close MVG-3002B, NAOH TO SPRAY PUMP B SUCT. ☐
5) Close MVG-3003A, SPRAY HDR ISOL LOOP A. ☐	5) Close MVG-3003B, SPRAY HDR ISOL LOOP B. ☐
6) Locally unlock and open XVT03010A-SP, RB SPRAY PUMP A TEST HEADER DISCH VALVE (AB-374). ☐	6) Locally unlock and open XVT03010B-SP, RB SPRAY PUMP B TEST HEADER DISCH VALVE (AB-374). ☐
7) Locally open XVG03011-SP, RB SPRAY PUMP FULL FLOW TEST ISOL VALVE (AB-374). ☐	7) Locally open XVG03011-SP, RB SPRAY PUMP FULL FLOW TEST ISOL VALVE (AB-374). ☐
(Step 25 continued on next page)	(Step 25 continued on next page)

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

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

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
26 **Maintain RWST temperature LESS THAN 140°F:**	
a. Monitor RWST temperature:	
• TI-7505, TEMP °F. ☐	
• TI-7507, TEMP °F. ☐	
b. Locally align Spent Fuel Cooling to maintain RWST temperature LESS THAN 140°F:	
1) Verify XPP0032B-SF, SPENT FUEL PIT COOLING PUMP B (AB-412), is stopped. ☐	1) Stop XPP0032B-SF, SPENT FUEL PIT COOLING PUMP B. **REFER TO SOP-123, SPENT FUEL COOLING SYSTEM.** ☐
2) Verify XPP0014, Spent Fuel Purification Pump (AB-412), is stopped. ☐	2) Stop XPP0014, Spent Fuel Purification Pump. **REFER TO SOP-123, SPENT FUEL COOLING SYSTEM.** ☐
3) Close the following:	
• XVG06661-SF, SF COOLING PUMP B SF POOL HDR ISOL VLV (AB-388). ☐	
• XVG06667-SF, SF HDR B CASK LOADING AREA ISOL VALVE (AB-388). ☐	
• XVG06663-SF, SPENT FUEL HEADER B DISCH ISOL VALVE (AB-388). ☐	
• XVG06660-SF, SPENT FUEL POOL OUTLET HDR ISOL VALVE (AB-412). ☐	
• XVG06665-SF, SPENT FUEL COOLING PUMP B SUCT ISOL VLV (AB-412). ☐	
• XVD06690-SF, SPENT FUEL PURIFICATION HDR ISOL VALVE (AB-436). ☐	
• XVG06668-SF, FUEL TRANSFER CANAL SF HDR ISOL VALVE (FB-436). ☐	
(Step 26 continued on next page)	(Step 26 continued on next page)

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
(Step 26 continued) 4) Open the following: • XVG06662-SF, REFUEL WTR STG TK SPENT FUEL ISOL VALVE (RWST PIT). ☐ • XVT06691-SF, SF PURIFICATION HEADER THROTTLE VALVE (RWST PIT). ☐ • XVD06694-SF, SF PUR HDR HYDRO TEST HEADER ISOL VALVE (RWST PIT). ☐ • XVG06664-SF, REFUEL WTR STG TK SF HDR B SUCT ISOL (AB-412). ☐ • XVG06651-SF, SPENT FUEL COOLING PUMP B SUCTION VALVE (AB-412). ☐ • XVT06659-SF, SPENT FUEL HEAT EXCHANGER B OUTLET VLV (AB-388). ☐ • XVD06692-SF, SF PUR HDR SF HEADER B SUP ISOL VALVE (AB-388). ☐ 5) Align Component Cooling Water to Spent Fuel Pool Heat Exchanger B (AB-388): a) Open XVB09624B-CC, SPENT FUEL HT EXCH B CC WTR INLET VALVE. ☐ b) Ensure XVB09628B-CC, SPENT FUEL HT EXCH B CC WTR OUTLET VLV, is throttled open. ☐ c) Ensure Component Cooling Water is supplying non-essential loads. ☐ 6) Start XPP0032B-SF, SPENT FUEL PIT COOLING PUMP B (AB-412). ☐ (Step 26 continued on next page)	(Step 26 continued) (Step 26 continued on next page)

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

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

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
29 **Secure RWST Cooling:**	
a. Verify RWST temperature is LESS THAN 100°F. ☐	a. WHEN RWST temperature is LESS THAN 100°F, THEN **COMPLETE Steps 29 and 30.** ☐ **RETURN TO Step 5.** ☐
b. Locally stop XPP0032B-SF, SPENT FUEL PIT COOLING PUMP B (AB-412). ☐	
c. Locally close the following:	
• XVG06662-SF, REFUEL WTR STG TK SPENT FUEL ISOL VALVE (RWST PIT). ☐	
• XVT06691-SF, SF PURIFICATION HEADER THROTTLE VALVE (RWST PIT). ☐	
• XVD06694-SF, SF PUR HDR HYDRO TEST HEADER ISOL VALVE (RWST PIT). ☐	
• XVG06664-SF, REFUEL WTR STG TK SF HDR B SUCT ISOL (AB-412). ☐	
• XVG06651-SF, SPENT FUEL COOLING PUMP B SUCTION VALVE (AB-412). ☐	
• XVD06692-SF, SF PUR HDR SF HEADER B SUP ISOL VALVE (AB-388). ☐	

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

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

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
33 **Restore RCS temperature to LESS THAN 140°F:** a. Maintain RCS cooldown rate LESS THAN 50°F/hr. ☐ b. Operate an RHR loop to continue RCS cooldown. **REFER TO SOP-115, RESIDUAL HEAT REMOVAL.** ☐ c. Cool down the RCS to LESS THAN 140°F. ☐	
34 **Maintain RCS Hot Leg level elevation GREATER THAN OR EQUAL TO 430' 10" as indicated on the following:** • Mansell Level Monitoring System. ☐ • Video Monitor. ☐ • Sight Glass (local). ☐ • LR-1330, LP A LVL INCHES (L-1330) (15.5 inches). ☐ • LR-1331, LP C LVL INCHES (L-1331) (15.5 inches). ☐	
35 **Maintain injection flow until either of the following conditions exist:** • Cause for loss of RCS inventory has been determined and corrected. ☐ OR • Pressurizer level is GREATER THAN OR EQUAL TO 50% on LI-462, COLD CAL LEVEL %. ☐	
36 **Consult with TSC personnel to determine further actions.** ☐	
End of AOP-115.5	

ESTABLISHING COLD LEG INJECTION

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
7 **Align RHR Loop A for gravity feed from the RWST to the RCS Cold Legs:** a. Close MVG-8701A and MVG-8702A, RCS LP A TO PUMP A. ☐ b. Close MVG-8887B, RHR LP B TO HOT LEGS. ☐ c. Open MVG-8809A, RWST TO RHR PP A. ☐ d. Open MVG-8888A, RHR LP A TO COLD LEGS. ☐ e. Ensure HCV-603A, A OUTLET, is open. ☐ f. Ensure FCV-605A, A BYP, is open. ☐	7 Align RHR Loop B for gravity feed from the RWST to the RCS Cold Legs: a) Close MVG-8701B and MVG-8702B, RCS LP C TO PUMP B. ☐ b) Close MVG-8887A, RHR LP A TO HOT LEGS. ☐ c) Open MVG-8809B, RWST TO RHR PP B. ☐ d) Open MVG-8888B, RHR LP B TO COLD LEGS. ☐ e) Ensure HCV-603B, B OUTLET, is open. ☐ f) Ensure FCV-605B, B BYP, is open. ☐
8 **Monitor RCS MIDLOOP LEVEL MONITORING:** • LR-1330, LP A LVL INCHES (L-1330). ☐ • LR-1331, LP C LVL INCHES (L-1331). ☐	8 Monitor RCS Hot Leg level: • Sight Glass (local). ☐ • Video monitor. ☐
9 **Restore RCS Hot Leg level to GREATER THAN <u>OR</u> EQUAL TO 15.5 inches.** ☐	
10 **RETURN TO Procedure Steps, Step 17.** ☐	

ESTABLISHING RCS MAKEUP

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

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
7 **Align RHR Loop A for gravity feed from the RWST to the RCS Cold Legs:** a. Close MVG-8701A and MVG-8702A, RCS LP A TO PUMP A. ☐ b. Close MVG-8887B, RHR LP B TO HOT LEGS. ☐ c. Open MVG-8809A, RWST TO RHR PP A. ☐ d. Open MVG-8888A, RHR LP A TO COLD LEGS. ☐ e. Ensure HCV-603A, A OUTLET, is open. ☐ f. Ensure FCV-605A, A BYP, is open. ☐	7 Align RHR Loop B for gravity feed from the RWST to the RCS Cold Legs: a) Close MVG-8701B and MVG-8702B, RCS LP C TO PUMP B. ☐ b) Close MVG-8887A, RHR LP A TO HOT LEGS. ☐ c) Open MVG-8809B, RWST TO RHR PP B. ☐ d) Open MVG-8888B, RHR LP B TO COLD LEGS. ☐ e) Ensure HCV-603B, B OUTLET, is open. ☐ f) Ensure FCV-605B, B BYP, is open. ☐
8 **Monitor RCS MIDLOOP LEVEL MONITORING:** • LR-1330, LP A LVL INCHES (L-1330). ☐ • LR-1331, LP C LVL INCHES (L-1331). ☐	8 Monitor RCS Hot Leg level: • Sight Glass (local). ☐ • Video monitor. ☐
9 **Restore RCS Hot Leg level to GREATER THAN OR EQUAL TO 15.5 inches.** ☐	
10 **RETURN TO Procedure Steps, Step 19.** ☐	

REDUCING RCS MAKEUP

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 **Check if a Charging Pump is running.** ☐	1 **GO TO Step 9.** ☐
2 **Check if Charging is aligned for Hot Leg Injection:**	2 **GO TO Step 7.** ☐
• MVG-8884 or MVG-8886, CHG LP A(B) TO HOT LEGS, is open. ☐	
• SI flow is indicated on FI-940 or FI-943, CHG LOOP A(B) CLD/HOT LG FLOW GPM. ☐	
3 **Terminate Hot Leg Injection:**	
a. Stop <u>any</u> running Charging Pump. ☐	
b. Open <u>both</u> LCV-115C(E), VCT OUTLET ISOL. ☐	
c. Close <u>both</u> LCV-115B(D), RWST TO CHG PP SUCT. ☐	
d. Close FCV-122, CHG FLOW. ☐	
e. Open <u>both</u> MVG-8107 and MVG-8108, CHG LINE ISOL. ☐	
f. Open MVG-8106, CHG PP, Miniflow Isolation. ☐	
g. Close MVG-8884, CHG LP A TO HOT LEGS. ☐	
h. Close MVG-8886, CHG LP B TO HOT LEGS. ☐	
i. Start <u>one</u> Charging Pump. ☐	
j. Adjust FCV-122, CHG FLOW, to obtain 60 gpm Charging flow. ☐	
4 **Monitor RCS level.** ☐	
5 **Verify RCS level is stable or increasing.** ☐	5 **GO TO ATTACHMENT 2, ESTABLISHING HOT LEG INJECTION.** ☐

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
6 **RETURN TO Procedure Steps, Step 28.** ☐	
7 **Check if Charging is aligned for Cold Leg Injection:** a. <u>One</u> of the following valves is open: • MVG-8801A(B), HIGH HEAD TO COLD LEG INJ. ☐ <u>OR</u> • MVG-8885, CHG LP A ALT TO COLD LEGS. ☐ b. SI flow is indicated on FI-940 or FI-943, CHG LOOP A(B) CLD/HOT LG FLOW GPM. ☐	7 **GO TO Step 12.** ☐

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
8 **Terminate Cold Leg Injection:**	
a. Stop any running Charging Pump. ☐	
b. Open both LCV-115C(E), VCT OUTLET ISOL. ☐	
c. Close both LCV-115B(D), RWST TO CHG PP SUCT. ☐	
d. Close FCV-122, CHG FLOW. ☐	
e. Open both MVG-8107 and MVG-8108, CHG LINE ISOL. ☐	
f. Open MVG-8106, CHG PP, Miniflow Isolation. ☐	
g. Ensure all of the following are closed:	
• MVG-8801A(B), HIGH HEAD TO COLD LEG INJ. ☐	
• MVG-8885, CHG LP A ALT TO COLD LEGS. ☐	
h. Start one Charging Pump. ☐	
i. Adjust FCV-122, CHG FLOW, to obtain 60 gpm Charging flow. ☐	
9 **Monitor RCS level.** ☐	
10 **Verify RCS level is stable or increasing.** ☐	10 **GO TO ATTACHMENT 1, ESTABLISHING COLD LEG INJECTION.** ☐
11 **RETURN TO Procedure Steps, Step 28.** ☐	

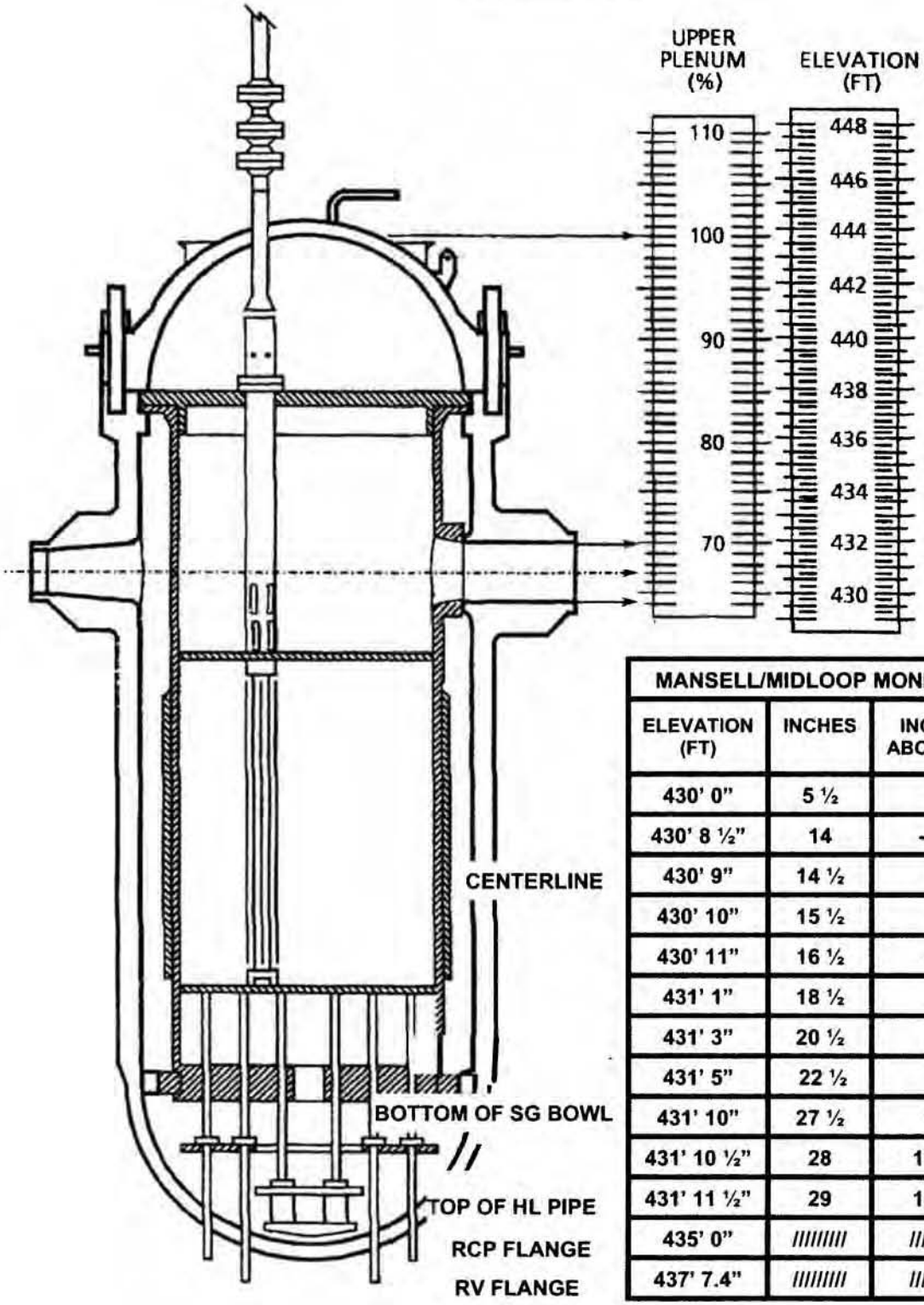
ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
12 **Check if RHR Loop A is aligned for gravity feed to the RCS:** a. XPP-0031A, PUMP A, is secured. ☐ b. MVG-8809A, RWST TO RHR PP A, is open. ☐ c. MVG-8701A and MVG-8702A, RCS LP A TO PUMP A, are closed. ☐ d. <u>One</u> of the following is open: • MVG-8888A, RHR LP A TO COLD LEGS. ☐ • MVG-8889, RHR LP A&B TO HOT LEGS. ☐	12 **GO TO Step 15.** ☐

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
13 **Realign RHR Loop A:**	
a. Close <u>both</u> of the following:	
• MVG-8888A, RHR LP A TO COLD LEGS. ☐	
• MVG-8889, RHR LP A&B TO HOT LEGS. ☐	
b. Monitor RCS level. ☐	
c. Verify RCS level is stable or increasing. ☐	c. Perform the following: 1) Open <u>one</u> of the following to reestablish gravity feed: • MVG-8888A, RHR LP A TO COLD LEGS. ☐ <u>OR</u> • MVG-8889, RHR LP A&B TO HOT LEGS. ☐ 2) **RETURN TO Procedure Steps, Step 28.** ☐
d. Close MVG-8809A, RWST TO RHR PP A. ☐	
e. Open <u>both</u> MVG-8701A and MVG-8702A, RCS LP A TO PUMP A. ☐	
f. Open MVG-8887B, RHR LP B TO HOT LEGS. ☐	
g. Open MVG-8888A, RHR LP A TO COLD LEGS. ☐	
h. Set FCV-605A, A BYP, to 40%. ☐	
i. Open HCV-603A, A OUTLET. ☐	
14 **RETURN TO Procedure Steps, Step 28.** ☐	

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
15 **Check if RHR Loop B is aligned for gravity feed to the RCS:** a. XPP-0031B, PUMP B, is OFF. ☐ b. MVG-8809B, RWST TO RHR PP B, is open. ☐ c. MVG-8701B and MVG-8702B, RCS LP C TO PUMP B, are closed. ☐ d. <u>One</u> of the following is open: • MVG-8888B, RHR LP B TO COLD LEGS. ☐ • MVG-8889, RHR LP A&B TO HOT LEGS. ☐	15 **RETURN TO Procedure Steps, Step 28.** ☐

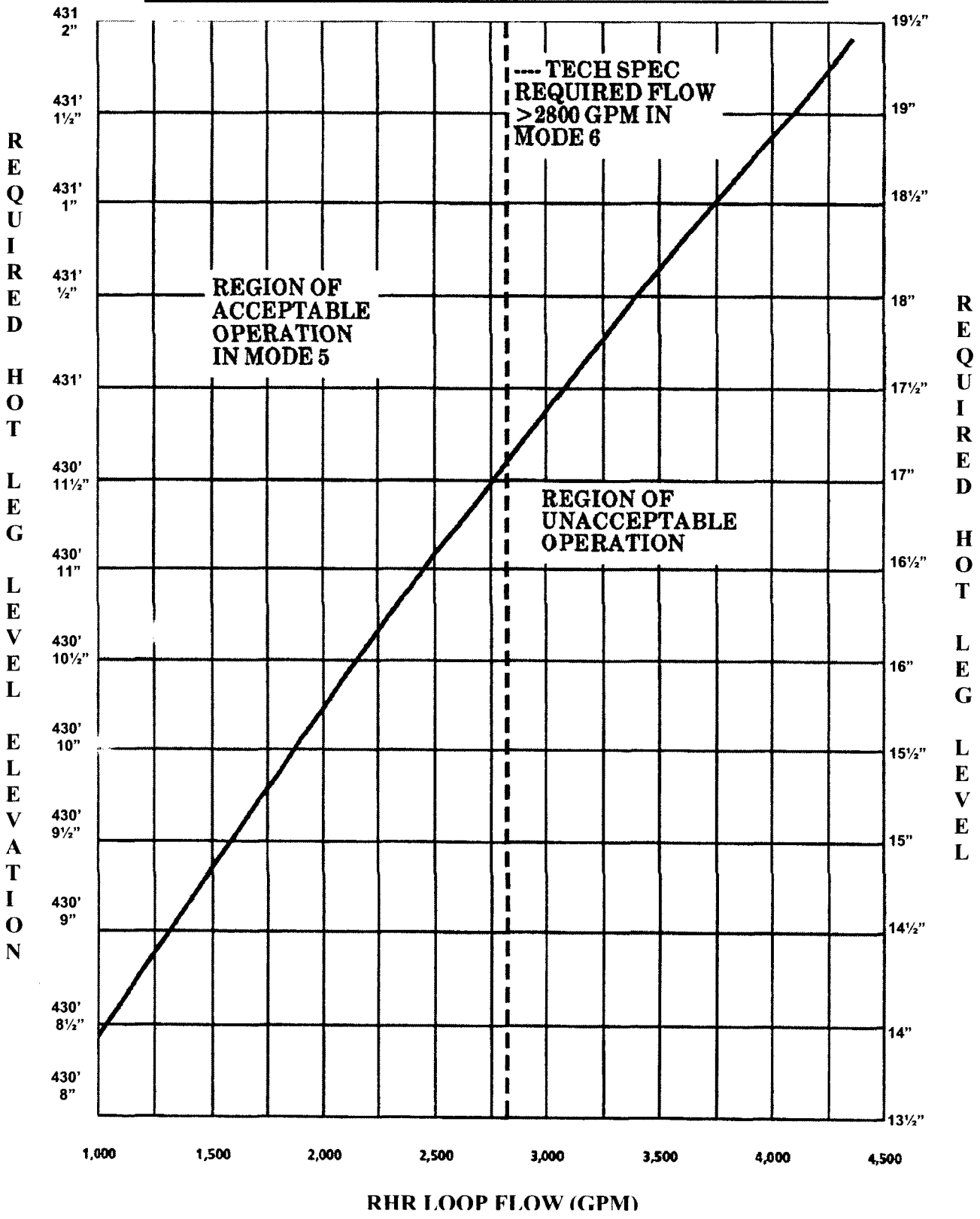
ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
16 **Realign RHR Loop B:**	
a. Ensure <u>both</u> of the following are closed:	
1) MVG-8888B, RHR LP B TO COLD LEGS. ☐	
2) MVG-8889, RHR LP A&B TO HOT LEGS. ☐	
b. Monitor RCS level. ☐	
c. Verify RCS level is stable or increasing. ☐	c. Perform the following:
	1) Open <u>one</u> of the following to reestablish gravity feed:
	• MVG-8888B, RHR LP B TO COLD LEGS. ☐
	<u>OR</u>
	• MVG-8889, RHR LP A&B TO HOT LEGS. ☐
	2) **RETURN TO Procedure Steps, Step 28.** ☐
d. Close MVG-8809B, RWST TO RHR PP B. ☐	
e. Open <u>both</u> MVG-8701B and MVG-8702B, RCS LP C TO PUMP B. ☐	
f. Open MVG-8887A, RHR LP A TO HOT LEGS. ☐	
g. Open MVG-8888B, RHR LP B TO COLD LEGS. ☐	
h. Set FCV-605B, B BYP, to 40%. ☐	
i. Open HCV-603B, B OUTLET. ☐	
17 **RETURN TO Procedure Steps, Step 28.** ☐	

RVLIS INDICATIONS



MANSELL/MIDLOOP MONITOR			RVLIS
ELEVATION (FT)	INCHES	INCHES ABOVE CL	UPPER PLENUM (%)
430' 0"	5 ½	-9	65.3
430' 8 ½"	14	-1/2	66.9
430' 9"	14 ½	0	67.0
430' 10"	15 ½	1	67.2
430' 11"	16 ½	2	67.4
431' 1"	18 ½	4	67.8
431' 3"	20 ½	6	68.2
431' 5"	22 ½	8	68.7
431' 10"	27 ½	13	69.7
431' 10 ½"	28	13 ½	69.8
431' 11 ½"	29	14 ½	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

REV NO: 1

CANDIDATE: _____

EXAMINER: _____

THIS JPM IS APPROVED

TASK:

045-020-04-01 RESPOND TO FAILURE OF TURBINE TO TRIP

TASK STANDARD:

Steam flow to the turbine is secured by tripping the main turbine. Safety Injection is manually actuated. 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: Safety Injection manually actuated.

PREFERRED EVALUATION LOCATION	*PREFERRED EVALUATION METHOD*
SIMULATOR	PERFORM

REFERENCES: EOP-1.0 REACTOR TRIP/SAFETY INJECTION ACTUATION

INDEX NO.	*K/A NO.*		*RO*	*SRO*
045000K447	K4.47	Turbine trip upon reactor trip	4.0	4.3
000007A101	EA1.01	T/G controls	3.7	3.4
000007A107	EA1.07	MT/G trip; verification that the MT/G has been tripped	4.3	4.3
000007A202	EA2.02	Proper actions to be taken if the automatic safety functions have not taken place	4.3	4.6

TOOLS: EOP-1.0

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 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*		*STEP STANDARD:*
No	Yes	Verify Turbine/Generator Trip: a. Verify all Turbine STM STOP VLVs are closed.	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*		*STEP STANDARD:*
No	Yes	Trip the turbine.	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*		*STEP STANDARD:*
Yes	Yes	IF the Turbine will NOT trip, THEN: Set LOAD LMT SET fully Counterclockwise.	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*		*STEP STANDARD:*
Yes	Yes	IF the Turbine will NOT trip, THEN: Place EHC Pumps A and B in PULL TO LK NON-A.	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*		*STEP STANDARD:*
Yes	Yes	IF the Turbine will NOT trip, THEN: Locally trip the Main Turbine from the Turbine Front Standard (TB-463).	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*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
No	Yes	Verify both ESF busses are energized.	Operator locates and verifies ESF busses 1DA & 1DB energized; verifies red lights ON and amps normal.

COMMENTS:

SAT _____

UNSAT _____

STEP: 8

CUES:

CR	*SEQ*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
Yes	Yes	Actuate SI using either SI ACTUATION Switch.	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

INDEX NO.	*K/A NO.*		*RO*	*SRO*
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*		*STEP STANDARD:*
No	Yes	Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen.	Operator locates PR-951, determines RB pressure > 12 psig and goes to Alternative Action.

COMMENTS:

SAT _____

UNSAT _____

STEP: 2

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Verify both of the following annunciators are lit: - XCP-612 3-2 (RB SPR ACT). - XCP-612 4-2 (PHASE B ISOL).	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*		*STEP STANDARD:*
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.	Operator locates and places CS-SGB1 AND CS-SGB2 switches in ACTUATE position.

COMMENTS:

SAT _____

UNSAT _____

STEP: 4

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Verify Phase B Isolation by ensuring RB SPRAY/PHASE B ISOL monitor lights are bright on XCP-6105.	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*		*STEP STANDARD:*
Yes	Yes	Ensure the following are open: - MVG-3001A(B), RWST TO SPRAY PUMP A(B) SUCT.	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*		*STEP STANDARD:*
Yes	Yes	Ensure the following are open: - MVG-3002A(B), NAOH TO SPRAY PUMP A(B) SUCT.	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*		*STEP STANDARD:*
Yes	Yes	Ensure the following are open: - MVG-3003A(B), SPRAY HDR ISOL LOOP A(B).	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*		*STEP STANDARD:*
Yes	Yes	Ensure both RB Spray Pumps are running.	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*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
Yes	Yes	Stop all RCPs.	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.

REACTOR TRIP/SAFETY INJECTION ACTUATION

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
* 8 **Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen.** ☐	* 8 Perform the following: a) Verify both the following annunciators are lit: • XCP-612 3-2 (RB SPR ACT). ☐ • XCP-612 4-2 (PHASE B ISOL). ☐ 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. ☐ b) Verify Phase B Isolation by ensuring RB SPRAY/PHASE B ISOL monitor lights are bright on XCP-6105. ☐ c) Ensure the following are open: • MVG-3001A(B), RWST TO SPRAY PUMP A(B) SUCT. ☐ • MVG-3002A(B), NAOH TO SPRAY PUMP A(B) SUCT. ☐ • MVG-3003A(B), SPRAY HDR ISOL LOOP A(B). ☐ d) Ensure both RB Spray Pumps are running. ☐ e) 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. ☐ f) Stop all RCPs. ☐

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:

INDEX NO.	*K/A NO.*		*RO*	*SRO*
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*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
Yes	Yes	Cycle one PZR PORV as necessary to depressurize the RCS.	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*		*STEP STANDARD:*
No	Yes	Verify PZR level is GREATER THAN 30% [50%].	Operator locates and verifies PZR level indicates greater than 30% (50% for adverse containment value).

COMMENTS:

SAT _____

UNSAT _____

STEP: 4

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Stop RCS depressurization.	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.

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
7 **Check if the SI System is in service:** • Any Charging Pump is running with flow indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. ☐ OR • Any RHR Pump is running in the SI Mode. ☐	7 IF SI has been terminated, THEN **GO TO Step 13.** ☐
NOTE - Step 8 If no RCP is running, the Reactor Vessel Head Upper Plenum may void during depressurization resulting in a rapidly increasing PZR level.	
8 **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 RCPs B AND C: 1) Open PCV-444C, PZR SPRAY. ☐ 2) Close PCV-444D, PZR SPRAY. ☐	a. Cycle one PZR PORV as necessary to depressurize the RCS. ☐
b. Verify PZR level is GREATER THAN 30% [50%]. ☐	b. WHEN PZR level is GREATER THAN 30% [50%], THEN **COMPLETE Step 8.** ☐ **CONTINUE WITH Step 9.** Observe the **CAUTION** and **NOTE** prior to **Step 9.** ☐
c. Stop RCS depressurization. ☐	

h
(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.

PREFERRED EVALUATION LOCATION *PREFERRED EVALUATION METHOD*

SIMULATOR PERFORM

REFERENCES:

INDEX NO.	*K/A NO.*		*RO*	*SRO*
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*		*STEP STANDARD:*
No	Yes	Record Reactor power on Attachments I and II.	Operator records approximately 60 cps on Attachment I.

COMMENTS:

SAT

UNSAT ____

STEP: 2

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Place the LEVEL TRIP switch to BYPASS.	Operator places the LEVEL TRIP switch to BYPASS.

COMMENTS:

SAT

UNSAT ____

STEP: 3

CUES:

CR	*SEQ*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
No	Yes	Turn the OPERATIONAL SELECTOR switch to LEVEL ADJUST.	Operator turns the OPERATIONAL SELECTOR switch to LEVEL ADJUST.

COMMENTS:

SAT

UNSAT

STEP: 5

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Verify the following: 1) CHANNEL ON TEST drawer light is lit. 2) NIS CHAN TEST annunciator (XCP-620 3-4) alarms.	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*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL ADJUST potentiometer clockwise until the POWER ABOVE PERMISSIVE P6 drawer light is lit.	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*		*STEP STANDARD:*
No	Yes	Verify the following: 1) P6 monitor light is lit. 2) CHAN I P6 monitor light is lit.	Operator verifies the P6 and CHAN I P6 monitor lights on the MCB are lit.

COMMENTS:

SAT _____

UNSAT

STEP: 8

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Record the P6 Permissive trip setpoint on Attachment I.	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*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL ROD STOP drawer light is lit.	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*		*STEP STANDARD:*
Yes	Yes	Record the HIGH LEVEL ROD STOP trip setpoint on Attachment I.	Operator records approximately 20 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

COMMENTS:

SAT _____

UNSAT _____

STEP: 11

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL ADJUST potentiometer clockwise until the HIGH LEVEL TRIP drawer light is lit.	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*		*STEP STANDARD:*
No	Yes	Verify the CHAN I IR FLUX HI monitor light is lit.	Operator verifies the CHAN I IR FLUX HI monitor light on the MCB is lit.

COMMENTS:

SAT

UNSAT _____

STEP: 13

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Record the HIGH LEVEL TRIP trip setpoint on Attachment I.	Operator records approximately 25 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

COMMENTS:

SAT _____

UNSAT _____

STEP: 14

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL TRIP drawer light extinguishes.	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*		*STEP STANDARD:*
No	Yes	Verify the CHAN I IR FLUX HI monitor light is off.	Operator verifies the CHAN I IR FLUX HI monitor light on the MCB is off.

COMMENTS:

SAT _____

UNSAT

STEP: 16

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Record the HIGH LEVEL TRIP reset setpoint on Attachment I.	Operator records approximately 20 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

COMMENTS:

SAT ____

UNSAT ____

STEP: 17

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL ADJUST potentiometer counterclockwise until the HIGH LEVEL ROD STOP drawer light extinguishes.	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*		*STEP STANDARD:*
Yes	Yes	Record the HIGH LEVEL ROD STOP reset setpoint on Attachment I.	Operator records approximately 19 (+/- 5.0) in the AS FOUND % PWR column of Attachment I.

COMMENTS:

SAT ____

UNSAT ____

STEP: 19

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL ADJUST potentiometer counterclockwise until the POWER ABOVE PERMISSIVE P6 drawer light is off.	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*		*STEP STANDARD:*
No	Yes	Verify the following: 1) P6 monitor light is off. 2) CHAN I P6 monitor light is off.	Operator verifies the P6 and CHAN I P6 monitor lights on the MCB are off.

COMMENTS:

SAT _____

UNSAT _____

STEP: 21

CUES:

CR	*SEQ*		*STEP STANDARD:*
Yes	Yes	Record the P6 Permissive reset setpoint on Attachment I.	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*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL ADJUST potentiometer fully counterclockwise.	Operator turns the LEVEL ADJUST potentiometer on drawer N-35 fully counterclockwise.

COMMENTS:

SAT .

UNSAT _____

STEP: 23

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Turn the OPERATOR SELECTOR switch through all positions, recording the indication for each position on Attachment I.	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*		*STEP STANDARD:*
Yes	Yes	Turn the OPERATOR SELECTOR switch to NORMAL.	Operator turns the OPERATOR SELECTOR switch on drawer N-35 to NORMAL.

COMMENTS:

SAT

UNSAT _____

STEP: 25

CUES:

CR	*SEQ*		*STEP STANDARD:*
No	Yes	Verify the following: 1) CHANNEL ON TEST drawer light is off. 2) NIS CHAN TEST annunciator (XCP-620 3-4) clears.	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*		*STEP STANDARD:*
Yes	Yes	Turn the LEVEL TRIP switch to NORMAL.	Operator turns the LEVEL TRIP switch to NORMAL.

COMMENTS:

SAT

UNSAT _____

STEP: 27

CUES:

CR	*SEQ*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
Yes	Yes	Verify channel restoration by a second operator.	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*		*STEP STANDARD:*
Yes	Yes	Determines if Acceptance Criteria is met.	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.

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 **11/06/98**
DISCIPLINE SUPERVISOR DATE

Original Signed By: G. Williams **11/09/98**
APPROVAL AUTHORITY 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.

TABLE OF CONTENTS

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 PXOPMANUALRTHE "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

INDEX NO.	*K/A NO.*		*RO*	*SRO*
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*		*STEP STANDARD:*
No	Yes	Locally open both reactor trip breakers.	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*		*STEP STANDARD:*
No	Yes	Verify open reactor trip bypass breakers	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*		*STEP STANDARD:*
Yes	Yes	OPEN Generator No. 1 GENERATOR breaker.	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*		*STEP STANDARD:*
Yes	Yes	OPEN Generator No. 1 MOTOR breaker.	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*		*STEP STANDARD:*
No	Yes	OPEN Generator No. 2 GENERATOR breaker.	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*		*STEP STANDARD:*
No	Yes	OPEN Generator No. 2 MOTOR breaker.	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*		*STEP STANDARD:*
Yes	Yes	OPEN breaker XSW1B1 06C, ROD DRIVE MG SET B XMG0001B-CR (TB-436)	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*		*STEP STANDARD:*
No	Yes	OPEN breaker XSW1C1 05D, ROD DRIVE MG SET A XMG0001A-CR (TB-412)	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:

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.

TRIPPING THE REACTOR LOCALLY

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
NOTE The following steps should be performed as necessary until the Reactor is tripped.	
1 **Open all the following breakers at XSW0001-CR, Reactor Trip Breaker Switchgear (IB-463):** • XSW0001-RT-A, REACTOR TRIP BREAKER A. ☐ • XSW0001-RT-B, REACTOR TRIP BREAKER B. ☐ • XSW0001-BY-A, REACTOR TRIP BYPASS BREAKER A. ☐ • XSW0001-BY-B, REACTOR TRIP BYPASS BREAKER B. ☐	1 Open all the following breakers at XCA0005-CR, Rod Drive MG Control Cabinet (IB-463): • Generator No. 1 GENERATOR. ☐ • Generator No. 1 MOTOR. ☐ • Generator No. 2 GENERATOR. ☐ • Generator No. 2 MOTOR. ☐ IF the Reactor is NOT tripped, THEN open the following breakers: • XSW1B1 06C, ROD DRIVE MG SET B XMG0001B-CR (TB-436). ☐ • XSW1C1 05D, ROD DRIVE MG SET A XMG0001A-CR (TB-412). ☐
2 **Notify the Control Room when actions are complete.** ☐	

J

(SRO-U also)

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

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

TASK:

061-012-01-04 RESET TURBINE DRIVEN EMERGENCY FEEDWATER PUMP(TDEFP) GOVERNOR STOP VALVE

TASK STANDARD:

TDEFP main steam throttle valve and speed control governor valve are reset per SOP-211. The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc.) and industrial safety practices meet expectations.

TERMINATING CUE: TDEFP is reset and ready for Auto start, or Operator returns SOP-211 to Examiner.

PREFERRED EVALUATION LOCATION *PREFERRED EVALUATION METHOD*

PLANT SIMULATE

REFERENCES: SOP-211 EMERGENCY FEEDWATER SYSTEM

INDEX NO.	*K/A NO.*		*RO*	*SRO*
000007A108	EA1.08	AFW System	4.4	4.3
061000A204	A2.04	pump failure or improper operation	3.4	3.8

TOOLS: SOP-211 SECTION IV.D, STEP 2.1

EVALUATION TIME 5 *TIME CRITICAL* No *10CFR55:* 45(a)7

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 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*		*STEP STANDARD:*
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.	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*		*STEP STANDARD:*
Yes	Yes	Reset the overspeed/manual trip linkage.	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*		*STEP STANDARD:*
Yes	Yes	Disengage the low oil pressure trip linkage from the trip latch lever.	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*		*STEP STANDARD:*
Yes	Yes	Turn the trip valve handwheel fully counter clockwise and back-off one quarter turn.	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*		*STEP STANDARD:*
Yes	Yes	Reset the EF PUMP TURBINE SPEED CONTROL GOVERNOR VLV as follows:	Operator locates and rotates the manual adjustment knob in the "MIN" direction (fully counter clockwise).
		1) Rotate the manual adjustment knob fully counterclockwise.	Operator rotates the manual adjustment knob in the "MAX" direction (fully clockwise).
		2) Rotate the manual adjustment knob 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:

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.

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

K

(SRO-U also)

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

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

INDEX NO.	*K/A NO.*		*RO*	*SRO*
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-5901alternate 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*		*STEP STANDARD:*
No	Yes	The TEST TRANSFER Switch is in the CENTER position.	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*		*STEP STANDARD:*
No	Yes	The MAN. BYPASS Switch is in the BYP TO PREF ISOLATE position.	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*		*STEP STANDARD:*
No	Yes	APN1FA 19, ALT SOURCE FOR APN5901 VIA XIT5901 is closed.	Locates and verifies APN1FA 19, ALT SOURCE FOR APN5901 VIA XIT5901 is closed.

COMMENTS:

SAT

UNSAT ____

STEP: 4

CUES:

EVALUTOR 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*		*STEP STANDARD:*
No	Yes	Verify the following: a. AC OUTPUT voltage is 120 volts. b. AC OUTPUT frequency is 60 hertz.	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*		*STEP STANDARD:*
Yes	Yes	Place the MAN. BYPASS Switch, to the NORMAL position.	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*		*STEP STANDARD:*
Yes	Yes	Place the SOURCE SELECTOR Switch, to the OUTPUT position.	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:

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-5901alternate 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.

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