Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Reactor has tripped.

Transition from 1-E-0 to 1-ES-0.1 has been completed.

INITIATING CUE

You are requested to transfer the steam dumps to the steam pressure mode in accordance with 1-ES-0.1.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

R743 M

TASK

Transfer the steam dumps to the steam pressure mode following a reactor trip (1-ES-0.1).

TASK STANDARDS

Steam dumps are transferred to the steam pressure mode and then manually closed when a subsequent failure of the main steam pressure transmitter causes the steam dumps to fully open.

K/A REFERENCE:

041-A4.04 (2.7/2.7)

ALTERNATE PATH:

1-MS-PT-1464 fails high causing steam dumps to fully open in steam pressure mode.

TASK COMPLETION TIMES

Validation Time = 10 minutes   Start Time = ________
Actual Time = ________ minutes   Stop Time = ________

PERFORMANCE EVALUATION

Rating   [ ] SATISFACTORY   [ ] UNSATISFACTORY

Candidate (Print) ______________________________

Evaluator (Print) ______________________________

Evaluator's Signature / Date ______________________________

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

R743 M

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

PREREQUISITES

The trainee has completed the applicable course knowledge training at the reactor operator level.

INITIAL CONDITIONS

Reactor has tripped.

Transition from 1-E-0 to 1-ES-0.1 has been completed.

INITIATING CUE

You are requested to transfer the steam dumps to the steam pressure mode in accordance with 1-ES-0.1.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

Copy of 1-ES-0.1 signed off to the point of transferring the steam dumps to steam pressure mode.

PERFORMANCE STEPS

START TIME __________

1	Verify condenser steam dumps are available.	Procedure Step 13.a

SAT [ ] UNSAT [ ]

Standards	Operator verifies steam dumps available (annunciator A-G1 not lit, MSIVs open).

Notes/Comments

2	Verify condenser steam dumps closed. **NO**	Procedure Step 13.b

SAT [ ] UNSAT [ ]

Standards	Operator notes steam dumps are NOT closed and goes to Step 13.b RNO (Transfer steam dumps to steam pressure mode in manual).

Notes/Comments

3	Put steam dump controller to MANUAL.	Procedure Step 13.b.1 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	Steam dump controller is placed in MANUAL.

Notes/Comments

4	Match steam dump controller output to demand indicated on TI-1408.	Procedure Step 13.b.2 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	Steam dump controller output is matched to 1-MS-TI-1408 indication.

Notes/Comments

5	Put mode selector switch to STEAM PRESS.	Procedure Step 13.b.3 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	Mode selector switch is placed in STEAM PRESS.

Notes/Comments

6	If desired, then return steam dump controller to AUTO.	Procedure Step 13.b.4

Critical Step	SAT [ ] UNSAT [ ]

Note to Evaluator	When the steam dump controller is placed in AUTO, a malfunction will cause 1-MS-PT-1464 to fail high and fully open all steam dumps.

Note to Evaluator	IAW the Dominion Nuclear Operations Standards and Expectations (DNOSE) handbook, page 114, if an automatic control malfunctions, the operator takes action to place that control in manual. Also, 1-ES-0.1, step 2.a is a continuous action step which directs the operator to stop dumping steam if temperature is decreasing.

Standards	Steam dump controller is placed in AUTO. Steam dumps are noted to be fully open. Steam dump interlock switch placed in OFF/Reset, **OR** Steam dump controller placed in manual and demand lowered to close steam dumps.

Performance Cue(s)	It is desired to return the steam dump controller to auto.

Performance Cue(s)	(After steam dumps are closed) Assume another operator will complete this task.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME __________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE
RXXX

TASK

Transfer the steam dumps to the steam-pressure mode following a reactor trip (1-ES-0.1).

CHECKLIST

_____ Recall IC 111.

_____ Enter the following malfunctions:

MS16, severity 1, ramp 30 seconds

_____ Using Expert, insert the following command for EACH run:

bat klti408.bat

_____ Perform steps of 1-ES-0.1 up to transferring the steam dumps to the steam pressure mode (step 13).

_____ Place the simulator in FREEZE.

NORTH ANNA POWER STATION

EMERGENCY PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-ES-0.1	REACTOR TRIP RESPONSE (WITH FOUR ATTACHMENTS)	31
		PAGE 1 of 23

PURPOSE

To provide instructions to stabilize and control the plant following a Reactor Trip without a Safety Injection.

TIME CRITICAL ACTIONS

ENTRY CONDITIONS

This procedure is entered from:

- 1-E-0, REACTOR TRIP OR SAFETY INJECTION.

UNIT ONE

CONTINUOUS USE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ✓	CHECK RCPs - ANY RUNNING	IF Condenser Steam Dumps are available, THEN transfer Steam Dumps to Steam Pressure mode in manual: ☐ a) Put Steam Dump controller to MANUAL. ☐ b) Match Steam Dump controller output to demand indicated on TI-1408. ☐ c) Put Mode Selector switch to STEAM PRESS. ☐ d) IF desired, THEN return Steam Dump Controller to AUTO. ☐ IF Condenser Steam Dumps are NOT available, THEN place both Steam Dump Interlock switches in OFF.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

*2. ___ CHECK RCS AVERAGE TEMPERATURE:

a) Check Temperature Control:

- STEAM DUMPS - CONTROLLING:
  - ☑ STABLE AT 547°F

    OR
  - ☑ TRENDING TO 547°F

    OR
- SG PORVs - CONTROLLING:
  - ☑ STABLE AT 551°F

    OR
  - ☑ TRENDING TO 551°F

a) Do the following:

IF temperature is less than control value AND decreasing, THEN:

☐ 1) Stop dumping steam.

☐ 2) Verify SG Blowdown Trip Valves are closed.

☐ IF NOT, THEN manually close valves.

☐ 3) Adjust total AFW flow to maintain greater than 400 gpm (340 gpm with RCPs OFF) until at least one SG narrow range level is greater than 11%.

4) IF cooldown continues, THEN close the following:

- ☐ MSTVs
- ☐ MSTV Bypass Valves

☐ 5) GO TO Step 3.

(STEP 2 CONTINUED ON NEXT PAGE)

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 2.	CHECK RCS AVERAGE TEMPERATURE: (Continued)	
		IF temperature is greater than control value AND increasing, THEN do the following:
		☐ • Dump steam to the Condenser
		OR
		☐ • Dump steam using SG PORVs
		OR
		• Dump steam using Decay Heat Release Valve:
		1) Locally open isolation valve(s) for NON-RUPTURED SG(s) to Decay Heat Release Valve:
		☐ • 1-MS-19, A Steam Line to 1-MS-HCV-104 Non-Return Valve
		☐ • 1-MS-58, B Steam Line to 1-MS-HCV-104 Non-Return Valve
		☐ • 1-MS-96, C Steam Line to 1-MS-HCV-104 Non-Return Valve
		☐ 2) Locally open 1-MS-20, Decay Heat Release Valve Upstream Isolation Valve.
		☐ 3) Manually open 1-MS-HCV-104, Decay Heat Release Valve.
		☐ GO TO Step 2.b.
	☐ b) Adjust total AFW flow between SGs to maintain greater than 400 gpm (340 gpm with RCPs OFF) until at least one SG narrow range level is greater than 11%.	

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	CHECK FEEDWATER STATUS:	
☑	a) Check RCS average temperature - LESS THAN 554°F	☐ a) <u>WHEN</u> temperature is less than 554°F, <u>THEN</u> do Step 3b. ☐ Continue with Step 3c.
☑	b) Verify Main Feed Reg Valves - CLOSED	☐ b) Manually close valves.
	c) Verify AFW Pumps - RUNNING ☑ • Motor-Driven AFW Pumps - RUNNING ☑ • Turbine-Driven AFW Pump - RUNNING	c) <u>IF</u> AFW Pumps are required, <u>THEN</u> do the following: ☐ • Manually start Motor-Driven Pumps • Manually open Turbine-Driven AFW Pump Steam Supply Valves: ☐ • 1-MS-TV-111A ☐ • 1-MS-TV-111B ☐ <u>IF</u> AFW Pumps are <u>NOT</u> required, <u>THEN</u> establish Main Feedwater on bypass.
	d) Verify total feed flow to SGs: ☑ • Total AFW flow - GREATER THAN OR EQUAL TO 400 GPM (340 GPM WITH RCPs OFF) <u>OR</u> ☐ • Main Feedwater flow to at least one SG - GREATER THAN 0.7E6 LBM/HR	d) Establish feed flow to the SGs as necessary: ☐ • AFW <u>OR</u> ☐ • Main Feedwater on bypass

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 4. ___	CHECK SG LEVELS:	
	☐ a) Check narrow range level in ALL SGs - GREATER THAN 11%	a) IF any affected SG wide range level is NOT increasing, THEN increase feed flow to that SG using: ☐ • AFW OR ☐ • Main Feedwater on bypass
	☐ b) Control feed flow to maintain narrow range levels between 23% and 33%	☐ b) IF narrow range level in any SG continues to increase, THEN stop feed to that SG.
5. ___	VERIFY CHARGING - IN SERVICE	Establish charging: ☐ a) Put controller for 1-CH-FCV-1122 in MANUAL and close. ☐ b) Close 1-CH-HCV-1311, Auxiliary Spray Valve. c) Open Normal Charging Line Isolation Valves: ☐ • 1-CH-MOV-1289A ☐ • 1-CH-MOV-1289B ☐ • 1-CH-HCV-1310 ☐ d) Adjust charging to restore PRZR level to greater than 15%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6.	CHECK PRZR LEVEL CONTROL:	
	☑ a) Level - GREATER THAN 15%	a) Do the following:
		☐ 1) Verify letdown isolation.
		☐ IF letdown is NOT isolated, THEN manually isolate.
		☐ 2) Verify PRZR Heaters are off.
		☐ IF PRZR Heaters are NOT off, THEN put heaters in PTL.
	☑ b) Verify CC system - IN SERVICE	☐ b) Place CC system in service using 1-OP-51.1, Component Cooling System.
		☐ WHEN CC system is in service, THEN perform Step 6c.
		☐ Continue with Step 6d.

(STEP 6 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6.	CHECK PRZR LEVEL CONTROL: (Continued)	
	☐ c) Verify Letdown - IN SERVICE	c) WHEN PRZR level is greater than 15%, THEN manually put letdown in service:
		☐ 1) Put 1-CH-PCV-1145 in MANUAL and open to 100%.
		2) Open the following Letdown Isolation Valves:
		☐ • 1-CH-TV-1204A
		☐ • 1-CH-TV-1204B
		☐ • 1-CH-LCV-1460A
		☐ • 1-CH-LCV-1460B
		☐ 3) Open 1-CH-FCV-1122 to establish at least 25 gpm flow.
		4) Open one of the following Letdown Orifice Isolation Valves:
		☐ • 1-CH-HCV-1200A
		OR
		☐ • 1-CH-HCV-1200B
		OR
		☐ • 1-CH-HCV-1200C
		☐ 5) Adjust 1-CH-PCV-1145 to establish 300 psig letdown pressure and put in AUTO.

(STEP 6 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6.	CHECK PRZR LEVEL CONTROL: (Continued)	
		☐ 6) Reset PRZR Heaters GROUP 3 CONTROL.
		7) IF RWST is aligned to Charging Pump Suction, THEN do the following:
		a. IF VCT level is less than 22%, THEN do the following:
		☐ 1. WHEN VCT level is greater than 42%, THEN do Step b to align charging pump suction to VCT.
		☐ 2. Continue with Step 6d.
		b. Align charging pump suction to VCT:
		1. Open Charging Pump Suction From VCT Isolation Valves:
		☐ • 1-CH-MOV-1115C
		☐ • 1-CH-MOV-1115E
		2. Close Charging Pump Suction From RWST Isolation Valves:
		☐ • 1-CH-MOV-1115B
		☐ • 1-CH-MOV-1115D
	☐ d) PRZR level - BETWEEN 20% AND 29%	☐ d) Control charging and letdown to maintain level on program for RCS temperature.

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 7.	CHECK PRZR PRESSURE CONTROL:	
	☐ a) Pressure - GREATER THAN 1780 PSIG	☐ a) Verify SI Actuation. ☐ IF SI is NOT actuated, THEN manually actuate SI. ☐ GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION, STEP 1.
	☐ b) Pressure - STABLE AT OR TRENDING TO 2235 PSIG	b) IF pressure is less than 2235 psig and decreasing, THEN: ☐ 1) Verify PRZR PORVs are closed. ☐ IF NOT, THEN manually close. ☐ IF any valve cannot be closed, THEN manually close its Block Valve. ☐ 2) Verify PRZR Spray Valves are closed. ☐ IF NOT, THEN manually close using controller. ☐ Verify PRZR spray valves - CLOSED. IF NOT, THEN place failed valve remote close switch in CLOSE: ☐ • 1-RC-SOV-1455A, 1-RC-PCV-1455A REMOTE CLOSE SOV ☐ • 1-RC-SOV-1455B, 1-RC-PCV-1455B REMOTE CLOSE SOV

(STEP 7 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* 7. CHECK PRZR PRESSURE CONTROL: (Continued)

IF spray valves can NOT be closed, THEN do the following:

IF 1-RC-PCV-1455A failed open, THEN:

- ☐ Stop 1-RC-P-1C.
- ☐ Stop 1-RC-P-1A.

IF 1-RC-PCV-1455B failed open, THEN:

- ☐ Stop 1-RC-P-1C.
- ☐ IF 1-RC-P-1A is running, THEN stop 1-RC-P-1B.

☐ 3) Verify PRZR Heaters are on.

☐ IF NOT, THEN manually energize heaters.

(STEP 7 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 7.	CHECK PRZR PRESSURE CONTROL: (Continued)	
		IF pressure is greater than 2235 psig and increasing, THEN:
		☐ 1) Verify PRZR Heaters are off.
		☐ IF NOT, THEN put heaters in PTL.
		☐ 2) Control pressure using normal PRZR spray.
		☐ IF normal PRZR spray is NOT available AND letdown is in service, THEN use Auxiliary Spray in accordance with ATTACHMENT 1, AUXILIARY SPRAY OPERATION.
		☐ IF normal PRZR spray AND Auxiliary Spray is NOT available, THEN use PRZR PORV(s).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.	✓ VERIFY ALL IRPIs - 10 STEPS OR LESS	IF TWO or more IRPIs indicate greater than 10 STEPS, THEN emergency borate as follows:

☐ a) Place the in-service Boric Acid Transfer Pump in FAST.

☐ b) Open 1-CH-MOV-1350, Emergency Borate Valve.

c) Verify Emergency Boration flow:

☐ • Emergency Boration Flow - 35 GPM OR GREATER

☐ • On-service Boric Acid Tank Level - DECREASING

☐ d) IF Emergency Boration flow NOT verified, THEN locally open 1-CH-MOV-1350 and verify flow.

e) IF Emergency Boration flow STILL NOT verified, THEN do the following:

☐ 1) Place Blender Mode switch in BORATE.

☐ 2) Place Blender Control switch in START.

☐ 3) Fully open 1-CH-FCV-1113A.

☐ 4) Close 1-CH-FCV-1113B.

☐ 5) Locally open 1-CH-241, Manual Emergency Borate Valve.

(STEP 8 CONTINUED ON NEXT PAGE)

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.	VERIFY ALL IRPIs - 10 STEPS OR LESS (Continued)	
		☐ f) Record the following: • Time Emergency Boration started: ________________ • Initial on-service BAST level: ________________
		☐ g) Initiate ATTACHMENT 3, EMERGENCY BORATION FOR CONTROL RODS NOT FULLY INSERTED, to determine when emergency boration can be secured.
		☐ h) Have the SRO refer to Tech Spec 3.1.1.
9. ✓	CHECK DILUTION PATH STATUS: ☑ • Close and lock 1-CH-217, PG to Blender Isolation Valve <u>OR</u> ☐ • Initiate 1-LOG-2A, RCS Makeup Log for Modes 3, 4, 5 and 6	
10. ✓	VERIFY ADEQUATE HP TURBINE GLAND STEAM PRESSURE ON 1-MS-PI-131	☐ Throttle 1-MS-MOV-106, GLAND STEAM DUMP BYPASS VALVE. ☐ <u>IF</u> gland steam pressure can <u>NOT</u> be increased, <u>THEN</u> throttle open 1-MS-198, Gland Steam Supply Header 1-MS-PCV-120 Bypass Valve, to control pressure on 1-MS-PI-118 between 1.5 and 5 psig.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11. ✓	ALIGN MSR VENTS TO MAIN CONDENSER: a) Open MSR Vent To Condenser Valves: ☑ • 1-SV-TV-101A ☑ • 1-SV-TV-101B ☑ • 1-SV-TV-101C ☑ • 1-SV-TV-101D b) Close MSR Vent To 1st Pt Htr Valves: ☑ • 1-SV-TV-100A ☑ • 1-SV-TV-100B ☑ • 1-SV-TV-100C ☑ • 1-SV-TV-100D	
* 12. ✓	VERIFY ALL AC BUSSES - ENERGIZED BY OFFSITE POWER	☐ Initiate 0-AP-10, LOSS OF ELECTRICAL POWER, to restore offsite power. ☐ Initiate 1-E-0, ATTACHMENT 9, SPENT FUEL PIT MONITORING. IF required, THEN manually load the following equipment upon restoration of any AC Emergency Bus: ☐ • CRDM Fans ☐ • Containment Air Recirc Fans ☐ • PRZR Heaters

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. ___	TRANSFER CONDENSER STEAM DUMP TO STEAM PRESSURE MODE:	
	☐ a) Verify Condenser Steam Dumps are available	☐ a) Use SG PORVs. ☐ GO TO Step 14.
	☐ b) Verify Condenser Steam Dumps - CLOSED	b) Transfer Steam Dumps to Steam Pressure mode in manual: ☐ 1) Put Steam Dump controller to MANUAL. ☐ 2) Match Steam Dump controller output to demand indicated on TI-1408. ☐ 3) Put Mode Selector switch to STEAM PRESS. ☐ 4) IF desired, THEN return Steam Dump Controller to AUTO. ☐ 5) GO TO Step 14.

(STEP 13 CONTINUED ON NEXT PAGE)

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED

13. TRANSFER CONDENSER STEAM DUMP TO STEAM PRESSURE MODE: (Continued)

c) Place Condenser Steam Dumps in Steam Pressure mode:

- ☐ 1) Put both Steam Dump Interlock switches to OFF/RESET
- ☐ 2) Put Steam Dump Controller to MANUAL
- ☐ 3) Put Mode Selector switch to STEAM PRESS
- ☐ 4) Verify or reduce Steam Dump demand to zero
- ☐ 5) Return Steam Dump Controller to AUTO
- ☐ 6) Verify Steam Dump demand - ZERO
- ☐ 7) Put both Interlock switches to ON

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14. ___	CHECK 1-RC-P-1C - RUNNING	Start RCP(s) to provide normal PRZR spray: a) Try to Start 1-RC-P-1C: ☐ 1) Establish conditions for starting C RCP using 1-OP-5.2, REACTOR COOLANT PUMP STARTUP AND SHUTDOWN ☐ 2) Start 1-RC-P-1C. b) IF C RCP cannot be started, THEN do the following using 1-OP-5.2: ☐ 1) Try to start 1-RC-P-1A. ☐ 2) WHEN 1-RC-P-1A is running, THEN start 1-RC-P-1B as necessary to provide enhanced spray. ☐ 3) IF 1-RC-P-1A cannot be started, THEN start 1-RC-P-1B. ☐ IF no RCP can be started, THEN initiate ATTACHMENT 2 to monitor natural circulation.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. ___	CHECK IF SOURCE RANGE DETECTORS SHOULD BE ENERGIZED:	
	a) Verify both of the following: ☐ • Intermediate Range flux - BELOW 5.0E-11 AMPS ON N-35 AND N-36 • P-6 - NOT LIT: ☐ • Annunciator Panel "L" F-1 ☐ • Annunciator Panel "L" F-2	☐ a) WHEN both conditions are satisfied OR 20 minutes have elapsed since Reactor Trip, THEN do Step 15b, Step 15c and Step 15d. ☐ Continue with Step 16.
	b) Verify both Source Range Detectors - ENERGIZED: ☐ • N-31 ☐ • N-32	☐ b) Manually energize BOTH Source Range Detectors using the Source Range Block and Reset switches.
	☐ c) Transfer recorder NR-45 to S1 and S2 (N-31 and N-32)	
	☐ d) Energize the Scaler-Timer using the power toggle switch	

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. ___	STOP AFW PUMPs:	
	☐ a) Verify all SG narrow range levels - GREATER THAN 23%	☐ a) WHEN all SG narrow range levels are greater than 23%, THEN perform Step 16b through Step 16i. Continue with Step 17.
	b) Verify the following systems - IN SERVICE: ☐ • Condensate ☐ • Feedwater	☐ b) WHEN Condensate AND Feedwater Systems are restored, THEN perform Step 16c through Step 16i. ☐ Continue with Step 17.
	☐ c) Verify all SG narrow range levels - LESS THAN 75%	☐ c) WHEN all SG narrow range levels are less than 75%, THEN perform Step 16d through Step 16i. ☐ Continue with Step 17.
	☐ d) Verify Annunciator Panel “P” H-3, FW BYP VLV BLKD SG LVL OR SI RESET REQUIRED - NOT LIT	☐ d) Reset both trains FW Bypass Valve Isolation.
	☐ e) Establish feed flow using Main Feed Bypass Valves	
	☐ f) Control feed flow to maintain all SG narrow range levels between 23% and 33%	
	☐ g) Reset AMSAC	

(STEP 16 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

16. STOP AFW PUMPs: (Continued)

h) Stop AFW Pumps and place in AUTO:

- Turbine-Driven AFW Pump Steam Supply Valves:
  - ☐ 1-MS-TV-111A
  - ☐ 1-MS-TV-111B
- ☐ 1-FW-P-3A
- ☐ 1-FW-P-3B

i) Open AFW supply valves:

- ☐ 1-FW-MOV-100D
- ☐ 1-FW-MOV-100B
- ☐ 1-FW-HCV-100C

17.___ INITIATE 1-OP-7.11, SHUTDOWN OF UNNECESSARY PLANT EQUIPMENT FOLLOWING ENTRY INTO EOPs

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

18. ___ MAINTAIN PLANT CONDITIONS - STABLE:

- ☐ • PRZR pressure - APPROXIMATELY 2235 PSIG
- ☐ • PRZR level - BETWEEN 20% AND 29%
- ☐ • Maintain SG narrow range level - BETWEEN 23% AND 33%
- • RCS average temperature:
  - • STEAM DUMPS - CONTROLLING:
    - ☐ • STABLE AT 547°F

      OR

    - ☐ • TRENDING TO 547°F

  OR

  - • SG PORVs - CONTROLLING:
    - ☐ • STABLE AT 551°F

      OR

    - ☐ • TRENDING TO 551°F

19. ___ IDENTIFY AND CLASSIFY CAUSE OF REACTOR TRIP:

- ☐ • First Out indication
- ☐ • Computer Post-trip Review
- ☐ • Sequence of Events Recorder
- ☐ • Initiate Reactor Shutdown and Trip Report in accordance with OP-AP-105, Post Trip Review

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20.	**DETERMINE IF A NATURAL CIRCULATION COOLDOWN IS REQUIRED:**	
	a) All conditions exist: ☐ • No RCPs - AVAILABLE ☐ • Cooldown is desired ☐ • Manager Nuclear Operations or Operations Manager On Call approval	a) GO TO appropriate procedure: ☐ • 1-OP-1.5, UNIT STARTUP FROM MODE 3 TO MODE 2 OR ☐ • 1-OP-3.2, UNIT SHUTDOWN FROM MODE 3 TO MODE 4
	☐ b) GO TO 1-ES-0.2A, NATURAL CIRCULATION COOLDOWN WITH CRDM FANS, STEP 1	

- END -

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Spray line differential temperature limits are 300 °F administrative and 320 °F TRM.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ___	CHECK SPRAY LINE DIFFERENTIAL TEMPERATURE BETWEEN THE FOLLOWING - LESS THAN 300 °F:	☐ WHEN spray line differential temperature condition is met, THEN continue with Step 1, as directed by SRO.
	☐ • 1-RC-TI-1454, PRZ VAPOR TEMP	☐ Continue with procedure and step in effect.
	☐ • 1-CH-TI-1123, REGEN HX CHARG OUTLET TEMP	

NOTE: Charging flow should be maintained greater than 25 gpm to control letdown temperature.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2. ___	DEPRESSURIZE RCS USING AUXILIARY SPRAY AS FOLLOWS:	
	a) Verify both PRZR Spray Valves - IN MANUAL AND CLOSED:	☐ a) Close both PRZR Spray Valves using controller in MANUAL.
	☐ • 1-RC-PCV-1455A	☐ Verify PRZR spray valves - CLOSED. IF NOT, THEN place failed valve remote close switch in CLOSE:
	☐ • 1-RC-PCV-1455B	☐ • 1-RC-SOV-1455A, 1-RC-PCV-1455A REMOTE CLOSE SOV
		☐ • 1-RC-SOV-1455B, 1-RC-PCV-1455B REMOTE CLOSE SOV

(STEP 2 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	DEPRESSURIZE RCS USING AUXILIARY SPRAY AS FOLLOWS: (Continued)	
	b) Fully open ONE PRZR Spray valve:	
☐	• 1-RC-PCV-1455A	
☐	• 1-RC-PCV-1455B	
☐	c) Open 1-CH-HCV-1311, Auxiliary Spray Isolation Valve	
☐	d) Close 1-CH-HCV-1310, Charging Line Isolation Valve	
☐	e) Throttle the PRZR Spray Valve opened in Step 2b to control Auxiliary Spray flow	

NOTE: Maximizing letdown flow will minimize spray line differential temperature.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.___	MAINTAIN SPRAY LINE DIFFERENTIAL TEMPERATURE LESS THAN 300 °F:	
☐	a) Throttle 1-CH-FCV-1122, Normal Charging Flow Control Valve AND PRZR Spray Valve as required to control Auxiliary Spray flow	
☐	b) Cycle PRZR Heaters as required to control RCS pressure	
☐	c) Open additional Letdown Orifice Isolation Valves, as required	
☐	d) Adjust 1-CH-PCV-1145, as required	
☐	e) Verify Auxiliary Spray line differential temperature - LESS THAN 300 °F	☐ IF differential temperature cannot be maintained less than 300 °F, THEN GO TO Step 4 and remove Auxiliary Spray from service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.___	CHECK IF REMOVAL OF AUXILIARY SPRAY FROM SERVICE IS REQUIRED	☐ WHEN removal of Auxiliary Spray from service is required, THEN RETURN TO Step 4.
	☐ a) Open 1-CH-HCV-1310, Charging Line Isolation Valve	☐ Continue with procedure and step in effect.
	☐ b) Close 1-CH-HCV-1311, Auxiliary Spray Isolation Valve	
	☐ c) Energize PRZR Heaters as required to control RCS pressure	
	☐ d) Operate PRZR Spray Valves as required	

- END -

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: The following conditions support or indicate natural circulation flow.

1.___	VERIFY NATURAL CIRCULATION FLOW ☐ • RCS subcooling based on Core Exit TCs - GREATER THAN 25°F ☐ • SG pressures - STABLE OR DECREASING ☐ • RCS Hot Leg temperatures - STABLE OR DECREASING ☐ • Core Exit TCs - STABLE OR DECREASING ☐ • RCS Cold Leg temperatures - AT SATURATION TEMPERATURE FOR SG PRESSURE	☐ Increase dumping steam.
2.___	CONTINUE TO MONITOR NATURAL CIRCULATION FLOW UNTIL FORCED CIRCULATION IS ESTABLISHED	

NOTE: If 1-CH-241 is used as the flow path, then the boration amount should be verified by the change in BAST level or by a 1-PT-10 series procedure.

1. ___ Determine conditions to stop Emergency Boration:

a) Determine total Equivalent Stuck Rods using the following table:

Actual IRPI Indication	Record IRPI IDs for IRPIs indicating NOT fully inserted	Convert Actual IRPI to Equivalent Stuck Rods (EQSR):	Record Equivalent Stuck Rod Subtotals:
Any Rod >20 steps	________	1 rod = 1 EQSR	________
Rods indicating 11-20 (inclusive) steps withdrawn	________	1 - 5 rods = 1 EQSR 6 - 9 rods = 2 EQSR 10 - 16 rods = 3 EQSR 17 - 32 rods = 4 EQSR 33 or more = 5 EQSR	________
		Total Equivalent Stuck Rods:	________

☐ b) IF ONLY ONE Total Equivalent Stuck Rod was recorded in Step 1a table, THEN GO TO ATTACHMENT 3, EMERGENCY BORATION FOR CONTROL RODS NOT FULLY INSERTED, Step 2 to stop Emergency Boration.

c) IF TWO or more Total Equivalent Stuck Rods were recorded in Step 1a table, THEN monitor for one of the following conditions to stop Emergency Boration:

☐ • 25 minutes for each Equivalent Stuck Rod has elapsed.

OR

☐ • 15% BAST Level for each Equivalent Stuck Rod has been inserted.

OR

☐ • Adequate shutdown margin has been verified using a 1-PT-10 series procedure.

2. ___ WHEN Emergency Boration is no longer required, THEN stop Emergency Boration as follows:

☐ a) Place Boric Acid Transfer Pump in AUTO.

b) Close valves that were opened:

☐ • 1-CH-MOV-1350

☐ • 1-CH-241

c) Ensure the following valves are in AUTO:

☐ • 1-CH-FCV-1113A

☐ • 1-CH-FCV-1113B

☐ d) Place Blender in AUTO or OFF.

e) Record the following:

☐ • Time Emergency Boration stopped: _________________

☐ • Final on-service BAST level: _________________

3. ___ Return to procedure and step in effect.

- END -

Continuous Action Page Steps are listed on the back of this page.

Continuous Action Page Steps are listed on the back of this page.

Continuous Action Page Steps are listed on the back of this page.

Continuous Action Page Steps are listed on the back of this page.

Continuous Action Page Steps are listed on the back of this page.

CONTINUOUS ACTION PAGE FOR 1-ES-0.1

1. SI ACTUATION CRITERIA

   IF either condition listed below occurs, THEN manually initiate SI AND GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION, STEP 1:

   - ☐ • RCS subcooling based on Core Exit TCs - LESS THAN 25°F, OR
   - ☐ • SI Actuation occurs OR is required.

2. ECST LEVEL CRITERIA

   ☐ WHEN the ECST level decreases to 40%, THEN initiate 1-AP-22.5, LOSS OF EMERGENCY CONDENSATE STORAGE TANK 1-CN-TK-1.

3. RCP CRITERIA

   - ☐ • RCPs should be run in the following order of priority to provide PRZR spray: C, A
   - ☐ • WHEN an RCP is stopped, THEN isolate PRZR spray from the stopped RCP.

4. REACTIVITY CONTROL CRITERIA

   ☐ An Operator should be sent to locally close and lock 1-CH-217, PG to Blender Isolation Valve.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

A faulty relay in breaker 15H11 (1H bus normal feeder) requires replacement.

The Generator Output breaker (G-12) is operable.

Breaker 1-EP-BKR-15B11 (1H bus alternate feeder) and "B" RSST transformer are operable.

Lake level is 250'.

An operator is standing by at the RSSTs with procedure to adjust tap changers, if needed.

INITIATING CUE

You are requested to transfer 1H emergency bus from "C" reserve station service transformer to 1B station service bus in accordance with 1-OP-26.1. Control operations will NOT defeat the directional overcurrent relays on 15H11 (one of these relays is faulty).

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

N522

TASK

Transfer an emergency bus from a reserve station service transformer to a station service bus (1-OP-26.1).

TASK STANDARDS

Breakers 15B11 and 15H1 are closed and breakers 15H11 and 15F3 are opened.

Task was performed as directed by the procedure referenced in the task statement within parentheses (one of the underlined procedures if several are cited).

K/A REFERENCE:

062A4.07 (3.1/3.1)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time =	10 minutes	Start Time =	_______
Actual Time =	_______ minutes	Stop Time =	_______

PERFORMANCE EVALUATION

Rating	[ ] SATISFACTORY	[ ] UNSATISFACTORY
Candidate (Print)	______________________________	
Evaluator (Print)	______________________________	
Evaluator's Signature / Date	______________________________	

EVALUATOR'S COMMENTS

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

N522

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

A faulty relay in breaker 15H11 (1H bus normal feeder) requires replacement.

The Generator Output breaker (G-12) is operable.

Breaker 1-EP-BKR-15B11 (1H bus alternate feeder) and "B" RSST transformer are operable.

Lake level is 250'.

An operator is standing by at the RSSTs with procedure to adjust tap changers, if needed.

INITIATING CUE

You are requested to transfer 1H emergency bus from "C" reserve station service transformer to 1B station service bus in accordance with 1-OP-26.1. Control operations will NOT defeat the directional overcurrent relays on 15H11 (one of these relays is faulty).

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-OP-26.1, Initial Conditions / Precautions and Limitations briefed prior to entering the simulator.

Sync key

PERFORMANCE STEPS

START TIME ___________

1	Verify the initial conditions are satisfied.	Procedure Step 5.5.1

SAT [ ] UNSAT [ ]

Standards	Initial conditions are verified to be satisfied.

Notes/Comments

2	Review precautions and limitations.	Procedure Step 5.5.2

SAT [ ] UNSAT [ ]

Standards	Precautions and limitations are reviewed.

Notes/Comments

3	If 1-FW-P-1B is not running, then place in pull-to-lock.	Procedure Step 5.5.3

SAT [ ] UNSAT [ ]

Standards	• Checks 1-FW-P-1B is not running. • Places pump switches in PTL.

Notes/Comments

4	Check G-12 operable (to ensure power maintained to 1H bus).	Procedure Step 5.5.4

SAT [ ] UNSAT [ ]

Standards	G-12 verified operable per initial conditions.

Notes/Comments

5	Check "B" SS is on normal feed (to ensure power maintained to 1H bus).	Procedure Step 5.5.4

SAT [ ] UNSAT [ ]

Standards	Checks 1-EP-BKR-15B2 is closed

Notes/Comments

6	If Control Ops is available, then defeat the directional overcurrent relays on breaker 15H11.	Procedure Step 5.5.5

SAT [ ] UNSAT [ ]

Standards	Operator NA's step (per initiating cue) and proceeds to the next applicable step.

Notes/Comments

7	Close the station service supply breaker to the emergency bus.	Procedure Step 5.5.6

Critical Step	SAT [ ] UNSAT [ ]

Standards	15B11 control switch is placed in CLOSE.

Notes/Comments

8	Check the applicable attachment to determine the incoming voltage and running voltage sources.	Procedure Step 5.5.7
		SAT [ ] UNSAT [ ]

Standards	Bus 1H is determined to be incoming and bus 1B is determined to be running.

Notes/Comments

9	Place the sync key for 15H1 in ON.	Procedure Step 5.5.8
	Critical Step	SAT [ ] UNSAT [ ]

Standards	15H1 sync key is placed in ON.

Notes/Comments

10	Request the OATC to have the 1B station service transformer tap changer or the "C" RSST tap changer adjusted so that the running voltage is 0 - 2 volts higher than incoming voltage.	Procedure Step 5.5.9

SAT [ ]   UNSAT [ ]

Standards	Running voltage is verified 0-2 volts higher than incoming voltage. If not, either the 1B station service transformer tap changer or the "C" reserve station service tap changer has been adjusted until running voltage is 0 - 2 volts higher than incoming voltage.

Notes/Comments

Voltage will be within 0-2 volts. No tap changer adjustment will be necessary.

11	Close breaker 15H1.	Procedure Step 5.5.10

Critical Step	SAT [ ] UNSAT [ ]

Standards	15H1 control switch is placed in CLOSE.

Notes/Comments

12	Verify current increases on the 4160v bus 1B Alt Feed AC Amps ammeter.	Procedure Step 5.5.11

SAT [ ] UNSAT [ ]

<u>Standards</u>	Current is verified to increase on the 4160v bus 1B Alt Feed AC Amps ammeter.

Notes/Comments

13	Place the sync key for the emergency bus alternate feeder breaker to OFF.	Procedure Step 5.5.12

SAT [ ] UNSAT [ ]

<u>Standards</u>	15H1 sync key is placed in OFF.

Notes/Comments

14	Open the emergency bus normal feeder breaker.	Procedure Step 5.5.13.a

Critical Step	SAT [ ] UNSAT [ ]

Standards	15H11 control switch is placed in OPEN.

Notes/Comments

15	Open the transfer bus supply breaker to the emergency bus.	Procedure Step 5.5.13.b

Critical Step	SAT [ ] UNSAT [ ]

Standards	15F3 control switch is placed in OPEN.

Notes/Comments

16	Verify 1H voltage is between 4200 and 4400 volts	Procedure Step 5.5.13.c

SAT [ ] UNSAT [ ]

Standards	Verifies 1H voltage between 4200 and 4400 volts.

Notes/Comments

17	Request Control Operations to restore the directional overcurrent relay on breaker 15H11 to normal.	Procedure Step 5.5.14

SAT [ ] UNSAT [ ]

Standards	Operator N/As step and states that the task is complete

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE
N522

TASK

Transfer an emergency bus from a reserve station service transformer to a station service bus (1-OP-26.1).

CHECKLIST

_____ Recall IC 112.

_____ Place the simulator in RUN.

_____ Close breaker 15B11.

_____ Place sync key for 15H1 in ON.

_____ Adjust 1B station service tap changer or “C” RSST tap changer so RUNNING voltage is 1 volt higher than INCOMING voltage using PNID screen.

_____ NOTE: May need to leave tap changer in MANUAL.

_____ Place sync key for 15H1 in OFF.

_____ Open breaker 15B11.

_____ Place the simulator in FREEZE.

MOVE SYNC KEY TO "J" EDG BREAKER BETWEEN RUNS

Dominion

NORTH ANNA POWER STATION

PROCEDURE NO:	1-OP-26.1
REVISION NO:	32
PROCEDURE TYPE: OPERATING PROCEDURE	UNIT NO: 1
PROCEDURE TITLE: TRANSFERRING 4160-VOLT BUSSES	

REVISION SUMMARY: FrameMaker Template Rev. 030.

Revised the procedure as follows for CA274276, Procedures to revise Unit 1 OP-26.1, 15.2, 26.8, MOP-26.78, and LOG-4, for CR534068: NANN - Main Generator Operating Range for kV:

- Added new Reference 2.4.12 of CA274276.
- Revised Step 4.6 second bullet to change lower voltage limit from 20.9 KV to 21.4 KV.
- Revised Note for Step 5.5.1 to change lower voltage limit from 20.9 KV to 21.4 KV.

Revised the procedure as follows for OPS Concern OP 12-0177:

- Added Critical Step star and concurrent verification to Step 5.3.8 and Step 5.3.10.
- Added new Step 5.3.7 to ‘Station an operator at the CW Screenwell house to locally check the position of breaker 15G10.’
- Added new Note for Step 5.3.7 that ‘After closing breaker 15G10, current may not increase on the 15G10 ammeter. An operator is stationed at the CW Screenwell house to locally check the position of breaker 15G10, if required.’
- Locally check breaker 15G10 is closed or Check current increases on 15G10 ammeter.

PROBLEMS ENCOUNTERED: ☐ NO ☐ YES **Note:** If YES, note problems in remarks.

REMARKS: ____

____

____

____

____

____ (Use back for additional remarks.)

SRO:	DATE:

UNIT ONE

CONTINUOUS USE

TABLE OF CONTENTS

1.0 PURPOSE

To provide instructions for directing the transferring of 4160-Volt Busses to various power supplies.

2.0 REFERENCES

2.1 Source Documents

None

2.2 Technical Specifications

2.2.1 Tech Spec 3.8.1

2.2.2 Tech Spec 3.8.2

2.2.3 Tech Spec 3.8.4

2.2.4 Tech Spec 3.8.5

2.2.5 Tech Spec 3.8.9

2.2.6 Tech Spec 3.8.10

2.3 Technical References

2.3.1 11715-FE-1A, B, C, D, and F

2.3.2 11715-FE-21AG, D. C. Elementary Diagram 4160V Bus, 1H Bkr 15H2, 15H11

2.3.3 11715-FE-21J, D. C. Elementary Diagram 4160V Bus 1J, Bkr 15J2, 15J11

2.3.4 UFSAR, Section 8

2.3.5 0-OP-26.7, Load Shed

2.3.6 11715-FE-21V, Station Service & Intake Structure Synchronizing

2.3.7 0-PT-80, AC Sources Operability Verification

2.3.8 E-mail from Michael L Baedke to Rich Pickering, dated 12-13-2006, Re: Fw: Ops Rounds Wording (see Rev. 24)

2.3.9 DCP 08-004, Replacement Of Station Service Transformers / North Anna / Unit 2.

2.3.10 DCP 08-003, Replacement Of Station Service Transformers / North Anna / Unit 1

2.3.11 DC NA-12-00052, Unit 1 Station Service Bus Relays

2.3.12 DC NA-12-00053, Replacement and Elimination of 1H Undervoltage Relays

2.3.13 Calculation NA-CALC-EEP-EE-0008, Rev.2, Addendum B and Addendum D

2.4 **Commitment Documents**

2.4.1 Engineering Transmittal ET CEE 02-0005, Rev. 3, Voltage Specifications For Emergency AC Buses

2.4.2 Plant Issue N-2006-3520, During a post-examination review of a Technical Specification Mode Change Evaluation JPM administered to the License Class SRO Candidates by the NRC Examination Team on 6/05/2006, a potential discrepancy was identified between the TS 3.8.1 (AC Sources - Operating) Bases and 0-PT-80 (AC Sources Operability Verification)

2.4.3 CA003179, 2B Bus amps in excess of 2500 amps with 1J Bus connected to the Bus

2.4.4 Standing Order No. 247, Rev. 0, Affect on Operability of Offsite Power Sources determined by the re-analysis for GDC 17

2.4.5 CR003487, Auto Start of Tandem Main Feedwater Pump Motors on Reserve Station Service Trans

2.4.6 CR003488, Unit 2 Trip Could Cause Bus 2H to load EDG in specific alignment

2.4.7 CR020405, Procedural weakness In Maintaining Electrical Source TS Operability

2.4.8 CA145835; CR346776: Enhance OP-26 Procedures for G Bus evolutions to address GE water plant trips

2.4.9 CR396995, Tandem Motor Start Potential Impact When 1H or 1J Fed From Alternate Source

2.4.10 CA180447, CA180450, Review Needed for Offsite Power Source Operability Verification Procedures

2.4.11 CA222211; CA212605; CR439135: NANN-Breaker 01-EP-BKR-15G10 fail to close

2.4.12 CA274276, Procedures to revise Unit 1 OP-26.1, 15.2, 26.8, MOP-26.78, and LOG-4, for CR534068: NANN - Main Generator Operating Range for kV

Init **Verif**

3.0 INITIAL CONDITIONS

______ 3.1 The incoming 4160-Volt Bus OR 4160-Volt Transformer is energized.

______ 3.2 IF transferring 1H Emergency Bus from F Transfer Bus (C RSST) to 1B Station Service Bus, THEN 1J Emergency Bus is being supplied from D Transfer Bus. **(Reference 2.4.2)**

______ 3.3 IF transferring 1J Emergency Bus from D Transfer Bus (A RSST) to 2B Station Service Bus, THEN 1H Emergency Bus is being supplied from F Transfer Bus. **(Reference 2.4.2)**

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Comply with the following guidelines when marking steps N/A:

______ • IF the conditional requirements of a step do not require the action to be performed, THEN mark the step N/A.

______ • IF any other step is marked N/A, THEN have the SRO approve the N/A and submit a Procedure Action Request (PAR).

______ 4.2 Do NOT leave two 4160-Volt Busses paralleled longer than necessary because circulating currents could overload a transformer.

______ 4.3 Do NOT parallel a bus to a bus that has a ground.

4.4 Station Service Busses will automatically transfer to Reserve Station Service (RSS) Transformers when the Station Service Supply Breaker trips open. This can be caused by either of the following:

______ • Turbine trip with G-12 failing to open (30-second time delay after all Turbine Trips except a Thrust Bearing Trip, which causes an immediate Main Generator trip and transfer to the RSS Transformers)

______ • Electrical Fault on the Main Generator or Station Service Transformer

4.5 Maintain the following bus loading limits:

______ • The loading limit for Unit 1 Station Service Busses is 3000 amps at all times.

• The loading limit for Unit 2 Station Service Busses is 3000 amps at all times, except as follows:

NOTE: The upper limit for the 2B Bus is 3000 amps under all circumstances. **(Reference 2.4.3 and 2.3.8)**

______ • When 2B Bus is carrying the 1J Bus, the upper limit is reduced to 2500 amps with no emergency loads running (such as CH Pp, LHSI Pp, etc.). The 2500 amp value provides 500 amps of margin in case the emergency loads start to ensure the total load does not exceed 3000 amps. When 2B Bus is carrying the 1J Bus, actions should be taken to not exceed 2450 amps. This will provide 50 amps of margin, so Operations personnel can take the necessary actions to ensure the 2500 amp limit is not challenged.

4.6 Maintain the following Main Generator voltage limits:

______ • IF Emergency Bus 1J is cross-tied to Station Service Bus 2B, THEN Unit 2 Generator MVAR MUST be limited to +300 MVAR Out (lagging) to ensure adequate Bus 1J voltage in accordance with GDC-17. No additional restrictions exist for Unit 2 Generator voltage other than 20.9 KV to 23.1 KV (machine rating). **(Reference 2.3.13)**

______ • IF Emergency Bus 1H is cross-tied to Station Service Bus 1B, THEN Unit 1 Main Generator MVAR MUST be limited to +300 MVAR Out (lagging) to ensure adequate Bus 1H voltage in accordance with GDC-17. No additional restrictions exist for Unit 1 Generator voltage other than 21.4 KV to 23.1 KV (machine rating). **(References 2.3.13 and 2.4.12)**

______ 4.7 IF either of the following conditions occur, THEN the UNIT 1/UNIT 2 G BUS FAST TRANSFER Switch (15G10) MUST be in DEFEAT:

______ • Lake Anna Reservoir Level is 251 feet or greater.

______ • 1G Bus and 2G Bus are NOT being supplied from their normal power supplies.

______ 4.8 Load Shedding is directed by 0-OP-26.7, Load Shed.

______ 4.9 IF the Directional Overcurrent relays are operable, THEN the possibility exists that the Emergency Bus Normal Feeder Breaker may be tripped by the Directional Overcurrent relays when transferring an Emergency Bus from the Reserve Station Service Transformer to the Station Service Bus or from the Station Service Bus to the Reserve Station Service Bus.

______ 4.10 Anytime a Reserve Station Service Transformer Tap Changer is manipulated with any loaded Bus, the affected Emergency Busses should be Monitored until a Stable Condition is Achieved. (Normal Operating Parameters)

______ 4.11 WHEN the 1A, 1B, or 1C Station Service Bus is transferred to the applicable Reserve Station Service Transformer, THEN notify Predictive Analysis Group by telephone or email.

______ 4.12 The voltage band for the 1H and 1J 4160 VAC Emergency Buses is 4200 to 4400 Volts when connected to offsite power through the alternate feed from the Station Service Transformers. **(Reference 2.4.1)**

______ 4.13 0-PT-80, AC Sources Operability Verification, is not written to check separation of offsite power when both 1H and 1J Emergency Busses are on alternate feed. IF required to place both 1H and 1J Emergency Busses on alternate feed, THEN this procedure and 0-PT-80 will require revision to check that separation of offsite power to 1H and 1J Emergency Busses would be maintained in the event of a dual Unit trip. **(Reference 2.4.2)**

______ 4.14 Due to the re-analysis of GDC 17, IF at anytime a Station Service bus is being powered from a RSST, THEN the 1-FW-P-1A OR 1-FW-P-1C Main Feedwater Pump fed from that bus must be running or incapable of auto-starting. IF 1-FW-P-1B, 1B Main Feedwater Pump will be in AUTO, THEN Switchyard 500/36.5 KV Bank No. 1 AND No. 2 Transformers MUST be in service with 500 KV bus voltage greater than 520 KV in accordance with 1-OP-26.8, 500 KV Switchyard Voltage. This is to prevent overloading the RSST in the event of an auto-start of a Main Feedwater Pump. **(References 2.3.11, 2.3.12, 2.4.4 and 2.4.5)**

NOTE: This procedure does not contain instructions for placing the 4160-Volt AC Busses in the alignment described below.

4.15 During normal operations to prevent heavy loading on Bus 4 and RSST B, the following bus lineup should be avoided until Engineering has performed an evaluation of bus loading, and it has been determined that RSST loading would not exceed assumptions of GDC 17: **(References 2.4.4 and 2.4.6)**

______ • RSST A fed from Bus 4, AND

______ • RSST B fed from Bus 4, AND

______ • RSST B supplying Bus 1G and Bus 2G with Breaker 25G1 open

______ 4.16 IF performing transfer operations that affect the 2G Bus, THEN the GE RO Operator MUST be notified in order to be on-site during the transfer. The GE RO System has "Phase Monitors" installed which are sensitive to voltage changes and can trip the RO System. The GE RO Operator should be on-site to restart the system as needed. **(Reference 2.4.8)**

______ 4.17 IF the 1H Emergency bus is being powered from the 1B Station Service bus, THEN the Unit 1 "B" Main Feedwater Pump MUST be running or incapable of auto-starting. This is to prevent an Undervoltage condition on the 1B Station Service bus in the event of an auto-start of a Main Feedwater Pump. The UV condition could result in transfer of 1H Emergency bus from offsite power to the 1H EDG. **(Reference 2.4.9)**

______ 4.18 IF the 1J Emergency bus is being powered from the 2B Station Service bus, THEN the Unit 2 "B" Main Feedwater Pump MUST be running or incapable of auto-starting. This is to prevent an Undervoltage condition on the 2B Station Service bus in the event of an auto-start of a Main Feedwater Pump. The UV condition could result in transfer of 1J Emergency bus from offsite power to the 1J EDG. **(Reference 2.4.9)**

5.0 INSTRUCTIONS

5.1 Transferring 1A, 1B, OR 1C Station Service Bus from Reserve Station Service Transformers to Station Service Transformers

______ 5.1.1 Check the Initial Condition is satisfied.

______ 5.1.2 Review the Precautions and Limitations.

______ 5.1.3 Check the Station Service Transformers are energized.

______ 5.1.4 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

5.1.5 IF transferring 1A Station Service Bus, THEN do the following:

______ a. Place the sync key for 15A2 in ON.

______ b. Adjust Unit 1 A Station Service Tap Changer using 1-GOP-26.11, Operation Of A Station Service Transformer Tap Changer, OR A RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the INCOMING voltage is 0 to 2 volts higher than the RUNNING voltage.

______ c. Close breaker 15A2.

______ d. Check current increases on 1A Station Service Transformer and/or 15A2 ammeter.

______ e. Open breaker 15A1.

______ f. Place the sync key for 15A2 in OFF.

______ g. IF 1-FW-P-1A, 1A Main Feedwater Pump, is NOT running, THEN place 1-FW-P-1A in AUTO, or condition as determined by the SRO. **(References 2.4.4 and 2.4.5)**

5.1.6 IF transferring 1B Station Service Bus, THEN do the following:

______ a. Place the sync key for 15B2 in ON.

______ b. Adjust Unit 1 B Station Service Tap Changer using 1-GOP-26.12, Operation Of B Station Service Transformer Tap Changer, OR B RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the INCOMING voltage is 0 to 2 volts higher than the RUNNING voltage.

______ c. Close breaker 15B2.

______ d. Check current increases on 1B Station Service Transformer and/or 15B2 ammeter.

______ e. Open breaker 15B1.

______ f. Place the sync key for 15B2 in OFF.

______ g. IF 1-FW-P-1B, 1B Main Feedwater Pump, is NOT running, THEN place 1-FW-P-1B in AUTO, or condition as determined by the SRO. **(References 2.4.4 and 2.4.5)**

5.1.7 IF transferring 1C Station Service Bus, THEN do the following:

______ a. Place the sync key for 15C2 in ON.

______ b. Adjust Unit 1 C Station Service Tap Changer using 1-GOP-26.13, Operation Of C Station Service Transformer Tap Changer, <u>OR</u> C RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the INCOMING voltage is 0 to 2 volts higher than the RUNNING voltage.

______ c. Close breaker 15C2.

______ d. Check current increases on 1C Station Service Transformer and/or 15C2 ammeter.

______ e. Open breaker 15C1.

______ f. Place the sync key for 15C2 in OFF.

______ g. <u>IF</u> 1-FW-P-1C, 1C Main Feedwater Pump, is <u>NOT</u> running, <u>THEN</u> place 1-FW-P-1C in AUTO, or condition as determined by the SRO. **(References 2.4.4 and 2.4.5)**

Completed by: ____ Date: _________

5.2 Transferring 1A, 1B, OR 1C Station Service Bus from Station Service Transformers to Reserve Station Service Transformers

______ 5.2.1 Check the Initial Condition is satisfied.

______ 5.2.2 Review the Precautions and Limitations.

______ 5.2.3 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

5.2.4 IF transferring 1A Station Service Bus, THEN do the following:

______ a. Ensure 1-FW-P-1A, 1A Main Feedwater Pump, is inservice or PTL. **(References 2.4.4 and 2.4.5)**

______ b. Place the sync key for 15A1 in ON.

______ c. Adjust Unit 1 A Station Service Tap Changer using 1-GOP-26.11, Operation Of A Station Service Transformer Tap Changer, OR A RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the INCOMING voltage is 0 to 2 volts higher than the RUNNING voltage.

______ d. Close breaker 15A1.

______ e. Check current increases on A RSS Transformer and/or 15A1 ammeter.

______ f. Open breaker 15A2.

______ g. Place the sync key for 15A1 in OFF.

5.2.5 IF transferring 1B Station Service Bus, THEN do the following:

NOTE: The intent of Step 5.2.5.a is to prevent the 1H Bus and 1J Bus from having the same off-site power source OR enter the Action of Tech Spec 3.8.1 or 3.8.2, as applicable. **(Reference 2.4.7)**

a. IF the A RSST and B RSST are powered from the same Bus AND the 1H Bus is powered from the 1B Station Service Bus, THEN do one of the following: **(Reference 2.4.7)**

______ • Using applicable procedure(s) as necessary, transfer the power source of the 1H Bus, A RSST, or B RSST to prevent the 1H Bus and the 1J Bus from have the same off-site power source.

______ • Enter the Action of Tech Spec 3.8.1 or 3.8.2, as applicable, due to the 1H Bus and the 1J Bus having the same off-site power source.

______ b. IF 1-FW-P-1B, 1B Main Feedwater Pump will be in AUTO, THEN ensure Switchyard 500/36.5 KV Bank No. 1 AND No. 2 Transformers are in service with 500 KV bus voltage greater than 520 KV in accordance with 1-OP-26.8, 500 KV Switchyard Voltage. **(References 2.3.11, 2.3.12, 2.4.4 and 2.4.5)**

______ c. Place the sync key for 15B1 in ON.

______ d. Adjust Unit 1 B Station Service Tap Changer using 1-GOP-26.12, Operation Of B Station Service Transformer Tap Changer, OR B RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the INCOMING voltage is 0 to 2 volts higher than the RUNNING voltage.

______ e. Close breaker 15B1.

______ f. Check current increases on B RSS Transformer and/or 15B1 ammeter.

______ g. Open breaker 15B2.

______ h. Place the sync key for 15B1 in OFF.

5.2.6 IF transferring 1C Station Service Bus, THEN do the following:

______ a. Ensure 1-FW-P-1C, 1C Main Feedwater Pump, is inservice or PTL. **(References 2.4.4 and 2.4.5)**

______ b. Place the sync key for 15C1 in ON.

______ c. Adjust Unit 1 C Station Service Tap Changer using 1-GOP-26.13, Operation Of C Station Service Transformer Tap Changer, OR C RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the INCOMING voltage is 0 to 2 volts higher than the RUNNING voltage.

______ d. Close breaker 15C1.

______ e. Check current increases on C RSS Transformer and/or 15C1 ammeter.

______ f. Open breaker 15C2.

______ g. Place the sync key for 15C1 in OFF.

Completed by: ____ Date: _________

5.3 Transferring 1G Bus from B Reserve Station Service Transformer to 2G Bus

______ 5.3.1 Check the Initial Condition is satisfied.

______ 5.3.2 Review the Precautions and Limitations.

______ 5.3.3 Place the Fast Transfer Switch for 15G10 in DEFEAT.

______ 5.3.4 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

______ 5.3.5 Place the sync key for 15G10, 1G/2G Crosstie, in ON.

______ 5.3.6 Adjust B RSST Tap Changer <u>OR</u> C RSST Tap Changer so that the RUNNING bus voltage is 0 to 70 volts higher than the INCOMING bus voltage.

CAUTION

Actuation of ANY one of the 86LS (Load Shed) relays will trip and lock out 1-EP-BKR-15G10, 1G TO 2G CROSS-TIE BREAKER.

NOTE: After closing breaker 15G10, current may not increase on the 15G10 ammeter. An operator is stationed at the CW Screenwell house to locally check the position of breaker 15G10, if required.

______ 5.3.7 Station an operator at the CW Screenwell house to locally check the position of breaker 15G10.

______ ______ CV 5.3.8 ★ Close breaker 15G10.

5.3.9 Do one of the following:

______ • Locally check breaker 15G10 is closed.

______ • Check current increases on 15G10 ammeter.

______ ______ CV 5.3.10 ★ Open 15G1, 4160 Bus 1G Supply Breaker from B RSS.

______ 5.3.11 Place the sync key for 15G10 in OFF.

Completed by: ____ Date: __________

5.4 Transferring 1G Bus from 2G Bus to B Reserve Station Service Transformer

______ 5.4.1 Check the Initial Condition is satisfied.

______ 5.4.2 Review the Precautions and Limitations.

5.4.3 IF 2H Bus is being supplied from the A RSST, THEN do the following:

______ a. Place the sync switch for 15E1 in ON. B RSST voltage is the indicated RUNNING voltage.

______ b. Adjust B RSST Tap Changer OR C RSST Tap Changer so that the RUNNING (B RSST) bus voltage indication is 0 to 70 volts higher than the INCOMING (1G 4160 Bus) bus voltage. B RSST voltage indication will need to be multiplied by 35 to compensate for the metering transformer turns ratio.

______ c. Place the sync key for 15E1 in OFF.

______ d. Place the sync key for 15G1 in ON.

______ e. Mark Steps 5.4.4 through 5.4.6 N/A.

______ 5.4.4 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

______ 5.4.5 Place the sync key for 15G1 in ON.

______ 5.4.6 Adjust B RSST Tap Changer OR C RSST Tap Changer so that the INCOMING bus voltage is 0 to 70 volts higher than the RUNNING bus voltage.

______ 5.4.7 Close 15G1, 4160 Bus 1G Supply Breaker from B RSS.

______ 5.4.8 Check current increases on B RSST and/or 15G1 ammeter.

______ 5.4.9 Open 15G10, 1G/2G Crosstie.

______ 5.4.10 Place the sync key for 15G1 in OFF.

5.4.11 Do one of the following:

______ a. IF Lake Anna Reservoir level is less than 251 feet, THEN place the Fast Transfer Switch for 15G10 in NORMAL.

______ b. IF Lake Anna Reservoir level is 251 feet or greater, THEN place the Fast Transfer Switch for 15G10 in DEFEAT.

Completed by: ____ Date: _________

5.5 Transferring 1H Emergency Bus from F Transfer Bus (C Reserve Station Service Transformer) to 1B Station Service Bus

NOTE: When Emergency Bus 1H is cross-tied to Station Service Bus 1B, the Unit 1 Main Generator MVAR MUST be limited to +300 MVAR Out (lagging) to ensure adequate Bus 1H voltage in accordance with GDC-17. No additional restrictions exist for Unit 1 Generator voltage other than 21.4 KV to 23.1 KV (machine rating). **(References 2.3.13 and 2.4.12)**

______ 5.5.1 Check the Initial Conditions are satisfied.

______ 5.5.2 Review the Precautions and Limitations.

______ 5.5.3 IF 1-FW-P-1B, 1B Main Feedwater Pump, is NOT running, THEN place 1-FW-P-1B in PULL-TO-LOCK. **(Reference 2.4.9)**

NOTE: The offsite circuit to Bus 1H cannot be considered operable if Bus 1H is being supplied from 1B Station Service Bus when 1B Station Service bus is being fed from “B” RSST, regardless of which 34.5 KV bus is supplying “B” RSST. **(Reference 2.4.10)**

5.5.4 To ensure power is maintained to 1H Emergency Bus in accordance with Tech Spec 3.8.1 or 3.8.2 as applicable and prevent the possibility of the 1H Bus and the 1J Bus having the same off-site power source, check BOTH of the following are satisfied, OR enter the appropriate Action of Tech Spec 3.8.1 or 3.8.2 as applicable for one offsite circuit inoperable: **(References 2.4.2 and 2.4.10)**

______ • Generator Output Breaker G-12 is operable OR open

______ • “B” Station Service is on NORMAL feed (breaker 1-EP-BKR-15B2 is closed)

CAUTION

IF the Directional Overcurrent relays are operable, THEN the possibility exists that 1-EE-BKR-15H11 may be tripped by the Directional Overcurrent relays when transferring the 1H Emergency Bus from F Transfer Bus (C Reserve Station Service Transformer) to 1B Station Service Bus.

5.5.5 IF Control Operations is available, THEN defeat the Directional Overcurrent relays on Breaker 1-EE-BKR-15H11 as follows:

______ SRO a. Have the SRO approve defeating the 1-EE-BKR-15H11 Directional Overcurrent relays.

______ b. Have Control Operations perform Attachment 1, Jumper Installation To Defeat 1-EE-BKR-15H11 Directional Overcurrent Trip.

______ SRO c. Notify the SRO that the 1-EE-BKR-15H11 Directional Overcurrent relays have been defeated.

______ 5.5.6 Close breaker 15B11.

______ 5.5.7 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

______ 5.5.8 Place the sync key for 15H1 in ON.

______ 5.5.9 Adjust Unit 1 B Station Service Tap Changer using 1-GOP-26.12, Operation Of B Station Service Transformer Tap Changer, OR C RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the RUNNING Voltage is 0-2 volts higher than the INCOMING voltages.

______ 5.5.10 Close breaker 15H1.

______ 5.5.11 Check current increases on the 4160 V Bus 1B Alt Feed AC Amps indicator on 1-EI-CB-08A.

______ 5.5.12 Place the sync key for 15H1 in OFF.

5.5.13 Do the following:

______ a. Open breaker 15H11.

______ b. Open breaker 15F3.

______ c. Check 1H bus voltage is between 4200 and 4400 Volts.

5.5.14 IF Control Operations defeated the 1-EE-BKR-15H11 Directional Overcurrent relays, THEN enable the Directional Overcurrent relays on Breaker 1-EE-BKR-15H11 as follows:

______ SRO a. Have the SRO approve enabling the 1-EE-BKR-15H11 Directional Overcurrent relays.

______ b. Have Control Operations perform Attachment 2, Jumper Removal To Enable 1-EE-BKR-15H11 Directional Overcurrent Trip.

______ SRO c. Notify the SRO that the 1-EE-BKR-15H11 Directional Overcurrent relays have been enabled.

Completed by: ____ Date: __________

5.6 Transferring 1H Emergency Bus from 1B Station Service Bus to F Transfer Bus (C Reserve Station Service Transformer)

______ 5.6.1 Check Initial Conditions are satisfied.

______ 5.6.2 Review the Precautions and Limitations.

CAUTION

IF the Directional Overcurrent relays are operable, THEN the possibility exists that 1-EE-BKR-15H11 may be tripped by the Directional Overcurrent relays when transferring the 1H Emergency Bus from 1B Station Service Bus to F Transfer Bus (C Reserve Station Service Transformer).

5.6.3 IF Control Operations is available, THEN defeat the Directional Overcurrent relays on Breaker 1-EE-BKR-15H11 as follows:

______ SRO a. Have the SRO approve defeating the 1-EE-BKR-15H11 Directional Overcurrent relays.

______ b. Have Control Operations perform Attachment 1, Jumper Installation To Defeat 1-EE-BKR-15H11 Directional Overcurrent Trip.

______ SRO c. Notify the SRO that the 1-EE-BKR-15H11 Directional Overcurrent relays have been defeated.

______ 5.6.4 Close breaker 15F1.

______ 5.6.5 Close breaker 15F3.

______ 5.6.6 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

______ 5.6.7 Place the sync key for 15H11 in ON.

______ 5.6.8 Adjust Unit 1 B Station Service Tap Changer using 1-GOP-26.12, Operation Of B Station Service Transformer Tap Changer, OR B RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, if supplying Bus 1B AND / OR C RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the RUNNING Voltage is 0-2 volts higher than the INCOMING voltages.

______ 5.6.9 Close breaker 15H11.

______ 5.6.10 Check current increases on the 4160V Bus F AC Amperes Indicator on 1-EI-CB-08A.

______ 5.6.11 Place the sync key for 15H11 in OFF.

5.6.12 Do the following:

______ a. Open breaker 15H1.

______ b. Open breaker 15B11.

______ c. Check 1H bus voltage is between 4200 and 4400 Volts.

5.6.13 IF Control Operations defeated the 1-EE-BKR-15H11 Directional Overcurrent relays, THEN enable the Directional Overcurrent relays on Breaker 1-EE-BKR-15H11 as follows:

______ SRO a. Have the SRO approve enabling the 1-EE-BKR-15H11 Directional Overcurrent relays.

______ b. Have Control Operations perform Attachment 2, Jumper Removal To Enable 1-EE-BKR-15H11 Directional Overcurrent Trip.

______ SRO

c. Notify the SRO that the 1-EE-BKR-15H11 Directional Overcurrent relays have been enabled.

5.6.14 IF 1-FW-P-1B, 1B Main Feedwater Pump, is NOT running, THEN place 1-FW-P-1B in condition determined by the SRO: **(Reference 2.4.9)**

______ • Remain in PULL-TO-LOCK

______ • Place in AUTO

Completed by: ____________________________________ Date: __________

5.7 Transferring 1J Emergency Bus from D Transfer Bus (A Reserve Station Service Transformer) to 2B Station Service Bus

NOTE: When Emergency Bus 1J is cross-tied to Station Service Bus 2B, the Unit 2 Main Generator MVAR MUST be limited to +300 MVAR Out (lagging) to ensure adequate Bus 1J voltage in accordance with GDC-17. No additional restrictions exist for Unit 2 Generator voltage other than 20.9 KV to 23.1 KV (machine rating). **(Reference 2.3.13)**

______ 5.7.1 Check the Initial Conditions are satisfied.

______ 5.7.2 Review the Precautions and Limitations.

______ 5.7.3 IF 2-FW-P-1B, 1B Main Feedwater Pump, is NOT running, THEN place 2-FW-P-1B in PULL-TO-LOCK. **(Reference 2.4.9)**

______ 5.7.4 To ensure power is maintained to 1J Emergency Bus in accordance with Tech Spec 3.8.1, check breaker 2-EP-BKR-25B1 and B RSST are operable. **(Reference 2.4.2)**

CAUTION

IF the Directional Overcurrent relays are operable, THEN the possibility exists that 1-EE-BKR-15J11 may be tripped by the Directional Overcurrent relays when transferring the 1J Emergency Bus from D Transfer Bus (A Reserve Station Service Transformer) to 2B Station Service Bus.

5.7.5 IF Control Operations is available, THEN defeat the Directional Overcurrent relays on Breaker 1-EE-BKR-15J11 as follows:

______ SRO a. Have the SRO approve defeating the 1-EE-BKR-15J11 Directional Overcurrent relays.

______ b. Have Control Operations perform Attachment 3, Jumper Installation To Defeat 1-EE-BKR-15J11 Directional Overcurrent Trip.

______ SRO c. Notify the SRO that the 1-EE-BKR-15J11 Directional Overcurrent relays have been defeated.

______ 5.7.6 Close breaker 25B10.

______ 5.7.7 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

______ 5.7.8 Place the sync key for 15J1 in ON.

______ 5.7.9 Adjust Unit 2 B Station Service Tap Changer using 2-GOP-26.12, Operation Of B Station Service Transformer Tap Changer, OR A RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the RUNNING Voltage is 0-2 volts higher than the INCOMING voltages.

______ 5.7.10 Close breaker 15J1.

______ 5.7.11 Check current increases on the 4160 V Bus 2B Alternate Feed AC Amps indicator on 1-EI-CB-08B.

______ 5.7.12 Place the sync key for 15J1 in OFF.

5.7.13 Do the following:

______ a. Open breaker 15J11.

______ b. Open breaker 15D3.

______ c. Check 1J bus voltage is between 4200 and 4400 Volts.

5.7.14 IF Control Operations defeated the 1-EE-BKR-15J11 Directional Overcurrent relays, THEN enable the Directional Overcurrent relays on Breaker 1-EE-BKR-15J11 as follows:

______ SRO

a. Have the SRO approve enabling the 1-EE-BKR-15J11 Directional Overcurrent relays.

______

b. Have Control Operations perform Attachment 4, Jumper Removal To Enable 1-EE-BKR-15J11 Directional Overcurrent Trip.

______ SRO

c. Notify the SRO that the 1-EE-BKR-15J11 Directional Overcurrent relays have been enabled.

Completed by: ______________________________ Date: __________

5.8 Transferring 1J Emergency Bus from 2B Station Service Bus to D Transfer Bus (A Reserve Station Service Transformer)

______ 5.8.1 Check the Initial Conditions are satisfied.

______ 5.8.2 Review the Precautions and Limitations.

CAUTION

IF the Directional Overcurrent relays are operable, THEN the possibility exists that 1-EE-BKR-15J11 may be tripped by the Directional Overcurrent relays when transferring the 1J Emergency Bus from 2B Station Service Bus to D Transfer Bus (A Reserve Station Service Transformer).

5.8.3 IF Control Operations is available, THEN defeat the Directional Overcurrent relays on Breaker 1-EE-BKR-15J11 as follows:

______ SRO a. Have the SRO approve defeating the 1-EE-BKR-15J11 Directional Overcurrent relays.

______ b. Have Control Operations perform Attachment 3, Jumper Installation To Defeat 1-EE-BKR-15J11 Directional Overcurrent Trip.

______ SRO c. Notify the SRO that the 1-EE-BKR-15J11 Directional Overcurrent relays have been defeated.

______ 5.8.4 Close breaker 15D1.

______ 5.8.5 Close breaker 15D3.

______ 5.8.6 Check Attachment 5, 4160V Synchronization Incoming and Running Volts, to determine the Incoming Voltage and the Running Voltage Sources.

______ 5.8.7 Place the sync key for 15J11 in ON.

______ 5.8.8 Adjust Unit 2 B Station Service Tap Changer using 2-GOP-26.12, Operation Of B Station Service Transformer Tap Changer, OR A RSS Transformer Tap Changer using 0-GOP-26.1, Operation Of Reserve Station Service Transformer Tap Changer, so that the RUNNING Voltage is 0-2 volts higher than the INCOMING voltages.

______ 5.8.9 Close breaker 15J11.

______ 5.8.10 Check current increases on the 4160V Bus D AC Amperes Indicator on 1-EI-CB-08B.

______ 5.8.11 Place the sync key for 15J11 in OFF.

5.8.12 Do the following:

______ a. Open breaker 15J1.

______ b. Open breaker 25B10.

______ c. Check 1J bus voltage is between 4200 and 4400 Volts.

5.8.13 IF Control Operations defeated the 1-EE-BKR-15J11 Directional Overcurrent relays, THEN enable the Directional Overcurrent relays on Breaker 1-EE-BKR-15J11 as follows:

______ SRO a. Have the SRO approve enabling the 1-EE-BKR-15J11 Directional Overcurrent relays.

______ b. Have Control Operations perform Attachment 4, Jumper Removal To Enable 1-EE-BKR-15J11 Directional Overcurrent Trip.

______
SRO

c. Notify the SRO that the 1-EE-BKR-15J11 Directional Overcurrent relays have been enabled.

5.8.14 IF 2-FW-P-1B, 1B Main Feedwater Pump, is NOT running, THEN place 2-FW-P-1B in condition determined by the SRO: **(Reference 2.4.9)**

______ • Remain in PULL-TO-LOCK

______ • Place in AUTO

Completed by: ____ Date: __________

(Page 1 of 1)

Attachment 1

Jumper Installation To Defeat 1-EE-BKR-15H11 Directional Overcurrent Trip

______ CO ______ CV

1. **TM:** At panel 1-EI-CB-202, 1H Emer Diesel Generator Diesel Isolation Cabinet (located in the Unit 1 Emergency Switchgear Room), obtain concurrent verification and remove the connecting plug for Relay 67A-1ENSH02, Dir O/C Relay Bkr 15H11-Phase A.

______ CO ______ CV

2. **TM:** At panel 1-EI-CB-202, 1H Emer Diesel Generator Diesel Isolation Cabinet (located in the Unit 1 Emergency Switchgear Room), obtain concurrent verification and remove the connecting plug for Relay 67B-1ENSH02, Dir O/C Relay Bkr 15H11-Phase B.

______ CO ______ CV

3. **TM:** At panel 1-EI-CB-202, 1H Emer Diesel Generator Diesel Isolation Cabinet (located in the Unit 1 Emergency Switchgear Room), obtain concurrent verification and remove the connecting plug for Relay 67C-1ENSH02, Dir O/C Relay Bkr 15H11-Phase C.

(Page 1 of 1)

Attachment 2

Jumper Removal To Enable 1-EE-BKR-15H11 Directional Overcurrent Trip

_____ CO _____ CV

1. **TM:** At panel 1-EI-CB-202, 1H Emer Diesel Generator Diesel Isolation Cabinet (located in the Unit 1 Emergency Switchgear Room), obtain concurrent verification and install the connecting plug and cover for Relay 67A-1ENSH02, Dir O/C Relay Bkr 15H11-Phase A.

_____ CO _____ CV

2. **TM:** At panel 1-EI-CB-202, 1H Emer Diesel Generator Diesel Isolation Cabinet (located in the Unit 1 Emergency Switchgear Room), obtain concurrent verification and install the connecting plug and cover for Relay 67B-1ENSH02, Dir O/C Relay Bkr 15H11-Phase B.

_____ CO _____ CV

3. **TM:** At panel 1-EI-CB-202, 1H Emer Diesel Generator Diesel Isolation Cabinet (located in the Unit 1 Emergency Switchgear Room), obtain concurrent verification and install the connecting plug and cover for Relay 67C-1ENSH02, Dir O/C Relay Bkr 15H11-Phase C.

(Page 1 of 1)

Attachment 3
Jumper Installation To Defeat 1-EE-BKR-15J11 Directional Overcurrent Trip

_____ CO _____ CV

1. **TM:** At panel 1-EI-CB-08B, Emergency Gen 1J (located in the Control Room), obtain concurrent verification and remove the connecting plug for Relay 67A-1ENSJ02, Direct Overcurrent Relay 15J11-Phase A.

_____ CO _____ CV

2. **TM:** At panel 1-EI-CB-08B, Emergency Gen 1J (located in the Control Room), obtain concurrent verification and remove the connecting plug for Relay 67B-1ENSJ02, Direct Overcurrent Relay 15J11-Phase B.

_____ CO _____ CV

3. **TM:** At panel 1-EI-CB-08B, Emergency Gen 1J (located in the Control Room), obtain concurrent verification and remove the connecting plug for Relay 67C-1ENSJ02, Direct Overcurrent Relay 15J11-Phase C.

(Page 1 of 1)

Attachment 4

Jumper Removal To Enable 1-EE-BKR-15J11 Directional Overcurrent Trip

______ CO ______ CV

1. **TM:** At panel 1-EI-CB-08B, Emergency Gen 1J (located in the Control Room), obtain concurrent verification and install the connecting plug and cover for Relay 67A-1ENSJ02, Direct Overcurrent Relay 15J11-Phase A.

______ CO ______ CV

2. **TM:** At panel 1-EI-CB-08B, Emergency Gen 1J (located in the Control Room), obtain concurrent verification and install the connecting plug and cover for Relay 67B-1ENSJ02, Direct Overcurrent Relay 15J11-Phase B.

______ CO ______ CV

3. **TM:** At panel 1-EI-CB-08B, Emergency Gen 1J (located in the Control Room), obtain concurrent verification and install the connecting plug and cover for Relay 67C-1ENSJ02, Direct Overcurrent Relay 15J11-Phase C.

Attachment 5

4160V Synchronization Incoming and Running Volts

Sync Switch	Incoming Volts	Running Volts
25-15A1	RSST A	4160V BUS 1A
25-15A2	SSTX 1A	4160V BUS 1A
25-15B1	RSST B	4160V BUS 1B
25-15B2	SSTX 1B	4160V BUS 1B
25-15C1	RSST C	4160V BUS 1C
25-15C2	SSTX 1C	4160V BUS 1C
25-15D1	4160V BUS D	RSST A
25-15E1	4160V BUS E	RSST B
25-15F1	4160V BUS F	RSST C
25-15G1	RSST B (2H Bus)	4160V BUS 1G
25-15G10	4160V BUS 1G	4160V BUS 2G
25-15H1	4160V BUS 1H	4160V BUS 1B
25-15H11	4160V BUS 1H	4160V BUS F
25-15H2	EMERGENCY GEN 1H	4160V BUS 1H
25A-15H1	4160V BUS 1H	4160V BUS 1B
25A-15H11	4160V BUS 1H	4160V BUS F
25A-15H2	EMERGENCY GEN 1H	4160V BUS 1H
25-15J1	4160V BUS 1J	4160V BUS 2B
25-15J11	4160V BUS 1J	4160V BUS D
25-15J2	EMERGENCY GEN 1J	4160V BUS 1J

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

1-E-1, "Loss of Reactor or Secondary Coolant," has directed the transition to 1-ES-1.4, "Transfer to Hot Leg Recirculation."

Safety Injection System is in the cold-leg recirculation mode.

INITIATING CUE

You are requested to transfer the Safety Injection System to the hot-leg recirculation mode in accordance with 1-ES-1.4, "Transfer to Hot Leg Recirculation."

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

R198 A

TASK

Transfer the Safety Injection System to the hot-leg recirculation mode (1-ES-1.4).

TASK STANDARDS

Safety Injection System is transferred to the hot-leg injection mode.

K/A REFERENCE:

006A4.07 (4.4/4.4)

ALTERNATE PATH:

No hot leg injection flow

TASK COMPLETION TIMES

Validation Time = 13 minutes   Start Time = _______
Actual Time = _______ minutes   Stop Time = _______

PERFORMANCE EVALUATION

Rating   [ ] SATISFACTORY   [ ] UNSATISFACTORY

Candidate (Print) ______________________________

Evaluator (Print) ______________________________

Evaluator's Signature / Date ______________________________

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

R198 A

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

1-E-1, "Loss of Reactor or Secondary Coolant," has directed the transition to 1-ES-1.4, "Transfer to Hot Leg Recirculation."

Safety Injection System is in the cold-leg recirculation mode.

INITIATING CUE

You are requested to transfer the Safety Injection System to the hot-leg recirculation mode in accordance with 1-ES-1.4, "Transfer to Hot Leg Recirculation."

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-ES-1.4

PERFORMANCE STEPS

START TIME ___________

1	Close the low-head safety injection pump discharge valves.	Procedure Step 1.a.1
	Critical Step	SAT [ ] UNSAT [ ]

NOTE TO THE EVALUATOR	This step is not critical if 1890C and 1890D are closed.
Standards	1-SI-MOV-1864A and 1-SI-MOV-1864B are closed.

Notes/Comments

2	Close the low-head safety injection pump cold-leg injection valves.	Procedure Step 1.a.2

Critical Step	SAT [ ] UNSAT [ ]

NOTE TO THE EVALUATOR	This step is not critical if 1864A and 1864B are closed.

Standards	1-SI-MOV-1890C and 1-SI-MOV-1890D are closed.

Notes/Comments

3	Open the following low-head safety injection pump hot-leg injection valves: • 1-SI-MOV-1890A • 1-SI-MOV-1890B	Procedure Step 1.b

Critical Step	SAT [ ] UNSAT [ ]

Standards	Key switches for 1-SI-MOV-1890A and 1-SI-MOV-1890B are placed in OPEN.

Notes/Comments

4	Verify two charging pumps in service. **NO**	Procedure Step 2

SAT [ ] UNSAT [ ]

Standards	Operator notes only one charging pump is in-service. Operator applies procedure step 2 RNO.

Notes/Comments

5	Verify 1-CH-HCV-1311, Auxiliary Spray Valve, is closed.	Procedure Step 5.a

SAT [ ] UNSAT [ ]

Standards	1-CH-HCV-1311 is verified closed (green light on, red light off)

Notes/Comments

6	Open normal charging line isolation valves.	Procedure Step 5.b

Critical Step	SAT [ ] UNSAT [ ]

Standards	1-CH-HCV-1310, 1-CH-MOV-1289A & B are opened or verified open.

Notes/Comments

7	Open 1-CH-FCV-1122.	Procedure Step 5.c

Critical Step	SAT [ ] UNSAT [ ]

Standards	1-CH-FCV-1122 is placed in manual and opened to establish 60 gpm charging flow.

Notes/Comments

8	Verify 1-SI-MOV-1836 and 1869A closed.	Procedure Step 5.d

	SAT [ ] UNSAT [ ]

Standards	1-SI-MOV-1836 and 1869A verified closed by checking light indication.

Notes/Comments

9	Close BIT inlet isolation valves.	Procedure Step 5.e

Critical Step	SAT [ ] UNSAT [ ]

NOTE TO THE EVALUATOR	Closing BIT inlets is not critical as long as outlets are closed.

Standards	1-SI-MOV-1867A and 1867B are closed.

Notes/Comments

10	Close BIT outlet isolation valves.	Procedure Step 5.f

Critical Step	SAT [ ] UNSAT [ ]

NOTE TO THE EVALUATOR	Closing BIT outlets is not critical as long as inlets are closed.

Standards	1-SI-MOV-1867C and 1867D are closed.

Notes/Comments

11	Open 1-SI-MOV-1869B. **NO**	Procedure Step 5.g

	SAT [ ] UNSAT [ ]

Standards	Key switch for 1-SI-MOV-1869B is placed in OPEN.

Notes/Comments 1-SI-MOV-1869B will NOT open. Operator should continue to step 5.h.

12	Verify hot leg injection flow. **NO** **(**Alternate Path)	Procedure Step 5.h

	SAT [ ] UNSAT [ ]

Standards	Operator notes no flow indicated on 1-SI-FI-1943, 1943-1, 1933, 1960, and 1932. Applies RNO.

Notes/Comments

13	Do the following: Verify 1-SI-MOV-1869B closed.	Procedure Step 5.h.1 RNO

	SAT [ ] UNSAT [ ]

Standards	Verifies 1-SI-MOV-1869B closed.

Notes/Comments

14	Open 1-SI-MOV-1869A.	Procedure Step 5.h.2 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	Key switch for 1-SI-MOV-1869A is placed in OPEN.

Notes/Comments

15	Verify alternate header flow.	Procedure Step 5.h.3 RNO

	SAT [ ] UNSAT [ ]

Standards	Verifies flow on 1-SI-FI-1940 and 1940-1.

Notes/Comments

16	Close normal charging isolation valves.	Procedure Step 5.i

	SAT [ ] UNSAT [ ]

Standards	1-CH-MOV-1289A and 1289B are closed.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME __________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE
R198A

TASK

Transfer the Safety Injection System to the hot-leg recirculation mode (1-ES-1.4).

CHECKLIST

_____ Recall IC 113.

_____ Enter the following malfunctions:

- RC0201
- CH1601
- CH1603

_____ Go to run and perform 1-E-0 to 1-E-1.

_____ Place the simulator in FREEZE.

_____ Put keys in 1-SI-MOV-1890A, 1890B, 1869A, and 1869B.

NORTH ANNA POWER STATION

EMERGENCY PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-ES-1.4	TRANSFER TO HOT LEG RECIRCULATION (WITH NO ATTACHMENTS)	10
		PAGE 1 of 7

PURPOSE

To provide instructions for transferring the Safety Injection System to the Hot Leg Recirculation Mode.

ENTRY CONDITIONS

This procedure is entered from:

- 1-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, or
- When conditions are met with TSC or Plant Staff concurrence, that transfer to Hot Leg Recirculation Mode is required. This may be eventually required, after transferring to Cold Leg Recirculation during implementation of any of the following:
  - 1-ES-1.2, POST-LOCA COOLDOWN AND DEPRESSURIZATION
  - 1-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED
  - 1-ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED

UNIT ONE

CONTINUOUS USE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

1. ___	ALIGN LOW-HEAD SI PUMPS FOR HOT LEG RECIRCULATION:	
	a) Close the following valves:	
	1) Low-Head SI Pump Discharge Valves:	
☐	• 1-SI-MOV-1864A	
☐	• 1-SI-MOV-1864B	
	2) Low-Head SI Pump Cold Leg Injection Valves:	
☐	• 1-SI-MOV-1890C	
☐	• 1-SI-MOV-1890D	
	b) Open the Low-Head SI Pump Hot Leg Injection Valves:	
☐	• 1-SI-MOV-1890A	
☐	• 1-SI-MOV-1890B	
2. ___	VERIFY TWO CHARGING PUMPS - IN SERVICE	☐ GO TO Step 5.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

3. ___ ALIGN CHARGING PUMP FLOWING THE BIT FOR HOT LEG RECIRCULATION:

a) Put the Standby Charging Pump in PTL:

- ______ 1-CH-P-1A
- ______ 1-CH-P-1B
- ______ 1-CH-P-1C

b) Put the Charging Pump that is flowing the BIT in PTL:

- ______ 1-CH-P-1A
- ______ 1-CH-P-1B
- ______ 1-CH-P-1C

c) Isolate the BIT by closing the following valves:

☐ • 1-SI-MOV-1867A

☐ • 1-SI-MOV-1867B

☐ • 1-SI-MOV-1867C

☐ • 1-SI-MOV-1867D

☐ d) Open 1-SI-MOV-1869B

☐ e) Start the Charging Pump stopped in Step 3b

(STEP 3 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	ALIGN CHARGING PUMP FLOWING THE BIT FOR HOT LEG RECIRCULATION: (Continued)	
	f) Verify Hot Leg injection flow before continuing: ☐ • 1-SI-FI-1943 ☐ • 1-SI-FI-1943-1 ☐ • 1-SI-FI-1933 (NQ) ☐ • 1-SI-FI-1960 (NQ) ☐ • 1-SI-FI-1932 (NQ)	f) Open the Normal Header Discharge Valve for the Charging Pump started in Step 3e: ☐ • 1-CH-MOV-1286A (1-CH-P-1A) ☐ • 1-CH-MOV-1286B (1-CH-P-1B) ☐ • 1-CH-MOV-1286C (1-CH-P-1C)
4.___	ALIGN CHARGING PUMP FLOWING THE ALTERNATE PATH FOR HOT LEG RECIRCULATION:	
	a) Put the Charging Pump that is flowing the alternate path in PTL: • ______ 1-CH-P-1A • ______ 1-CH-P-1B • ______ 1-CH-P-1C	
	☐ b) Close 1-SI-MOV-1836	
	☐ c) Open 1-SI-MOV-1869A	
	☐ d) Start the Charging Pump stopped in Step 4a	

(STEP 4 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	ALIGN CHARGING PUMP FLOWING THE ALTERNATE PATH FOR HOT LEG RECIRCULATION: (Continued)	
	e) Verify Alternate Header flow: ☐ • 1-SI-FI-1940 ☐ • 1-SI-FI-1940-1	e) Open the Alternate Header Discharge Valve for the Charging Pump started in Step 4d: ☐ • 1-CH-MOV-1287A (1-CH-P-1A) ☐ • 1-CH-MOV-1287B (1-CH-P-1B) ☐ • 1-CH-MOV-1287C (1-CH-P-1C)
	f) Put the Standby Charging Pump in AFTER-STOP: • ______ 1-CH-P-1A • ______ 1-CH-P-1B • ______ 1-CH-P-1C	
	☐ g) GO TO Step 6.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: To provide adequate Charging Pump cooling, Charging flow must be maintained at least 60 gpm during transfer to Hot Leg recirculation.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.___	BIT ISOLATION WITH ONE OPERATING CHARGING PUMP:	
☐	a) Verify 1-CH-HCV-1311, Auxiliary Spray Valve is closed.	
	b) Open Normal Charging Line Isolation Valves:	
☐	• 1-CH-HCV-1310	
☐	• 1-CH-MOV-1289A	
☐	• 1-CH-MOV-1289B	
☐	c) Open 1-CH-FCV-1122 in Manual to establish 60 gpm Charging flow.	
	d) Verify the following valves - CLOSED:	☐ d) Place control power on <u>AND</u> close valves.
☐	• 1-SI-MOV-1836	
☐	• 1-SI-MOV-1869A	
	e) Close BIT Inlet Isolation Valves:	
☐	• 1-SI-MOV-1867A	
☐	• 1-SI-MOV-1867B	

(STEP 5 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

5. BIT ISOLATION WITH ONE OPERATING CHARGING PUMP: (Continued)

f) Close BIT Outlet Isolation Valves:

- ☐ • 1-SI-MOV-1867C
- ☐ • 1-SI-MOV-1867D

☐ g) Open 1-SI-MOV-1869B.

h) Verify Hot Leg Injection flow:

- ☐ • 1-SI-FI-1943
- ☐ • 1-SI-FI-1943-1
- ☐ • 1-SI-FI-1933 (NQ)
- ☐ • 1-SI-FI-1960 (NQ)
- ☐ • 1-SI-FI-1932 (NQ)

RESPONSE NOT OBTAINED:

h) Do the following:

☐ 1) Verify 1-SI-MOV-1869B closed.

☐ IF NOT, THEN close 1-SI-MOV-1869B.

☐ 2) Open 1-SI-MOV-1869A.

3) Verify Alternate Header flow:

- ☐ • 1-SI-FI-1940
- ☐ • 1-SI-FI-1940-1

☐ IF no Alternate Header flow, THEN consult TSC or Plant Staff.

i) Close Normal Charging Line Isolation Valves:

- ☐ • 1-CH-MOV-1289A
- ☐ • 1-CH-MOV-1289B

6.___ RETURN TO PROCEDURE AND STEP IN EFFECT

- END -

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Unit is in mode 5.

One of the pressurizer safety valves has been removed.

Residual Heat Removal System is unavailable for decay-heat removal.

All high-head safety injection pumps are unavailable.

The “B” low-head safety injection pump is unavailable.

INITIATING CUE

You are requested to initiate forced feed-and-spill using the "A" low-head safety injection pump cold-leg injection flow path in accordance with 1-AP-11, attachment 6.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

RXXX

TASK

Initiate forced feed-and-spill cooling in response to a loss of residual heat removal (1-AP-11).

TASK STANDARDS

"A" LHSI pump is aligned and flowing to the cold legs.

Reactor Coolant System temperature is stable or decreasing.

K/A REFERENCE:

025AA1.22 (2.9/2.8)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time =	10 minutes	Start Time =	_______
Actual Time =	_______ minutes	Stop Time =	_______

PERFORMANCE EVALUATION

Rating	[ ] SATISFACTORY	[ ] UNSATISFACTORY
Candidate (Print)	______________________________	
Evaluator (Print)	______________________________	
Evaluator's Signature / Date	______________________________	

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

RXXX

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit is in mode 5.

One of the pressurizer safety valves has been removed.

Residual Heat Removal System is unavailable for decay-heat removal.

All high-head safety injection pumps are unavailable.

The “B” low-head safety injection pump is unavailable.

INITIATING CUE

You are requested to initiate forced feed-and-spill using the "A" low-head safety injection pump cold-leg injection flow path in accordance with 1-AP-11, attachment 6.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-AP-11, Attachment 6

PERFORMANCE STEPS

START TIME ___________

1	Stop the containment sump pumps, if desired.	Procedure Step 1

	SAT [ ] UNSAT [ ]

Standards	1-DA-P-4A and 4B control switches are placed in OFF.
Performance Cue(s)	The shift manager desires to conserve containment sump inventory.

Notes/Comments

2	Verify a charging (HHSI) pump available. **NO**	Procedure Step 2
		SAT [ ] UNSAT [ ]

Standards	Answers “No” and goes to Step 5 because all HHSI pumps unavailable as per JPM initial conditions.

Notes/Comments

3	Align a LHSI pump to makeup to the RCS.	Procedure Step 5.a
	Critical Step	SAT [ ] UNSAT [ ]

Standards	Ensures 1-SI-MOV-1862A open.

Notes/Comments

4	Close both LHSI pump discharge isolation valves to the hot legs.	Procedure Step 5.b
		SAT [ ] UNSAT [ ]

Standards	Closes 1-SI-MOV-1890A&B or ensures closed.

Notes/Comments

5	Open the desired LHSI pump discharge isolation valve.	Procedure Step 5.c

Critical Step	SAT [ ] UNSAT [ ]

Standards	Opens 1-SI-MOV-1864A.

Notes/Comments

6	Start the desired LHSI pump.	Procedure Step 5.d

Critical Step	SAT [ ] UNSAT [ ]

Standards	Starts "A" LHSI pump.

Notes/Comments

7	Open the desired LHSI pump discharge isolation valve to the cold legs.	Procedure Step 5.e

Critical Step	SAT [ ] UNSAT [ ]

Standards	Opens either 1-SI-MOV-1890C or D.

Notes/Comments

8	Establish RCS bleed path using one of the following methods:	Procedure Step 6

	SAT [ ] UNSAT [ ]

Standards	Verifies one pressurizer safety valve is removed per JPM initial conditions.

Notes/Comments

9	Maintain RCS makeup and heat removal.	Procedure Step 7

	SAT [ ] UNSAT [ ]

Standards	Checks LHSI flow. Checks pressurizer safety valve removed. Checks RWST level greater than 15%.

Notes/Comments

10	When RHR … is established, then consult with TSC or Plant Staff to determine if SI flow can be stopped. When SI flow can be stopped, then continue with Step 9.	Procedure Step 8

	SAT [ ] UNSAT [ ]

Standards	Task is complete.

Performance Cue(s)	Assume another operator will complete this task.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME __________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE
RXXX

TASK

Initiate forced feed and spill cooling in response to a loss of residual heat removal (1-AP-11).

CHECKLIST

_____ Recall IC 114.

_____ Place all charging pumps and LHSI pumps in PULL-TO-LOCK.

_____ Depressurize the RCS to atmospheric.

_____ Ensure PRZR PORVs are closed and block valves are open.

_____ Ensure PRZR level is 20% to 30%.

_____ Ensure the following valves are closed:

- SI-MOV-1890C and D
- SI-MOV-1864A and B

_____ Ensure containment sump pump 1-DA-P-4A is in AUTO and 1-DA-P-4B is in OFF.

_____ Enter malfunctions RH0501 and RH0502, delay time = 0.

_____ Place the simulator in FREEZE.

_____ Place red sticker on 1-SI-P-1B.

* *

CAUTION:
- If the RCS is vented to the PRT, then PRT pressure indication should be monitored as an indication of RCS pressure. Changes in RCS pressure can result in Reactor Vessel water level changes that may not show on RCS standpipe level indicator 1-RC-LI-103.
- Depending on equipment and RCS conditions, boiling in the core may lead to PRZR surge line flooding and cause RVLIS and RCS Standpipe level indications to read higher than actual.
- If RWST level decreases to 15%, then the SI System should be aligned for recirculation using ATTACHMENT 7, ALIGNING THE SI SYSTEM FOR RECIRC, to provide long-term cooling.
- Charging and Low-Head Pumps taking suction from the RWST must be stopped when RWST level decreases to 8%. An alternate water source will be necessary in order to prevent loss of pump suction.

* *

NOTE:
- IF Cold leg injection is NOT available, THEN Hot leg injection using ATTACHMENT 5, HOT LEG INJECTION FORCED FEED AND SPILL, should be used.
- IF a maintenance breech OR leakage has been identified on a Cold leg, THEN Hot leg injection using ATTACHMENT 5, HOT LEG INJECTION FORCED FEED AND SPILL, should be used.
- IF a maintenance breech OR leakage has been identified on a Hot leg, THEN Cold leg injection using this Attachment, should be used.
- IF leak location has NOT been identified, THEN Cold leg injection using this Attachment, is the preferred flowpath.

1. IF desired to conserve Containment Sump inventory for RCS recirculation, THEN place the following Containment Sump Pumps in OFF:

   ___ • 1-DA-P-4A

   ___ • 1-DA-P-4B

2. ___ Verify a Charging (HHSI) Pump available AND is specified by the Alternate Core Cooling Method Assessment. IF NOT, THEN GO TO Step 5.

3. ___ Verify a Charging (HHSI) Pump flow path to the RCS cold legs is available. IF NOT, THEN GO TO Step 5.

4. Align a Charging Pump to make up to the RCS as follows:

   a. Open Charging Pump Suction from RWST Isolation Valves:

___ • 1-CH-MOV-1115B

___ • 1-CH-MOV-1115D

   b. Close Charging Pump Suction from VCT Isolation Valves:

___ • 1-CH-MOV-1115C

___ • 1-CH-MOV-1115E

___ c. Open 1-CH-MOV-1373, Charging Pump Recirc Header Isolation Valve.

   d. Open the Charging Pump Recirc Valves:

___ • 1-CH-MOV-1275A for 1-CH-P-1A

___ • 1-CH-MOV-1275B for 1-CH-P-1B

___ • 1-CH-MOV-1275C for 1-CH-P-1C

___ e. Start one Charging Pump.

   f. Close the Normal Charging Isolation Valves:

___ • 1-CH-MOV-1289A

___ • 1-CH-MOV-1289B

(STEP 4 CONTINUED ON NEXT PAGE)

g. Align one of the following cold leg injection flow paths as desired:

- BIT injection flow path:
  a. Close BIT Recirc Valves:
     - ___ 1-SI-TV-1884A
     - ___ 1-SI-TV-1884B
     - ___ 1-SI-TV-1884C
  b. Open BIT Outlet Valves:
     - ___ 1-SI-MOV-1867C
     - ___ 1-SI-MOV-1867D
  c. Open BIT Inlet Valves:
     - ___ 1-SI-MOV-1867A
     - ___ 1-SI-MOV-1867B

<u>OR</u>

- ___ Open 1-SI-MOV-1836, BIT Bypass Valve.

___ h. Verify Cold Leg SI flow indicated. <u>IF</u> <u>NOT</u>, <u>THEN</u> GO TO Step 5.

i. Close the Charging Pump Recirc Valves:

- ___ 1-CH-MOV-1275A for 1-CH-P-1A
- ___ 1-CH-MOV-1275B for 1-CH-P-1B
- ___ 1-CH-MOV-1275C for 1-CH-P-1C

j. Check the following to determine if charging flow is adequate:

- ___ RCS level is stable or increasing
- ___ RCS temperature is stable or decreasing

___ k. <u>IF</u> charging flow is adequate, <u>THEN</u> GO TO Step 6. <u>IF</u> charging flow is <u>NOT</u> adequate, <u>THEN</u> GO TO Step 5 to align a Low-Head SI Pump.

5. Align a Low-Head SI Pump to make up to the RCS as follows:

a. Open the desired Low-Head SI Pump Suction From RWST Suction Valve:

___ • 1-SI-MOV-1862A

OR

___ • 1-SI-MOV-1862B

b. Close both of the Low-Head SI Pump Discharge Isolation Valves to the Hot Legs:

___ • 1-SI-MOV-1890A

___ • 1-SI-MOV-1890B

c. Open the desired Low-Head SI Pump Discharge Isolation Valve:

___ • 1-SI-MOV-1864A

OR

___ • 1-SI-MOV-1864B

d. Start the desired Low-Head SI Pump:

___ • 1-SI-P-1A

OR

___ • 1-SI-P-1B

e. Open the desired Low-Head SI Pump Discharge Isolation Valve to the Cold Legs:

___ • 1-SI-MOV-1890C

OR

___ • 1-SI-MOV-1890D

6. Establish RCS bleed path using one of the following methods:

___ • Verify at least one PRZR Safety Valve is removed

OR

• Use PRZR PORVs:

___ 1) Verify power is available or restore power to PRZR PORV Block Valves.

___ 2) Open both PRZR PORV Block Valves.

___ 3) Open both PRZR PORVs.

7. Maintain RCS makeup and heat removal:

___ a. Maintain Charging or Low-Head SI flow.

___ b. Maintain RCS bleed path.

___ c. WHEN RWST level decreases to 15%, THEN initiate ATTACHMENT 7, ALIGNING THE SI SYSTEM FOR RECIRC.

*8. ___ WHEN RHR OR other means of decay heat removal is established, THEN consult TSC or Plant Staff to determine if SI flow can be stopped. WHEN SI flow can be stopped, THEN continue with Step 9.

9. ___ IF both of the following Low-Head SI Containment Suction Valves are closed, THEN GO TO Step 11. IF either valve is open, THEN GO TO Step 10:

• 1-SI-MOV-1860A

• 1-SI-MOV-1860B

* *

CAUTION: To provide adequate Charging Pump cooling, Charging flow must be maintained at least 60 gpm. During SI Recirculation Mode the Charging Pump recircs must remain closed to prevent lifting the Seal Water return relief valve.

* *

10. IF a Low Head SI Pump is aligned to supply Charging Pump suction in the SI Recirculation Mode, THEN have TSC or plant staff ensure the following is the desired Recovery method. IF NOT the desired Recovery method, THEN GO TO Step 14:

___ a. Verify 1-CH-HCV-1311, Auxiliary Spray Valve is closed.

b. Open Normal Charging Line Isolation Valves:

___ • 1-CH-HCV-1310

___ • 1-CH-MOV-1289A

___ • 1-CH-MOV-1289B

___ c. Open 1-CH-FCV-1122 in Manual to establish 60 gpm Charging flow.

d. Close BIT Inlet Isolation Valves:

___ • 1-SI-MOV-1867A

___ • 1-SI-MOV-1867B

e. Close BIT Outlet Isolation Valves:

___ • 1-SI-MOV-1867C

___ • 1-SI-MOV-1867D

___ f. IF 1-SI-MOV-1836 is open, THEN place control power on AND close.

___ g. Establish and maintain greater than 60 gpm Charging flow using 1-CH-FCV-1122 in MANUAL.

___ h. Have TSC or plant staff provide guidance on realigning systems for recovery.

___ i. GO TO Step 14.

11. ISOLATE BIT:

a. Do the following:

___ 1) Open 1-CH-MOV-1373, Charging Pump Recirc Header Isolation Valve.

2) Open Charging Pump Recirc Valves:

___ • 1-CH-MOV-1275A for 1-CH-P-1A

___ • 1-CH-MOV-1275B for 1-CH-P-1B

___ • 1-CH-MOV-1275C for 1-CH-P-1C

b. Close BIT Inlet Isolation Valves:

___ • 1-SI-MOV-1867A

___ • 1-SI-MOV-1867B

c. Close BIT Outlet Isolation Valves:

___ • 1-SI-MOV-1867C

___ • 1-SI-MOV-1867D

___ d. IF 1-SI-MOV-1836 is open, THEN place control power on AND close.

12. Establish normal Charging and Letdown:

___ a. Put controller for 1-CH-FCV-1122, Normal Charging Flow Control Valve, in MANUAL and close.

___ b. Verify 1-CH-HCV-1311, Auxiliary Spray Valve, is closed.

c. Open Normal Charging Line Isolation Valves:

___ • 1-CH-HCV-1310

___ • 1-CH-MOV-1289A

___ • 1-CH-MOV-1289B

___ d. Open 1-CH-FCV-1122, Normal Charging Flow Control Valve, to establish desired flow.

(STEP 12 CONTINUED ON NEXT PAGE)

e. Establish Letdown:

___ 1) Verify at least one CC Pump is running. IF NOT, THEN start at least one CC Pump using 1-OP-51.1, COMPONENT COOLING SYSTEM OR 1-AP-15, LOSS OF COMPONENT COOLING.

___ 2) Put 1-CH-PCV-1145 in MANUAL and open to 100%.

3) Open the following:

___ • 1-CH-TV-1204A

___ • 1-CH-TV-1204B

4) Place desired Letdown path in service:

___ • Open 1-CH-HCV-1142, RHR TO LETDOWN ISOL VALVE, to establish Letdown from RHR.

OR

• Do the following to establish Letdown from RCS:

a. Open the following:

___ • 1-CH-LCV-1460A

___ • 1-CH-LCV-1460B

b. Open at least one of the following Letdown Orifice Valves:

___ • 1-CH-HCV-1200A

___ • 1-CH-HCV-1200B

___ • 1-CH-HCV-1200C

___ 5) Adjust 1-CH-PCV-1145 in MANUAL or AUTO to establish desired letdown pressure.

(STEP 12 CONTINUED ON NEXT PAGE)

f. Check VCT makeup control system, as follows:

___ 1) Verify one Boric Acid Transfer Pump is aligned to Unit 1 blender. IF NOT, THEN align one Boric Acid Transfer Pump using the applicable 0-OP-8 series procedure.

___ 2) Verify at least one PG Pump is running. IF NOT, THEN start one PG Pump.

3) Set makeup concentration at greater than 2600 ppm, as follows:

___ a. Set Boric Acid Controller to 8.25 (16.5 gpm)

___ b. Set PG Controller to 4.25 (65 gpm)

___ 4) Place Blender control in AUTOMATIC.

g. Align Charging Pump suction to VCT, as follows:

___ 1) Verify VCT level is greater than 22%. IF NOT, THEN, WHEN VCT level is greater than 42%, THEN do Step 12.g.2 below:

2) Do the following:

a. Open Charging Pump Suction From VCT Isolation Valves:

___ • 1-CH-MOV-1115C

___ • 1-CH-MOV-1115E

b. Close Charging Pump Suction From RWST Isolation Valves:

___ • 1-CH-MOV-1115B

___ • 1-CH-MOV-1115D

13. SECURING LOW-HEAD SI PUMP:

a. Close Low-Head SI Pump Discharge to Cold Legs Valves:

___ • 1-SI-MOV-1864A

___ • 1-SI-MOV-1864B

___ b. Stop Low-Head SI Pump.

14. Do the following:

___ a. Continue alignment of Charging and Low-Head SI Systems as directed by the Station Emergency Manager.

___ b. RETURN TO 1-AP-11, LOSS OF RHR, step in effect.

- END -

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Unit one reactor tripped.

A large break LOCA occurred after the crew transitioned to 1-ES-0.1.

All higher red or orange path functional restoration procedures have been addressed.

INITIATING CUE

You are requested to perform 1-FR-Z.1.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

R216

TASK

Perform 1-FR-Z.1.

TASK STANDARDS

1-FR-Z.1 is completed and 1-QS-P-1B is manually started.

K/A REFERENCE:

026A4.01 (4.5/4.3)

ALTERNATE PATH:

1-QS-P-1B fails to automatically start.

TASK COMPLETION TIMES

Validation Time = 15 minutes   Start Time = _______
Actual Time = _______ minutes   Stop Time = _______

PERFORMANCE EVALUATION

Rating   [ ] SATISFACTORY   [ ] UNSATISFACTORY

Candidate (Print) ____________________

Evaluator (Print) ____________________

Evaluator's Signature / Date ____________________

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

R216

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit one reactor tripped.

A large break LOCA occurred after the crew transitioned to 1-ES-0.1.

All higher red or orange path functional restoration procedures have been addressed.

INITIATING CUE

You are requested to perform 1-FR-Z.1.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-FR-Z.1

PERFORMANCE STEPS

START TIME __________

1	Verify phase A isolation valves closed.	Procedure Step 1
		SAT [ ] UNSAT [ ]

Standards	Checks all phase A isolation valves indicate closed.

Notes/Comments

2	Check if CDA is required: Containment pressure has exceeded 28 psia.	Procedure Step 2.a

	SAT [ ] UNSAT [ ]

Standards	Notes containment pressure is 45 psia.

Notes/Comments

3	Do the following: Manually actuate CDA.	Procedure Step 2.b.1

Critical Step	SAT [ ] UNSAT [ ]

Standards	Simultaneously turn both CDA switches on either the BOP or the RO panel.

Notes/Comments Operator may choose to use both sets of switches (2 on the BOP panel and 2 on the RO panel).

4	Verify CC pumps tripped.	Procedure Step 2.b.2
		SAT [ ] UNSAT [ ]

Standards	Verifies 1-CC-P-1A and 1B are tripped.

Notes/Comments

5	Stop all RCPs.	Procedure Step 2.b.3
	Critical Step	SAT [ ] UNSAT [ ]

Standards	Stops 1-RC-P-1A, B, and C.

Notes/Comments

6	Verify phase B isolation valves closed.	Procedure Step 2.b.4
		SAT [ ] UNSAT [ ]

Standards	Verifies all phase B valves closed.

Notes/Comments

7	Verify QS pump discharge MOVs open.	Procedure Step 3.a
		SAT [ ] UNSAT [ ]

Standards	Verifies 1-QS-MOV-101A and 101B are open.

Notes/Comments

8	Verify QS pumps running.	Procedure Step 3.b

	SAT [ ] UNSAT [ ]

Standards	Verifies 1-QS-P-1A is running. Notes 1-QS-P-1B is not running. Applies RNO.

Notes/Comments

9	Manually start pumps.	Procedure Step 3.b RNO

	SAT [ ] UNSAT [ ]

Standards	Starts 1-QS-P-1B.

Notes/Comments

10	Verify at least four SW pumps running.	Procedure Step 4.a
		SAT [ ] UNSAT [ ]

Standards	Verifies four SW pumps running by checking lights and amps on each SW pump.

Notes/Comments

11	Verify SW supply to CC heat exchangers closed.	Procedure Step 4.b
		SAT [ ] UNSAT [ ]

Standards	Verifies 1-SW-MOV-108A and 108B closed.

Notes/Comments

12	Verify recirc spray heat exchanger SW flow indicated.	Procedure Step 4.c
		SAT [ ] UNSAT [ ]

Standards	Verifies flow indicated on 1-SW-FI-100A-D.

Notes/Comments

13	Verify casing cooling pump isolation valves are open.	Procedure Step 5.a
		SAT [ ] UNSAT [ ]

Standards	Verifies 1-RS-MOV-100A and 101B open. Verifies 1-RS-MOV-100B and 101A open.

Notes/Comments

14	Verify both casing cooling pumps are running.	Procedure Step 5.b

	SAT [ ] UNSAT [ ]

Standards	Verifies 1-RS-P-3A and 3B are running.

Notes/Comments

15	Verify that the recirculation spray sump level > 4 ft 10 in. **NO**	Procedure Step 5.c and 5.c RNO

SAT [ ] UNSAT [ ]

Standards	Notes recirc spray sump level is < 4 ft 10 in. Applies RNO and proceeds to step 6.

Notes/Comments

16	Verify all main steam trip valves closed.	Procedure Step 6.a

SAT [ ] UNSAT [ ]

Standards	Verifies 1-MS-TV-101A,B,C are closed.

Notes/Comments

17	Verify all main steam trip valve bypass valves closed.	Procedure Step 6.b

	SAT [ ] UNSAT [ ]

Standards	Verifies 1-MS-TV-1113A,B,C, are closed.

Notes/Comments

18	Check if feed flow should be isolated to any steam generator. **NO**	Procedure Step 7.a and 7.a RNO

SAT [ ] UNSAT [ ]

Standards	Verifies no steam generator pressure decreasing in an uncontrolled manner. Verifies no steam generator completely depressurized. Applies procedure step 7.a RNO and goes to step 8.

Notes/Comments

19	Return to procedure and step in effect.	Procedure Step 8

	SAT [ ] UNSAT [ ]

Cue:	**Another operator will continue with this procedure.**

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE

TASK

Align the containment spray systems in response to high containment pressure (1-FR-Z.1).

CHECKLIST

______ Recall IC 115

______ Block automatic CDA

______ Block manual CDA

______ Allow simulator to run until > 4ft. 10in. in recirc spray sump

Dominion

NORTH ANNA POWER STATION

FUNCTION RESTORATION PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-FR-Z.1	RESPONSE TO HIGH CONTAINMENT PRESSURE (WITH NO ATTACHMENTS)	10
		PAGE 1 of 7

PURPOSE

To provide instructions to respond to a high Containment pressure.

ENTRY CONDITIONS

This procedure is entered from:

- Red, Orange, or Yellow terminus of the CONTAINMENT CSF STATUS TREE.

UNIT ONE

CONTINUOUS USE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.___	VERIFY PHASE A ISOLATION VALVES - CLOSED	☐ IF flow path is NOT necessary, THEN close valves.

* *

CAUTION: If 1-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, is in effect, then, to preserve RWST inventory, Step 2 through Step 5 of this procedure should not be performed.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.___	**CHECK IF CDA IS REQUIRED:**	
	☐ a) Containment pressure - HAS EXCEEDED 28 PSIA	☐ a) RETURN TO procedure and step in effect.
	b) Do the following:	
	☐ 1) Manually actuate CDA	
	☐ 2) Verify CC Pumps - TRIPPED	2) Stop CC Pumps: ☐ • 1-CC-P-1A ☐ • 1-CC-P-1B
	☐ 3) Stop all RCPs	
	☐ 4) Verify Phase B Isolation Valves - CLOSED	☐ 4) Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3. ___	VERIFY PROPER OPERATION OF CONTAINMENT QUENCH SPRAY SYSTEMS:	
	a) Verify QS Pump Discharge MOVs - OPEN:	☐ a) Manually open valves.
☐	• 1-QS-MOV-101A	
☐	• 1-QS-MOV-101B	
	b) Verify QS Pumps - RUNNING:	☐ b) Manually start pumps.
☐	• 1-QS-P-1A	
☐	• 1-QS-P-1B	
4. ___	VERIFY PROPER SERVICE WATER SYSTEM OPERATION:	
☐	a) At least four Service Water Pumps - RUNNING	☐ a) Manually start pumps.
	b) Verify Service Water Supply to CC Heat Exchangers - CLOSED:	☐ b) Manually close valves.
☐	• 1-SW-MOV-108A	
☐	• 1-SW-MOV-108B	

(STEP 4 CONTINUED ON NEXT PAGE)

STEP	ACTION/ EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	VERIFY PROPER SERVICE WATER SYSTEM OPERATION: (Continued)	
	c) Verify Recirc Spray Heat Exchanger Service Water flow - INDICATED: "H" TRAIN ☐ • 1-SW-FI-100A, RECIR SP HX A SW FLOW ☐ • 1-SW-FI-100D, RECIR SP HX D SW FLOW "J"' TRAIN ☐ • 1-SW-FI-100B, RECIR SP HX B SW FLOW ☐ • 1-SW-FI-100C, RECIR SP HX C SW FLOW	c) Manually open valves: "H" TRAIN ☐ • 1-SW-MOV-103A ☐ • 1-SW-MOV-101A ☐ • 1-SW-MOV-103D ☐ • 1-SW-MOV-101C ☐ • 1-SW-MOV-104A ☐ • 1-SW-MOV-105A ☐ • 1-SW-MOV-104D ☐ • 1-SW-MOV-105C "J"' TRAIN ☐ • 1-SW-MOV-103B ☐ • 1-SW-MOV-101B ☐ • 1-SW-MOV-103C ☐ • 1-SW-MOV-101D ☐ • 1-SW-MOV-104B ☐ • 1-SW-MOV-105B ☐ • 1-SW-MOV-104C ☐ • 1-SW-MOV-105D

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5. ___	VERIFY PROPER OPERATION OF CONTAINMENT RECIRC SPRAY SYSTEMS:	
	a) Verify Casing Cooling Pump Isolation Valves - OPEN:	☐ a) Manually open valves.
	"H" TRAIN	
☐	• 1-RS-MOV-100A	
☐	• 1-RS-MOV-101B	
	"J" TRAIN	
☐	• 1-RS-MOV-100B	
☐	• 1-RS-MOV-101A	
	b) Verify the following pumps - RUNNING:	☐ b) Manually start pumps.
	"H" TRAIN	
☐	• 1-RS-P-3A	
	"J" TRAIN	
☐	• 1-RS-P-3B	
☐	c) Verify Recirc Spray Sump level - GREATER THAN 4 FT 10 IN	☐ c) WHEN Recirc Spray Sump is greater than 4 ft 10 in, THEN perform Step 5.d through Step 5.f.
		☐ Continue with Step 6.

(STEP 5 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	VERIFY PROPER OPERATION OF CONTAINMENT RECIRC SPRAY SYSTEMS: (Continued)	
	d) Verify Recirc Spray Pump Isolation Valves - OPEN:	☐ d) Manually open valves.
	"H" TRAIN	
☐	• 1-RS-MOV-155A	
☐	• 1-RS-MOV-156A	
	"J" TRAIN	
☐	• 1-RS-MOV-155B	
☐	• 1-RS-MOV-156B	
	e) Verify the following pumps - RUNNING:	e) Do the following:
	"H" TRAIN	• Manually start ORS pumps:
☐	• 1-RS-P-1A (2 minute time delay)	☐ • 1-RS-P-2A
☐	• 1-RS-P-2A	☐ • 1-RS-P-2B
	"J" TRAIN	• Manually start IRS pumps following time delay:
☐	• 1-RS-P-1B (2 minute time delay)	☐ • 1-RS-P-1A
☐	• 1-RS-P-2B	☐ • 1-RS-P-1B
	f) Start the following sample pumps on the Unit 1 Radiation Monitoring Panel:	
☐	• 1-SW-P-5	
☐	• 1-SW-P-8	
☐	• 1-SW-P-6	
☐	• 1-SW-P-7	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.___	VERIFY MAIN STEAMLINE ISOLATION: ☐ a) ALL MSTVs - CLOSED ☐ b) ALL MSTV Bypass Valves - CLOSED	☐ Manually close valves. ☐ IF valves cannot be closed, THEN manually close SG Non-Return Valves and SG NRV Bypass Valves.

* *

CAUTION:
- At least one SG should be kept available for RCS cooldown to maintain secondary heat sink.
- If all SGs are faulted, then at least 100 gpm feed flow should be maintained to each SG.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.___	CHECK IF FEED FLOW SHOULD BE ISOLATED TO ANY SG:	
	a) Check pressures in all SGs: ☐ • Any SG pressure decreasing in an uncontrolled manner OR ☐ • Any SG completely depressurized	☐ a) GO TO Step 8.
	b) Isolate feed flow to affected SGs, unless required to maintain secondary heat sink: ☐ • Main Feedwater ☐ • AFW	
8.___	RETURN TO PROCEDURE AND STEP IN EFFECT	

- END -

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

The unit is at 100% power.

INITIATING CUE

You are requested to respond to plant conditions and perform any applicable immediate operator actions.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

R517 M

TASK

Perform the immediate operator actions in response to a loss of one or more circulating water pumps (1-AP-13).

TASK STANDARDS

1-CW-MOV-100B is manually closed

K/A REFERENCE:

075A2.02 (2.5/2.7)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 10 minutes
Actual Time = ________ minutes

Start Time = ________
Stop Time = ________

PERFORMANCE EVALUATION

Rating	[ ] SATISFACTORY	[ ] UNSATISFACTORY
Candidate (Print)	________________________________	
Evaluator (Print)	________________________________	
Evaluator's Signature / Date	________________________________	

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

R517 M

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

The unit is at 100% power.

INITIATING CUE

You are requested to respond to plant conditions and perform any applicable immediate operator actions.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-AP-13

PERFORMANCE STEPS

START TIME ___________

1	Verify at least two circulating water pumps are running.	Procedure Step 1
		SAT [ ] UNSAT [ ]

Standards	Notes 1-CW-P-1B has tripped. Verifies at least two circ water pumps running by checking indicating lights and amps for 1-CW-P-1A, C and D.

Notes/Comments

2	Verify condenser vacuum $\leq$ 3.5 inches and stable. **NO**	Procedure Step 2

	SAT [ ] UNSAT [ ]

Standards	Notes condenser vacuum is < 3.5 inches, but is NOT stable. Applies RNO to initiate 1-AP-14 while continuing with this procedure.

Performance Cue(s)	Assume another operator will initiate 1-AP-14.

Notes/Comments

3	Check circulating water pump discharge MOV on all non-running pumps – closed. **NO**	Procedure Step 3

Critical Step	SAT [ ] UNSAT [ ]

Standards	Notes 1-CW-MOV-100B is open. Applies RNO.

Notes/Comments

4	Manually or locally close the affected MOV.	Procedure Step 3 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	THROTTLE button is pushed and held to fully close 1-CW-MOV-100B.

Notes/Comments

5	Check circ water pump discharge MOVs on all running pumps – open or throttled open to maximum allowed by plant conditions	Procedure Step 4

	SAT [ ] UNSAT [ ]

Standards	Checks 1-CW-MOV-100A,C and D open by checking red open lights.

Notes/Comments

6	Check any circ water pump degraded as indicated by low amps. **NO**	Procedure Step 5

	SAT [ ] UNSAT [ ]

Standards	Checks amps normal on 1-CW-P-1A, C, and D. Applies RNO and goes to step 6.

Notes/Comments

7	Check operating circ water pump amps – less than 340 amps.	Procedure Step 6

	SAT [ ] UNSAT [ ]

Standards	Checks less than 340 amps on 1-CW-P-1A, C and D.

Simulation Cue(s)	Assume another operator will complete this task.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE
R517

TASK

Perform the immediate operator actions in response to a loss of one or more circulating water pumps (1-AP-13).

CHECKLIST

_____ Recall IC 116

_____ Enter the following malfunctions

- MCW0101; Trigger = 1
- MCW0102; Trigger = 1
- MCW0103; Trigger = 1
- TU03
- RD32
- AMSAC_DEFEAT

_____ DMF TU03 trigger 2

_____ Set up trigger 2 to actuate on reactor trip as follows: RKF200 < 60.0

NORTH ANNA POWER STATION

ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-AP-13	LOSS OF ONE OR MORE CIRCULATING WATER PUMPS (WITH TWO ATTACHMENTS)	17
		PAGE 1 of 10

PURPOSE

To provide instructions to follow in the event that one or more Circulating Water Pumps are lost.

ENTRY CONDITIONS

This procedure is entered when any of the following conditions exist:

- TRIP indication on breaker control switches on the Circulating Water Control Panel, or
- One or more Circulating Water Pump Motors read zero amps, or
- One or more Circulating Water Pump Motors degraded as indicated by low amps, or
- Annunciator Panel “B” A-5, CW PP 1A-1B-1C-1D AUTO TRIP, is LIT

UNIT ONE

CONTINUOUS USE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[1] ___	VERIFY AT LEAST TWO CIRCULATING WATER PUMPS - RUNNING	☐ GO TO 1-E-0, REACTOR TRIP OR WATER SAFETY INJECTION, while continuing with this procedure.
*2. ___	VERIFY CONDENSER VACUUM: ☐ • 3.5 INCHES HG ABS OR LESS AND ☐ • STABLE	☐ Initiate 1-AP-14, LOW CONDENSER VACUUM, while continuing with this procedure.
3. ___	CHECK CIRCULATING WATER PUMP DISCHARGE MOV ON ALL NON-RUNNING PUMPS - CLOSED	Manually or locally close affected MOV: ☐ • 1-CW-MOV-100A ☐ • 1-CW-MOV-100B ☐ • 1-CW-MOV-100C ☐ • 1-CW-MOV-100D

* *

CAUTION: IF 2 CW pumps are aligned to 4 waterboxes, THEN the discharge MOVs should be throttled to 72.5 - 77.5% open by meter indication to prevent runout.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4. ___	CHECK CIRCULATING WATER PUMP DISCHARGE MOVs ON ALL RUNNING PUMPS - OPEN OR THROTTLED OPEN TO MAXIMUM ALLOWED BY PLANT CONDITIONS	Open or throttle open affected CW Pump Discharge MOV, while continuing with this procedure: ☐ • 1-CW-MOV-100A ☐ • 1-CW-MOV-100B ☐ • 1-CW-MOV-100C ☐ • 1-CW-MOV-100D

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.___	CHECK ANY CIRCULATING WATER PUMP DEGRADED AS INDICATED BY LOW AMPS	☐ GO TO Step 6.
	☐ a) Place affected Circulating Water Pump control switch in PTL	
	☐ b) Verify affected pump discharge MOV closed	b) Manually or locally close affected MOV: ☐ • 1-CW-MOV-100A ☐ • 1-CW-MOV-100B ☐ • 1-CW-MOV-100C ☐ • 1-CW-MOV-100D
6.___	CHECK OPERATING CIRCULATING WATER PUMP AMPS - LESS THAN 340 AMPS	Reduce operating Circulating Water Pump amps by doing one of the following, while continuing with this procedure: ☐ • Throttle discharge MOVs using 1-OP-48.2, Operation of Circulating Water System. OR • Reduce number of water boxes in service using the following applicable procedure: ☐ • A Water Box - 1-MOP-48.30 ☐ • B Water Box - 1-MOP-48.31 ☐ • C Water Box - 1-MOP-48.32 ☐ • D Water Box - 1-MOP-48.33

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.___	VERIFY BEARING COOLING SYSTEM SUPPORT: ☐ • Circ Water Intake Tunnel Full - LIGHT LIT ☐ • At least one Circulating Water pump - RUNNING	<u>IF</u> Bearing Cooling is aligned Lake-to-Lake, <u>THEN</u> do the following: ☐ • Place 1-WT-P-25 in service using 1-OP-48.4, OPERATION OF AUXILIARY FLASH EVAPORATOR PUMP 1-WT-P-25. <u>OR</u> ☐ • Align Bearing Cooling to Tower-to-Tower using 1-OP-50.2, OPERATION OF THE BEARING COOLING WATER SYSTEM. ☐ GO TO 1-AP-19, LOSS OF BEARING COOLING WATER, while continuing with this procedure.
8.___	VERIFY BEARING COOLING MAKEUP PUMP SYSTEM SUPPORT: ☐ • At least one Circulating Water pump - RUNNING <u>OR</u> ☐ • 1-WT-P-25, Auxiliary Flash Evaporator Pump - RUNNING	☐ Secure Unit 1 Bearing Cooling Makeup Pumps using 1-OP-50.2, Operation Of The Bearing Cooling Water System.
9.___	DETERMINE IF SECURING LIQUID WASTE RELEASES REQUIRED: ☐ a) Have HP Count Room determine if securing liquid waste releases is required based on Circulating Water system status ☐ b) Health Physics has determined securing liquid waste releases is required	 ☐ b) GO TO Step 11.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. ___	SECURE LIQUID WASTE RELEASES:	
	a) Verify SG Blowdown Trip Valves - CLOSED:	a) Do the following, as required:
	☐ • Unit 1 SG Blowdown ☐ • Unit 2 SG Blowdown	☐ • Manually close SG Blowdown Trip valves. <u>OR</u> • Locally close the following: ☐ • SG Blowdown HCVs for Low Capacity SG Blowdown ☐ • SG Blowdown FCVs for High Capacity SG Blowdown
	b) Send an operator to locally close the following: ☐ • 1-BD-1005, SG BD flash tk to SG BD Flash Tk Drn Clrs Isol Vv ☐ • 2-BD-182, SG BD Flash Tk To SG BD Flash Tk Drn Clrs Isol Vv	

(STEP 10 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	SECURE LIQUID WASTE RELEASES: (Continued)	
	c) Stop the following pumps to prevent clarifier system overflow:	
	• Contaminated Drain Tank Pumps:	
☐	• 1-LW-P-6A	
☐	• 1-LW-P-6B	
	• Low Level Liquid Waste Tank Pumps:	
☐	• 1-LW-P-1A	
☐	• 1-LW-P-1B	
	• Boron Recovery Test Tank Pumps:	
☐	• 1-BR-P-5A	
☐	• 1-BR-P-5B	
	d) Send an operator to stop Containment Matt Sump Pumps:	
	1) Locally open SOV breakers:	
☐	• Unit 1 - 1-EP-DB-2, Breakers 6 AND 7	
☐	• Unit 2 - 2-EP-DB-5, Breakers 6 AND 7	
☐	2) Verify Pumps are stopped	☐ 2) Manually isolate Service Air to Pump(s).

(STEP 10 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	SECURE LIQUID WASTE RELEASES: (Continued)	
	☐ e) Verify Liquid Waste release secured by verifying 1-LW-PCV-115 - IN HAND CONTROL AND CLOSED	☐ e) Place 1-LW-PCV-115 control in HAND and close.
11. ___	VERIFY LP TURBINE RUPTURE DISCS - INTACT	Secure condenser air ejectors using 1-OP-36.2, MAIN CONDENSER AIR EJECTOR SYSTEM: ☐ • WHEN condenser vacuum reaches zero, THEN secure Gland Steam System using 1-OP-39.1, Gland Seal Steam System. ☐ • Enter Condition Report to replace rupture discs.
12. ___	CHECK HOTWELL TEMPERATURE - LESS THAN 130 °F	☐ • IF Powdex system is in Precoat Mode, THEN bypass powdex using 1-OP-30.2, Powdex System. ☐ • IF NO Circulating Water pumps are running, THEN perform ATTACHMENT 2, WATER BOX AND CONDENSER COOLDOWN, as applicable.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

13. ___ VERIFY LIQUID WASTE RELEASE PATHS - AVAILABLE:

- ☐ • Verify liquid waste release forms in effect
- ☐ • Re-establish liquid waste releases using 0-OP-22.11, Releasing Radioactive Liquid Waste, as required
- • Re-establish Unit 1 Blowdown, as required:
  - ☐ • High Capacity SG Blowdown using 1-OP-32.3, High Capacity Steam Generator Blowdown System Operation

    OR

  - ☐ • Low Capacity SG Blowdown using 1-OP-32.1, Low Capacity Steam Generator Blowdown System
- • Re-establish Unit 2 Blowdown, as required:
  - ☐ • High Capacity SG Blowdown using 2-OP-32.3, High Capacity Steam Generator Blowdown System Operation

    OR

  - ☐ • Low Capacity SG Blowdown using 2-OP-32.1, Utilizing Steam Generator Blowdown Tank 2-BD-TK-1

RESPONSE NOT OBTAINED:

Do the following:

- ☐ a) Obtain Health Physics concurrence on alternate Liquid Waste Release paths.
- ☐ b) Initiate liquid waste release to Unit 2 discharge tunnel using 0-OP-22.11, Releasing Radioactive Liquid Waste.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: If the loss of Circulating Water Pumps was caused by SI/CDA load shed, then 0-AP-47, UNIT OPERATION DURING OPPOSITE UNIT EMERGENCY, must be used for instructions on resetting SI/CDA load shed. Circulating Water Pump Breaker control switches must be placed to TRIP position before load shed is reset to prevent a possible auto start of Circulating Water Pumps.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14. ___	DETERMINE STATUS OF CIRCULATING WATER PUMP(S):	
	☐ a) Condition Report(s) - ENTERED	☐ a) Enter Condition Report(s).
	☐ b) Affected Circulating Water Pump(s) - AVAILABLE	☐ b) Continue with other procedures in effect. ☐ WHEN affected pumps are available, THEN GO TO Step 15.
15. ___	RESTORE CIRCULATING WATER SYSTEM USING 1-OP-48.2, OPERATION OF THE CIRCULATING WATER SYSTEM	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. ___	DETERMINE STATUS OF BEARING COOLING MAKEUP PUMP SYSTEM:	
	a) Check system support:	☐ a) WHEN system support condition is met, THEN GO TO Step 16.b.
	☐ 1) At least one Circulating Water pump - RUNNING	
	OR	
	☐ 2) 1-WT-P-25, Auxiliary Flash Evaporator Pump - RUNNING	
	☐ b) Return Unit 1 Bearing Cooling Makeup to service using 1-OP-50.2, Operation Of The Bearing Cooling Water System	
17. ___	RETURN TO PROCEDURE AND STEP IN EFFECT	

- END -

- 11715-FM-77, CIRCULATING WATER SYSTEM
- DCP 88-03-1, TURBINE TRIP - REACTOR TRIP, Setpoint change to P-8
- DCP 94-003, Steam Generator Blowdown System Upgrades Unit 1
- 1-AP-2.1, TURBINE TRIP WITHOUT REACTOR TRIP REQUIRED
- 1-OP-32.1, LOW CAPACITY STEAM GENERATOR BLOWDOWN SYSTEM
- 2-OP-32.1, STEAM GENERATOR BLOWDOWN UTILIZING STEAM GENERATOR BLOWDOWN TANK (2-BD-TK-1)
- 1-OP-32.3, HIGH CAPACITY STEAM GENERATOR BLOWDOWN SYSTEM OPERATION
- 2-OP-32.3, HIGH CAPACITY STEAM GENERATOR BLOWDOWN SYSTEM OPERATION
- 1-OP-36.2, MAIN CONDENSER AIR EJECTORS
- 1-OP-39.1, GLAND SEAL STEAM SYSTEM
- 1-OP-50.2, OPERATION OF THE BEARING COOLING WATER SYSTEM TOWER-TO-TOWER
- 1-OP-30.2, POWDEX SYSTEM
- 1-OP-22.11, RELEASING RADIOACTIVE LIQUID WASTE
- 1-OP-48.2, OPERATION OF THE CIRCULATING WATER SYSTEM
- 1-E-0, REACTOR TRIP OR SAFETY INJECTION
- 0-AP-47, UNIT OPERATION DURING OPPOSITE UNIT EMERGENCY
- 1-AP-14, LOW CONDENSER VACUUM
- 1-AP-19, LOSS OF BEARING COOLING WATER
- OP-08-0352, Rewrite AP to Provide Enhancements (Rev 14)
- SOER 07-2, Intake Cooling Water Blockage for CA076323, CR100270 (Rev 14)
- CA158976, CR362709, Enhance AP-13 to Address Hotwell Temperature Issues from Total Loss of CW (Step 11 & Att. 2, Rev 16)
- CA157216, CR363390, Improve AP-13 Regarding BC Makeup Pumps Upon a Loss of all CW (Step 7 & 15, Rev 16)

* *

CAUTION: Only one Feedwater Recirc should be in service during Hotwell feed and bleed with a Condensate Recirc open, to prevent a low Feedwater suction pressure condition.

* *

1. Do the following to cool the Hotwell:

NOTE: 1-FW-FCV-150C, S/G FEED PUMP RECIRC, is the preferred FW recirc.

___ a) Verify only one S/G Feed Pump Recirc is open. IF NOT, THEN close FW recircs until only one is open:

☐ • 1-FW-FCV-150A

☐ • 1-FW-FCV-150B

b) Do the following using 1-OP-30.1, Operation Of Condensate System:

___ 1) Fail open 1-CN-FCV-107, Condensate Pumps Recirc To 1B Cndsr Flow Cont Vv.

___ 2) Establish approximately 95 gpm Hotwell feed and bleed using subsection for Control of Hotwell Chemistry Using Bleed and Feed.

2. ___ Start 1-WT-P-25 using 1-OP-48.4, Operation Of Auxiliary Flash Evaporator Pump 1-WT-P-25.

3. Ensure ALL Water Box outlets are closed:

☐ • 1-CW-MOV-102A

☐ • 1-CW-MOV-102B

☐ • 1-CW-MOV-102C

☐ • 1-CW-MOV-102D

4. Verify the following Condenser Water Box drains are closed:

- ☐ • 1-CW-27, 1A Inlet Water Box Drain Valve
- ☐ • 1-CW-29, 1B Inlet Water Box Drain Valve
- ☐ • 1-CW-35, 1C Inlet Water Box Drain Valve
- ☐ • 1-CW-37, 1D Inlet Water Box Drain Valve

5. Verify the Water Box Vacuum Breaker valve for the Water Box requiring priming is open:

- ☐ • 1-VP-27, A Inlet Water Box Vacuum Breaker Isol Valve
- ☐ • 1-VP-38, B Inlet Water Box Vacuum Breaker Isol Valve
- ☐ • 1-VP-49, C Inlet Water Box Vacuum Breaker Isol Valve
- ☐ • 1-VP-60, D Inlet Water Box Vacuum Breaker Isol Valve

6. ___ IF 1-WT-P-25, Auxiliary Flash Evaporator Pump, is operating, THEN ensure switch for MOV-CW-103 (1-CW-MOV-103, Auxiliary Flash Evap Pump Discharge Isol Valve) is in INTER and verify white light is LIT.

7. Close Water Box LCV isolation for DESIRED Water Box(s):

- ☐ • 1-VP-30, A CW Water Box 1-VP-LCV-100D Outlet Isol
- ☐ • 1-VP-41, B CW Water Box 1-VP-LCV-100C Outlet Isol
- ☐ • 1-VP-52, C CW Water Box 1-VP-LCV-100B Outlet Isol
- ☐ • 1-VP-63, D CW Water Box 1-VP-LCV-100A Outlet Isol

8. Open breaker for DESIRED Water Box(s) inlet MOV to be hand operated. Mark breakers not operated NA:

- ___ • 1-EP-BKR-1A1-2 F4, 1-CW-MOV-101A, 1A Inlet Water Box Isol Valve Circuit Breaker
- ___ • 1-EP-BKR-1B1-3 I2, 1-CW-MOV-101B, 1B Inlet Water Box Isol Valve Circuit Breaker
- ___ • 1-EP-BKR-1A2-2 B3, 1-CW-MOV-101C, 1C Inlet Water Box Isol Valve Circuit Breaker
- ___ • 1-EP-BKR-1C2-2 D3, 1-CW-MOV-101D, 1D Inlet Water Box Isol Valve Circuit Breaker

NOTE: A fill rate of 2 inches/minute results in approximately a 2 hour waterbox fill.

9. IF filling A Water Box, THEN do the following:

___ a) Remove cap and attach a tygon hose standpipe to 1-CW-ICV-3002, 1-CW-PDI-100A High Side Inlet Line Vent Valve.

___ b) Route the tygon hose above the water box to the mezzanine.

___ c) Ensure 1-CW-26, 1A Inlet Water Box 1-CW-PDI-100A Isol Valve, is open.

___ d) Open 1-CW-ICV-3002, 1-CW-PDI-100A High Side Inlet Line Vent Valve.

___ e) Throttle open 1-CW-MOV-101A, 1A Inlet Water Box Isolation Valve, by hand to slowly fill the condenser.

___ f) WHEN water level is visible in the standpipe, THEN throttle 1-CW-MOV-101A, 1A Inlet Water Box Isolation Valve, as required to obtain the standpipe fill rate of ≤ 2 inches/minute.

___ g) WHEN the standpipe level stabilizes near the top of the water box, THEN close 1-CW-ICV-3002, 1-CW-PDI-100A High Side Inlet Line Vent Valve.

___ h) WHEN the condenser water box indicates filled by no air issuing from the Inlet Water Box Vacuum Breaker, THEN close 1-VP-27, A Inlet Water Box Vacuum Breaker Isol Valve.

* *

CAUTION: Vacuum Pump capacity should not be exceeded.

* *

___ i) Slowly open 1-VP-30, A CW Water Box 1-VP-LCV-100D Outlet Isol.

___ j) WHEN water level is observed in gage glass 1-VP-LG-104D for A water box, THEN verify proper operation of vacuum priming valve 1-VP-LCV-100D.

___ ___ k) Using concurrent verification, close 1-EP-BKR-1A1-2 F4, 1-CW-MOV-101A, 1A Inlet Water Box Isol Valve Circuit Breaker.

___ l) Fully open 1-CW-MOV-101A, A WATERBOX INLET, electrically.

NOTE: Do not position the MOV too tightly against the mechanical stop.

___ m) Using the handwheel, manually open 1-CW-MOV-101A to the mechanical stop as indicated by the marking on the actuator.

NOTE: A fill rate of 2 inches/minute results in approximately a 2 hour waterbox fill.

10. IF filling B Water Box, THEN do the following:

___ a) Remove cap and attach a tygon hose standpipe to 1-CW-ICV-3004, Test Connection.

___ b) Route the tygon hose above the water box to the mezzanine.

___ c) Ensure 1-CW-28, 1B Inlet Water Box 1-CW-PDI-100B Isol Valve, is open.

___ d) Open 1-CW-ICV-3004, Test Connection.

___ e) Throttle open 1-CW-MOV-101B, 1B Inlet Water Box Isolation Valve, by hand to slowly fill the condenser.

___ f) WHEN water level is visible in the standpipe, THEN throttle 1-CW-MOV-101B, 1B Inlet Water Box Isolation Valve, as required to obtain the standpipe fill rate of ≤ 2 inches/minute.

___ g) WHEN the standpipe level stabilizes near the top of the water box, THEN close 1-CW-ICV-3004, Test Connection.

___ h) WHEN the condenser water box indicates filled by no air issuing from the Inlet Water Box Vacuum Breaker, THEN close 1-VP-38, B Inlet Water Box Vacuum Breaker Isol Valve.

* *

CAUTION: Vacuum Pump capacity should not be exceeded.

* *

___ i) Slowly open 1-VP-41, B CW Water Box 1-VP-LCV-100C Outlet Isol.

___ j) WHEN water level is observed in gage glass 1-VP-LG-104C for B water box, THEN verify proper operation of vacuum priming valve 1-VP-LCV-100C.

___ ___ k) Using concurrent verification, close 1-EP-BKR-1B1-3 I2, 1-CW-MOV-101B, 1B Inlet Water Box Isol Valve Circuit Breaker.

___ l) Fully open 1-CW-MOV-101B, B WATERBOX INLET, electrically.

NOTE: Do not position the MOV too tightly against the mechanical stop.

___ m) Using the handwheel, manually open 1-CW-MOV-101B to the mechanical stop as indicated by the marking on the actuator.

NOTE: A fill rate of 2 inches/minute results in approximately a 2 hour waterbox fill.

11. IF filling C Water Box, THEN do the following:

___ a) Remove cap and attach a tygon hose standpipe to 1-CW-ICV-3006, 1-CW-PDI-100C High Side Inlet Line Vent Valve.

___ b) Route the tygon hose above the water box to the mezzanine.

___ c) Ensure 1-CW-34, 1C Inlet Water Box 1-CW-PDI-100C Isol Valve, is open.

___ d) Open 1-CW-ICV-3006, 1-CW-PDI-100C High Side Inlet Line Vent Valve.

___ e) Throttle open 1-CW-MOV-101C, 1C Inlet Water Box Isolation Valve, by hand to slowly fill the condenser.

___ f) WHEN water level is visible in the standpipe, THEN throttle 1-CW-MOV-101C, 1C Inlet Water Box Isolation Valve, as required to obtain the standpipe fill rate of ≤ 2 inches/minute.

___ g) WHEN the standpipe level stabilizes near the top of the water box, THEN close 1-CW-ICV-3006, 1-CW-PDI-100C High Side Inlet Line Vent Valve.

___ h) WHEN the condenser water box indicates filled by no air issuing from the Inlet Water Box Vacuum Breaker, THEN close 1-VP-49, C Inlet Water Box Vacuum Breaker Isol Valve.

* *

CAUTION: Vacuum Pump capacity should not be exceeded.

* *

___ i) Slowly open 1-VP-52, C CW Water Box 1-VP-LCV-100B Outlet Isol.

___ j) WHEN water level is observed in gage glass 1-VP-LG-104B for C water box, THEN verify proper operation of vacuum priming valve 1-VP-LCV-100B.

___ ___ k) Using concurrent verification, close 1-EP-BKR-1A2-2 B3, 1-CW-MOV-101C, 1C Inlet Water Box Isol Valve Circuit Breaker.

___ l) Fully open 1-CW-MOV-101C, C WATERBOX INLET, electrically.

NOTE: Do not position the MOV too tightly against the mechanical stop.

___ m) Using the handwheel, manually open 1-CW-MOV-101C to the mechanical stop as indicated by the marking on the actuator.

NOTE: A fill rate of 2 inches/minute results in approximately a 2 hour waterbox fill.

12. IF filling D Water Box, THEN do the following:

___ a) Remove cap and attach a tygon hose standpipe to 1-CW-ICV-3008, Test Connection.

___ b) Route the tygon hose above the water box to the mezzanine.

___ c) Ensure 1-CW-36, 1D Inlet Water Box 1-CW-PDI-100D Isol Valve, is open.

___ d) Open 1-CW-ICV-3008, Test Connection.

___ e) Throttle open 1-CW-MOV-101D, 1D Inlet Water Box Isolation Valve, by hand to slowly fill the condenser.

___ f) WHEN water level is visible in the standpipe, THEN throttle 1-CW-MOV-101D, 1D Inlet Water Box Isolation Valve, as required to obtain the standpipe fill rate of ≤ 2 inches/minute.

___ g) WHEN the standpipe level stabilizes near the top of the water box, THEN close 1-CW-ICV-3008, Test Connection.

___ h) WHEN the condenser water box indicates filled by no air issuing from the Inlet Water Box Vacuum Breaker, THEN close 1-VP-60, D Inlet Water Box Vacuum Breaker Isol Valve.

* *

CAUTION: Vacuum Pump capacity should not be exceeded.

* *

___ i) Slowly open 1-VP-63, D CW Water Box 1-VP-LCV-100A Outlet Isol.

___ j) WHEN water level is observed in gage glass 1-VP-LG-104A for D water box, THEN verify proper operation of vacuum priming valve 1-VP-LCV-100A.

___ ___ k) Using concurrent verification, close 1-EP-BKR-1C2-2 D3, 1-CW-MOV-101D, 1D Inlet Water Box Isol Valve Circuit Breaker.

___ l) Fully open 1-CW-MOV-101D, D WATERBOX INLET, electrically.

NOTE: Do not position the MOV too tightly against the mechanical stop.

___ m) Using the handwheel, manually open 1-CW-MOV-101D to the mechanical stop as indicated by the marking on the actuator.

13. ___ Disconnect the tygon hose(s) and replace the cap on Test Connection(s).

14. ___ Have System Engineering determine the desired Water Box(s) cooldown rate.

15. ___ WHEN the desired Water Box(s) cooldown rate is obtained, THEN continue with Step 16.

NOTE: The following should be monitored during waterbox cooldown:

- Waterbox inlet temperature
- Waterbox outlet temperature
- Hotwell temperature
- Condenser vacuum

NOTE: The water box outlet temperature should be within approximately 5°F of the outlet temperature of any inservice water box in the same condenser, prior to electrically opening outlet isolation.

16. Manual throttle the required Outlet Water Box Isolation Valve(s), as follows:

a) IF throttling filled A Water Box outlet isolation valve, THEN do the following:

___ 1) Ensure 1-EP-BKR-1A1-2 F3, 1-CW-MOV-102A, 1A Outlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 2) Independently verify that 1-EP-BKR-1A1-2 F3, 1-CW-MOV-102A, 1A Outlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 3) Throttle open 1-CW-MOV-102A, 1A Outlet Water Box Isolation Valve, to the desired position to control water box cooldown, as directed by the Control Room.

b) IF throttling filled B Water Box outlet isolation valve, THEN do the following:

___ 1) Ensure 1-EP-MCC-1B1-3 I1, 1-CW-MOV-102B, 1B Outlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 2) Independently verify that 1-EP-MCC-1B1-3 I1, 1-CW-MOV-102B, 1B Outlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 3) Throttle open 1-CW-MOV-102B, 1B Outlet Water Box Isolation Valve, to the desired position to control water box cooldown, as directed by the Control Room.

c) IF throttling filled C Water Box outlet isolation valve, THEN do the following:

___ 1) Ensure 1-EP-BKR-1A2-4 A1, 1-CW-MOV-102C, 1C Inlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 2) Independently verify that 1-EP-BKR-1A2-4 A1, 1-CW-MOV-102C, 1C Inlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 3) Throttle open 1-CW-MOV-102C, 1C Outlet Water Box Isolation Valve, to the desired position to control water box cooldown, as directed by the Control Room.

d) IF throttling filled D Water Box outlet isolation valve, THEN do the following:

___ 1) Ensure 1-EP-BKR-1B2-2 F1, 1-CW-MOV-102D, 1D Outlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 2) Independently verify that 1-EP-BKR-1B2-2 F1, 1-CW-MOV-102D, 1D Outlet Water Box Isol Valve Circuit Breaker, is in the open position.

___ 3) Throttle open 1-CW-MOV-102D, 1D Outlet Water Box Isolation Valve, to the desired position to control water box cooldown, as directed by the Control Room.

___ e) WHEN monitored temperatures have stabilized, THEN continue Step 17.

17. ___ Return Unit 1 Bearing Cooling Makeup to service, as applicable using 1-OP-50.2, Operation Of The Bearing Cooling Water System.

NOTE: IF the Outlet Water Box Isolation Valve is open, THEN the valve will close one minute after being energized.

18. WHEN Circulating Water System is available, THEN do the following:

___ a) Perform 1-OP-48.2, Operation Of Circulating Water System, as applicable.

___ b) IF required, THEN do the following to open the Outlet Water Box Isolation Valve(s) in conjunction with 1-OP-48.2:

1) IF opening filled A Water Box outlet isolation valve, THEN do the following:

___ a. IF 1-CW-MOV-102A is open, THEN to prevent the 1-CW-MOV-102A from closing, notify the Unit SRO to fully open 1-CW-MOV-102A within one minute of closing 1-EP-BKR-1A1-2 F3.

___ ___ b. Using concurrent verification, close 1-EP-BKR-1A1-2 F3, 1-CW-MOV-102A, 1A Outlet Water Box Isol Valve Circuit Breaker.

___ c. Open 1-CW-MOV-102A, A WATERBOX OUTLET, as directed by 1-OP-48.2.

2) IF opening filled B Water Box outlet isolation valve, THEN do the following:

___ a. IF 1-CW-MOV-102B is open, THEN to prevent the 1-CW-MOV-102B from closing, notify the Unit SRO to fully open 1-CW-MOV-102B within one minute of closing 1-EP-MCC-1B1-3 I1.

___ ___ b. Using concurrent verification, close 1-EP-MCC-1B1-3 I1, 1-CW-MOV-102B, 1B Outlet Water Box Isol Valve Circuit Breaker.

___ c. Open 1-CW-MOV-102B, B WATERBOX OUTLET, as directed by 1-OP-48.2.

3) IF opening filled C Water Box outlet isolation valve, THEN do the following:

___ a. IF 1-CW-MOV-102C is open, THEN to prevent the 1-CW-MOV-102C from closing, notify the Unit SRO to fully open 1-CW-MOV-102C within one minute of closing 1-EP-BKR-1A2-4 A1.

___ ___ b. Using concurrent verification, close 1-EP-BKR-1A2-4 A1, 1-CW-MOV-102C, 1C Outlet Water Box Isol Valve Circuit Breaker.

___ c. Open 1-CW-MOV-102C, C WATERBOX OUTLET, as directed by 1-OP-48.2.

4) IF opening filled D Water Box outlet isolation valve, THEN do the following:

___ a. IF 1-CW-MOV-102D is open, THEN to prevent the 1-CW-MOV-102D from closing, notify the Unit SRO to fully open 1-CW-MOV-102D within one minute of closing 1-EP-BKR-1B2-2 F1.

___ ___ b. Using concurrent verification, close 1-EP-BKR-1B2-2 F1, 1-CW-MOV-102D, 1D Outlet Water Box Isol Valve Circuit Breaker.

___ c. Open 1-CW-MOV-102D, D WATERBOX OUTLET, as directed by 1-OP-48.2.

Dominion
North Anna Power Station

LICENSED OPERATOR REQUALIFICATION PROGRAM

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

The unit will be ramped from 100% to 75% at .3%/minute using rods and boron.

50 gallons of boric acid must be added to the RCS in preparation for lowering turbine load.

INITIATING CUE

You are requested to add 50 gallons of boric acid to the RCS at 3 gpm.

A blender flush will NOT be required after the boration.

Notify the unit supervisor when the task is complete.

Dominion
North Anna Power Station

LICENSED OPERATOR REQUALIFICATION PROGRAM

JOB PERFORMANCE MEASURE

R706 / 15779

TASK

Borate the Reactor Coolant System using the blender (1-GOP-8.3.4).

TASK STANDARDS

The boration is started IAW 1-GOP-8.3.4.

The boration is stopped when the malfunction (1-CH-FCV-114 open) is noted.

K/A REFERENCE:

004-A4.07 (3.9/3.7)

ALTERNATE-PATH TOPIC

1-CH-FCV-1114A opens in borate mode.

TASK COMPLETION TIMES

Validation Time =	12 minutes	Start Time =	________
Actual Time =	________ minutes	Stop Time =	________

PERFORMANCE EVALUATION

Rating	[ ] SATISFACTORY	[ ] UNSATISFACTORY
Candidate (Print)	____________________	
Evaluator (Print)	____________________	
Evaluator's Signature / Date	____________________	

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

LICENSED OPERATOR REQUALIFICATION PROGRAM

JOB PERFORMANCE MEASURE

R706 / 15779

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

The unit will be ramped from 100% to 75% at .3%/minute using rods and boron.

50 gallons of boric acid must be added to the RCS in preparation for lowering turbine load.

INITIATING CUE

You are requested to add 50 gallons of boric acid to the RCS at 3 gpm.

A blender flush will NOT be required after the boration.

Notify the unit supervisor when the task is complete.

EVALUATION METHOD

Perform if conducted in the simulator or in the electrical laboratory (use Performance Cue(s)

Simulate if conducted in the station (use Simulation Cue(s)

TOOLS AND EQUIPMENT

1-GOP-8.3.4

PERFORMANCE STEPS

START TIME ___________

1	Initial Conditions Verified / Precautions & Limitations Reviewed	Procedure Step 1

SAT [ ] UNSAT [ ]

Standards	Operator notes 1-LOG-2A, RCS Makeup Log does NOT need to be initiated based on plant conditions (Unit in Mode 1). Reviews Precautions and Limitations.

Notes/Comments	

2	Determine the rate and magnitude of boric acid makeup.	Procedure Step 2

SAT [ ] UNSAT [ ]

Standards	3 gpm and 50 gallons are determined as per the initiating cue.

Notes/Comments	

3	Obtain unit SRO concurrence makeup is proper.	Procedure Step 3

SAT [ ] UNSAT [ ]

Standards	Asks for concurrence on rate and magnitude of boration.
Performance Cue(s)	I concur.

Notes/Comments	

4	Place the blender control switch to STOP.	Procedure Step 4

SAT [ ] UNSAT [ ]

Standards	Blender control switch is placed in STOP.

Notes/Comments	

5	Place the blender mode switch in BORATE.	Procedure Step 5

CRITICAL STEP

SAT [ ] UNSAT [ ]

Standards	Blender mode selector switch is placed in BORATE.

Notes/Comments	

6	Ensure the boric acid supply valve, 1-CH-FCV-1113A, is in AUTO and open.	Procedure Step 6

SAT [ ] UNSAT [ ]

Standards	1-CH-FCV-1113A is verified to be open (RED light LIT, Green light OFF) with control switch in auto.

Notes/Comments	

7	Place the BLENDER CONTROL switch to START.	Procedure Step 7

CRITICAL STEP

SAT [ ] UNSAT [ ]

Standards	BLENDER CONTROL selector switch is in START.

Notes/Comments	TIME BORATION STARTED __________

8	Respond to 1-CH-FCV-1114A failure **(alternate path step)**	Procedure Step N/A

CRITICAL STEP SAT [ ] UNSAT [ ]

Note To The Evaluator	1-CH-FCV-1114A will fail open 30 seconds after start of boration. Per OP-AP-300, Reactivity Management, if unexpected conditions/indications are encountered during reactivity manipulations, stop the evolution and resolve prior to proceeding. 1-CH-FCV-1114A will not close if operator attempts to close manually.

Standards	Operator identifies the unexpected PG flow and places the blender control switch in STOP before Tavg increases 0.2°F.

Performance Cue(s)	When the operator notices the PG flow and stops the boration: Acknowledge report and state that the JPM is complete.

Notes/Comments	Initial Tavg ___________ Final Tavg ___________ TIME BORATION STOPPED ____________

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE

R706 / 15779

NORMAL TASK

Borate the Reactor Coolant System using the blender (1-GOP-8.3.4).

ALTERNATE-PATH TOPIC

1-CH-FCV-1114A opens in borate mode.

CHECKLIST

_____ Recall IC for 100% power, MOL (180)

_____ Enter Switch Override: FCV114A_O = ON, Delay = 0, Trigger = 1 with a 30 second time delay

_____ Set up trigger 1 to actuate on boric acid flow as follows: yic113a_flow .ge. 0.2

_____ Do simspray, then rod banks

_____ Set up BA pot to keep alarm out when 3 gpm is established

_____ **After each operator is finished**:

_____ **Check PCS program, RCS Boron Adjustment, and adjust values as required**

_____ **Check calculators zeroed and curve book returned to shelf**

_____ **Check blender flows on screen are reset to zero when IC recalled**

_____ **Replace GOP/procedure that was used**

PLACING THE BLENDER IN THE BORATE MODE OF OPERATION

☐ **PURPOSE** – To provide instructions for placing the blender in the Borate mode of operation.

☐ **INITIAL CONDITIONS** – IF Unit 1 is in Mode 3, 4, 5, or 6, THEN 1-LOG-2A, RCS Makeup Log, has been initiated.

☐ **PRECAUTIONS AND LIMITATIONS** – To minimize the risk of an unexpected RCS boron dilution, closely monitor blender Boric Acid and/or PG flows to ensure that the desired flows are maintained.
Peer checking is required for the performance of this procedure.

1. Initial Conditions Verified / Precautions & Limitations Reviewed — Init: ____
2. Determine Rate And Magnitude Of BA Makeup — Init: ____
3. Obtain Unit SRO Concurrence Makeup Is Proper For Current Plant Conditions — Init: ____
4. Place BLENDER CONTROL SWITCH To STOP — Init: ____
5. Place BLENDER MODE SWITCH In BORATE — Init: ____
6. Ensure 1-CH-FCV-1113A In AUTO & OPEN — Init: ____
7. Place BLENDER CONTROL SWITCH To START — Init: ____
8. Adjust 1-CH-LCV-1112C as Required — Init: ____
9. Adjust BA as Required Using 1-CH-FC-1113A — Init: ____
10. WHEN Boration Complete, THEN Place BLENDER CONTROL SWITCH To STOP — Init: ____
11. Blender Flush Required? — Init: ____
    - Place controller for 1-CH-LCV-1112C at 7.1 — Init: ____
    - Perform 1-GOP-8.3.3 Or 1-OP-8.3.3 — Init: ____
12. Blender Flush NOT Required? — Init: ____
    - Place controller for 1-CH-LCV-1112C at 7.1 — Init: ____
    - Ensure 1-CH-FCV-1114B In AUTO & CLOSED — Init: ____
    - Ensure 1-CH-FCV-1114A In AUTO & CLOSED — Init: ____
    - Ensure 1-CH-FCV-1113B In AUTO & CLOSED — Init: ____
    - Place BLENDER MODE SWITCH In AUTO — Init: ____
    - Ensure 1-CH-FCV-1113A In AUTO & OPEN — Init: ____
    - Place BLENDER CONTROL SWITCH To START — Init: ____
    - VCT Level Trend unchanged. (N/A if changed) — Init: ____
    - IF Undesirable Downward Trend, THEN evaluate 1-AP-16 entry — Init: ____

Completed By: ______________________ Date: __________

Peer Check By: ______________________ Date: __________

Reviewed By: ______________________ Date: __________

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

The unit is at 100% power.

INITIATING CUE

You are requested to respond to plant conditions as required.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

R633 Modified

TASK

Respond to a failure of the controlling pressurizer level channel (1-RC-LT-1459) IAW 1-AP-3.

TASK STANDARDS

Pressurizer level channel 461/460 was selected and affected systems were restored.

K/A REFERENCE:

016A2.01 (3.0/3.1)

ALTERNATE PATH:

TASK COMPLETION TIMES

Validation Time =	10 minutes	Start Time = _______
Actual Time = _______ minutes		Stop Time = _______

PERFORMANCE EVALUATION

Rating	[ ] SATISFACTORY	[ ] UNSATISFACTORY
Candidate (Print)	________________________________	
Evaluator (Print)	________________________________	
Evaluator's Signature / Date	________________________________	

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

R633 Modified

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

PREREQUISITES

The trainee has completed the applicable course knowledge training at the reactor operator level.

INITIAL CONDITIONS

The unit is at 100% power.

INITIATING CUE

You are requested to respond to plant conditions as required.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

Copy of 1-AP-3

PERFORMANCE STEPS

START TIME ___________

1	Verify redundant instrument channel indication normal.	Procedure Step 1
		SAT [ ] UNSAT [ ]

Standards	1-RC-LT-1460 and 1461 are verified to be normal.

Notes/Comments

Operator may place 1-CH-FCV-1122 in manual and lower charging flow.

Indications of 1-RC-LT-1459 failing low:

- PRZ LO LEVEL and PRZ LO LEV HTRS OFF – LETDWN ISOL annunciators
- 1-RC-LI-1459 indicates 0%
- Increased makeup flow due to 1-CH-FCV-1122 opening to raise pressurizer level
- Letdown isolates due to indicated low pressurizer level

2	Verify steam generator level controlling channels normal.	Procedure Step 2
		SAT [ ] UNSAT [ ]

Standards	Steam flow, feed flow, steam generator level, and steam pressure are verified to be normal for each steam generator.

Notes/Comments

3	Verify turbine first stage pressure indications normal.	Procedure Step 3

	SAT [ ] UNSAT [ ]

Standards	Turbine first stage pressure indications (1-MS-PT-1446 and 1447) are verified to be normal.

Notes/Comments

4	Verify pressurizer level indications normal. **NO**	Procedure Step 4

Critical Step	SAT [ ] UNSAT [ ]

Standards	Notes 1-RC-LT-1459 is failed low. Applies procedure step 4 RNO.

Notes/Comments

5	Place 1-CH-FCV-1122, charging flow control valve, in manual and control pressurizer level at program.	Procedure Step 4 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	1-CH-FCV-1122 placed in manual and charging flow is lowered to restore pressurizer level to program.

Performance Cue(s)	(If operator stops after completing Immediate Operator Actions) You are requested to continue in 1-AP-3.

Notes/Comments

6	Verify operable pressurizer level channel selected. **NO**	Procedure Step 5.a

Critical Step	SAT [ ] UNSAT [ ]

Standards	Checks indication for selected pressurizer level channels. Notes 1-RC-LT-1459 is failed low and the Pressurizer Level Channel Defeat Switch is in the 459/460 position. Applies procedure step 5.a RNO

Notes/Comments

7	Select operable pressurizer level channels for control.	Procedure Step 5.a.1 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	PZR LEVEL CHANNEL DEFEAT switch is selected to 461/460.

Notes/Comments

8	Verify the following annunciators are proper for plant conditions:	Procedure Step 5.a.2 RNO

SAT [ ] UNSAT [ ]

Standards	Verifies annunciators B-F8, B-G6, B-G7, and B-G8 are not lit.

Notes/Comments

9	Verify the emergency bus backup heaters are restored.	Procedure Step 5.b

SAT [ ] UNSAT [ ]

Standards	Verifies emergency bus backup heaters are not tripped.

Notes/Comments

10	Verify letdown in service. **NO**	Procedure Step 5.c

SAT [ ] UNSAT [ ]

Standards	Notes letdown flow not indicated Applies procedure step 5.c RNO (Restore letdown using Attachment 2)

Notes/Comments

11	Restore letdown using Attachment 2, LETDOWN RESTORATION.	Procedure Step 5.c RNO

SAT [ ] UNSAT [ ]

Standards	Goes to Attachment 2

Notes/Comments

12	Ensure charging flow is at least 25 gpm.	Procedure Step 1 Att.2

SAT [ ] UNSAT [ ]

Standards	Adjusts charging flow to 25 – 40 gpm.

Notes/Comments

13	Ensure letdown isolation valves are open.	Procedure Step 2 Att.2

Critical Step	SAT [ ] UNSAT [ ]

Standards	Control switch for 1-CH-LCV-1460A is placed in OPEN Notes 1-CH-LCV-1460B, 1-CH-TV-1204A, and 1-CH-TV-1204B are open.

Notes/Comments

14	Place 1-CH-PCV-1145, Letdown Pressure Control Valve, in MANUAL.	Procedure Step 3 Att.2

Critical Step	SAT [ ] UNSAT [ ]

Standards	Letdown pressure control valve 1-CH-PCV-1145 MANUAL push-button is depressed.

Notes/Comments

15	Fully open 1-CH-PCV-1145.	Procedure Step 4 Att.2

Critical Step	SAT [ ] UNSAT [ ]

Standards	Raise push-button on the controller for 1-CH-PCV-1145 is depressed until controller output is 100% and the RAISE push-button back light is illuminated.

Notes/Comments

16	Open the desired letdown orifice isolation valve.	Procedure Step 5 Att.2

Critical Step	SAT [ ] UNSAT [ ]

Standards	Control switch for 1-CH-HCV-1200A, 1200B, or 1200C is placed in OPEN.

Performance Cue(s)	If asked: The US desires to use 1-CH-HCV-1200B.

Notes/Comments

17	Adjust 1-CH-PCV-1145 to obtain 300-psig letdown pressure as indicated on 1-CH-PI-1145, Non-regenerative Heat Exchanger Outlet Pressure.	Procedure Step 6 Att.2

Critical Step	SAT [ ] UNSAT [ ]

Standards	1-CH-PCV-1145 is manually closed until 300 psig is indicated on 1-CH-PI-1145.

Notes/Comments

18	Place 1-CH-PCV-1145 in AUTO.	Procedure Step 7 Att.2

SAT [ ] UNSAT [ ]

NOTE TO THE EVALUATOR	IF 1-CH-PCV-1145 WAS NOT ADJUSTED TO 300 PSIG, THEN THIS STEP IS CRITICAL.

Standards	Letdown pressure control valve 1-CH-PCV-1145 AUTO push-button is depressed.

Notes/Comments

19	Adjust charging and letdown to maintain program pressurizer level.	Procedure Step 8 Att.2

SAT [ ] UNSAT [ ]

Standards	Ensures pressurizer level is lowering to program level and adjusts 1-CH-FCV-1122 as necessary.

Performance Cue(s)	Assume another operator will complete this task.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

SIMULATOR SETUP

JOB PERFORMANCE MEASURE
R633

TASK

Respond to a failure of the controlling pressurizer level channel (1-RC-LT-1459) IAW 1-AP-3.

CHECKLIST

_____ Recall IC 118

_____ Ensure that 459/460 is selected

_____ Enter malfunction MRC0801, Ramp = 1, Severity = -1

_____ Place simulator in RUN

_____ Place the simulator in FREEZE

Dominion

NORTH ANNA POWER STATION

ABNORMAL PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-AP-3	LOSS OF VITAL INSTRUMENTATION (WITH TWO ATTACHMENTS)	26
		PAGE 1 of 19

PURPOSE

To provide instructions to follow in the event of a loss of vital instrumentation.

ENTRY CONDITIONS

This procedure is entered when a faulty indication occurs on any of the following vital instrumentation channels:

- Reactor Coolant Flow, or
- Pressurizer Level, or
- Pressurizer Pressure Protection, or
- DELTA T/TAVE Protection, or
- Containment Pressure Protection, or
- RWST Level, or
- Steam Generator Level, or
- Turbine Stop Valves Indication, or
- Turbine First Stage Impulse Pressure, or
- Turbine Auto Stop Oil Low Pressure Trip Signal, or
- Steam Flow, or
- Feed Flow, or
- Steam Pressure, or
- Station Service Bus Undervoltage, or
- Station Service Bus Underfrequency.

UNIT ONE

CONTINUOUS USE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
[1]___	VERIFY REDUNDANT INSTRUMENT CHANNEL INDICATION - NORMAL	☐ IF unable to determine Reactor is in a safe operating condition, THEN GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION.
[2]___	VERIFY STEAM GENERATOR LEVEL CONTROLLING CHANNELS - NORMAL: ☐ • Steam Flow ☐ • Feed Flow ☐ • Steam Generator Level ☐ • Steam Pressure	Do the following: a) Place the associated valves in MANUAL: ☐ • Main Feed Reg Valves ☐ • Main Feed Reg Bypass Valves ☐ b) Control Steam Generator level.
[3]___	VERIFY TURBINE FIRST STAGE PRESSURE INDICATIONS - NORMAL	IF the controlling channel failed, THEN do the following: ☐ • Place Control Rod Mode Selector switch in MANUAL. ☐ • Manually control SG level on program, as desired.
[4]___	VERIFY PRESSURIZER LEVEL INDICATIONS - NORMAL	IF any selected channel failed, THEN do the following: ☐ a) Place 1-CH-FCV-1122, Charging Flow Control Valve, in MANUAL. ☐ b) Control Pressurizer level at program.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5. ___	VERIFY SYSTEMS AFFECTED BY PRESSURIZER LEVEL CHANNELS - NORMAL	
	☐ a) Verify operable Pressurizer level channels - SELECTED	a) Do the following: ☐ 1) Select operable Pressurizer level channels for control. 2) Verify the following Annunciators are proper for plant conditions: ☐ • Panel B-F8, PRZ LO LEVEL ☐ • Panel B-G6, PRZ HI LEVEL - BU HTRS ON ☐ • Panel B-G7, PRZ LO LEV HTRS OFF - LETDWN ISOL ☐ • Panel B-G8, PRZ HI LEVEL
	☐ b) Verify Emergency Bus backup Heaters - RESTORED	☐ b) IF Emergency Bus backup Heaters will NOT restore, THEN enter Tech Spec 3.4.9.
	☐ c) Verify Letdown - IN SERVICE	☐ c) Restore letdown using Attachment 2, LETDOWN RESTORATION.

(STEP 5 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	VERIFY SYSTEMS AFFECTED BY PRESSURIZER LEVEL CHANNELS - NORMAL (Continued)	
☐	d) Verify Pressurizer Level Control - IN AUTO	d) Do the following: ☐ 1) Verify level restored to program. ☐ 2) Check output of 1-RC-LCV-1459G, Pressurizer Level Control and adjust as required. ☐ 3) Place 1-CH-FCV-1122, Charging Flow Control Valve in AUTO.
☐	e) Verify Pressurizer Control Group Heaters - NOT TRIPPED	☐ e) Reset Pressurizer Control Group Heaters by placing control switch to START position.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. ___	VERIFY BOTH TURBINE FIRST STAGE PRESSURE CHANNELS - NORMAL	IF Condenser Steam Dumps are available, THEN transfer to Steam Pressure Mode by doing the following: ☐ a) Place both STEAM DUMP INTLK switches to OFF/RESET. ☐ b) Place STEAM DUMP CONTROLLER to MANUAL. ☐ c) Place MODE SELECTOR switch to STEAM PRESS. ☐ d) Ensure Steam Dump demand is ZERO. ☐ e) Return STEAM DUMP CONTROLLER to AUTO. ☐ f) Verify Steam Dump demand is ZERO. ☐ g) Place both STEAM DUMP INTLK switches to ON.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. ___	VERIFY OPERABLE CHANNELS SELECTED FOR ALL OF THE FOLLOWING SGWLC INSTRUMENTS: ☐ • Turbine First Stage Pressure ☐ • "A" SG Steam Flow ☐ • "B" SG Steam Flow ☐ • "C" SG Steam Flow ☐ • "A" SG Feed Flow ☐ • "B" SG Feed Flow ☐ • "C" SG Feed Flow	Do one of the following as directed by the Unit 1 SRO: ☐ • IF desired to swap ONLY the failed channel, THEN GO TO Step 9. OR ☐ • IF desired to swap ALL SGWLC channels to the same channel, THEN GO TO Step 10.
8. ___	GO TO STEP 11	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.___	SWAP ONLY THE FAILED SGWLC CHANNEL AS FOLLOWS:	
	☐ a) Swap of Turbine First Stage Pressure channel - DESIRED	☐ a) GO TO Step 9b.
	☐ 1) Verify Rod Control Mode Selector Switch in MANUAL	☐ 1) Place Rod Control Mode Selector Switch is in MANUAL.
	2) Verify Steam Dumps in one of the following conditions:	2) Do one of the following with Unit SRO concurrence:
	☐ • Steam Pressure Mode <u>OR</u>	☐ • Place Steam Dumps in - OFF <u>OR</u>
	☐ • OFF	• <u>IF</u> Condenser Steam Dumps are available, <u>THEN</u> transfer to Steam Pressure Mode by doing the following:
		☐ 1. Place both STEAM DUMP INTLK switches to OFF/RESET.
		☐ 2. Place STEAM DUMP CONTROLLER to MANUAL.
		☐ 3. Place MODE SELECTOR switch to STEAM PRESS.
		☐ 4. Ensure Steam Dump demand is ZERO.
		☐ 5. Place STEAM DUMP CONTROLLER to AUTO.
		☐ 6. Verify Steam Dump demand is ZERO.
		☐ 7. Place both STEAM DUMP INTLK switches to ON.

(STEP 9 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	SWAP ONLY THE FAILED SGWLC CHANNEL AS FOLLOWS: (Continued)	
☐	3) Check ALL Bypass Feed Reg valves in MANUAL	☐ 3) Place ALL Bypass Feed Reg valves are in MANUAL.
☐	4) Place ALL Main Feed Reg valves in MANUAL	
☐	5) Select the operable Turbine First Stage Pressure channel for control	
☐	6) Verify ALL Steam Generator Level Median Controlling channels - OPERABLE	☐ 6) GO TO Step 9a7.
☐	a. Verify Steam Generator Levels are on program	
☐	b. Return the Main or Bypass Feed Reg Valves to AUTO, as required	
☐	7) Verify Condenser Steam Dumps - AVAILABLE	☐ 7) GO TO Step 9a9.

(STEP 9 CONTINUED ON NEXT PAGE)

STEP	ACTION / EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9. SWAP ONLY THE FAILED SGWLC CHANNEL AS FOLLOWS: (Continued)

   8) Place Steam Dumps in Steam Pressure Mode by doing the following with Unit SRO concurrence:

      ☐ a. Place both STEAM DUMP INTLK switches to OFF/RESET

      ☐ b. Place STEAM DUMP CONTROLLER to MANUAL

      ☐ c. Place MODE SELECTOR switch to STEAM PRESS

      ☐ d. Ensure Steam Dump demand is ZERO

      ☐ e. Place STEAM DUMP CONTROLLER to AUTO

      ☐ f. Verify Steam Dump demand is ZERO

      ☐ g. Place both STEAM DUMP INTLK switches to ON

(STEP 9 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	SWAP ONLY THE FAILED SGWLC CHANNEL AS FOLLOWS: (Continued)	
☐	9) Auto Rod Control - DESIRED	☐ 9) GO TO Step 9b.
☐	a. Verify Tave and Tref - MATCHED WITHIN 1.5°F	a. Adjust Tave and Tref, as required: ☐ • Manually adjust Control Rods. ☐ • Manually adjust Turbine load.
☐	b. Return Rod Control Mode Selector switch to AUTO	
☐	b) Swap of Steam Flow channel - DESIRED	☐ b) GO TO Step 9c.
☐	1) Verify affected Main Feed Reg valve in MANUAL	☐ 1) Place affected Main Feed Reg valve in MANUAL.
☐	2) Select the operable Steam Flow channel for control	
☐	3) Verify affected Steam Generator Level Median Controlling channel - OPERABLE	☐ 3) GO TO Step 9c.
☐	a. Verify affected Steam Generator Level is on program	
☐	b. Return affected Main Feed Reg Valve to AUTO, as required	

(STEP 9 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	SWAP ONLY THE FAILED SGWLC CHANNEL AS FOLLOWS: (Continued)	
☐	c) Swap of Feed Flow channel - DESIRED	☐ c) GO TO Step 11.
☐	1) Verify affected Main Feed Reg valve in MANUAL	☐ 1) Place affected Main Feed Reg valve in MANUAL.
☐	2) Select the operable Feed Flow channel for control	
☐	3) Verify affected Steam Generator Level Median Controlling channel - OPERABLE	☐ 3) GO TO Step 11.
☐	a. Verify affected Steam Generator Level is on program	
☐	b. Return affected Main Feed Reg Valve to AUTO, as required	
☐	d) GO TO Step 11	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. ___	SWAP ALL SGWLC CHANNELS AS FOLLOWS:	
	☐ a) Verify Rod Control Mode Selector Switch in MANUAL	☐ a) Place Rod Control Mode Selector Switch in MANUAL.
	b) Verify Steam Dumps in one of the following conditions:	b) Do one of the following with Unit SRO concurrence:
	☐ • Steam Pressure Mode	☐ • Place Steam Dumps in - OFF
	OR	OR
	☐ • OFF	• IF Condenser Steam Dumps are available, THEN transfer to Steam Pressure Mode by doing the following:
		☐ a. Place both STEAM DUMP INTLK switches to OFF/RESET.
		☐ b. Place STEAM DUMP CONTROLLER to MANUAL.
		☐ c. Place MODE SELECTOR switch to STEAM PRESS.
		☐ d. Ensure Steam Dump demand is ZERO.
		☐ e. Place STEAM DUMP CONTROLLER to AUTO.
		☐ f. Verify Steam Dump demand is ZERO.
		☐ g. Place both STEAM DUMP INTLK switches to ON.

(STEP 10 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	SWAP ALL SGWLC CHANNELS AS FOLLOWS: (Continued)	
☐	c) Check ALL Bypass Feed Reg valves in MANUAL	☐ c) Place ALL Bypass Feed Reg valves are in MANUAL.
☐	d) Place ALL Main Feed Reg valves in MANUAL	
	e) Select ALL of the following channels to the same channel:	
☐	• Steam Flow	
☐	• Feed Flow	
☐	• First Stage Pressure	
☐	f) Verify ALL Steam Generator Level Median Controlling channels - OPERABLE	☐ f) GO TO Step 10g.
☐	1) Verify Steam Generator Levels are on program	
☐	2) Return the Main or Bypass Feed Reg Valves to AUTO, as required	
☐	g) Verify Condenser Steam Dumps - AVAILABLE	☐ g) GO TO Step 10i.

(STEP 10 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10. SWAP ALL SGWLC CHANNELS AS FOLLOWS: (Continued)

h) Do one of the following with Unit SRO concurrence:

- Place Steam Dumps in Steam Pressure Mode by doing the following:

☐ 1) Place both STEAM DUMP INTLK switches to OFF/RESET

☐ 2) Place STEAM DUMP CONTROLLER to MANUAL

☐ 3) Place MODE SELECTOR switch to STEAM PRESS

☐ 4) Ensure Steam Dump demand is ZERO

☐ 5) Place STEAM DUMP CONTROLLER to AUTO

☐ 6) Verify Steam Dump demand is ZERO

☐ 7) Place both STEAM DUMP INTLK switches to ON

<u>OR</u>

(STEP 10 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	SWAP ALL SGWLC CHANNELS AS FOLLOWS: (Continued)	
	• Place Steam Dumps in Tave Mode by doing the following:	
☐	1. Verify BOTH channels of Turbine First Stage Pressure are operable	
☐	2. Place both STEAM DUMP INTLK switches to OFF/RESET	
☐	3. VERIFY ANNUNCIATOR PANEL “P” E-4, C-7 PERM STM DUMP ARMED FROM LOSS OF LOAD - NOT LIT	☐ 3) Place Steam Dump Mode Selector switch to RESET.
☐	4. Place MODE SELECTOR switch to TAVE	
☐	5. Ensure Steam Dump demand is ZERO	
☐	6. Place both STEAM DUMP INTLK switches to ON	

(STEP 10 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	SWAP ALL SGWLC CHANNELS AS FOLLOWS: (Continued)	
	☐ i) Auto Rod Control - DESIRED	☐ i) GO TO Step 11.
	☐ 1) Verify Tave and Tref - MATCHED WITHIN 1.5°F	1) Adjust Tave and Tref, as required: ☐ • Manually adjust Control Rods. ☐ • Manually adjust Turbine load.
	☐ 2) Return Rod Control Mode Selector switch to AUTO	

NOTE: With one instrument channel lost, operations may continue only if the channel is placed in trip condition within the specified time period and the conditions of the applicable Technical Specification are met.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.___	VERIFY OPERATION OF THE FOLLOWING INSTRUMENTS:	
	☐ a) Reactor Coolant Flow Instrumentation indication - NORMAL	☐ a) IF unit is in Mode 1, THEN complete 1-MOP-55.71, REACTOR COOLANT FLOW INSTRUMENTATION within 72 hours.
	☐ b) Pressurizer Level Instrumentation indication - NORMAL	☐ b) IF unit is in Mode 1 or 2, THEN complete 1-MOP-55.72, PRESSURIZER LEVEL INSTRUMENTATION within 72 hours.
	☐ c) Pressurizer Pressure Protection Instrumentation indication - NORMAL	☐ c) IF unit is in Mode 1, 2, or 3, THEN complete 1-MOP-55.73, PRESSURIZER PRESSURE PROTECTION INSTRUMENTATION, Section 5.1 within one hour.

(STEP 11 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.	VERIFY OPERATION OF THE FOLLOWING INSTRUMENTS: (Continued)	
	☐ d) Loop ΔT/TAVE Protection Instrumentation indication - NORMAL	☐ d) IF unit is in Mode 1, 2, or 3, THEN complete 1-MOP-55.74, LOOP ΔT/TAVE PROTECTION INSTRUMENTATION, Section 5.1 within one hour.
	☐ e) Containment Pressure Protection Instrumentation indication - NORMAL	☐ e) IF unit is in Mode 1, 2, 3, or 4, THEN complete 1-MOP-55.75, CONTAINMENT PRESSURE PROTECTION INSTRUMENTATION within 72 hours.
	☐ f) Steam Generator Level Instrumentation indication - NORMAL	f) Do the following: ☐ • IF unit is in Mode 1 or 2, THEN enter TRM 3.3.11, Condition A. ☐ • IF unit is in Mode 1, 2, or 3, THEN complete 1-MOP-55.76, STEAM GENERATOR LEVEL INSTRUMENTATION within 72 hours.
	☐ g) Steam Pressure Instrumentation indication - NORMAL	☐ g) IF unit is in Mode 1, 2, or 3, THEN complete 1-MOP-55.79, STEAM PRESSURE INSTRUMENTATION within 72 hours.
	☐ h) Steam Flow Instrumentation indication - NORMAL	☐ h) IF unit is in Mode 1, 2, or 3, THEN complete 1-MOP-55.77, STEAM FLOW INSTRUMENTATION within 72 hours.
	☐ i) Feed Flow Instrumentation indication - NORMAL	☐ i) IF unit is in Mode 1 or 2, THEN complete 1-MOP-55.78, FEED FLOW INSTRUMENTATION within 72 hours.

(STEP 11 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.	VERIFY OPERATION OF THE FOLLOWING INSTRUMENTS: (Continued)	
	☐ j) Turbine Stop Valve Closure Signal Instrumentation annunciator indication - NORMAL	☐ j) IF unit is in Mode 1, THEN complete 1-MOP-55.80, TURBINE STOP VALVE CLOSURE SIGNAL INSTRUMENTATION within 72 hours.
	☐ k) Turbine First Stage Pressure Instrumentation indication - NORMAL	☐ k) IF unit is in Mode 1, 2, or 3, THEN complete 1-MOP-55.81, TURBINE FIRST STAGE PRESSURE INSTRUMENTATION, Section 5.1 within one hour.
	☐ l) Turbine Auto Stop Oil Pressure annunciator indication - NORMAL	☐ l) IF unit is in Mode 1, THEN complete 1-MOP-55.82, TURBINE AUTO STOP OIL LOW PRESSURE INSTRUMENTATION within 72 hours.
	☐ m) RCP Bus Undervoltage annunciator indication - NORMAL	☐ m) IF unit is in Mode 1, THEN complete 1-MOP-55.83, REACTOR PROTECTION SYSTEM INPUT FROM STATION SERVICE BUSES 2A, 2B, AND 2C UNDERVOLTAGE within 72 hours.
	☐ n) RCP Bus Underfrequency annunciator indication - NORMAL	☐ n) IF unit is in Mode 1, THEN complete 1-MOP-55.84, REACTOR PROTECTION SYSTEM INPUT FROM STATION SERVICE BUSES 2A, 2B, AND 2C UNDERFREQUENCY within 72 hours.
	☐ o) RWST Level Instrumentation indication - NORMAL	☐ o) IF unit is in Mode 1, 2, 3, or 4, THEN complete 1-MOP-55.85, RWST LEVEL INSTRUMENTATION within 72 hours.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. ___	VERIFY MAINTENANCE OPERATING PROCEDURE(S) - INITIATED FOR ALL FAULTY INSTRUMENT CHANNELS	IF the failed instrument channel was not in the mode specified, THEN do the following: ☐ a) Continue operation. ☐ b) Enter Action Statement. c) Do either of the following: ☐ • Initiate the appropriate MOP specified in Step 11 for the failed channel(s). OR ☐ • Have the I&C department place the failed channel(s) in trip. ☐ d) Refer to the applicable Technical Specifications as listed in the Reference Section of the associated MOP. ☐ e) DO NOT enter mode specified in Technical Specification until all requirements of Technical Specifications for affected channel have been met. ☐ f) Notify Instrument Department to repair faulty channel
13. ___	NOTIFY MANAGER NUCLEAR OPERATIONS OR OPERATIONS MANAGER ON CALL OF FAILURE	
14. ___	RETURN TO PROCEDURE IN EFFECT	

- END -

- Westinghouse SSP Tech Manual
- Westinghouse Process Instrumentation Manual and Prints
- Instrument Department PTs
- Tech Spec 3.3.1
- Tech Spec 3.3.2
- Tech Spec 3.3.4
- Tech Spec 3.3.3
- TRM 3.3.11, Steam Generator Water Level Control System Median Signal Selector
- CTS 02-92-2506-001, from HPES 92-04
- 1-MOP-55.71, REACTOR COOLANT FLOW INSTRUMENTATION
- 1-MOP-55.72, PRESSURIZER LEVEL INSTRUMENTATION
- 1-MOP-55.73, PRESSURIZER PRESSURE PROTECTION INSTRUMENTATION
- 1-MOP-55.74, LOOP ΔT/TAVE PROTECTION INSTRUMENTATION
- 1-MOP-55.75, CONTAINMENT PRESSURE PROTECTION INSTRUMENTATION
- 1-MOP-55.76, STEAM GENERATOR LEVEL INSTRUMENTATION
- 1-MOP-55.77, STEAM FLOW INSTRUMENTATION
- 1-MOP-55.78, FEED FLOW INSTRUMENTATION
- 1-MOP-55.79, STEAM PRESSURE INSTRUMENTATION
- 1-MOP-55.80, TURBINE STOP VALVE CLOSURE SIGNAL INSTRUMENTATION
- 1-MOP-55.81, TURBINE FIRST STAGE PRESSURE INSTRUMENTATION
- 1-MOP-55.82, AUTO STOP OIL LOW PRESSURE INSTRUMENTATION
- 1-MOP-55.83, REACTOR PROTECTION SYSTEM INPUT FROM STATION SERVICE BUSES 1A, 1B, AND 1C UNDERVOLTAGE
- 1-MOP-55.84, REACTOR PROTECTION SYSTEM INPUT FROM STATION SERVICE BUSES 1A, 1B, AND 1C UNDERFREQUENCY
- 1-MOP-55.85, RWST LEVEL INSTRUMENTATION

- CTS Assignment 02-99-1801-003, Tech Spec Change 290
- DCP 06-015, NRC GSI-191, RWST Level ESFAS Function to Support Containment Sump Modifications/North Anna/Unit 1 (Rev 22, Step 10.o)
- DC NA-11-01097, Steam Flow/Feed Flow Coincident with Low Steam Generator Level Reactor Trip Elimination - Unit 1 and TSCR N-078 and TRMCR 124, Elimination of the Steam Flow/Feed Flow Mismatch with Low Steam Generator Water Level Reactor Trip (Rev 26, Step 2, 9.a.6, 9.b.3, 9.c.3, 10.f and 11.f RNO)

1. ___ Ensure Charging Flow is at least 25 gpm.

2. Ensure the following valves are open:

   ___ • 1-CH-LCV-1460A, LETDOWN ISOLATION VALVE

   ___ • 1-CH-LCV-1460B, LETDOWN ISOLATION VALVE

   ___ • 1-CH-TV-1204A, LETDOWN ISOLATION VALVE

   ___ • 1-CH-TV-1204B, LETDOWN ISOLATION VALVE

3. ___ Place 1-CH-PCV-1145, LETDOWN PRESSURE CONTROL VALVE, in MAN.

4. ___ Fully open 1-CH-PCV-1145.

NOTE: To prevent potential overheating of Letdown, Charging flow may need to be increased immediately after establishing Letdown flow.

5. Open the desired Letdown Orifice Isolation Valve(s):

   ___ • 1-CH-HCV-1200A, A LETDOWN ORIFICE ISOLATION VALVE

   ___ • 1-CH-HCV-1200B, B LETDOWN ORIFICE ISOLATION VALVE

   ___ • 1-CH-HCV-1200C, C LETDOWN ORIFICE ISOLATION VALVE

6. ___ Adjust 1-CH-PCV-1145 to obtain 300 psig Letdown pressure as indicated on 1-CH-PI-1145, NONREGENERATIVE HEAT EXCH OUTLET PRESS.

7. ___ Place 1-CH-PCV-1145 in AUTO.

8. ___ Adjust Charging and Letdown to maintain program PRZR level.

- END -

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

The control room has been evacuated and the OATC is at the Aux Shutdown Panel.

Turbine trip from the control room is not possible.

INITIATING CUE

You are requested to trip the main turbine locally in accordance with the "Remote Turbine Trip" attachment in 1-AP-20.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

N867

TASK

Trip the main turbine locally (1-AP-20, 1-FR-S.1).

TASK STANDARDS

The unit 1 main turbine was locally tripped.

K/A REFERENCE:

045A3.04 (3.4/3.6)

ALTERNATE PATH:

Local trip lever does not trip the main turbine.

TASK COMPLETION TIMES

Validation Time = 10 minutes Start Time = ________
Actual Time = ________ minutes Stop Time = ________

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) ______________________________

Evaluator (Print) ______________________________

Evaluator's Signature / Date ______________________________

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

N867

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

PREREQUISITES

Before being evaluated on the task, the trainee must have completed the reactor operator's course checkout during which the objectives listed below would have been addressed.

INITIAL CONDITIONS

The control room has been evacuated and the OATC is at the Aux Shutdown Panel.

Turbine trip from the control room is not possible.

INITIATING CUE

You are requested to trip the main turbine locally in accordance with the "Remote Turbine Trip" attachment in 1-AP-20.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-AP-20, Attachment 6

PERFORMANCE STEPS

START TIME ___________

1	At the main turbine pedestal, place the local trip lever in TRIPPED position.	Procedure Step 1.a

	SAT [ ] UNSAT [ ]

Standards	Simulates placing turbine trip lever in the TRIPPED position.

Simulation Cue(s)	If asked, state that there is no change in sound.

Notes/Comments

2	Verify all eight turbine stop and control valves are closed in the doghouse. **NO** **(Alternate Path)**	Procedure Step 1.b

SAT [ ] UNSAT [ ]

Note to Evaluator	If the operator was told there was no change in sound when the trip lever was placed in TRIPPED, he might answer "No" on this step without entering the doghouse.

Standards	Enters doghouse and visually checks position of stop valves and control valves and notes they are not closed. Applies procedure step 1.b RNO.

Simulation Cue(s)	All governor and throttle valves are as you see them.

Notes/Comments

3	Open both of the following breakers at turbine mezzanine east:	Procedure Step 1.b.1 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	Simulates opening breakers 1A1-2D1 AND 1B1-3A2 (power supplies for EHC pumps, 1-TM-P-3 and 1-TM-P-4).

Notes/Comments

4	Open EHC accumulator drain valves.	Procedure Step 1.b.2 RNO

Critical Step	SAT [ ] UNSAT [ ]

Standards	Simulates opening 1-EH-15, 17, 19, and 21.

Simulation Cue(s)	Pressure is decreasing on the accumulator indicators.

Notes/Comments

5	Notify the OATC of the status of the turbine stop valves and EHC system.	Procedure Step 2

SAT [ ] UNSAT [ ]

Standards	Visually checks turbine stop valve position and notes they are closed. Simulates reporting stop valves are closed, EHC accumulators are drained, and EHC pump breakers are open.

Simulation Cue(s)	If operator returns to the doghouse: “Stop valves are closed.” “You may return to normal duties.”

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: EHC fluid is a health hazard and is under high pressure.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.___	LOCALLY TRIP THE TURBINE FROM THE TURBINE PEDESTAL:	
	☐ a) Place the local Trip Lever in the TRIPPED position	
	b) Verify all 8 Turbine Stop and Control Valves - CLOSED in Doghouse:	b)) Perform the following: 1) Open both the following breakers at Turbine Mezzanine East:
	☐ • 1-MS-TV-1A	☐ • 1A1-2 D1, Power to 1-TM-P-3, EHC Pump
	☐ • 1-MS-TV-1B	☐ • 1B1-3 A2, Power to 1-TM-P-4, EHC Pump.
	☐ • 1-MS-TV-1C	
	☐ • 1-MS-TV-1D	
	☐ • 1-MS-GOV-1A	2) Open EHC Accumulator Drain Valves:
	☐ • 1-MS-GOV-1B	☐ • 1-EH-15, “A” EHC Accumulator Drain
	☐ • 1-MS-GOV-1C	☐ • 1-EH-17, “B” EHC Accumulator Drain
	☐ • 1-MS-GOV-1D	☐ • 1-EH-19, “C” EHC Accumulator Drain
		☐ • 1-EH-21, “D” EHC Accumulator Drain

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.___	MAKE NOTIFICATIONS	
	☐ Notify the OATC at the Aux Shutdown Panel of status of Turbine Stop Valves and EHC System and await further instructions	

- END -

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Both units are in mode 1.

Unit 2 accumulator makeup is required.

INITIATING CUE

You are requested to align for makeup to the unit-2 SI accumulators from the unit-2 RWST in accordance with 2-OP-7.3.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

TASK

Align the hydro-test pump in order to fill the safety injection accumulators (2-OP-7.3).

TASK STANDARDS

Task was performed as directed by the procedure referenced in the task statement within parentheses (one of the underlined procedures if several are cited).

Work was performed in compliance with the Radiation Work Permit; exposure to surface and airborne contamination was minimized; and ALARA principles were applied.

K/A REFERENCE:

006A1.13 (3.5/3.7)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time =	30 minutes	Start Time = _______
Actual Time =	_______ minutes	Stop Time = _______

PERFORMANCE EVALUATION

Rating	[ ] SATISFACTORY	[ ] UNSATISFACTORY
Candidate (Print)	____________________	
Evaluator (Print)	____________________	
Evaluator's Signature / Date	____________________	

EVALUATOR'S COMMENTS

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

PREREQUISITES

Before being evaluated on the task, the trainee must have completed the reactor operator's course checkout during which the objectives listed below would have been addressed.

INITIAL CONDITIONS

Both units are in mode 1.

Unit 2 accumulator makeup is required.

INITIATING CUE

You are requested to align for makeup to the unit-2 SI accumulators from the unit-2 RWST in accordance with 2-OP-7.3.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

Admin key

2-OP-7.3

PERFORMANCE STEPS

START TIME __________

1	Check initial conditions and review precautions and limitations.	Procedure Step 5.1.1 and 5.1.2

SAT [ ] UNSAT [ ]

Standards	Initial conditions checked and P&Ls reviewed.

Notes/Comments

2	Ensure 1-SI-48, RWST to Hydro Test Pump Suction Header Isol Valve, is closed.	Procedure Step 5.1.3.a

SAT [ ] UNSAT [ ]

Standards	Simulates attempting to operate 1-SI-48 in the closed direction to verify no stem movement.

Simulation Cue(s)	Valve handwheel did not move.

Notes/Comments U1, 244', west wall

3	Ensure 1-SI-58, Hydro Test PP to SI Accum Makeup Line Isol Valve, is locked and closed.	Procedure Step 5.1.3.b

SAT [ ] UNSAT [ ]

Standards	Ensures 1-SI-58 locked closed by simulating pulling lock and chain to check for integrity, checking locking device hinders valve operation, and checking valve stem position.

Notes/Comments U1, 244', penetration #20

4	Open 2-SI-16, RWST to Hydro Test Pump Suction Header Isol Valve.	Procedure Step 5.1.3.c

Critical Step	SAT [ ] UNSAT [ ]

Standards	Opens 2-SI-16 by simulating turning the valve handwheel in the open direction until the valve is fully open as indicated by no more stem movement.

Simulation Cue(s)	Stem moved out and handwheel stopped.

Notes/Comments

U2, 244', east wall

5	Open 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.	Procedure Step 5.1.3.d

Critical Step	SAT [ ] UNSAT [ ]

Standards	Opens 1-SI-50 by simulating turning the valve handwheel in the open direction until the valve is fully open as indicated by no more stem movement.

Simulation Cue(s)	Stem moved out and handwheel stopped.

Notes/Comments

At the hydro test pump

6	Open 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.	Procedure Step 5.1.3.e

Critical Step	SAT [ ] UNSAT [ ]

Standards	Opens 1-SI-52 by simulating turning the valve handwheel in the open direction until the valve is fully open as indicated by no more stem movement.

Simulation Cue(s)	Stem moved out and handwheel stopped.

Notes/Comments

At the hydro test pump

7	Unlock and open 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve.	Procedure Step 5.1.3.f

Critical Step	SAT [ ] UNSAT [ ]

Standards	Unlocks and opens 2-SI-47 by simulating the following: • Use admin key to remove lock and chain. • Turn valve handwheel in open direction until no more stem movement.

Simulation Cue(s)	Stem moved out and handwheel stopped.

Simulation Cue(s)	Another operator will remain in the area to close 2-SI-47, if required.

Notes/Comments

U2, 244’, penetration #20

8	Independently verify the valve lineup.	Procedure Step 5.1.3.g

SAT [ ] UNSAT [ ]

Standards	Requests IV be performed by another operator and waits for IV completion.

Simulation Cue(s)	Independent verification is complete. (Evaluator initials IV steps.)

Notes/Comments

9	Check hydro-test pump cooling tank level and oil level do not indicate low level.	Procedure Step 5.1.4.a & b

SAT [ ] UNSAT [ ]

Standards	Checks cooling tank sight glass and pump oil sight glass to verify low level not indicated.

Simulation Cue(s)	Level is as you see it (in each sight glass).

Notes/Comments

10	Check Unit 1 panel 1G-G5 is not lit.	Procedure Step 5.1.5

	SAT [ ] UNSAT [ ]

Standards	Notifies control room that alignment steps are complete and requests RO to perform remaining steps.

Simulation Cue(s)	Another operator will complete this procedure.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

Dominion	PROCEDURE NO: 2-OP-7.3
NORTH ANNA POWER STATION	REVISION NO: 48
PROCEDURE TYPE: **OPERATING PROCEDURE**	UNIT NO: **2**

PROCEDURE TITLE:

FILLING, DRAINING, PRESSURIZING, AND VENTING SI ACCUMULATORS

SURV REQ				**EOP AP**		

REVISION SUMMARY:

Incorporated OPS Concern OP 13-0329:

- Added Section 5.10 to Initial Condition 3.5.
- Added Step 5.10.13 to adjust 1-GN-466 as necessary to maintain 650 psig.

PROBLEMS ENCOUNTERED: ☐ NO ☐ YES **Note:** If YES, note problems in remarks.

REMARKS: ____

____

____

____

____

____ (Use back for additional remarks.)

SRO:	DATE:

UNIT TWO

CONTINUOUS USE

TABLE OF CONTENTS

1.0 PURPOSE

To provide instructions for filling, draining, pressurizing, recirculating A, B, or C Accumulator, and venting SI Accumulators.

The following synopsis is designed as an aid to understanding the procedure, and is not intended to alter or take the place of the actual purpose, instructions, or text of the procedure itself.

Before filling an accumulator, the hydrostatic test pump is aligned to the Unit 2 RWST, the accumulator level is logged, and the accumulator fill valve is opened. The hydrostatic test pump speed controller is set to 0%, the pump is started, and the speed controller is adjusted as desired to control pump capacity. When the desired level in the accumulator has been reached, the speed controller is set to 0%. After waiting 15 seconds, the pump is stopped. After waiting an additional 60 seconds, the fill valve is closed. The new accumulator level is then logged. If the Unit is in Mode 1 or 2, or Mode 3 with RCS pressure > 1000 psig, then a new sample is taken and boron concentration is verified, within 6 hours after each solution volume increase of $\geq$ 50% increase of indicated level.

Though sampling is required by Tech Spec SR 3.5.1.4 only when the source of makeup is not from the RWST, Accumulator level changes are logged and samples are taken regardless of makeup source to maintain a permanent record of all additions.

An accumulator may be drained to either the RWST or to the Primary Drain Transfer Tank. To drain to the Primary Drain Transfer Tank, the appropriate drain valve is opened and then closed when the desired accumulator level has been reached. To drain to the RWST, the accumulator test line containment isolation trip valves are opened and then the appropriate accumulator test line isolation valve is opened. The test line isolation and trip valves are closed when the desired level has been reached.

An accumulator is pressurized using the nitrogen supply header. The accumulator nitrogen header supply valve controller is placed at 0% output (closed). The nitrogen supply containment isolation trip valve is opened and the controller output is slowly increased. The appropriate accumulator nitrogen supply/vent valve is opened and accumulator pressure is allowed to increase. When the desired accumulator pressure has been reached, the accumulator nitrogen supply/vent valve is closed, as is the nitrogen supply containment isolation trip valve. The accumulator nitrogen header supply valve controller output is set to 100%.

To vent an accumulator the nitrogen header supply valve controller is placed at 0% output (closed). The nitrogen supply containment isolation trip valve is closed and the accumulator vent header controller is set to 0% (closed). The OPEN pushbutton for the accumulator vent header is pressed and then the accumulator vent header containment isolation trip valve is opened. The appropriate accumulator nitrogen supply/vent valve is opened and the controller output is slowly increased, allowing accumulator pressure to decrease. When accumulator pressure has decreased to the desired pressure, then the controller output is set to 0% and the accumulator vent/supply valve is closed. The accumulator vent header containment isolation trip valve is closed and the CLOSE pushbutton for accumulator vent header is pushed.

When recirculating the Accumulator, within 6 hours after each solution volume increase of $\geq$ 50% increase of indicated level, the boron concentration of the Accumulator is verified. Though not required by Tech Spec SR 3.5.1.4 when recirculating to the RWST, Accumulator level changes are logged regardless of makeup source to maintain a permanent record of all additions. IF samples are taken, analyzed and reported hourly, THEN the requirement can not be violated. Only one Accumulator may be recirculated at a time. Do not allow the Accumulator level to decrease to below the Low Level alarm setpoint of 55 percent, or increase to above the High Level alarm setpoint of 71.2 percent. Do not allow the RWST level to increase to above the High Level alarm setpoint of 98.5 percent, or to decrease to below the Level Below Norm alarm setpoint of 96.7 percent.

The gas spaces of accumulators are not to be cross-connected in Modes 1 through 3 because during a large break LOCA, nitrogen pressure in the cross-connected SI accumulator is postulated to bleed off through the faulted loop accumulator. As a result, the nitrogen pressure in the cross-connected accumulator may be less than that assumed in the Accident Analysis.

IF there is in-leakage from the RCS, THEN the boron concentration in the piping between the SI Accumulator discharge check valves may be less than the Tech Spec SR 3.5.1.4 minimum boron concentration requirement of 2500 ppm. As described in Tech Spec Design Bases for SR 3.5.1.4, the minimum boron concentration requirement of 2500 ppm does not apply to this run of piping and a boron concentration less than 2500 ppm is acceptable. **(Reference 2.4.5)**

When pressurizing an accumulator following maintenance, care must be taken to prevent violation of Tech Spec 3.4.12, Low Temperature Overpressure Protection (LTOP) System. To prevent violation of the Tech Spec, the procedure has two barriers, first is a verification that NDT protection is NOT required. Additionally the Accumulator(s) to be pressurized are isolated and power is removed from the valve operator.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR Section 6.3.2.1.1, Accumulators

2.2 Technical Specifications

2.2.1 Tech Spec 3.4.12, Low Temperature Overpressure Protection (LTOP) System

2.2.2 Tech Spec 3.5.1, Accumulators

2.2.3 Tech Spec SR 3.5.1.2, Accumulator volume

2.2.4 Tech Spec SR 3.5.1.3, Accumulator pressure

2.2.5 Tech Spec SR 3.5.1.4, Accumulator boron concentration

2.2.6 Tech Spec 3.6.3, Containment Isolation Valves

2.2.7 TRM TR 4.1, Table 4.1-2, Unit 2 Containment Isolation Valves

2.3 Technical References

2.3.1 Drawings 12050-FM-96A and 96B, Safety Injection System

2.3.2 2-LOG-4B, Accumulator Log

2.3.3 DCP 85-24, Containment Nitrogen Supply Header Valve Addition

2.3.4 RCM Recommendation MNSLSW01

2.3.5 This procedure is referenced by the Abnormal Procedures listed below:

- 2-AP-17, Shutdown LOCA
- 2-AP-24.1, Shutdown Steam Generator Tube Leak

2.3.6 This procedure is referenced by the Emergency Procedures listed below:

- 2-E-1, Loss of Reactor Or Secondary Coolant
- 2-ECA-1.1, Loss of Emergency Coolant Recirculation
- 2-ECA-2.1, Uncontrolled Depressurization Of All Steam Generators
- 2-ECA-3.1, SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired
- 2-ECA-3.2, SGTR With Loss Of Reactor Coolant - Saturated Recovery Desired
- 2-ECA-3.3, SGTR Without Pressurizer Pressure Control
- 2-ES-0.2A, Natural Circulation Cooldown With CRDM Fans
- 2-ES-0.2B, Natural Circulation Cooldown Without CRDM Fans
- 2-ES-0.3, Natural circulation Cooldown With Steam Void In Vessel (With RVLIS)
- 2-ES-0.4, Natural Circulation Cooldown With Steam Void In Vessel (Without RVLIS)
- 2-ES-1.2, Post-LOCA Cooldown and Depressurization
- 2-ES-3.1, Post-SGTR Cooldown Using Backfill
- 2-ES-3.2, Post-SGTR Cooldown using Blowdown
- 2-ES-3.3, Post-SGTR Cooldown Using Steam Dump
- 2-FR-C.1, Response to Inadequate Core Cooling
- 2-FR-C.2, Response to Degraded Core Cooling
- 2-FR-H.1, Response to Loss of Secondary Heat Sink
- 2-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition

2.3.7 DCP 95-114, Nitrogen System Pressure Change

2.3.8 DCP 97-135, Accumulator Sample Line Upgrade

2.3.9 DCP 00-112, Loop Isolation Valve - Removal of Disc Pressurization Piping/NAPS/Unit 2

2.4 Commitment Documents

2.4.1 DR N-92-1843, Valves opened without establishing administrative controls

2.4.2 CTS 02-94-1207-002, Safety Injection Accumulator Boron Concentration Level Less Than Technical Specification Limits for Greater Than Four Hours

2.4.3 DR N-96-782, Cross connecting of SI accumulators Concern

2.4.4 CTS Assignment 02-96-2202, Commitment 002, Operation with Cross-Connected SI Accumulators North Anna Power Station Units 1 and 2

2.4.5 CTS Assignment 02-98-1808, Commitment 004, Technical Specification Change Request 352A, Safety Injection (SI) Accumulator Boron Concentration Verification

2.4.6 DR N-99-0332, Loss of Accumulator N_2 Pressure

2.4.7 CTS Assignment 02-88-2275, Commitment 001, SERR 87-N-HPES-87-144, Revision 1

2.4.8 CA187276 and CR405180, 1-SI-P-2 Hydro Test Pump Was Operated With Suction Valve Closed

Init **Verif**

3.0 INITIAL CONDITIONS

______ 3.1 Review the equipment status to check station configuration supports the performance of this procedure.

______ 3.2 RWST boron concentration is between 2600 and 2800 ppm boron for the RWST to be used.

______ 3.3 WHEN Unit 2 is in Mode 1 or 2, or Mode 3 with RCS pressure > 1000 psig, THEN RWST level is between 96 and 99 percent.

______ 3.4 IF the Safety Injection Accumulators will be filled, THEN obtain an Admin key for 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve.

3.5 IF pressurizing Safety Injection Accumulators using Subsections 5.4, 5.8 or 5.10, THEN ensure that an adequate source of Nitrogen is available to provide greater than 667 psig N_2 to the SI Accumulators, from any of the following sources: **(Reference 2.4.6)**

- ______ Liquid Nitrogen System
- ______ Nitrogen Tube Trailer(s)
- ______ Nitrogen bottles in the Primary Plant Gas House

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Comply with the following guideline when marking steps N/A:

- ______ IF the conditional requirements of a step do not require the action to be performed, THEN mark the step N/A.
- ______ IF any other step is marked N/A, THEN have the SRO (or designee) approve the N/A and justify the N/A on the Procedure Cover Sheet.

______ 4.2 Ensure the boron concentration limits of Tech Spec SR 3.5.1.4 are maintained for each accumulator.

______ 4.3 To prevent lifting of the Hydro Test Pump Relief Valve, allow a 60 second coast down before isolating the discharge flow path.

______ 4.4 The Hydro Test Pump suctions from Unit 1 and 2 RWSTs MUST NOT be open at the same time.

______ 4.5 Before draining an SI Accumulator, check sufficient volume exists in the RWST.

______ 4.6 IF in Mode 1 or 2, or Mode 3 with RCS pressure >1000 psig AND the cumulative change of indicated accumulator level is $\geq$ 50% after a filling operation, THEN sampling and verification of boron concentration accumulator solution is required within 6 hours. Though sampling is required by Tech Spec SR 3.5.1.4 only when the source of makeup is not from the RWST, Accumulator level changes are logged and samples are taken regardless of makeup source to maintain a permanent record of all additions.

______ 4.7 WHEN 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is open in Mode 1, 2, 3, OR 4, THEN an Operator MUST remain in the immediate area in order to close 2-SI-47 quickly if containment isolation becomes necessary for Tech Spec 3.6.3 and TRM TR 4.1. **(Reference 2.4.1)**

______ 4.8 IF Nitrogen system header pressure becomes too low, THEN the Liquid Nitrogen system pump will lock out and must be manually reset.

4.9 WHEN recirculating the Accumulator, THEN the following precautions apply:

______ • Within 6 hours after each solution volume increase of $\geq$50% increase of indicated level, the boron concentration of the Accumulator is verified. Though not required by Tech Spec SR 3.5.1.4 when recirculating to the RWST, Accumulator level changes are logged and samples are taken regardless of makeup source to maintain a permanent record of all additions.

______ • Only one Accumulator may be recirculated at a time.

______ • Do not allow the Accumulator level to decrease to below the Low Level alarm setpoint of 55 percent, or increase to above the High Level alarm setpoint of 71.2 percent.

______ • Do not allow the RWST level to increase to above the High Level alarm setpoint of 98.5 percent, or to decrease to below the Level Below Norm alarm setpoint of 96.7 percent.

______ • The Unit 2 RWST must be used as a suction for 1-SI-P-2.

______ 4.10 Do not cross-connect the accumulator gas spaces in Modes 1 through 3. During a large break LOCA, Nitrogen pressure in the cross-connected SI accumulator could bleed off through the faulted loop accumulator. As a result, the nitrogen pressure in the cross-connected accumulator may be less than that assumed in the Accident Analysis. **(References 2.4.3 and 2.4.4)**

______ 4.11 IF 2-SI-RV-204, Unit 2 Accumulator Test Line Relief Valve, lifts during the performance of this procedure, THEN promptly notify the Control Room to close the containment Trip Valves 2-SI-TV-2842 and 2-SI-TV-2859 to prevent high temperature water from reaching SFGDs.

______ 4.12 Section 5.8, Pressurizing SI Accumulators To 600 psig Or Greater Following Maintenance, can only be performed when the Unit is in Mode 5, 6, or Defueled AND NDT protection is NOT required. Thus the SI Accumulator pressure restriction associated Tech Spec 3.4.12, Low Temperature Overpressure Protection (LTOP) System, is not applicable. **(Reference 2.4.7)**

______ 4.13 The cross-connection of the liquid space of SI Accumulator to the liquid space of another SI Accumulator is NOT allowed.

5.0 INSTRUCTIONS

5.1 Filling Safety Injection Accumulators

______ 5.1.1 Check Initial Conditions are satisfied.

______ 5.1.2 Review Precautions and Limitations.

CAUTION

WHEN 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is open in Mode 1, 2, 3, OR 4, THEN an Operator MUST remain in the immediate area in order to close 2-SI-47 quickly if containment isolation becomes necessary. **(Reference 2.4.1)**

5.1.3 Align 2-QS-TK-1, Refueling Water Storage Tank, as the water source for 1-SI-P-2, Hydro Test Pump, as follows:

______ a. Ensure 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed.

______ b. Ensure 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed.

______ c. Open 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

______ d. Open 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

______ e. Open 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

______ f. Unlock and open 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve.

g. Independently verify the following lineup: **(Reference 2.4.8)**

______ IV
- 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed

______ IV
- 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed

______ IV
- 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve, is open

______ IV
- 1-SI-50, Hydro Test Pump Suction Header Isolation Valve, is open

______ IV
- 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve, is open

______ IV
- 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is unlocked and open

5.1.4 Have local operator check 1-SI-P-2 Hydro Test Pump to check:

______ a. Cooling tank sight glass does NOT indicate low level.

______ b. Pump oil sight glass does NOT indicate low level. **(Reference 2.3.4)**

______ 5.1.5 Check Unit 1 Panel G-G5, HYDRO TEST PP STUFFING BOX RESERVOIR LO LEVEL, is NOT LIT. **(Reference 2.3.4)**

______ 5.1.6 IF in Mode 1 or 2, or Mode 3 with RCS pressure > 1000 psig, THEN record the initial level(s) of the accumulator(s) to be filled in the table in Attachment 1, Accumulator Level Addition Data Tables, Section 1.

CAUTION

DO NOT fill more than ONE SI Accumulator at a time. The cross-connection of the liquid space of SI Accumulator to the liquid space of another SI Accumulator is NOT allowed.

5.1.7 Do the following to align the accumulator(s) to be filled. Mark accumulator(s) not to be filled N/A.

______ • IF 2-SI-TK-1A, Safety Injection Accumulator 1A, is to be filled, THEN open 2-SI-HCV-2851A, A SI ACCUMULATOR MAKEUP LINE ISOL.

______ • IF 2-SI-TK-1B, Safety Injection Accumulator 1B, is to be filled, THEN open 2-SI-HCV-2851B, B SI ACCUMULATOR MAKEUP LINE ISOL.

______ • IF 2-SI-TK-1C, Safety Injection Accumulator 1C, is to be filled, THEN open 2-SI-HCV-2851C, C SI ACCUMULATOR MAKEUP LINE ISOL.

______ 5.1.8 Set 1-SI-HIC-1947, HYDRO TEST PP SPEED CONT, to 0 percent output.

______ 5.1.9 Start 1-SI-P-2, HYDRO TEST PUMP.

______ 5.1.10 Operate 1-SI-HIC-1947 as desired to regulate pump capacity.

CAUTION

IF accumulator pressure rises excessively during filling, THEN the accumulator must be vented to the Gaseous Waste System using Subsection 5.5, Venting Safety Injection Accumulators.

5.1.11 WHEN the accumulator being filled reaches the desired level(s), THEN do the following:

______ a. Set 1-SI-HIC-1947 to 0 percent output.

______ b. Wait 15 seconds for the Speed Changer Motor to reduce the speed.

______ c. Stop 1-SI-P-2.

______ d. Wait 60 seconds for 1-SI-P-2 to stop.

5.1.12 Do the following for the accumulator(s) just filled. Mark Accumulators not filled N/A:

______ ______ IV
- IF 2-SI-TK-1A was just filled, THEN close 2-SI-HCV-2851A, A SI ACCUMULATOR MAKEUP LINE ISOL.

______ ______ IV
- IF 2-SI-TK-1B was just filled, THEN close 2-SI-HCV-2851B, B SI ACCUMULATOR MAKEUP LINE ISOL.

______ ______ IV
- IF 2-SI-TK-1C was just filled, THEN close 2-SI-HCV-2851C, C SI ACCUMULATOR MAKEUP LINE ISOL.

______ 5.1.13 IF in Mode 1 or 2, or Mode 3 with RCS pressure > 1000 psig, THEN record the final level(s) of the accumulator(s) just filled in the table in Attachment 1, Section 1.

______ 5.1.14 IF desired to fill another SI Accumulator, THEN perform Steps 5.1.6 through 5.1.13.

______ ______ IV 5.1.15 Close and lock 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve. **(Reference 2.4.1)**

______ ______ IV 5.1.16 Close 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

______ ______ IV 5.1.17 Close 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

______ ______ IV 5.1.18 Close 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

5.1.19 IF in Mode 1 or 2, or Mode 3 with RCS pressure > 1000 psig, THEN do the following:

______ a. Determine the accumulator addition by subtracting percentages recorded in the table in Attachment 1, Section 1.

______ b. Complete 2-LOG-4B, Accumulator Log.

______ IV c. Have an qualified individual independent verify the calculations in 2-LOG-4B, Accumulator Log.

CAUTION

IF the Accumulator requires sampling in accordance with 2-LOG-4B, THEN sample results are required within 6 hours in accordance with Tech Spec SR 3.5.1.4. IF the Accumulator Boron concentration is NOT 2500 to 2800 ppm, THEN the Action Statement of Tech Spec 3.5.1 applies.

______ d. IF 2-LOG-4B requires sampling an accumulator, THEN immediately notify Chemistry to sample the accumulator.

______ e. IF samples were taken, THEN record sampling results below. Mark Accumulators not sampled N/A:

Accumulator Tank	**Sample ppm**
2-SI-TK-1A, Safety Injection Accumulator 1A	
2-SI-TK-1B, Safety Injection Accumulator 1B	
2-SI-TK-1C, Safety Injection Accumulator 1C	

Completed by: ______________________________ Date: __________

5.2 Draining Safety Injection Accumulators to the Primary Drain Transfer Tank

______ 5.2.1 Check Initial Conditions are satisfied.

______ 5.2.2 Review Precautions and Limitations.

______ 5.2.3 Establish communications with the Control Room.

NOTE: All locally operated manual valves referenced in this Section are located inside containment.

5.2.4 IF desired to drain 2-SI-TK-1A, Safety Injection Accumulator 1A, THEN do the following:

______ a. Open 2-SI-HCV-2852A, A SI ACCUMULATOR DRAIN ISOLATION.

______ b. Throttle open 2-SI-147, 1A SI Accum To Prim Drain Transfer Tank Isol Valve, as required to establish desired drain rate.

NOTE: IF in Mode 1-3, THEN Accumulator level should not be reduced below 56%.

______ c. WHEN the desired level is reached, THEN close 2-SI-HCV-2852A.

______ ______ d. Close 2-SI-147.
IV

5.2.5 IF desired to drain 2-SI-TK-1B, Safety Injection Accumulator 1B, THEN do the following:

______ a. Open 2-SI-HCV-2852B, B SI ACCUMULATOR DRAIN ISOLATION.

______ b. Throttle open 2-SI-164, 1B SI Accum To Prim Drain Transfer Tank Isol Valve, as required to establish desired drain rate.

NOTE: IF in Mode 1-3, THEN Accumulator level should not be reduced below 56%.

______ c. WHEN the desired level is reached, THEN close 2-SI-HCV-2852B.

______ ______ IV d. Close 2-SI-164.

5.2.6 IF desired to drain 2-SI-TK-1C, Safety Injection Accumulator 1C, THEN do the following:

______ a. Open 2-SI-HCV-2852C, C SI ACCUMULATOR DRAIN ISOLATION.

______ b. Throttle open 2-SI-181, 1C SI Accum To Prim Drain Transfer Tank Isol Valve, as required to establish desired drain rate.

NOTE: IF in Mode 1-3, THEN Accumulator level should not be reduced below 56%.

______ c. WHEN the desired level is reached, THEN close 2-SI-HCV-2852C.

______ ______ IV d. Close 2-SI-181.

Completed by: ____ Date: __________

5.3 Draining Safety Injection Accumulators to the RWST

______ 5.3.1 Check Initial Conditions are satisfied.

______ 5.3.2 Review Precautions and Limitations.

NOTE: All locally operated manual valves referenced in this Section are located inside containment.

______ 5.3.3 Open 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ 5.3.4 Open 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

5.3.5 IF 2-SI-TK-1A is to be drained, THEN do the following:

a. IF 2-SI-MOV-2865A, A SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is closed, THEN do the following valve line-up:

______ 1. Ensure 2-SI-HCV-2852A, A SI ACCUMULATOR DRAIN ISOLATION, is closed.

______ 2. Close 2-SI-149, 1A SI Accum Check Valve 2-SI-151 Leak Test Isol.

______ 3. Open 2-SI-147, 1A SI Accum To Prim Drain Transfer Tank Isol Valve.

______ 4. Open 2-SI-225, 2-SI-MOV-2865A Bypass Valve.

______ 5. IF desired, THEN throttle 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve, to control drain rate.

b. IF RCS pressure is ≥ 1000 psi, THEN do the following:

______ 1. Station an operator in Safeguards to observe 2-SI-RV-204.

______ 2. IF 2-SI-RV-204 lifts, THEN immediately notify the OATC to close 2-SI-TV-2842 and 2-SI-TV-2859.

______ c. Open 2-SI-HCV-2850A, A SI ACCUMULATOR SAMPLE ISOL.

______ d. WHEN the desired level is reached, THEN close 2-SI-HCV-2850A.

5.3.6 IF 2-SI-TK-1B is to be drained, THEN do the following:

a. IF 2-SI-MOV-2865B, B SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is closed, THEN do the following valve line-up:

______ 1. Ensure 2-SI-HCV-2852B, B SI ACCUMULATOR DRAIN ISOLATION, is closed.

______ 2. Close 2-SI-166, 1B SI Accum Check Valve 2-SI-168 Leak Test Isol.

______ 3. Open 2-SI-164, 1B SI Accum To Prim Drain Transfer Tank Isol Valve.

______ 4. Open 2-SI-220, 2-SI-MOV-2865B Bypass Valve.

______ 5. IF desired, THEN throttle 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve, to control drain rate.

b. IF RCS pressure is ≥ 1000 psi, THEN do the following:

______ 1. Station an operator in Safeguards to observe 2-SI-RV-204.

______ 2. IF 2-SI-RV-204 lifts, THEN immediately notify the OATC to close 2-SI-TV-2842 and 2-SI-TV-2859.

______ c. Open 2-SI-HCV-2850C, B SI Accumulator Sample Isolation.

______ d. WHEN the desired level is reached, THEN close 2-SI-HCV-2850C.

5.3.7 IF 2-SI-TK-1C is to be drained, THEN do the following:

a. IF 2-SI-MOV-2865C, C SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is closed, THEN do the following valve line-up:

______ 1. Ensure 2-SI-HCV-2852C, C SI ACCUMULATOR DRAIN ISOLATION, is closed.

______ 2. Close 2-SI-183, 1C SI Accum Check Valve 2-SI-185 Leak Test Isol.

______ 3. Open 2-SI-181, 1C SI Accum To Prim Drain Transfer Tank Isol Valve.

______ 4. Open 2-SI-222, 2-SI-MOV-2865C Bypass Valve.

______ 5. IF desired, THEN throttle 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve, to control drain rate.

b. IF RCS pressure is ≥ 1000 psi, THEN do the following:

______ 1. Station an operator in Safeguards to observe 2-SI-RV-204.

______ 2. IF 2-SI-RV-204 lifts, THEN immediately notify the OATC to close 2-SI-TV-2842 and 2-SI-TV-2859.

______ c. Open 2-SI-HCV-2850E, C SI ACCUMULATOR SAMPLE ISOLATION.

______ d. WHEN the desired level is reached, THEN close 2-SI-HCV-2850E.

5.3.8 Do the following for the accumulator(s) just drained:

a. IF 2-SI-TK-1A was just drained AND 2-SI-MOV-2865A, A SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is closed, THEN do the following:

_______ _______ IV
1. Close 2-SI-147, 1A SI Accum To Prim Drain Transfer Tank Isol Valve.

_______ _______ IV
2. Close 2-SI-225, 2-SI-MOV-2865A Bypass Valve.

_______ _______ IV
3. Open 2-SI-149, 1A SI Accum Check Valve 2-SI-151 Leak Test Isol.

b. IF 2-SI-TK-1B was just drained AND 2-SI-MOV-2865B, B SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is closed, THEN do the following:

_______ _______ IV
1. Close 2-SI-164, 1B SI Accum To Prim Drain Transfer Tank Isol Valve.

_______ _______ IV
2. Close 2-SI-220, 2-SI-MOV-2865B Bypass Valve.

_______ _______ IV
3. Open 2-SI-166, 1B SI Accum Check Valve 2-SI-168 Leak Test Isol.

c. IF 2-SI-TK-1C was just drained AND 2-SI-MOV-2865C, C SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is closed, THEN do the following:

_______ _______ IV
1. Close 2-SI-181, 1C SI Accum To Prim Drain Transfer Tank Isol Valve.

_______ _______ IV
2. Close 2-SI-222, 2-SI-MOV-2865C Bypass Valve.

_______ _______ IV
3. Open 2-SI-183, 1C SI Accum Check Valve 2-SI-185 Leak Test Isol.

_______ _______ IV
5.3.9 Close 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ ______
IV

5.3.10 Close 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

Completed by: ____ Date: _________

5.4 Pressurizing Safety Injection Accumulators

______ 5.4.1 Check Initial Conditions are satisfied.

______ 5.4.2 Review Precautions and Limitations.

______ 5.4.3 Place 2-SI-HIC-200, CNTMT NITROGEN SUPPLY HEADER, at 0 percent output.

NOTE: Liquid Nitrogen system pump should be started prior to initiating Nitrogen flow.

NOTE: To open 2-SI-TV-200, the pushbuttons on both the H Safeguards Panel (2-SI-TV-200A) AND the J Safeguards Panel (2-SI-TV-200B) must be used.

______ 5.4.4 Open 2-SI-TV-200, NITROGEN SUPPLY TO CNTMT.

______ 5.4.5 Slowly increase the output of 2-SI-HIC-200 to pressurize the accumulator supply header.

CAUTION

Do not cross-connect the accumulator gas spaces in Mode 3 or above. During a large break LOCA, nitrogen pressure in the cross-connected SI accumulator could bleed off through the faulted loop accumulator. As a result, the nitrogen pressure in the cross-connected accumulator may be less than that assumed in the Accident Analysis. **(References 2.4.3 and 2.4.4)**

5.4.6 Open N_2 valve for desired Accumulator (only 1 valve is allowed open at a time):

______ • IF 2-SI-TK-1A is to be pressurized, THEN open 2-SI-HCV-2853A, A SI ACCUMULATOR N2 SUPPLY VALVE.

______ • IF 2-SI-TK-1B is to be pressurized, THEN open 2-SI-HCV-2853B, B SI ACCUMULATOR N2 SUPPLY VALVE.

______ • IF 2-SI-TK-1C is to be pressurized, THEN open 2-SI-HCV-2853C, C SI ACCUMULATOR N2 SUPPLY VALVE.

NOTE: Maximum Accumulator Pressure is 667 psig.

5.4.7 WHEN the desired pressure has been reached, THEN do the following:

______ a. IF the N_2 System is aligned to supply the PORV N_2 accumulators, THEN place 2-SI-HIC-200 at zero percent output.

b. Do the following for the Accumulator just pressurized:

______ ______ IV • IF 2-SI-TK-1A was just pressurized, THEN close 2-SI-HCV-2853A, A SI ACCUMULATOR N2 SUPPLY VALVE.

______ ______ IV • IF 2-SI-TK-1B was just pressurized, THEN close 2-SI-HCV-2853B, B SI ACCUMULATOR N2 SUPPLY VALVE.

______ ______ IV • IF 2-SI-TK-1C was just pressurized, THEN close 2-SI-HCV-2853C, C SI ACCUMULATOR N2 SUPPLY VALVE.

______ c. IF desired to pressurize another accumulator, THEN return to Step 5.4.5.

NOTE: To close 2-SI-TV-200, the pushbutton on either the H Safeguards Panel (2-SI-TV-200A) or the J Safeguards Panel (2-SI-TV-200B) may be used. If desired, both pushbuttons may be used.

______ d. IF the Nitrogen System is NOT aligned to supply the PORV N_2 accumulators, THEN close 2-SI-TV-200, NITROGEN SUPPLY TO CNTMT.

______ e. IF the N_2 System is NOT aligned to supply the PORV N_2 accumulators, THEN increase the output of 2-SI-HIC-200 to 100 percent.

Completed by: ______________________________________ Date: __________

5.5 Venting Safety Injection Accumulators

______ 5.5.1 Check Initial Conditions are satisfied.

______ 5.5.2 Review Precautions and Limitations.

______ 5.5.3 Decrease the output of 2-SI-HIC-200, CNTMT NITROGEN SUPPLY HEADER, to 0 percent.

NOTE: To close 2-SI-TV-200, the pushbutton on either the H Safeguards Panel (2-SI-TV-200A) or the J Safeguards Panel (2-SI-TV-200B) may be used. If desired, both pushbuttons may be used.

______ 5.5.4 IF the Nitrogen System is NOT aligned to supply the PORV N_2 accumulators, THEN close 2-SI-TV-200, NITROGEN SUPPLY TO CNTMT.

______ 5.5.5 Decrease the output of 2-SI-HIC-2936, SI ACCUM NITROGEN VENT TO GW, to zero percent.

______ 5.5.6 Push the OPEN button for 2-SI-HCV-2936, SI ACCUM NITROGEN VENT TO GW.

______ 5.5.7 Open 2-SI-TV-201, SI ACCUM NITROGEN VENT TO GW.

CAUTION

Accumulators should be vented slowly to prevent pressurizing the process vent system, which may result in the spread of contamination due to back flowing the dilution air filter.

5.5.8 IF 2-SI-TK-1A is to be vented, THEN do the following:

______ a. Open 2-SI-HCV-2853A, A SI Accumulator N2 Supply Valve.

______ b. Raise the output of 2-SI-HIC-2936, SI ACCUM NITROGEN VENT TO GW, to lower pressure in the accumulator.

______ c. WHEN the desired pressure is reached, THEN lower the output of 2-SI-HIC-2936 to zero percent.

______ ______ IV d. Close 2-SI-HCV-2853A.

5.5.9 IF 2-SI-TK-1B is to be vented, THEN do the following:

______ a. Open 2-SI-HCV-2853B, B SI Accumulator N2 Supply Valve.

______ b. Raise the output of 2-SI-HIC-2936, SI ACCUM NITROGEN VENT TO GW, to lower pressure in the accumulator.

______ c. WHEN the desired pressure is reached, THEN lower the output of 2-SI-HIC-2936 to zero percent.

______ ______ IV d. Close 2-SI-HCV-2853B.

5.5.10 IF 2-SI-TK-1C is to be vented, THEN do the following:

______ a. Open 2-SI-HCV-2853C, C SI Accumulator N2 Supply Valve.

______ b. Raise the output of 2-SI-HIC-2936, SI ACCUM NITROGEN VENT TO GW, to lower pressure in the accumulator.

______ c. WHEN the desired pressure is reached, THEN lower the output of 2-SI-HIC-2936 to zero percent.

______ ______ IV d. Close 2-SI-HCV-2853C.

______ ______ IV 5.5.11 Close 2-SI-TV-201, SI ACCUM NITROGEN VENT TO GW.

______ 5.5.12 Push the CLOSE button for 2-SI-HCV-2936, SI ACCUM NITROGEN VENT TO GW.

______ 5.5.13 IF the N_2 System is NOT aligned to supply the PORV N_2 accumulators, THEN increase the output of 2-SI-HIC-200 to 100 percent.

Completed by: ____ Date: _________

5.6 Recirculating B SI Accumulator for Boron Concentration Adjustment (RCS Pressure > 1000 psig)

______ 5.6.1 Check Initial Conditions are satisfied.

______ 5.6.2 Review Precautions and Limitations.

5.6.3 Check the following:

______ a. RCS pressure is greater than 1000 psig.

______ b. 2-SI-MOV-2865B, B SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is open.

5.6.4 Ensure that the following valves are closed:

______ • 2-SI-53, SI Accum Test Line to Safeguards Sump Isol Vv

______ • 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve

______ 5.6.5 Close 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

______ 5.6.6 Ensure valve 2-SI-54, SI Accum Test To RWST 2-SI-PI-2942 Isol Valve, is open.

CAUTION

Only one Accumulator may be recirculated at a time.

NOTE: Actual draining/filling of 2-SI-TK-1B will begin in Step 5.6.9.

5.6.7 Prepare for draining 2-SI-TK-1B as follows:

______ a. Open 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ b. Open 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

______ c. Open 2-SI-HCV-2850C, B SI ACCUMULATOR SAMPLE ISOLATION.

5.6.8 Prepare for filling 2-SI-TK-1B as follows:

CAUTION

WHEN 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is open in Mode 1, 2, 3, OR 4, THEN an Operator MUST remain in the immediate area in order to close 2-SI-47 quickly if containment isolation becomes necessary. **(Reference 2.4.1)**

a. Align 2-QS-TK-1, Refueling Water Storage Tank, as the water source for 1-SI-P-2, Hydro Test Pump, as follows:

______ 1. Ensure 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed.

______ 2. Ensure 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed.

______ 3. Open 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

_______ 4. Open 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

_______ 5. Open 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

_______ 6. Unlock and open 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve.

b. Independently verify the following lineup: **(Reference 2.4.8)**

- _______ IV — 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed
- _______ IV — 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed
- _______ IV — 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve, is open
- _______ IV — 1-SI-50, Hydro Test Pump Suction Header Isolation Valve, is open
- _______ IV — 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve, is open
- _______ IV — 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is unlocked and open

_______ c. Have the Local Operator check the cooling tank sight glass for 1-SI-P-2, Hydro Test Pump, does not indicate a low level. **(Reference 2.3.4)**

_______ d. Check Unit 1 Panel G-G5, HYDRO TEST PP STUFFING BOX RESERVOIR LO LEVEL, is <u>NOT</u> LIT. **(Reference 2.3.4)**

______ e. Open 2-SI-HCV-2851B, B SI ACCUMULATOR MAKEUP LINE ISOL, for 2-SI-TK-1B.

______ f. Set 1-SI-HIC-1947, HYDRO TEST PP SPEED CONT, to 0 percent output.

CAUTION

- Accumulator level MUST be maintained between the Low Level alarm setpoint of 55 percent and the High Level alarm setpoint of 71.2 percent.
- Do not allow the RWST level to increase to above the High Level alarm setpoint of 98.5 percent, or to decrease to below the Level Below Norm alarm setpoint of 96.7 percent.
- IF 2-SI-RV-204, Unit 2 Accumulator Test Line Relief Valve, lifts during the performance of this procedure, THEN prompt notification of the OATC should be done to close the containment Trip Valves 2-SI-TV-2842 and 2-SI-TV-2859 to prevent high temperature water from reaching SFGDs.

5.6.9 Simultaneously do the following:

______ a. Throttle 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve, to establish 4 gpm as indicated on 2-SI-FI-2942, SI Accum Test Line To RWST Flow Indicator (2-SI-458, Unit 2 Accumulator Test Line Throttle Valve, should be set to flow 5 gpm with its isolation valves full open).

b. Do the following for 1-SI-P-2, Hydro Test Pump, to maintain Accumulator level stable between 55% and 71% indicated level:

______ 1. Start and stop 1-SI-P-2, HYDRO TEST PUMP, as required.

______ 2. Operate 1-SI-HIC-1947 as desired to regulate pump capacity.

______ 5.6.10 Check that the other two Accumulator levels are stable.

CAUTION

Within 6 hours after each solution volume increase of ≥ 50% increase of indicated level, the boron concentration of the Accumulator is verified. Though not required by Tech Spec SR 3.5.1.4 when recirculating to the RWST, Accumulator level changes are logged and samples are taken regardless of makeup source to maintain a permanent record of all additions.

NOTE: Completion of Steps 5.6.11 through 5.6.13 are to be indicated by initialing on Attachment 2, Accumulator Recirc Sample Step Completion Sheet.

NOTE: The Accumulator to be sampled will be listed on Attachment 2, Accumulator Recirc Sample Step Completion Sheet.

5.6.11 Have Chemistry Department sample, analyze, and report the Accumulator boron concentration hourly as follows:

______ a. Throttle open 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve, and purge 200 to 400 ml to funnel.

______ b. Obtain sample in labeled sample bottle.

______ ______ IV c. Close 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve.

______ 5.6.12 Record sample results on 2-LOG-4B, Accumulator Level Additions.

______ 5.6.13 Ensure that sample results show that Accumulator boron concentration is changing in the desired direction.

5.6.14 WHEN the desired Accumulator boron concentration is obtained, THEN do the following:

______ a. Ensure Accumulator level for 2-SI-TK-1B is stable between 55% and 71% indicated level.

______ b. Close 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

c. Stop 1-SI-P-2 as follows:

______ 1. Set 1-SI-HIC-1947 to 0 percent output.

______ 2. Wait 15 seconds for the Speed Changer Motor to reduce the speed.

______ 3. Stop 1-SI-P-2.

______ 4. Wait 60 seconds for 1-SI-P-2 to stop.

5.6.15 Secure the drain lineup as follows:

______ a. Close 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ b. Close 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

______ c. Close 2-SI-HCV-2850C, B SI ACCUMULATOR SAMPLE ISOLATION.

______ ______ IV d. Open 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

5.6.16 Secure the fill lineup as follows:

______ a. Close 2-SI-HCV-2851B, B SI Accumulator Makeup Line Isol.

______ b. Close and lock 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve. **(Reference 2.4.1)**

______ ______ IV c. Close 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

______ ______ IV d. Close 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

______ ______
IV

e. Close 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

______

5.6.17 Have Chemistry Department obtain a final boron concentration sample using the appropriate Chemistry procedure, and record the sample results on 2-LOG-4B, Accumulator Level Additions.

5.6.18 Ensure that the following Accumulator parameters are satisfactory:

______ • Level

______ • Pressure

______ • Boron concentration

Completed by: ____ Date: _________

5.7 Recirculating A SI Accumulator for Boron Concentration Adjustment (RCS Pressure > 1000 psig)

______ 5.7.1 Check Initial Conditions are satisfied.

______ 5.7.2 Review Precautions and Limitations.

5.7.3 Check the following:

______ a. RCS pressure is greater than 1000 psig.

______ b. 2-SI-MOV-2865A, A SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is open.

5.7.4 Ensure that the following valves are closed:

______ • 2-SI-53, SI Accum Test Line to Safeguards Sump Isol Vv

______ • 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve

______ 5.7.5 Close 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

______ 5.7.6 Ensure valve 2-SI-54, SI Accum Test To RWST 2-SI-PI-2942 Isol Valve, is open.

CAUTION

Only one Accumulator may be recirculated at a time.

NOTE: Actual draining/filling of 2-SI-TK-1A will begin in Step 5.7.9.

5.7.7 Prepare for draining 2-SI-TK-1A as follows:

______ a. Open 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ b. Open 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

______ c. Open 2-SI-HCV-2850A, A SI ACCUMULATOR SAMPLE ISOLATION.

5.7.8 Prepare for filling 2-SI-TK-1A as follows:

CAUTION

<u>WHEN</u> 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is open in Mode 1, 2, 3, <u>OR</u> 4, <u>THEN</u> an Operator <u>MUST</u> remain in the immediate area in order to close 2-SI-47 quickly if containment isolation becomes necessary. **(Reference 2.4.1)**

a. Use 2-QS-TK-1, Refueling Water Storage Tank, as the water source for 1-SI-P-2, Hydro Test Pump, as follows:

______ 1. Ensure 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed.

______ 2. Ensure 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed.

______ 3. Open 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

_______ 4. Open 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

_______ 5. Open 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

_______ 6. Unlock and open 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve.

b. Independently verify the following lineup: **(Reference 2.4.8)**

_______ IV
- 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed

_______ IV
- 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed

_______ IV
- 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve, is open

_______ IV
- 1-SI-50, Hydro Test Pump Suction Header Isolation Valve, is open

_______ IV
- 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve, is open

_______ IV
- 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is unlocked and open

_______ c. Have the Local Operator check the cooling tank sight glass for 1-SI-P-2, Hydro Test Pump, does not indicate a low level. **(Reference 2.3.4)**

_______ d. Check Unit 1 Panel G-G5, HYDRO TEST PP STUFFING BOX RESERVOIR LO LEVEL, is NOT LIT. **(Reference 2.3.4)**

______ e. Open 2-SI-HCV-2851A, A SI ACCUMULATOR MAKEUP LINE ISOL, for 2-SI-TK-1A.

______ f. Set 1-SI-HIC-1947, HYDRO TEST PP SPEED CONT, to 0 percent output.

CAUTION

- Accumulator level MUST be maintained between the Low Level alarm setpoint of 55 percent and the High Level alarm setpoint of 71.2 percent.
- Do not allow the RWST level to increase to above the High Level alarm setpoint of 98.5 percent, or to decrease to below the Level Below Norm alarm setpoint of 96.7 percent.
- IF 2-SI-RV-204, Unit 2 Accumulator Test Line Relief Valve, lifts during the performance of this procedure, THEN prompt notification of the OATC should be done to close the containment Trip Valves 2-SI-TV-2842 and 2-SI-TV-2859 to prevent high temperature water from reaching SFGDs.

5.7.9 Simultaneously do the following:

______ a. Throttle 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve, to establish 4 gpm as indicated on 2-SI-FI-2942, SI Accum Test Line To RWST Flow Indicator (2-SI-458, Unit 2 Accumulator Test Line Throttle Valve, should be set to flow 5 gpm with its isolation valves full open).

b. Do the following for 1-SI-P-2, Hydro Test Pump, to maintain Accumulator level stable between 55% and 71% indicated level:

______ 1. Start and stop 1-SI-P-2, HYDRO TEST PUMP, as required.

______ 2. Operate 1-SI-HIC-1947 as desired to regulate pump capacity.

______ 5.7.10 Check that the other two Accumulator levels are stable.

CAUTION

Tech Spec SR 3.5.1.4 requires verification of boron concentration once within 6 hours after each solution volume increase of $\geq$ 50% level that is not the result of addition from the RWST. IF samples are taken, analyzed and reported hourly, THEN the TS can not be violated.

NOTE: Completion of Steps 5.7.11 through 5.7.13 are to be indicated by initialing on Attachment 2, Accumulator Recirc Sample Step Completion Sheet.

NOTE: The Accumulator to be sampled will be listed on Attachment 2, Accumulator Recirc Sample Step Completion Sheet.

5.7.11 Have Chemistry Department sample, analyze, and report the Accumulator boron concentration hourly as follows:

______ a. Throttle open 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve, and purge 200 to 400 ml to funnel.

______ b. Obtain sample in labeled sample bottle.

______ ______ IV c. Close 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve.

______ 5.7.12 Record sample results on 2-LOG-4B, Accumulator Level Additions.

______ 5.7.13 Ensure that sample results show that Accumulator boron concentration is changing in the desired direction.

5.7.14 WHEN the desired Accumulator boron concentration is obtained, THEN do the following:

______ a. Ensure Accumulator level for 2-SI-TK-1A is stable between 55% and 71% indicated level.

______ b. Close 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

c. Stop 1-SI-P-2 as follows:

______ 1. Set 1-SI-HIC-1947 to 0 percent output.

______ 2. Wait 15 seconds for the Speed Changer Motor to reduce the speed.

______ 3. Stop 1-SI-P-2.

______ 4. Wait 60 seconds for 1-SI-P-2 to stop.

5.7.15 Secure the drain lineup as follows:

______ a. Close 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ b. Close 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

______ c. Close 2-SI-HCV-2850A, A SI ACCUMULATOR SAMPLE ISOLATION.

______ ______ IV d. Open 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

5.7.16 Secure the fill lineup as follows:

______ a. Close 2-SI-HCV-2851A, A SI Accumulator Makeup Line Isol.

______ b. Close and lock 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve. **(Reference 2.4.1)**

______ ______ IV c. Close 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

______ ______ IV d. Close 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

______ ______
IV

e. Close 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

______ 5.7.17 Have Chemistry Department obtain a final boron concentration sample using the appropriate Chemistry procedure, and record the sample results on 2-LOG-4B, Accumulator Level Additions.

5.7.18 Ensure that the following Accumulator parameters are satisfactory:

______ • Level

______ • Pressure

______ • Boron concentration

Completed by: ____ Date: _________

5.8 Pressurizing SI Accumulators To 600 psig Or Greater Following Maintenance

______ OMOC 5.8.1 Obtain OMOC approval before performing this section.

______ 5.8.2 Check Unit 2 is in Mode 5, 6 or Defueled AND NDT protection is NOT required. **(Reference 2.4.7)**

5.8.3 Ensure the SI Accumulator(s) to be pressurized meet the following criteria:

______ a. Normal operating level of 56 - 70% has been established.

b. The Accumulator(s) to be pressurized are isolated as follows:

- The Accumulator Discharge MOV is CLOSED:

  ______ ______ IV
  - 2-SI-MOV-2865A, A SI ACCUMULATOR DISCHARGE ISOLATION VALVE

  ______ ______ IV
  - 2-SI-MOV-2865B, B SI ACCUMULATOR DISCHARGE ISOLATION VALVE

  ______ ______ IV
  - 2-SI-MOV-2865C, C SI ACCUMULATOR DISCHARGE ISOLATION VALVE

- The Power Supply breaker to the discharge MOV is Danger Tagged OFF:

  ______
  - 2-EP-BKR-2H1-2N L3, 2-SI-MOV-2865A, 2-SI-TK-2A Discharge

  ______
  - 2-EP-BKR-2H1-2N H4, 2-SI-MOV-2865B, 2-SI-TK-2B Discharge

  ______
  - 2-EP-BKR-2J1-2N K4, 2-SI-MOV-2865C, SI Accum Discharge MOV

- The Accumulator Discharge MOV Handwheel is Danger Tagged:

  ______
  - 2-SI-MOV-2865A, A SI ACCUMULATOR DISCHARGE ISOLATION VALVE

  ______
  - 2-SI-MOV-2865B, B SI ACCUMULATOR DISCHARGE ISOLATION VALVE

  ______
  - 2-SI-MOV-2865C, C SI ACCUMULATOR DISCHARGE ISOLATION VALVE

- The Accumulator Discharge MOV Bypass valve is Danger Tagged CLOSED:
  - ______ 2-SI-225, 2-SI-MOV-2865A Bypass Valve
  - ______ 2-SI-220, 2-SI-MOV-2865B Bypass Valve
  - ______ 2-SI-222, 2-SI-MOV-2865C Bypass Valve

______ 5.8.4 Place 2-SI-HIC-200, CNTMT NITROGEN SUPPLY HEADER, at 0 percent output.

NOTE: Liquid Nitrogen system pump should be started prior to initiating Nitrogen To open 2-SI-TV-200, the pushbuttons on both the H Safeguards Panel (2-SI-TV-200A) AND the J Safeguards Panel (2-SI-TV-200B) must be used.

______ 5.8.5 Open 2-SI-TV-200, NITROGEN SUPPLY TO CNTMT.

______ 5.8.6 Slowly increase the output of 2-SI-HIC-200 to pressurize the accumulator supply header.

5.8.7 Open N_2 fill valve for SI Accumulator to be pressurized:

- ______ IF 2-SI-TK-1A is to be pressurized, THEN open 2-SI-HCV-2853A, A SI ACCUMULATOR N2 SUPPLY VALVE.
- ______ IF 2-SI-TK-1B is to be pressurized, THEN open 2-SI-HCV-2853B, B SI ACCUMULATOR N2 SUPPLY VALVE.
- ______ IF 2-SI-TK-1C is to be pressurized, THEN open 2-SI-HCV-2853C, C SI ACCUMULATOR N2 SUPPLY VALVE.

CAUTION

Maximum Accumulator Pressure is 667 psig.

5.8.8 WHEN the desired pressure has been reached, THEN do the following:

______ a. IF the N_2 System is aligned to supply the PORV N_2 accumulators, THEN place 2-SI-HIC-200 at zero percent output.

b. Do the following for the Accumulator just pressurized:

______ ______ IV
- IF 2-SI-TK-1A was just pressurized, THEN close 2-SI-HCV-2853A, A SI ACCUMULATOR N2 SUPPLY VALVE.

______ ______ IV
- IF 2-SI-TK-1B was just pressurized, THEN close 2-SI-HCV-2853B, B SI ACCUMULATOR N2 SUPPLY VALVE.

______ ______ IV
- IF 2-SI-TK-1C was just pressurized, THEN close 2-SI-HCV-2853C, C SI ACCUMULATOR N2 SUPPLY VALVE.

______ c. IF desired to pressurize another SI Accumulator while testing the accumulator just pressurized, THEN RETURN TO Step 5.8.6.

NOTE: To close 2-SI-TV-200, the pushbutton on either the H Safeguards Panel (2-SI-TV-200A) or the J Safeguards Panel (2-SI-TV-200B) may be used. If desired, both pushbuttons may be used.

______ d. IF the Nitrogen System is NOT aligned to supply the PORV N_2 accumulators, THEN close 2-SI-TV-200, NITROGEN SUPPLY TO CNTMT.

______ e. IF the N_2 System is NOT aligned to supply the PORV N_2 accumulators, THEN increase the output of 2-SI-HIC-200 to 100 percent.

5.8.9 WHEN testing of the SI Accumulator is complete, THEN do one of the following:

______ • IF another SI Accumulator will be tested, THEN GO TO Step 5.8.10.

______ • IF NO other SI Accumulator will be tested, THEN GO TO Section 5.5, Venting Safety Injection Accumulators, to reduce pressure to less than 350 psig.

5.8.10 Vent the SI Accumulator just tested to the next SI Accumulator to be tested as follows:

a. Open N_2 fill valve for the SI Accumulator to be tested: Mark valve for SI Accumulator that will not be tested N/A.

______ • IF 2-SI-TK-1A is to be pressurized, THEN open 2-SI-HCV-2853A, A SI ACCUMULATOR N2 SUPPLY VALVE.

______ • IF 2-SI-TK-1B is to be pressurized, THEN open 2-SI-HCV-2853B, B SI ACCUMULATOR N2 SUPPLY VALVE.

______ • IF 2-SI-TK-1C is to be pressurized, THEN open 2-SI-HCV-2853C, C SI ACCUMULATOR N2 SUPPLY VALVE.

b. Open N_2 fill valve for the SI Accumulator just tested: Mark valve for SI Accumulator that will not be tested N/A.

______ • IF 2-SI-TK-1A is to be pressurized, THEN open 2-SI-HCV-2853A, A SI ACCUMULATOR N_2 SUPPLY VALVE.

______ • IF 2-SI-TK-1B is to be pressurized, THEN open 2-SI-HCV-2853B, B SI ACCUMULATOR N_2 SUPPLY VALVE.

______ • IF 2-SI-TK-1C is to be pressurized, THEN open 2-SI-HCV-2853C, C SI ACCUMULATOR N_2 SUPPLY VALVE.

c. WHEN pressure has equalized, THEN close the N_2 fill valve for the SI Accumulator just tested: Mark other valves N/A.

______ • IF 2-SI-TK-1A is to be pressurized, THEN open 2-SI-HCV-2853A, A SI ACCUMULATOR N_2 SUPPLY VALVE.

______ • IF 2-SI-TK-1B is to be pressurized, THEN open 2-SI-HCV-2853B, B SI ACCUMULATOR N_2 SUPPLY VALVE.

______ • IF 2-SI-TK-1C is to be pressurized, THEN open 2-SI-HCV-2853C, C SI ACCUMULATOR N_2 SUPPLY VALVE.

______ d. IF the pressure in the SI Accumulator just tested is NOT less than 350 psig, THEN GO TO Section 5.5, Venting Safety Injection Accumulators, to reduce pressure to less than 350 psig.

______ e. Pressurize the SI Accumulator to be tested to test pressure by performing Subsection 5.8.

5.8.11 IF desired, THEN remove the Danger Tags from the SI Accumulator MOV and Bypass Valve:

- Accumulator Discharge MOV Power Supply breaker:

______ • 2-EP-BKR-2H1-2N L3, 2-SI-MOV-2865A, 2-SI-TK-2A Discharge

______ • 2-EP-BKR-2H1-2N H4, 2-SI-MOV-2865B, 2-SI-TK-2B Discharge

______ • 2-EP-BKR-2J1-2N K4, 2-SI-MOV-2865C, SI Accum Discharge MOV

- Accumulator Discharge MOV Handwheel:

______ • 2-SI-MOV-2865A, A SI Accumulator Discharge Isolation Valve

______ • 2-SI-MOV-2865B, B SI Accumulator Discharge Isolation Valve

______ • 2-SI-MOV-2865C, C SI Accumulator Discharge Isolation Valve

- Accumulator Discharge MOV Bypass Valve:

______ • 2-SI-225, 2-SI-MOV-2865A Bypass Valve

______ • 2-SI-220, 2-SI-MOV-2865B Bypass Valve

______ • 2-SI-222, 2-SI-MOV-2865C Bypass Valve

Completed by: ____ Date: __________

5.9 Recirculating C SI Accumulator for Boron Concentration Adjustment (RCS Pressure > 1000 psig)

______ 5.9.1 Check Initial Conditions are satisfied.

______ 5.9.2 Review Precautions and Limitations.

5.9.3 Check the following:

______ a. RCS pressure is greater than 1000 psig.

______ b. 2-SI-MOV-2865C, C SI ACCUMULATOR DISCHARGE ISOLATION VALVE, is open.

5.9.4 Ensure that the following valves are closed:

______ • 2-SI-53, SI Accum Test Line to Safeguards Sump Isol Vv

______ • 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve

______ 5.9.5 Close 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

______ 5.9.6 Ensure valve 2-SI-54, SI Accum Test To RWST 2-SI-PI-2942 Isol Valve, is open.

CAUTION

Only one Accumulator may be recirculated at a time.

NOTE: Actual draining/filling of 2-SI-TK-1C will begin in Step 5.9.9.

5.9.7 Prepare for draining 2-SI-TK-1C as follows:

______ a. Open 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ b. Open 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

______ c. Open 2-SI-HCV-2850E, C SI ACCUMULATOR SAMPLE ISOLATION.

5.9.8 Prepare for filling 2-SI-TK-1C as follows:

CAUTION

WHEN 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is open in Mode 1, 2, 3, OR 4, THEN an Operator MUST remain in the immediate area in order to close 2-SI-47 quickly if containment isolation becomes necessary. **(Reference 2.4.1)**

a. Use 2-QS-TK-1, Refueling Water Storage Tank, as the water source for 1-SI-P-2, Hydro Test Pump, as follows:

______ 1. Ensure 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed.

______ 2. Ensure 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed.

______ 3. Open 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

_______ 4. Open 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

_______ 5. Open 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

_______ 6. Unlock and open 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve.

b. Independently verify the following lineup: **(Reference 2.4.8)**

- _______ IV 1-SI-48, RWST To Hydro Test Pump Suction Header Isol Valve, is closed
- _______ IV 1-SI-58, Hydro Test PP To SI Accum Makeup Line Isol Valve, is locked closed
- _______ IV 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve, is open
- _______ IV 1-SI-50, Hydro Test Pump Suction Header Isolation Valve, is open
- _______ IV 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve, is open
- _______ IV 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve, is unlocked and open

_______ c. Have the Local Operator check the cooling tank sight glass for 1-SI-P-2, Hydro Test Pump, does not indicate a low level. **(Reference 2.3.4)**

_______ d. Check Unit 1 Panel G-G5, HYDRO TEST PP STUFFING BOX RESERVOIR LO LEVEL, is NOT LIT. **(Reference 2.3.4)**

______ e. Open 2-SI-HCV-2851C, C SI ACCUMULATOR MAKEUP LINE ISOL, for 2-SI-TK-1C.

______ f. Set 1-SI-HIC-1947, HYDRO TEST PP SPEED CONT, to 0 percent output.

CAUTION

- Accumulator level MUST be maintained between the Low Level alarm setpoint of 55 percent and the High Level alarm setpoint of 71.2 percent.
- Do not allow the RWST level to increase to above the High Level alarm setpoint of 98.5 percent, or to decrease to below the Level Below Norm alarm setpoint of 96.7 percent.
- IF 2-SI-RV-204, Unit 2 Accumulator Test Line Relief Valve, lifts during the performance of this procedure, THEN prompt notification of the OATC should be done to close the containment Trip Valves 2-SI-TV-2842 and 2-SI-TV-2859 to prevent high temperature water from reaching SFGDs.

5.9.9 Simultaneously do the following:

______ a. Throttle 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve, to establish 4 gpm as indicated on 2-SI-FI-2942, SI Accum Test Line To RWST Flow Indicator (2-SI-458, Unit 2 Accumulator Test Line Throttle Valve, should be set to flow 5 gpm with its isolation valves full open).

b. Do the following for 1-SI-P-2, Hydro Test Pump, to maintain Accumulator level stable between 55% and 71% indicated level:

______ 1. Start and stop 1-SI-P-2, HYDRO TEST PUMP, as required.

______ 2. Operate 1-SI-HIC-1947 as desired to regulate pump capacity.

______ 5.9.10 Check that the other two Accumulator levels are stable.

CAUTION

Tech Spec SR 3.5.1.4 requires verification of boron concentration once within 6 hours after each solution volume increase of $\geq$ 50% level that is not the result of addition from the RWST. IF samples are taken, analyzed and reported hourly, THEN the TS can not be violated.

NOTE: Completion of Steps 5.9.11 through 5.9.13 are to be indicated by initialing on Attachment 2, Accumulator Recirc Sample Step Completion Sheet.

NOTE: The Accumulator to be sampled will be listed on Attachment 2, Accumulator Recirc Sample Step Completion Sheet.

5.9.11 Have Chemistry Department sample, analyze, and report the Accumulator boron concentration hourly as follows:

______ a. Throttle open 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve, and purge 200 to 400 ml to funnel.

______ b. Obtain sample in labeled sample bottle.

______ ______ IV c. Close 2-SI-352, 2-SI-PI-2942 Inlet Line Sample/Vent Valve.

______ 5.9.12 Record sample results on 2-LOG-4B, Accumulator Level Additions.

______ 5.9.13 Ensure that sample results show that Accumulator boron concentration is changing in the desired direction.

5.9.14 WHEN the desired Accumulator boron concentration is obtained, THEN do the following:

______ a. Ensure Accumulator level for 2-SI-TK-1C is stable between 55% and 71% indicated level.

______ b. Close 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

c. Stop 1-SI-P-2 as follows:

______ 1. Set 1-SI-HIC-1947 to 0 percent output.

______ 2. Wait 15 seconds for the Speed Changer Motor to reduce the speed.

______ 3. Stop 1-SI-P-2.

______ 4. Wait 60 seconds for 1-SI-P-2 to stop.

5.9.15 Secure the drain lineup as follows:

______ a. Close 2-SI-TV-2842, SI ACCUM TEST LINE INSIDE ISOL.

______ b. Close 2-SI-TV-2859, SI ACCUM TEST LINE OUTSIDE ISOL.

______ c. Close 2-SI-HCV-2850E, C SI ACCUMULATOR SAMPLE ISOLATION.

______ ______ IV d. Open 2-SI-459, Unit 2 Accumulator Test Line Isolation Valve.

5.9.16 Secure the fill lineup as follows:

______ a. Close 2-SI-HCV-2851C, C SI Accumulator Makeup Line Isol.

______ b. Close and lock 2-SI-47, Hydro Test Pump Discharge Header Isolation Valve. **(Reference 2.4.1)**

______ ______ IV c. Close 2-SI-16, RWST To Hydro Test Pump Suction Header Isol Valve.

______ ______ IV d. Close 1-SI-52, Hydro Test Pump Discharge Header Isolation Valve.

______ ______
IV

e. Close 1-SI-50, Hydro Test Pump Suction Header Isolation Valve.

______ 5.9.17 Have Chemistry Department obtain a final boron concentration sample using the appropriate Chemistry procedure, and record the sample results on 2-LOG-4B, Accumulator Level Additions.

5.9.18 Ensure that the following Accumulator parameters are satisfactory:

______ • Level

______ • Pressure

______ • Boron concentration

Completed by: ____ Date: __________

5.10 Pressurizing Safety Injection Accumulators Using Manual Control of Nitrogen Pressure

______ 5.10.1 Check Initial Conditions are satisfied.

______ 5.10.2 Review Precautions and Limitations.

______ 5.10.3 Ensure 1-GN-79, Nitrogen Supply To Unit 2 Primary Plant Drain Vv, is closed. (Pent. 53)

______ 5.10.4 Connect a 0-3000 psig gauge or equivalent to 1-GN-79.

______ 5.10.5 Have an operator stand by the liquid N2 plant and monitor as required to maintain plant system pressure using 1-OP-24.1, Operation of the Primary Plant Gas System.

______ 5.10.6 Close 1-GN-466, N2 Sply To Unit 2 Cont Primary Plant Isol Valve. (Pent. 53)

______ 5.10.7 Open 1-GN-79, Nitrogen Supply To Unit 2 Primary Plant Drain Vv. (Pent. 53)

______ 5.10.8 Place 2-SI-HIC-200, CNTMT NITROGEN SUPPLY HEADER, at 0 percent output.

NOTE: Liquid Nitrogen system pump should be started prior to initiating Nitrogen flow.

NOTE: To open 2-SI-TV-200, the pushbuttons on both the H Safeguards Panel (2-SI-TV-200A) AND the J Safeguards Panel (2-SI-TV-200B) must be used.

______ 5.10.9 Open 2-SI-TV-200, NITROGEN SUPPLY TO CNTMT.

______ 5.10.10 Slowly increase the output of 2-SI-HIC-200 to 20 percent .

CAUTION

Do not cross-connect the accumulator gas spaces in Mode 3 or above. During a large break LOCA, nitrogen pressure in the cross-connected SI accumulator could bleed off through the faulted loop accumulator. As a result, the nitrogen pressure in the cross-connected accumulator may be less than that assumed in the Accident Analysis. **(References 2.4.3 and 2.4.4)**

NOTE: By ensuring that pressure at the temporary gauge installed at 1-GN-79 reads greater than the accumulator to be pressurized, reverse flow out of the accumulator is prevented. There is no check valve in the line.

______ 5.10.11 Throttle open 1-GN-466, N2 Sply To Unit 2 Cont Primary Plant Isol Valve, to maintain approximately 650 psig. (Pent. 53)

5.10.12 Open N_2 valve for desired Accumulator (only 1 valve is allowed open at a time):

______ • IF 2-SI-TK-1A is to be pressurized, THEN open 2-SI-HCV-2853A, A SI ACCUMULATOR N2 SUPPLY VALVE

______ • IF 2-SI-TK-1B is to be pressurized, THEN open 2-SI-HCV-2853B, B SI ACCUMULATOR N2 SUPPLY VALVE

______ • IF 2-SI-TK-1C is to be pressurized, THEN open 2-SI-HCV-2853C, C SI ACCUMULATOR N2 SUPPLY VALVE

______ 5.10.13 Adjust 1-GN-466, N2 Sply to Unit 2 Cont Primary Plant Isol Valve, as necessary to maintain approximately 650 psig.

NOTE: Maximum Accumulator Pressure is 667 psig.

5.10.14 WHEN the desired pressure has been reached, THEN do the following:

______ a. IF the N_2 System is aligned to supply the PORV N_2 accumulators, THEN place 2-SI-HIC-200 at zero percent output.

b. Do the following for the Accumulator just pressurized:

______ ______ IV
- IF 2-SI-TK-1A was just pressurized, THEN close 2-SI-HCV-2853A, A SI ACCUMULATOR N2 SUPPLY VALVE.

______ ______ IV
- IF 2-SI-TK-1B was just pressurized, THEN close 2-SI-HCV-2853B, B SI ACCUMULATOR N2 SUPPLY VALVE.

______ ______ IV
- IF 2-SI-TK-1C was just pressurized, THEN close 2-SI-HCV-2853C, C SI ACCUMULATOR N2 SUPPLY VALVE.

______ c. IF desired to pressurize another accumulator, THEN return to Step 5.10.10.

NOTE: To close 2-SI-TV-200, the pushbutton on either the H Safeguards Panel (2-SI-TV-200A) or the J Safeguards Panel (2-SI-TV-200B) may be used. If desired, both pushbuttons may be used.

______ d. IF the Nitrogen System is NOT aligned to supply the PORV N_2 accumulators, THEN close 2-SI-TV-200, NITROGEN SUPPLY TO CNTMT.

______ e. IF the N_2 System is NOT aligned to supply the PORV N_2 accumulators, THEN increase the output of 2-SI-HIC-200 to 100 percent.

______ 5.10.15 Close 1-GN-79, Nitrogen Supply To Unit 2 Primary Plant Drain Vv. (Pent. 53)

______ 5.10.16 Remove test gauge from 1-GN-79 and re-install the pipe cap.

______ 5.10.17 Open 1-GN-466, N2 Sply To Unit 2 Cont Primary Plant Isol Valve. (Pent. 53)

______ IV 5.10.18 Independently verify 1-GN-79, Nitrogen Supply To Unit 2 Primary Plant Drain Vv is closed and capped.

______ IV 5.10.19 Independently verify 1-GN-466, N2 Sply To Unit 2 Cont Primary Plant Isol Valve, is open.

Completed by: ____ Date: __________

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Attachment 1
Accumulator Level Addition Data Tables

1. **Filling Safety Injection Accumulators**

Accumulator Tank	Final Level (Step 5.1.13) (X%)	minus (-)	Initial Level (Step 5.1.6) (Y%)	equals (=)	Accumulator Addition (X-Y) %
2-SI-TK-1A, Safety Injection Accumulator 1A					
2-SI-TK-1B, Safety Injection Accumulator 1B					
2-SI-TK-1C, Safety Injection Accumulator 1C					

(Page 1 of 2)

Attachment 2

Accumulator Recirc Sample Step Completion Sheet

Accumulator Being Sampled (A, B, or C)	**Sample Time (24 hour format)**	**5.6.11.a or 5.7.11.a or 5.9.11.a**	**5.6.11.b or 5.7.11.b or 5.9.11.b**	**5.6.11.c or 5.7.11.c or 5.9.11.c**	**5.6.11.c or 5.7.11.c or 5.9.11.c Verification**	**5.6.12 or 5.7.12 or 5.9.12**	**5.6.13 or 5.7.13 or 5.9.13**

(Page 2 of 2)

Attachment 2

Accumulator Recirc Sample Step Completion Sheet

Accumulator Being Sampled (A, B, or C)	Sample Time (24 hour format)	5.6.11.a or 5.7.11.a or 5.9.11.a	5.6.11.b or 5.7.11.b or 5.9.11.b	5.6.11.c or 5.7.11.c or 5.9.11.c	5.6.11.c or 5.7.11.c or 5.9.11.c Verification	5.6.12 or 5.7.12 or 5.9.12	5.6.13 or 5.7.13 or 5.9.13

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Component cooling surge tank level is low (45%).

1-CN-441 has been verified open.

INITIATING CUE

You are requested to makeup to the component cooling water head tank from the Condensate System in accordance with 1-AP-15, Attachment 4, and raise level to 60%.

It is not desired to place 1-CC-LCV-100 in service.

After completing the makeup, the Condensate System WILL be needed for a makeup to the chemical feed head tank.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

N876

TASK

Fill the component cooling water head tank (1-AP-15).

TASK STANDARDS

The CC head tank has been filled.

K/A REFERENCE:

008A2.02 (3.2/3.5)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time =	20 minutes	Start Time =	________
Actual Time =	________ minutes	Stop Time =	________

PERFORMANCE EVALUATION

Rating	[ ] SATISFACTORY	[ ] UNSATISFACTORY
Candidate (Print)	______________________________	
Evaluator (Print)	______________________________	
Evaluator's Signature / Date	______________________________	

EVALUATOR'S COMMENTS

____

____

____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

N876

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Component cooling surge tank level is low (45%).

1-CN-441 has been verified open.

INITIATING CUE

You are requested to makeup to the component cooling water head tank from the Condensate System in accordance with 1-AP-15, Attachment 4, and raise level to 60%.

It is not desired to place 1-CC-LCV-100 in service.

After completing the makeup, the Condensate System WILL be needed for a makeup to the chemical feed head tank.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-AP-15, Attachment 4, with step 1 completed (1-CN-441 open).

PERFORMANCE STEPS

START TIME ___________

1	Open at least one of the following valves to supply makeup to the CC head tank:	Procedure Step 1
		SAT [ ] UNSAT [ ]

Standards	1-CN-441 is initialed open as per the initial conditions.

Notes/Comments

2	Open Condensate to CC Surge Tank isolation valve.	Procedure Step 2

Critical Step	SAT [ ] UNSAT [ ]

Standards	1-CN-41 is opened by simulating turning the valve handwheel in the open direction until stem movement stops.

Simulation Cue(s)	Valve stem moved out and handwheel stopped.

Notes/Comments

3	Open 1-CC-LCV-100 bypass valve.	Procedure Step 3

Critical Step	SAT [ ] UNSAT [ ]

Note to Evaluator	Local level indication is on the side of the tank opposite from the room entrance.

Standards	1-CC-625 is opened by simulating turning the valve handwheel in the open direction until stem movement stops.

Simulation Cue(s)	You hear flow through the valve. Valve stem moved out and handwheel stopped. (If operator checks level indication, report that level is 50% and going up.)

Notes/Comments

4	If desired to place 1-CC-LCV-100 in service, then do the following:	Procedure Step 4

SAT [ ]   UNSAT [ ]

Standards	Step is N/A'd per the initiating cue.

Simulation Cue(s)	It is not desired to place 1-CC-LCV-100 in service.

Notes/Comments

5	When the desired level is reached, then do the following: Close the following valves:	Procedure Step 5.a

Critical Step	SAT [ ] UNSAT [ ]

Note to Evaluator	Local level indication is on the side of the tank opposite from the room entrance.

Standards	CC head tank level is monitored locally and makeup is isolated when desired level is obtained. 1-CC-625 is closed by simulating turning the handwheel in the closed direction until stem movement stops. 1-CC-624 and 623 are verified closed by simulating attempting to turn the handwheel in the closed direction.

Simulation Cue(s)	CC head tank level is 60%. (If operator does not check local indication, give cue that the control room has paged him and reports CC head tank level is 60%.) Valve stem moved in and handwheel stopped. (1-CC-625) Handwheel did not rotate. (1-CC-624 and 623)

Notes/Comments

6	Ensure 1-CC-LCV-100 is not in manual override.	Procedure Step 5.b

SAT [ ] UNSAT [ ]

Standards	Simulates checking handwheel in full clockwise position.

Simulation Cue(s)	Handwheel did not move.

Notes/Comments

7	Close Condensate to CC Surge Tank isolation valve	Procedure Step 5.c

SAT [ ] UNSAT [ ]

Standards	1-CN-41 is closed by simulating turning the handwheel in the closed direction until stem movement stops.

Simulation Cue(s)	Valve stem moved in and handwheel stopped.

Notes/Comments

8	If condensate will not be needed for makeup to the Chemical Feed Head Tank, then close the following valves:	Procedure Step 6

	SAT [ ] UNSAT [ ]

Standards	Step is N/A'd because initiating cue states condensate WILLl be needed.

Notes/Comments

9	Notify Chemistry department to sample CC system for chromates.	Procedure Step 7

	SAT [ ] UNSAT [ ]

Standards	Chemistry is notified (gaitronics, phone, in-person, control room…).
Simulation Cue(s)	Acknowledge notification.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME ___________

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)

NUMBER 1-AP-15	ATTACHMENT TITLE	ATTACHMENT 4
REVISION 23	CONDENSATE MAKEUP TO THE CC HEAD TANK	PAGE 1 of 2

1. Open at least one of the following valves to supply makeup to the CC Head Tank:

   N/A • 1-CN-426, Condensate to Auxiliary Building from Unit 1 Isolation Valve, located in the Turbine Building Basement at the entrance to the Emergency Switchgear Room

   ___ • 1-CN-441, Condensate to Auxiliary Building from Unit 2 Isolation Valve, located in the Turbine Building Basement at the entrance to the Emergency Switchgear Room

2. ___ Open 1-CN-41, Condensate To Component Clg Wtr Surge Tk Isol Vv, located on the Auxiliary Building second floor at the East end of the Auxiliary Steam Header.

3. ___ Open 1-CC-625, 1-CC-LCV-100 Bypass Valve.

4. IF desired to place 1-CC-LCV-100 in service, THEN do the following:

   ___ a) Open 1-CC-623, 1-CC-LCV-100 Inlet Isolation Valve.

   ___ b) Open 1-CC-624, 1-CC-LCV-100 Outlet Isolation Valve.

   ___ c) Verify 1-CC-LCV-100 is open. IF NOT, THEN manually override 1-CC-LCV-100 by turning handwheel in counter-clockwise (open) direction.

5. WHEN the desired level is reached, THEN do the following:

   a) Close the following valves:

   ___ • 1-CC-625, 1-CC-LCV-100 Bypass Valve

   ___ • 1-CC-624, 1-CC-LCV-100 Outlet Isolation Valve

   ___ • 1-CC-623, 1-CC-LCV-100 Inlet Isolation Valve

   ___ b) Ensure 1-CC-LCV-100 is NOT in manual override by checking handwheel in full clockwise position.

   ___ c) Close 1-CN-41, Condensate To Component Clg Wtr Surge Tk Isol Vv.

6. IF Condensate will NOT be needed for makeup to the Chemical Feed Head Tank, THEN close the following valves:

   ___ • 1-CN-426, Condensate to Auxiliary Building from Unit 1 Isolation Valve, located in the Turbine Building Basement at the entrance to the Emergency Switchgear Room

   ___ • 1-CN-441, Condensate to Auxiliary Building from Unit 2 Isolation Valve, located in the Turbine Building Basement at the entrance to the Emergency Switchgear Room

7. ___ Notify the Chemistry Department to sample the CC System for chromates.