Facility:	HB ROBINSON	Task No.:	01000110605
Task Title:	Withdrawing Control Rod Shutdown Bank B	JPM No.:	2011-2 NRC JPM A
K/A Reference:	003 AK3.04	3.8/4.1	

Examinee: NRC Examiner: N/A

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Preparations for a reactor startup are in progress.

GP-003 has been completed up to Step 8.2.22.d.

Reactor Engineering has provided Mode 2 determination point of 28 steps on Control Bank C.

You are the Reactor Operator.

Task Standard: Drive Control Rods into the core to ensure reactor is shutdown.

Required Materials: GP-003, Normal Plant Startup from Hot Shutdown to Critical, Revision 93

AOP-001, Malfunction of Reactor Control System, Revision 26

General References: GP-003

AOP-001

Handouts: GP-003 completed up to Step 8.2.22.d

Initiating Cue: The CRS has directed you to continue rod withdrawal in support of performing a reactor startup.

Time Critical Task: NO

Validation Time: 7 minutes

SIMULATOR SETUP

1. Reset to IC-806
2. Open SCN: 008_JPM_NRC_A
3. Place simulator in run when directed by the examiner.

(Denote Critical Steps with an asterisk *)

START TIME: _____

* **Performance Step: 1** Select SBB on the Rod Bank Selector switch (Step 8.2.22.d)

Standard: Candidate places the rod bank selector switch in the SBB (Shutdown Bank B) position.

Examiner's Note:

Comment:

NOTE

During rod withdrawal, the Operator At The Controls (OAC) is manipulating the Rod Withdrawal and monitoring applicable parameters. Simultaneously, a licensed RO other that the assigned OAC will assist in performing the Attachment 10.3, Control Rod Withdrawal Checklist.

CAUTION

When above 220 steps withdrawn, Shutdown Banks should be withdrawn in 1 or 2 step increments to prevent overstepping of the control rods.

* **Performance Step: 2** Withdraw Shutdown Bank "B" to 225 steps while performing the checks of Attachment 10.3, Control Rod Withdrawal Checklist. (Step 8.2.22.e)

Standard: Candidate places the IN-HOLD-OUT lever in the OUT position and withdraws Shutdown Bank B rods.

Examiner's Note: When the rods reach 70 steps withdrawn, 4 of the rods will drop into the core. The candidate will be expected to perform the immediate actions of AOP-001 and then enter the procedure.

Examiner's Cue:

Comment:

NOTE

Steps 1 through 3 are immediate action steps.

Performance Step: 3 Check unexpected rod motion – IN PROGRESS (Step 1)

Standard: Candidate determines that no unexpected rod motion is in progress, proceeds to the RNO step and proceeds to Step 7.

Examiner's Note:

Comment:

Performance Step: 4 Make a PA announcement for procedure entry (Step 7)

Standard: Candidate uses an available PA handset and makes a PA announcement for entry into AOP-001.

Examiner's Note:

Comment:

Performance Step: 5 Determine if multiple rods have dropped as follows: (Step 8)

a. Analyze indications for multiple rod drop
- Prompt drop – PRESENT
- More than 1 rod bottom light – ILLUMINATED
- More than 1 IRPI – INDICATES ON BOTTOM

b. Check multiple dropped rods - PRESENT

Standard: Candidate determines that there are multiple dropped rods by the IRPI indication for the affected rods at zero and rod bottom bistables illuminated.

Examiner's Note:

Comment:

Performance Step: 6 Check reactor status – MODE 1 OR 2 (Step 9)

Standard: Candidate determines the reactor is in Mode 3, proceeds to the RNO step and proceeds to Section A, Dropped Rod.

Examiner's Note:

Comment:

Performance Step: 7 Check plant status – Mode 1 (Step 1, Section A)

Standard: Candidate determines the reactor is in Mode 3, proceeds to the RNO step and proceeds to caution prior to Step 35.

Examiner's Note:

Comment:

CAUTION

Attempts to recover a dropped rod from a Mode 2 initial condition could result in an inadvertent return to criticality.

Performance Step: 8 Check plant status – MODE 2 (Step 35, Section A)

Standard: Candidate determines that the plant is in Mode 3 and proceeds to the RNO step which directs transition to Step 37.

Examiner's Note:

Comment:

***Performance Step: 9** Perform the following: (Step 37, Section A)

a. Fully insert all Control Bank rods
b. Fully insert Shutdown Bank B rods
c. Fully insert Shutdown Bank A rods

Standard: Candidate determines that the control bank rods are fully inserted by observing the IRPI and step counters for the control bank rods.
Candidate starts inserting Shutdown Bank B rods by placing the IN-HOLD-OUT lever in the IN position and observes the IRPI downward movement along with the applicable step counters indicating inward rod motion.

Examiner's Note: **Once the rod insertion of Shutdown Bank B has commenced, the JPM can be terminated.**

Comment:

END OF TASK

Terminating Cue: **When control rod insertion is commenced, the evaluation of this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM A

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

Preparations for a reactor startup are in progress.

GP-003 has been completed up to Step 8.2.22.d.

Reactor Engineering has provided Mode 2 determination point of 28 steps on Control Bank C.

You are the Reactor Operator.

INITIATING CUE:

The CRS has directed you to continue rod withdrawal in support of performing a reactor startup.

8.2.22.a (Continued)

INIT

(3) **RECORD** which Plant Curve ~~was used~~.

CURVE 1.9A / CURVE ~~1.9B~~ (Circle curve used)

(4) **RECORD** the Rod Insertion Limits for the following:

Control Bank "C" 95 Steps

Control Bank "D" 0 Steps

b. **PERFORM** the following check every 2 hours until critical to satisfy requirements of ITS SR 3.1.6.1:

Estimated time of ECC/ECP	Minimum Rod Position (500 PCM below the ECC) Bank / Steps	Within COLR limits? (Circle one)
Then	D / 40	(YES) / NO
		YES / NO
		YES / NO
		YES / NO
		YES / NO

c. **IF** the control bank positions shown on the POWERTRAX printout for the estimated time of the ECC/ECP are **NOT** within the control bank insertion limits specified in the COLR, **THEN PERFORM** the following:

(1) **INSERT** all control banks to 0 steps. N/A

(2) **MARK** the remaining steps in Section 8.2 as N/A **AND PERFORM** the required actions of Section 8.3 for a missed or aborted startup. N/A

START →

d. **SELECT** SBB on the Rod Bank Selector switch.

8.2.22 (Continued)

INIT

NOTE: During Rod Withdrawal, the Operator at the Controls (OAC) is manipulating the Rod Withdrawal and monitoring applicable parameters. Simultaneously, a licensed RO other than the assigned OAC will assist in performing the Attachment 10.3, Control Rod Withdrawal Checklist.

CAUTION

When above 220 steps withdrawn, Shutdown Banks should be withdrawn in 1 or 2 step increments to prevent overstepping of the control rods.

e. **WITHDRAW** Shutdown Bank "B" to 225 steps while performing the checks of Attachment 10.3, Control Rod Withdrawal Checklist.

f. **IF** an alternate MODE 2 Declaration Point has **NOT** been established **AND** Shutdown Bank "B" is greater than 20 steps, **THEN PERFORM** the following (NCR 233326):

- **MAKE** a plant announcement that MODE 2 has been entered. ____
- **CHANGE** the ERFIS Mode indication to display MODE 2 by using the PMODE function. ____

g. **IF** an alternate MODE 2 declaration point has been established, **THEN PERFORM** the following: (NCR 233326)

(1) **WHEN** the Control Banks reach the position calculated for MODE 2 recorded in Attachment 10.3, Control Rod Withdrawal Checklist, **THEN PERFORM** the following:

- **MAKE** a plant announcement that MODE 2 has been entered. ____
- **CHANGE** the ERFIS Mode indication to display MODE 2 by using the PMODE function. ____

CONTINUOUS USE

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL
VOLUME 3
PART 5
ABNORMAL OPERATING PROCEDURE

AOP-001

MALFUNCTION OF REACTOR CONTROL SYSTEM

REVISION 26

AOP-001, Revision 26
Summary Of Changes
(PRR 429230)

ENTRY CONDITIONS

Replaced the word unwarranted with unexpected to the types of rod motion.(PRR 418409)

Main Procedure

Various Steps	Added titles of the sections to facilitate finding the correct entry point in these procedures. (Editorial)
Various Steps	Changed Path-1 to Path-1 or EOP-E-0 in preperation for EOP upgrade. (PRR 464456)

Section A

Step 11.c	Added AFD - Within Operating Band check and RNO with the appropriate RNO actions. (PRR 429230)
Step 12.c	Changed increase to raise for human error prevention. (Editorial)
Step 31.b.2	Changed to allow the P to A converter to be raised or lowered, previously it was only allowed to be lowered. (PRR 429230)
N36	This note was added to inform Operators that AOP-007 is not required to be entered as the Operator is taking control of the Turbine. (PRR 429230)
Step 40	Added ITS 3.1.1 to the Technical Specifications that should be reviewed by the Operators. (PRR 429230)

AOP-001, Revision 26
Summary Of Changes
(PRR 429230)

Section B	
Step 13.a & 21 a	Changed step so that now when the Operator is checking SDM being adequate, they are directed to FMP-012 for direction. (PRR 436602)
Step 13.b, 21.b & 22 RNO	As the procedure GP-006 has been changed, made changes to this procedure to reflect that the information is now located in GP-006-1 or 2. (PRR 462956)
N59	Added this note to inform the Operators that AOP-007 should NOT be used in response to the following steps. (PRR 429230)
Section D	
Step 1 RNO	Added another item to check to determine why power is not available to IRPI. (PRR 430089)
Attachment 1	
Step 6	Added the option to press the HOLD button as well as the Go button. (PRR 398019)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

1. PURPOSE

This procedure provides the instructions necessary for the Operator to recover a dropped rod, realign a misaligned rod, stop abnormal continuous rod motion and operate with an IRPI failure.

This procedure is applicable in Modes 1, 2, and 3 with the exception of IRPI which is MODE 2 and MODE 1.

2. ENTRY CONDITIONS

Any indication of a dropped rod, misaligned rod, unexpected rod motion, inability to move rod(s) or suspected IRPI malfunction.

It is not intended to enter AOP-001 while in MODE 3 during a startup when the MODE 1 and MODE 2 ITS 3.1.7 alignment limits of 7.5 inches of the average of the individual IRPIs in the associated bank when < 200 steps or IRPI within 15 inches of the associated bank demand position when > 200 steps are exceeded due to normal indicator drift during a startup while in MODE 3.

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

Steps 1 through 3 are Immediate Action Steps.

1. Check Unexpected Rod Motion - IN PROGRESS — Go To Step 7.

2. Check Reactor Power - GREATER THAN 15% — Trip the Reactor AND Go To Path-1 or EOP-E-0, Reactor Trip or Safety Injection.

3. Check Turbine Load -
   - CONTROL RODS STEPPING IN
     AND
   - UNEXPECTED LOAD REDUCTION IN PROGRESS
     OR
   - UNEXPECTED LOAD REDUCTION HAS OCCURRED

   Attempt To Stop Rod Motion As Follows:

   a. IF ROD BANK SELECTOR Switch position in A (AUTO), THEN Place the ROD BANK SELECTOR Switch in M (Manual)

   b. IF ROD BANK SELECTOR Switch in M (Manual) OR Individual Bank Select, THEN Place the ROD BANK SELECTOR Switch in A (Auto).

   IF Rod Motion does NOT stop, THEN Trip the Reactor and Go To Path-1 or EOP-E-0, Reactor Trip or Safety Injection.

   Go To Step 5.

4. Go To AOP-015, Secondary Load Rejection

5. Make PA Announcement For Procedure Entry

6. Go To Section C, Continuous Rod Motion

7. Make PA Announcement For Procedure Entry

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
8.	Determine If Multiple Rods Have Dropped As Follows:	
	a. Analyze Indications For Multiple Rod Drop	
	• Prompt Drop - PRESENT Yes	
	• More than 1 Rod Bottom Light - ILLUMINATED Yes	
	• More Than 1 IRPI - INDICATES ON BOTTOM Yes	
	b. Check Multiple Dropped Rods - PRESENT	b. Go To Step 11.
9.	Check Reactor Status - MODE 1 OR 2	Go To Section A, Dropped Rod
10.	Trip The Reactor and Go To Path-1 or EOP-E-0, Reactor Trip Or Safety Injection.	
11.	Check T_{avg} - TRENDING TO T_{ref}	Perform Attachment 1, Turbine Load Adjustment, to restore T_{avg} within -1.5 to +1.5°F of T_{ref}.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
12.	Determine The Status Of Rods As Follows: a. Analyze the below indications for a dropped rod: • APP-005-A3, PR DROP ROD - ILLUMINATED • APP-005-F2, ROD BOTTOM ROD DROP - ILLUMINATED • Rod Bottom Light for affected rod - ILLUMINATED • Indication of Prompt Drop - PRESENT • Quadrant Power Tilt indications - PRESENT • APP-005-F3, PR UPPER CH HI FLUX DEV/AUTO DEFEAT - ILLUMINATED • APP-005-F4, PR LOWER CH HI FLUX DEV/AUTO DEFEAT - ILLUMINATED • APP-005-C3, PR CHANNEL DEV - ILLUMINATED • Power Range Drawer Indications b. Check Dropped Rod - PRESENT	b. Observe the <u>NOTE</u> prior to Step 14 and Go To Step 14.
13.	Go To Section A, Dropped Rod	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

- IF there is any doubt as to IRPI failure OR actual rod misalignment, THEN assume rod misalignment is present.
- Malfunctioning IRPI(s) may be identified by erratic or drifting IRPI indication when the associated Rod Bank is not being moved, or sudden large changes in IRPI indication with no corresponding change in nuclear power or motion of other rods in the associated bank.
- ERFIS Rod Position Indication may be used for IRPI indication below.

14. Determine The Status Of IRPI As Follows:

a. Analyze the below indications for an IRPI problem:

- IRPI Indication
  - Indicator drift with NO flux effects
  - Erratic indicator movement with NO flux effects
  - Indicator off-scale High OR Low with NO flux effects
- Dropped Rod Indication with no flux changes
  - Rod Bottom Light for affected rod - ILLUMINATED

AND

  - APP-005-A3, PR DROP ROD - EXTINGUISHED

(CONTINUED NEXT PAGE)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
14.	(CONTINUED) • Simultaneous loss of ALL IRPI Indication (Power Supply Failure) - PRESENT	
	b. Check IRPI malfunction - PRESENT	b. Go To Step 16.
15.	Go To Section D, Individual Rod Position Indication Malfunction	
16.	Determine The Status Of Rods As Follows: a. Analyze below indications of An Immovable OR Misaligned Rod • Rod - CAN NOT BE MOVED • APP-005-E2, ROD CONT SYSTEM URGENT FAILURE - ILLUMINATED • Rod Indication - OUT OF ALIGNMENT WITH REMAINDER OF BANK	
	b. Check Misaligned/Immovable Rod - PRESENT	b. Reanalyze procedure entry conditions. IF conditions do NOT warrant AOP-001 use, THEN return to procedure and step in effect. IF a Rod Control malfunction exists, THEN Go To Step 1.
17.	Go To Section B, Immovable/Misaligned Rods	

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 1 of 23)

1.	Check Plant Status - MODE 1	Observe CAUTION prior to Step 35 and Go To Step 35.
2.	Check Dropped Rod Location - IN CONTROLLING BANK	Observe the CAUTION prior to Step 4 and Go To Step 4.

NOTE

Key #13 is required to open the Lift Coil Disconnect Panel Door.

3. Place Lift Coil Disconnect Switch For The Dropped Rod, In The OFF Position

****

CAUTION

Equipment repairs or manipulations to correct the cause of the dropped rod prior to procedural direction could inadvertently withdraw the dropped rod.

****

4. Notify Reactor Engineering AND I&C Personnel To Perform The Following:

   a. Verify the status of the dropped rod

   b. Investigate the cause of the dropped rod

   c. Avoid ANY action that could cause inadvertent withdrawal of the affected rod

   d. Determine appropriate recovery actions

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

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5.	Check APP-005-B5, ROD BANKS A/B/C/D LO LIMIT - EXTINGUISHED	Borate to clear the alarm using OP-301, Chemical and Volume Control System (CVCS), while continuing with this procedure.

NOTE

ITS LCO 3.1.4 restricts operation above 70% power when rods are misaligned greater than ITS limits.

6.	Establish Stable Conditions At OR Below 70% Reactor Power As Follows:	
	a. Check Reactor power - GREATER THAN 70%	a. Go To Step 7.
	b. Check APP-005-E2, ROD CONT SYSTEM URGENT FAILURE - EXTINGUISHED	b. Reduce Reactor AND Turbine power to less than or equal to 70% within 2 hours using boration to maintain Tavg within -1.5 to +1.5°F of Tref using OP-301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist, AND Attachment 1, Turbine Load Adjustment. Go To Step 7.
	c. Reduce Reactor AND Turbine power to less than or equal to 70% within 2 hours using rods and boration to maintain Tavg within -1.5 to +1.5°F of Tref using OP-301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist, AND Attachment 1, Turbine Load Adjustment.	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

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7.	Notify Load Dispatcher Of The Unit's Load Capability	
* 8.	Check Total Reactor Power Change - GREATER THAN 15% IN ANY ONE HOUR PERIOD	IF Reactor power is changed greater than 15% in any one hour period, THEN perform Step 9. Observe the NOTE prior to Step 10 and Go To Step 10.
9.	Notify Chemistry personnel of the following: a. A Reactor power change of greater than 15% in a one hour period has occurred b. Perform sampling as required by ITS SR 3.4.16.2	

NOTE

- Quadrant Power Tilt information may be obtained from Group Display QPTR LOG on ERFIS
- FMP-007, Quadrant Power Tilt provides instruction for manual QPTR calculation if ERFIS is unavailable.

10.	Monitor Quadrant Power Tilt AND Axial Flux Difference To Ensure Compliance With ITS LCO 3.2.3 and ITS LCO 3.2.4	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

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11.	Determine If Axial Flux Difference (AFD) Should Be Adjusted As Follows:	
	a. Check APP-005-E2, ROD CONT SYSTEM URGENT FAILURE - EXTINGUISHED	a. Go To Step 12.
	b. Check AFD - WITHIN TARGET BAND	b. Perform one of the following: • IF AFD is below the target band, THEN borate using OP-301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist, while withdrawing Control Rods to restore AFD to the target band. • IF AFD is above the target band, THEN dilute using OP-301, Chemical and Volume Control System (CVCS), RCS Dilution Quick Checklist, while inserting Control Rods to restore AFD to within the target band. WHEN AFD is restored to within the target band, THEN Go To Step 13.
	c. Check AFD - Within Operating Band	c. IF AFD is outside the Operating Band, AND Power is less than 90% THEN use Attachment 1 to reduce load to less than or equal to 50% within 30 minutes.
	d. Go To Step 13	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

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12. Control Reactor Power As Follows:

a.	Check AFD - OUTSIDE TARGET BAND	a. Go To Step 13
b.	Consult with Reactor Engineering to determine expected flux shift for power change	
c.	Perform EITHER of the following at the request of Reactor Engineering: • Borate to reduce Reactor power using OP-301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist, AND adjust Turbine load to adjust Tavg to within -1.5 to +1.5°F of Tref using Attachment 1, Turbine Load Adjustment. OR • Dilute to raise Reactor power using OP-301, Chemical and Volume Control System (CVCS), RCS Dilution Quick Checklist, AND adjust Turbine load to adjust Tavg to within -1.5 to +1.5°F of Tref using Attachment 1, Turbine Load Adjustment.	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 6 of 23)

13. Confirm Dropped Rod As Follows:

a. Determine if a dropped rod exists by at least ONE of the following:

- Quadrant Power Tilt indications - PRESENT
  - APP-005-F3, PR UPPER CH HI FLUX DEV/AUTO DEFEAT - ILLUMINATED
  - APP-005-F4, PR LOWER CH HI FLUX DEV/AUTO DEFEAT - ILLUMINATED
  - APP-005-C3, PR CHANNEL DEV - ILLUMINATED
  - Power Range Drawer Indications
- Axial Flux Difference indications
- Incore flux map
- Reactor Engineering or I&C determination
- APP-005-A3, PR DROP ROD - PREVIOUSLY ILLUMINATED

b. Check dropped rod determination - COMPLETE

b. WHEN determination is complete, THEN Go To Step 14.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 7 of 23)

14.	Check Dropped Rod - CONFIRMED	Perform the following: a. Place the ROD BANK SELECTOR Switch in A (Auto) OR M (Manual) as desired. b. Resume normal rod operations. c. Go To Section D, Individual Rod Position Indication Failure

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 8 of 23)

NOTE

This Continuous Action step is designed to assure compliance with ITS LCO 3.1.4 if the rod can NOT be recovered within 1 hour.

*15. Check Rod Recovery Status - COMPLETE

IF the rod will NOT be restored to within the alignment limits within 1 hour of discovery, THEN perform the following:

a. Verify SDM is within the limits specified in the COLR within 1 hour in accordance with FMP-012, Manual Determination of Shutdown Margin Boron Concentration.

b. Reduce Thermal Power to less than or equal to 70% within 2 hours

c. Verify SDM is within the limits provided in the COLR every 12 hours in accordance with FMP-012, Manual Determination of Shutdown Margin Boron Concentration.

d. Notify Reactor Engineering to perform ITS SR 3.2.1.1 AND SR 3.2.2.1 within 72 hours

e. IF the rod can NOT be realigned, THEN within 5 days, complete a Safety Analysis for continued operation with the misaligned rod.

(CONTINUED NEXT PAGE)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 9 of 23)

15. (CONTINUED)

f. IF the requirements of items a through e can NOT be achieved, THEN be in Mode 3 within 6 hours.

16. Notify I&C To Make Repairs As Necessary To Restore Proper Operation Of The Rod Control System

17. Check IRPI for the dropped rod - INDICATES ROD FULLY INSERTED

Perform one of the following:

- IF the rod has been confirmed to be fully inserted by Reactor Engineering, THEN perform Section D for IRPI adjustment prior to continuing with this section.

OR

- IF the rod has been confirmed to be partially inserted, THEN Go To Section B, Immovable/misaligned Rods

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 10 of 23)

NOTE

The rate of rod withdrawal referred to below is in relation to the duration of time over which the rod should be recovered, NOT rod speed.

18. Contact Reactor Engineering To Obtain The Following:

    a. Power level at which recovery is to be performed

    Power Level % _____

    b. Rate at which rod should be withdrawn

    Rate of Rod Withdrawal _____

19. Notify Manager - Operations OR His Designee Of The Following:

    a. Current plant conditions

    b. Power level required for rod alignment

    c. Approval for rod alignment is required prior to continuing

    d. Check rod recovery - APPROVED — d. Go To Step 39.

20. Check Cause Of Dropped Rod - FOUND AND CORRECTED — WHEN cause is found AND corrected, THEN Go To Step 21.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 11 of 23)

21.	Determine If The Rod Control System Is Ready For Rod Recovery As Follows:	
	a. Check APP-005-E2, ROD CONT SYSTEM URGENT FAILURE - EXTINGUISHED	a. Depress the ROD ALARM RESET Pushbutton on the RTGB AND verify APP-005-E2 clears.
	b. Verify ROD BANK SELECTOR Switch - IN M (Manual)	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 12 of 23)

22. Make Preparations For Rod Alignment As Follows:

a. Monitor the highest indicating Power Range NIS Channel

b. Check power reduction - REQUIRED — b. Go To Step 22.d.

c. Adjust Reactor power level as follows:

- Borate to reduce Reactor power using OP-301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist
- Adjust Turbine load using Attachment 1, Turbine Load Adjustment, OR steam dumping rate to adjust Tavg to within -1.5 to +1.5°F of Tref

d. Record the following in the CO Log:

- Time that rod drop occurred
- Power level at which rod will be recovered
- Rate of rod withdrawal to be used
- Core location of dropped rod

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 13 of 23)

23. Record The Group Step Counter Reading For The Group Associated With The Dropped Rod

_____ Steps

NOTE

The P-A Converter is located in the Computer Room in RACK RPI #2 - ROD POSITION DETECTOR & BISTABLE ASSEMBLIES. Key #16 is required to unlock the cabinet door.

24. Determine If The P-A Converter Reading Needs To Be Recorded As Follows:

a. Check dropped rod location - LOCATED IN ANY CONTROL BANK — a. Go To Step 25.

b. Place the DISPLAY Selector Switch in the affected bank position

c. Record the P-A Converter reading for the affected Control Bank

_____ Steps

d. Place the DISPLAY Selector Switch in the OFF position

25. Set The Group Step Counter For The Affected Group To Zero

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 14 of 23)

NOTE

Key #13 is required to open the Lift Coil Disconnect Panel Door.

26. Place Lift Coil Disconnect Switches For All Rods In The Affected Bank As Follows:

    - Dropped Rod - ON Position
    - Unaffected Rods - OFF Position

27. Adjust Tavg To Within -1.5 TO +1.5°F Of Tref During Rod Alignment As Follows:

    - Adjust Turbine load using Attachment 1, Turbine Load Adjustment

    OR

    - Adjust boron concentration using OP-301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

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NOTE

- APP-005-E2, ROD CONT SYSTEM URGENT FAILURE, will illuminate when the rod is moved due to all Lift Coil Disconnect Switches being off in the unaffected group.
- APP-005-A5, ROD BANKS A/B/C/D WITHDRAWN, may illuminate when the rod is moved due to additional counts on the P-A Converter.
- APP-005-F2, ROD BOTTOM ROD DROP, may reflash during rod recovery as the rod is stepping through the bistable setpoints.

28. Align The Affected Rod As Follows:

    a. Maintain reactor power less than or equal to 70% in subsequent steps below.

    b. IF traversing the ROD BANK SELECTOR Switch through the AUTO position is required in the next step, THEN Depress AND hold the AUTO ROD DEFEAT Pushbutton

    c. Select the affected bank with the ROD BANK SELECTOR Switch

    d. IF the AUTO ROD DEFEAT Pushbutton is depressed, THEN release the AUTO ROD DEFEAT Pushbutton

    e. Withdraw the rod at the rate specified in Step 18 to the Group Step Counter position recorded in Step 23

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 16 of 23)

29. Establish Proper Rod Group Sequencing As Follows:

a. Check Group 1 and Group 2 Group Step Counter readings for the affected bank - EQUAL

a. Perform one of the following:

- IF the dropped rod was in Group 2, THEN Go To Step 29.c.

OR

- IF the dropped rod was in Group 1, THEN Go To Step 30.

b. Check dropped rod location - WAS IN GROUP 1

b. Go To Step 30.

c. Withdraw the rod one step

d. Insert the rod one step

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 17 of 23)

30. Return The Rod Control System To Normal As Follows:

a. Place the Lift Coil Disconnect Switches for the affected bank in the ON position

b. IF traversing the ROD BANK SELECTOR Switch through the AUTO position is required in the next step, THEN Depress AND hold the AUTO ROD DEFEAT Pushbutton

c. Place ROD BANK SELECTOR Switch in M (Manual)

d. IF the AUTO ROD DEFEAT Pushbutton is depressed, THEN release the AUTO ROD DEFEAT Pushbutton

e. Depress the ROD ALARM RESET Pushbutton on the RTGB

f. Verify APP-005-E2 clears

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 18 of 23)

NOTE

The P-A Converter is located in the Computer Room in RACK RPI #2 - ROD POSITION DETECTOR & BISTABLE ASSEMBLIES. Key #16 is required to unlock the cabinet door.

31. Determine If The P-A Converter Needs To Be Reset As Follows:

    a. Check dropped rod location - LOCATED IN CONTROL BANK

    a. Observe the NOTE prior to Step 32 and Go To Step 32.

    b. Reset the P-A Converter as follows:

        1) Place the DISPLAY Selector Switch in the affected bank position

        2) While holding the AUTOMATIC-MANUAL Switch in MANUAL, depress the UP OR DOWN Pushbutton the required number of times to return the DISPLAY to the position recorded in Step 24

        3) Return AUTOMATIC-MANUAL Switch to AUTOMATIC (spring return)

        4) Place the DISPLAY Selector Switch in the OFF position

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 19 of 23)

NOTE

Turn on code to access ERFIS ROD BANK SUPERVISION is RODUP.

32.	Check ERFIS ROD BANK SUPERVISION Function - BANK POSITIONS CORRECT	Update Bank Position Pulse Counters.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 20 of 23)

33. Check That Rod Motion Has Occurred As Indicated By At Least One Of The Following:

- IRPI indicates rod alignment

OR

- Tavg changed during rod withdrawal due to rod motion

OR

- Flux map indicates rod alignment

Perform the following:

a. Contact Plant Management to determine need for further attempts to recover the dropped rod.

b. Perform The Following To Assure Compliance With ITS 3.1.4:

1) Verify SDM is within the limits provided in the COLR every 12 hours in accordance with FMP-012, Manual Determination of Shutdown Margin Boron Concentration.

2) Notify Reactor Engineering to perform ITS SR 3.2.1.1 AND SR 3.2.2.1 within 72 hours

3) IF the rod can NOT be realigned within 5 days, THEN perform a Safety Analysis for continued operation with the misaligned rod

4) IF the requirements of items 1 through 3 above can NOT be achieved, THEN be in Mode 3 within 6 hours

c. Go To Step 39.

34. Go To Step 39

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 21 of 23)

****

CAUTION

Attempts to recover a dropped rod from a Mode 2 initial condition could result in an inadvertent return to criticality.

****

35. Check Plant Status - MODE 2 — Go To Step 37.

NOTE

AOP-007 is NOT applicable for the following step.

36. Check Turbine Status As Follows:

a. Check Turbine - ROLLING — a. Go To Step 37.

b. Depress AND hold the THINK Button

c. Manually trip the Turbine

d. Verify the following valves go closed:

- Turbine Stop Valves
- Governor Valves
- Reheat Stop Valves
- Reheat Intercept Valves

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 22 of 23)

37. Perform The Following:

a. Fully insert all Control Bank rods

a. Perform the following.

1) IF Control Bank Rods can NOT be inserted, THEN initiate boration of the RCS using OP-301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist.

2) Contact Reactor Engineering to determine All Rods Out 1% Shutdown Boron Concentration.

3) WHEN the required 1% shutdown concentration has been achieved, THEN trip the Control Rods.

4) Go To Step 38.

b. Fully insert SHUTDOWN BANK B rods

c. Fully insert SHUTDOWN BANK A rods

38. Contact I&C and Reactor Engineering to troubleshoot and correct the problem.

39. Implement the EALs

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

DROPPED ROD

(Page 23 of 23)

40. Review Technical Specifications To Assure All Applicable LCO requirements Have Been Met:

- ITS 3.1.1 - Shutdown Margin (SDM)
- ITS 3.1.4 - Rod Alignment
- ITS 3.1.5 - Shutdown Bank RIL
- ITS 3.1.6 - Control Bank RIL and overlap
- ITS 3.1.7 - IRPI
- ITS 3.2.1 - Fq(Z)
- ITS 3.2.2 - FΔh
- ITS 3.2.3 - AFD
- ITS 3.2.4 - QPTR

41. Check APP-005-A3, PR DROP ROD - EXTINGUISHED

Momentarily place the DROPPED ROD MODE Switch on the affected Power Range A Drawer to RESET, AND return to NORMAL.

42. Return To Procedure And Step In Effect

- END -

Facility:	HB ROBINSON	Task No.:	01000110305
Task Title:	Align SI System for Cold Leg Recirculation	JPM No.:	2011-2 NRC JPM B
K/A Reference:	006 A4.05 011 EA1.11	3.9/3.8 4.2/4.2	

Examinee: NRC Examiner: N/A

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Plant was at 100% RTP.

A Large Break LOCA occurred.

PATH-1 has been implemented.

APP-002-A3, RWST HI/LO LVL has been received with RWST level at 27%

Task Standard: Align the Safety Injection system for cold leg recirculation.

Required Materials: EPP-9, Transfer to Cold Leg Recirculation, Revision 33.

General References: PATH-1
EPP-9

Handouts: EPP-9

Initiating Cue: The CRS has directed you to implement cold leg recirculation IAW EPP-9.

THIS TASK IS TIME CRITICAL.

Time Critical Task: YES (5 minutes for Performance Steps 1-5)
(20 minutes for Performance Steps 6-23)

Validation Time: 16 minutes

SIMULATOR SETUP

1. Reset to IC-807
2. Open SCN: 008_JPM_NRC_B
3. Place simulator in run when directed by the examiner.

(Denote Critical Steps with an asterisk *)

START TIME: _____ **START 1ST TIME CRITICAL TIME: _____**

CAUTION

Steps 1 through 24 must be performed without delay to accomplish switchover prior to RWST level reaching 9%.

NOTE

- Foldouts are NOT applicable during the performance of this procedure.
- Functional Restoration Procedures are NOT applicable until after Step 43.

Performance Step: 1 Check capability to establish recirculation – EXISTS (Step 1)

- Establishment of 354 inches in the CV Sump is possible

AND

- Establishment of at least one flow path from the CV Sump to the RCS is possible.

Standard: Candidate determines that the CV Sump is greater than 354 inches by observing LI-801 and LI-802 on the PAM Panel or from the ERFIS computer.

Candidate determines that at least one flow path from the CV Sump to the RCS is possible by observing RTGB indication for the required pumps and valves.

Examiner's Note:

Comment:

Performance Step: 2 Reset Safety Injection (Step 2)

Standard: Candidate depresses the Safety Injection reset pushbutton.

Examiner's Note: SI can be verified as reset by observing the SI Overridden Train A and Train B status light being illuminated and/or by the EDG WHITE start lights being extinguished.

Examiner's Cue:

Comment:

Performance Step: 3 Place the Containment Spray key switch to the OVRD/RESET position (Step 3).

Standard: Candidate places the key switch to the OVRD/RESET position.

Examiner's Note: **Annunciator APP-002-C1 will be received when this action is performed.**

Comment:

Performance Step: 4 Verify RCPs – ALL STOPPED (Step 4)

Standard: Candidate verifies that all of the RCPs have been stopped by observing the RCP status lights above the control switches on the RTGB have the GREEN off indication illuminated.

Examiner's Note:

Comment:

* **Performance Step: 5** Stop pumps to obtain the following conditions: (Step 5)

- SI Pumps – ONE RUNNING
- RHR Pumps – ALL STOPPED
- Charging Pumps – ALL STOPPED
- CV Spray Pumps – MAXIMUM ONE RUNNING

Standard: Candidate stops one of the SI Pumps by placing the control switch to the STOP position and observing the GREEN off indication illuminated.

Candidate stops both of the RHR Pumps by placing the control switches to the STOP position and observing the GREEN off indications illuminated.

Candidate stops all of the Charging Pumps by placing the control switches to the STOP position and observing the GREEN off indications illuminated.

Candidate verifies that no more than one CV Spray Pump is operating by observing the GREEN off light is illuminated on both CV Spray Pumps.

Examiner's Note:

Comment:

STOP 1ST TIME CRITICAL TIME: _____ (5 minutes)
START 2ND TIME CRITICAL TIME: _____

NOTE
Attachment 1 will locally close valves that have lost power due to an electrical train failure.

Performance Step: 6 Close the discharge valves associated with any stopped CV Spray Pump: (Step 6)

- CV Spray Pump A – SI-880A and SI-880B
- CV Spray Pump B – SI-880C and SI-880D

Standard: Candidate determines the CV Spray Pumps that have been secured by observing the GREEN off indication illuminated and closes the associated discharge valves by placing the control switches for the applicable SI-880 valves to the close position and observing the GREEN close lights illuminated.

Examiner's Note: Valves SI-880A and B are parallel flow paths and both valves must be closed to isolate the path.

Valves SI-880C and D are parallel flow paths and both valves must be closed to isolate the path.

Comment:

* **Performance Step: 7** Close SI PUMP RECIRC valves (Step 7)

- SI-856A AND SI-856B

Standard: Candidate closes valves SI-856A and B by placing the control switches to the closed position and observing the GREEN closed indication illuminated.

Examiner's Note: Valves SI-856A and B are in series and the flow path will be isolated by the closure of either valve.

Booth Operator Cue:

Comment:

Performance Step: 8 Perform the following: (Step 8)

a. Dispatch an operator to perform Attachment 1

b. Inform the operator performing Attachment 1 of any electrical train failure that has occurred.

c. Dispatch a second operator to perform Attachment 2.

Standard: Candidate will communicate the need and information for Attachments 1 and 2 to be performed locally.

Examiner's Cue: Respond that the operators have the attachments and performance has been implemented.

Comment:

Performance Step: 9 Check BIT OUTLET valves – ENERGIZED

- SI-870A and SI-870B

Standard: Candidate determines that the valves are energized by observing indication available on the RTGB for the valves.

Examiner's Note:

Comment:

* **Performance Step: 10** Establish CCW flow to the RHR Heat Exchangers as follows: (Step 10)

a. Start CCW Pumps as necessary to obtain two pumps running.

b. Open CC-749A and B, CCW FROM RHR HX, while continuing with this procedure.

Standard: Candidate will start an additional CCW Pump by placing the control switch to the START position and observing the RED on indication illuminated.

Candidate will open valves CCW-749A and B by placing the control switch to the OPEN position and observing the RED open indication illuminated.

Examiner's Note: **Valves CCW-749A and B have a long travel time and will take ~2 minutes to travel open.**

Comment:

Performance Step: 11 Check RWST level – Less than 9% (Step 11)

Standard: Candidate determines that RWST level is above 9% by observing LI-948 and LI-969 on the RTGB and proceeds to the RNO step. Candidate proceeds to Step 13.

Examiner's Note:

Comment:

* **Performance Step: 12** Place the key switches for the following valves in the NORMAL position (Step 13)

- SI-862A and SI-862B
- SI-863A and SI-863B
- SI-864A and SI-864B
- SI-866A and SI-866B
- SI-869

Standard: Candidate will place the control power key switches for the valves in the NORMAL position.

Examiner's Note: **There is a key switch for each valve listed that is located in the rear of the RTGB on the ECCS Valves Control Power Defeat Panel. An AMBER light above each key switch will illuminate when the key switch is placed in the NORMAL position.**

Comment:

Performance Step: 13 Open SI-869, SI HOT LEG HDR valves (Step 14)

Standard: Candidate will open valve SI-869 by placing the control switch to the open position and observing the RED open indication illuminated.

Examiner's Note:

Comment:

* **Performance Step: 14** Close the following RWST to RHR valves (Step 15)

- SI-862A and SI-862B

Standard: Candidate will close valves SI-862A and B by placing the control switches to the close position and observing the GREEN close indication illuminated.

Examiner's Note: **Valves SI-862A and SI-862B are in series and requires only one of the valves to be closed to isolate the flow path.**

Comment:

Performance Step: 15 Check the following alarms - EXTINGUISHED (Step 16)

- APP-001-B7, RHR PMP A COOL WTR LO FLOW
- APP-001-C7, RHR PMP B COOL WTR LO FLOW
- APP-002-E1, CV SRY PMP COOL WTR LO FLOW
- APP-002-E5, SI PMP COOL WTR LO FLOW

Standard: Candidate determines that all of the annunciators listed are extinguished by observing the annunciator panels on the RTGB.

Examiner's Note:

Comment:

Performance Step: 16 Verify at least one RWST to RHR valve closed prior to proceeding to Step 18: (Step 17)

- SI-862A OR SI-862B

Standard: Candidate determines that one of the SI-862 valves is closed by observing the GREEN close indication illuminated for the applicable valve.

Examiner's Note:

Comment:

* **Performance Step: 17** Open CV SUMP TO RHR valves: (Step 18)

- SI-860A and SI-861A
- SI-860B and SI-861B

Standard: Candidate opens valves SI-860A, SI-861A, SI-860B and SI-861B by placing the control switches to the open position and observing that the RED open indication for each valve is illuminated.

Examiner's Note:

Comment:

Performance Step: 18 Check at least one train of CV SUMP TO RHR valves – OPEN: (Step 19)

- RHR Pump A – SI-860A and SI-861A
- RHR Pump B – SI-860B and SI-861B

Standard: Candidate will select one of the trains and check that the valves supporting that train are open by observing the RED open indication illuminated.

Examiner's Note:

Comment:

Performance Step: 19 Check CV water level – Greater than 354 inches (Step 20)

Standard: Candidate determines that CV water level is greater than 354 inches by observing LI-801 and LI-802 on the PAM Panel or from the ERFIS computer.

Examiner's Note:

Comment:

Performance Step: 20 Check CCW FROM RHR HX valve(s) opened in Step 10.b – OPEN (Step 21)

- CC-749A
- CC-749B

Standard: Candidate determines that both of the valves are open by observing the RED open indication illuminated.

Examiner's Note:

Comment:

Performance Step: 21 Check RCS pressure – Less than 125 PSIG (Step 22)

Standard: Candidate determines that RCS pressure is less than 125 PSIG by observing Wide Range pressure on the ICCM Subcooling Monitor on the PAM Panel.

Examiner's Note:

Comment:

Performance Step: 22 Check all of the following completed: (Step 23)

- Attachment 1 Critical Steps
- Attachment 2 Critical Steps
- Any local actions in the following areas:
  BIT Room, SI Pump Room, RHR Pit, Pipe Alley

Standard: Candidate determines that the attachments and local actions are completed by communicating with the operators assigned to perform the local activities.

Examiner's Cue: **Inform the candidate that Attachments 1 and 2 and all required local actions have been completed.**

Comment:

Performance Step: 23 Establish recirculation flow as follows: (Step 24)

a. Verify CV SUMP TO RHR valves for the RHR Pump to be started – OPEN:
   - RHR Pump A – SI-860A and SI-861A
   - RHR Pump B – SI-860B and SI-861B

b. Verify one RHR Pump - RUNNING

Standard: Candidate determines that both of the valves to support the selected train of RHR are open by observing the RED open indication illuminated for the valves.

Candidate starts the selected RHR Pump by placing the control switch to the START position and observing the RED on indication illuminated.

Examiner's Note:

Comment:

STOP 2ND TIME CRITICAL TIME: _____ (20 minutes)

Performance Step: 24 Check Both the following: (Step 25)

- RVLIS Full Range – Stable OR Rising

AND

- Core Exit T/Cs – Stable OR Lowering

Standard: Candidate determines that RVLIS Full Range is stable by observing the RVLIS monitor on the PAM Panel or on the ERFIS computer.

Candidate determines that the core exit thermocouples are lowering by observing the ICCM Monitor on the PAM Panel or on the ERFIS computer.

Examiner's Note:

Comment:

Performance Step: 25 Check RWST level – Less than 9% (Step 26)

Standard: Candidate determines that RWST level is greater than 9% by observing LI-948 and LI-969 on the RTGB and proceeds to the RNO step.

Examiner's Note: **This is a hold step and procedure progression cannot continue until the RWST level lowers to 9%.**

Comment:

END OF TASK

Terminating Cue: **Cold leg recirculation has been established with one RHR Pump operating.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM B

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

Plant was at 100% RTP.

A Large Break LOCA occurred.

PATH-1 has been implemented.

APP-002-A3, RWST HI/LO LVL has been received with RWST level at 27%

INITIATING CUE:

The CRS has directed you to implement cold leg recirculation IAW EPP-9.

THIS TASK IS TIME CRITICAL.

CONTINUOUSUSE

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3

PART 4

END PATH PROCEDURE

EPP-9

TRANSFER TO COLD LEG RECIRCULATION

REVISION 33

EPP-9, Revision 33
Summary Of Changes (PRR 427144

Various Steps	Changed all occurances of increase and decrease to other words with the same meaning. (Generic)
Step 22 RNO	Made changes to this RNO step to make it easier to determine the intent of the step. (PRR 427144)
Step 23	Changed this step to make it more evident to the reader that the intent is to ensure personnel are out of the areas that may experience higher radiation levels once recirculation is commenced. (PRR 430444)

Purpose and Entry Conditions

(Page 1 of 1)

1. PURPOSE

   This procedure provides the necessary instructions for transferring the safety injection system and containment spray system to the recirculation mode.

2. ENTRY CONDITIONS

   When RWST level lowers to less than 27%.

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

****

CAUTION

Steps 1 Through 24 must be performed without delay to accomplish switchover prior to RWST level reaching 9%.

****

NOTE

- Foldouts are NOT applicable during the performance of this procedure.
- Functional Restoration Procedures are NOT applicable until after Step 43.

1. Check Capability To Establish Recirculation - EXISTS

   Go To EPP-15, Loss Of Emergency Coolant Recirculation.

   - Establishment of 354 inches in the CV Sump is possible

   AND

   - Establishment of at least one flow path from the CV Sump to the RCS is possible

2. Reset SAFETY INJECTION

3. Place The CONTAINMENT SPRAY Key Switch To The OVRD/RESET Position

4. Verify RCPs - ALL STOPPED

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

5.	Stop Pumps To Obtain The Following Conditions:
	• SI Pumps - ONE RUNNING
	• RHR Pumps - ALL STOPPED
	• Charging Pumps - ALL STOPPED
	• CV Spray Pumps - MAXIMUM ONE RUNNING
		Dispatch the BOP Operator to locally trip ANY pump that fails to stop:
		• Bus E-1
		  • SI Pump A - CMPT 21C
		  • RHR Pump A - CMPT 22A
		  • CV Spray Pump A - CMPT 19A
		  • SI Pump B - CMPT 22B
		  • Charging Pump B - CMPT 21B
		• Bus E-2
		  • SI Pump C - CMPT 23B
		  • RHR Pump B - CMPT 26B
		  • CV Spray Pump B - CMPT 25C
		  • SI Pump B - CMPT 29B
		  • Charging Pump C - CMPT 23A
		• DS Bus
		  • Charging Pump A - CMPT 34B

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

Attachment 1 will locally close valves that have lost power due to an electrical train failure.

6. Close The DISCH Valves Associated With Any Stopped CV Spray Pump:

   CV SPRAY PUMP A

   SI-880A

   SI-880B

   CV SPRAY PUMP B

   SI-880C

   SI-880D

IF a valve has failed AND failure is NOT due to an electrical train failure, THEN Dispatch an Operator to locally close the valve.

7. Close SI PUMP RECIRC Valves

   SI-856A

   AND

   SI-856B

8. Perform The Following

   a. Dispatch an Operator to perform Attachment 1

   b. Inform the Operator performing Attachment 1 of any electrical train failure that has occurred

   c. Dispatch a second Operator to perform Attachment 2

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
9.	Check BIT OUTLET Valves - ENERGIZED: SI-870A AND SI-870B	IF the de-energized BIT OUTLET Valve is OPEN, THEN dispatch an Operator to locally close the valve. (Located in BIT Room on top of platform)
10.	Establish CCW Flow To The RHR Heat Exchangers As Follows:	
	a. Start CCW Pumps as necessary to obtain two pumps running	a. IF only one CCW Pump is available, THEN open one CCW FROM RHR HX Valve, while continuing with this procedure. • CC-749A OR • CC-749B Go To Step 11.
	b. Open CC-749A & B, CCW FROM RHR HX, while continuing with this procedure	
*11.	Check RWST Level - LESS THAN 9%	WHEN RWST level is less than 9%, THEN perform Step 12. Go To Step 13.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

12. Verify The Following:

    a. SI Pumps - ALL STOPPED

    b. CV Spray Pumps - ALL STOPPED

    c. CV SPRAY PUMP DISCH Valves - CLOSED:

    - SI-880A
    - SI-880B
    - SI-880C
    - SI-880D

13. Place the Key Switches For The Following Valves In The NORMAL Position

    - SI-862A
    - SI-862B
    - SI-863A
    - SI-863B
    - SI-864A
    - SI-864B
    - SI-866A
    - SI-866B
    - SI-869

14. Open SI-869, SI HOT LEG HDR Valve

    Locally open SI-869. (Located in Pipe Alley at sleeve S-2, top row 2nd from left.)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
15.	Close The Following RWST To RHR Valves SI-862A AND SI-862B	Verify at least ONE valve is closing/closed. IF at least one of the valves can NOT be closed, THEN locally close SI-862A OR SI-862B. (Located in RHR Pit on platform above RHR PUMP B)
16.	Check The Following Alarms - EXTINGUISHED APP-001-B7, RHR PMP A COOL WTR LO FLOW APP-001-C7, RHR PMP B COOL WTR LO FLOW APP-002-E1, CV SRY PMP COOL WTR LO FLOW APP-002-E5, SI PMP COOL WTR LO FLOW	Establish CCW flow.
17.	Verify At Least One RWST TO RHR Valve CLOSED Prior To Proceeding To Step 18: SI-862A OR SI-862B	
18.	Open CV SUMP TO RHR Valves: SI-860A SI-860B SI-861A SI-861B	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
19.	Check At Least One Train Of CV SUMP TO RHR Valves - OPEN: • RHR PUMP A SI-860A SI-861A • RHR PUMP B SI-860B SI-861B	IF at least one train of valves can NOT be opened, THEN Go To EPP-15, Loss Of Emergency Coolant Recirculation.
20.	Check CV Water Level - GREATER THAN 354 INCHES	IF RWST Level is less than 9%, THEN Go To EPP-15, Loss Of Emergency Coolant Recirculation. WHEN CV water level is greater than 354 inches, THEN Go To Step 21.
21.	Check CCW FROM RHR HX Valve(s) Opened At Step 10.b - OPEN: • CC-749A • CC-749B	WHEN the valve(s) are open, THEN Go To Step 22. IF either CC-749A OR CC-749B can NOT be opened, THEN use the opposite train RHR Pump in subsequent steps. Go To Step 22.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

22.	Check RCS Pressure - LESS THAN 125 PSIG	<u>WHEN</u> all of the following are completed, <u>THEN</u> Go To Step 26:
		• Attachment 1 Critical Steps
		• Attachment 2 Critical Steps
		• Any Local Actions in the following areas:
		  • BIT Room
		  • SI Pump Room
		  • RHR Pit
		  • Pipe Alley

23.	Check All Of The Following Completed:
	• Attachment 1 Critical Steps
	• Attachment 2 Critical Steps
	• Any local actions in the following areas:
	  • BIT Room
	  • SI Pump Room
	  • RHR Pit
	  • Pipe Alley
		<u>WHEN</u> all actions are complete, <u>THEN</u> Go To Step 24.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
24.	Establish Recirculation Flow As Follows:	
	a. Verify CV SUMP TO RHR Valves for the RHR Pump to be started - OPEN: • RHR PUMP A SI-860A SI-861A • RHR PUMP B SI-860B SI-861B	
	b. Verify one RHR Pump - RUNNING	
25.	Check Both The Following: • RVLIS Full Range - STABLE OR RISING AND • Core Exit T/Cs - STABLE OR LOWERING	IF RCS pressure is greater than 125 psig, THEN perform the following: a. Stop the running RHR Pump b. Go To Step 26. IF RCS pressure is less than 125 psig, THEN perform the following: a. Stop the running RHR Pump b. Start the opposite train RHR Pump.
26.	Check RWST Level - LESS THAN 9%	WHEN RWST level is less than 9%, THEN Go To Step 27.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
27.	Verify The Following: a. SI Pumps - ALL STOPPED b. CV Spray Pumps - ALL STOPPED c. CV SPRAY PUMP DISCH Valves - CLOSED: • SI-880A • SI-880B • SI-880C • SI-880D	Dispatch the BOP Operator to locally trip ANY pump that fails to stop: • Bus E-1 • SI Pump A - CMPT 21C • CV Spray Pump A - CMPT 19A • SI Pump B - CMPT 22B • Bus E-2 • SI Pump C - CMPT 23B • CV Spray Pump B - CMPT 25C • SI Pump B - CMPT 29B
28.	Close RWST DISCH Valves: • SI-864A AND • SI-864B	
29.	Check RHR Pump Status - RUNNING	Go To Step 33.
30.	Check CV Pressure - GREATER THAN 10 PSIG	Go To Step 42.
31.	Check Time Elapsed Since Starting Accident - GREATER THAN 73 MINUTES	WHEN 73 minutes have elapsed, THEN Go To Step 32.
32.	Verify Both RHR Pumps - STOPPED	
33.	Close The RHR HX DISCH Valves: • RHR-759A AND • RHR-759B	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
34.	Check At Least One RWST DISCH Valve - CLOSED: • SI-864A OR • SI-864B	WHEN either RWST DISCH Valve is closed, THEN Go To Step 35.
35.	Check BOTH RHR HX DISCH Valves - CLOSED: • RHR-759A • RHR-759B	WHEN both RHR HX DISCH Valves are closed, THEN Go To Step 36. IF either RHR-759A OR RHR-759B can NOT be closed, THEN use the opposite train RHR Pump in Step Step 36 and Go To Step 36.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
36.	Establish Recirculation Flow As Follows:	
	a. Check RHR-759A - CLOSED	a. Perform the following: 1) Verify CLOSED RHR-759B. 2) Verify RHR PUMP A is stopped. 3) Open SI-863B, RHR LOOP RECIRC. 4) Close SI-863A, RHR LOOP RECIRC 5) Start RHR PUMP B. 6) Go To Step 37.
	b. Open SI-863A, RHR LOOP RECIRC.	b. Perform the following: 1) Verify RHR-759B CLOSED. 2) Open SI-863B, RHR LOOP RECIRC. 3) Close SI-863A. 4) Start RHR PUMP B 5) Go To Step 37.
	c. Start RHR PUMP A	c. Perform the following: 1) Verify RHR-759B CLOSED. 2) Open SI-863B, RHR LOOP RECIRC. 3) Close SI-863A. 4) Start RHR PUMP B
37.	Start One SI Pump	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
38.	Check Both The Following: • RVLIS Full Range - STABLE <u>OR</u> RISING <u>AND</u> • Core Exit T/Cs - STABLE <u>OR</u> LOWERING	Perform the following: a. Stop the running SI Pump b. Stop the running RHR Pump c. Use the opposite train pumps. d. Go To Step 36.
39.	Maintain SI Recirculation Flow To The RCS At All Times	
40.	Check CV Pressure - GREATER THAN 10 PSIG	Go To Step 42.
41.	Perform The Following: a. Start ONE CV Spray Pump b. Open the DISCHARGE valves for the selected CV Spray Pump • CV SPRAY PUMP A • SI-880A • SI-880B • CV SPRAY PUMP B • SI-880C • SI-880D	
*42.	Check Spray Additive Tank Level - GREATER THAN 0%	Verify Spray Additive Tank isolated as follows: • SI-845A, SAT DISCH, CLOSED • SI-845B, SAT DISCH, CLOSED • SI-845C, SAT THROTTLE VALVE, CLOSED
43.	Reset SPDS <u>AND</u> Commence Monitoring CSFSTs	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
*44.	Check ANY condition below - PRESENT • APP-001-D4, RHR PIT A HI-HI LEVEL - ILLUMINATED OR • APP-001-D5, RHR PIT B HI-HI LEVEL - ILLUMINATED OR • EITHER RTGB RHR Pit indication - GREATER THAN 24 INCHES	IF ANY of the conditions occur, THEN Go To EPP-24, Isolation Of Leakage In The RHR Pump Pit. Go To Step 46.
45.	Go To EPP-24, Isolation Of Leakage In The RHR Pump Pit	
46.	Makeup To RWST Using Supplement P, While Continuing With This Procedure	

****

CAUTION

The Operator should be sure that cavitation is taking place prior to transitioning to steps that attempt to mitigate screen blockage. The actions taken are beyond design basis AND should NOT be taken unless warranted.

****

*47.	Using Available Indications, Determine If RHR Pump Discharge Pressure AND Flow Is Stable • PI-602A • PI-602B • FI-605	IF indication of pump cavitation becomes present, THEN Go To Step 57.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
*48.	Determine CV Sump pH As Follows:	
	a. Request Chemistry Personnel obtain an RHR sample, while continuing with this procedure	
	b. Check RHR Sample Results - AVAILABLE	b. WHEN sample results are available, THEN Perform step 48.c. Go To Step 49.
	c. Check RHR pH - GREATER THAN 8.5	c. Go To Attachment 3, Increasing CV Sump pH.
*49.	Check CV Pressure - LESS THAN 4 PSIG	WHEN CV Pressure is less than 4 psig, THEN perform Step 50. Observe the NOTE prior to step 51 and Go To Step 51.
50.	Perform The Following To Secure CV Spray:	
	a. Stop the operating CV Spray Pump	
	b. Verify CV SPRAY PUMP DISCH Valves - CLOSED: • SI-880A • SI-880B • SI-880C • SI-880D	

NOTE

The charging and RCP seal injection lines have been isolated and will not be available for subsequent actions.

51.	Determine Status Of Attachment 1 AND 2, Local Cold Leg Recirculation Lineups	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
52.	Check Entry To This Procedure - FROM PATH-1	Go To Step 54.
53.	Reset SPDS AND Return To Procedure And Step In Effect	
54.	Check RCS Subcooling - LESS THAN 35°F [55°F]	Continue operation in cold leg recirculation. Contact Plant Operations Staff to evaluate long term plant status.
55.	Check Elapsed Time Since Event Initiation - GREATER THAN 11 HOURS	WHEN 11 hours has elapsed, THEN Go To EPP-10, Transfer To Long Term Recirculation
56.	Go To EPP-10, Transfer To Long Term Recirculation.	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
57.	Determine IF CV Spray Pumps Are Required:	
	a. Check CV Spray Pump - RUNNING	a. Go To Step 60
	b. Check CV Pressure - LESS THAN 4 PSIG	b. IF greater than or equal to 3 CV RECIRC FANs are running, THEN Go To Step 57.c IF less than 3 CV RECIRC FANs are running then Go To Step 60.
	c. Verify all CV Spray Pumps - STOPPED	
	d. Close CV SPRAY PUMP DISCH Valves on any stopped pump: 1) CV SPRAY PUMP A • SI-880A • SI-880B 2) CV SPRAY PUMP B • SI-880C • SI-880D	
58.	Check RHR Pump Discharge Pressure AND Flow - STABLE • PI-602A • PI-602B • FI-605	Go To Step 60.
59.	Go To Step 48	
60.	Check RHR System Alignment - IN PIGGY-BACK MODE	Go To Step 32.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
61.	Determine If CV Pressure Can Be Raised:	
	a. Check CV Pressure - LESS THAN 30 PSIG	a. Go To Step 62.
	b. Perform Supplement O to Raise CV Pressure Using PAHV	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
*62.	Operate RHR AND SI Pumps Intermittently As Follows:	
	a. Check BOTH Trains of SI AND RHR Pumps - AVAILABLE	a. Go To Step 63.
	b. Stop ALL SI, CV Spray, AND RHR Pumps	
	c. Close CV SPRAY PUMP DISCH Valves on any stopped pump: 1) CV SPRAY PUMP A • SI-880A • SI-880B 2) CV SPRAY PUMP B • SI-880C • SI-880D	
	d. Start 1 RHR Pump AND 1 SI Pump on the opposite train to establish flow	
	e. Check RHR Pump Cavitation - PRESENT	e. WHEN RHR Pump cavitation has been eliminated, THEN discontinue intermittent operation of the SI AND RHR Pumps. Go To Step 63
	f. Stop the SI AND RHR Pump that was started	
	g. Wait 6 minutes	
	h. Start 1 RHR Pump AND 1 SI Pump on the opposite train to establish flow	

(CONTINUED NEXT PAGE)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
62.	(CONTINUED)	
	i. Check RHR Pump Cavitation - PRESENT	i. WHEN RHR Pump cavitation has been eliminated, THEN discontinue intermittent operation of the SI AND RHR Pumps. Go To Step 63
	j. Continue intermittent operation of the SI AND RHR Pumps at 6 minute intervals	
63.	Check CV Pressure - LESS THAN 30 PSIG	IF cavitation is present, THEN Go To Step 60. IF cavitation is NOT present, THEN Go To Step 48.
64.	Check RWST Level - GREATER THAN 19%	IF cavitation is present, THEN Go To Step 60. IF cavitation is NOT present, THEN Go To Step 48.
65.	Stop All SI AND RHR Pumps	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

66. Align Valves For SI Injection As Follows:

    a. Verify both RHR LOOP RECIRC valves - CLOSED

    - SI-863A
    - SI-863B

    b. Verify both RWST DISCH Valves - OPEN

    - SI-864A
    - SI-864B

    c. Verify at least one BIT INLET Valve - OPEN

    - SI-867A
    - SI-867B

    d. Verify at least one BIT OUTLET Valve - OPEN

    - SI-870A
    - SI-870B

NOTE

FRP-J.2, Response To Containment Flooding, is NOT applicable during intentional CV Flood.

67. Start One SI Pump

68. Check Either Condition Below Met:

    - RWST Level - LESS THAN 9%

    OR

    - CV Water Level - GREATER THAN 420 INCHES

WHEN either RWST level lowers below 9% OR CV Water Level becomes greater than 420 inches, THEN Go To Step 69.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
69.	Stop The SI Pump	
70.	Align Valves For Piggy-Back Mode As Follows:	
	a. Verify both RWST DISCH Valves - CLOSED • SI-864A • SI-864B	
	b. Check BOTH RHR HX DISCH Valves - CLOSED: • RHR-759A • RHR-759B	b. IF either RHR-759A OR RHR-759B can NOT be closed, THEN use the opposite train RHR Pump in Step 71.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
71.	Establish Recirculation Flow As Follows:	
	a. Check RHR-759A - CLOSED	a. Perform the following: 1) Verify CLOSED RHR-759B. 2) Verify RHR PUMP A is stopped. 3) Open SI-863B, RHR LOOP RECIRC. 4) Close SI-863A, RHR LOOP RECIRC 5) Start RHR PUMP B. 6) Start one SI Pump 7) Go To Step 72.
	b. Open SI-863A, RHR LOOP RECIRC.	b. Perform the following: 1) Verify RHR-759B CLOSED. 2) Open SI-863B, RHR LOOP RECIRC. 3) Close SI-863A. 4) Start RHR PUMP B 5) Start one SI Pump 6) Go To Step 72.
	c. Start RHR PUMP A	c. Perform the following: 1) Verify RHR-759B CLOSED. 2) Open SI-863B, RHR LOOP RECIRC. 3) Close SI-863A. 4) Start RHR PUMP B
	d. Start one SI Pump	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
72.	Check RHR Pump Discharge Pressure AND Flow - STABLE • PI-602A • PI-602B • FI-605	Resume intermittent operation of the RHR AND SI Pump at 6 minutes between run cycles until discharge pressure AND flow are stable. Go To Step 74.
73.	Go To Step 48	
*74.	Check Supplement O - COMPLETED	WHEN Supplement O is complete, THEN Go To Step 75. Go To Step 60.
75.	Check RHR Pump Discharge Pressure AND Flow - STABLE • PI-602A • PI-602B	Go To Step 60.
76.	Go To Step 48	

- END -

CONTINUOUS USE

ATTACHMENT 1

Attachment 1

(Page 1 of 4)

****

CAUTION

Normal Security and Radiation Protection Procedures are not applicable during the performance of this Attachment.

****

1. The critical steps of this Attachment should be performed as rapidly as possible.

2. Obtain the following equipment as required:

   a. Two way radio OR Cell Phone

   b. Flashlight

NOTE

- SI-856A&B are located between SI Pumps B and C.
- SI-856A&B are rotated clockwise to close.

3. Perform the following valve lineup in the SI Pump Room between SI Pumps B and C:

   a. Verify SI-856A, SI PUMP RECIRC Valve - HANDWHEEL CLOSED.

   b. Verify SI-856B, SI PUMP RECIRC Valve - HANDWHEEL CLOSED.

CONTINUOUS USE

ATTACHMENT 1

Attachment 1

(Page 2 of 4)

4. IF an electrical train failure has occurred (E-1/E-2 failure), THEN manually align Spray Pump Discharge valves as follows:

   a. IF a Train A failure has occurred, THEN close Spray Pump "A" valves:

      - SI-880A, CONTAINMENT SPRAY PUMP "A" DISCHARGE
      - SI-880B, CONTAINMENT SPRAY PUMP "A" DISCHARGE

   b. IF a Train B failure has occurred, THEN close Spray Pump "B" valves:

      - SI-880C, CONTAINMENT SPRAY PUMP "B" DISCHARGE
      - SI-880D, CONTAINMENT SPRAY PUMP "B" DISCHARGE

NOTE

PS-996 is located at the South end on the West wall.

5. In Pipe Alley, open PS-996, RHR/PASS ISOLATION.

6. Notify Control Room that the Critical Steps of Attachment 1 are complete.

CONTINUOUS USE

ATTACHMENT 1

Attachment 1

(Page 3 of 4)

****

CAUTION

The Control Room will be initiating CV Sump Recirculation. This may result in high radiation in the Auxiliary Building.

****

NOTE

The following equipment will be required to perform the steps below:

- Controlled Keys 174 and 175
- Fuse Pullers

7. Isolate the RHR Pump suction as follows:

   a. At MCC-5 (CMPT-6J):

      1) Close the breaker for RHR-752A, RHR PUMP A SUCTION.

      2) Insert Key #174 in control switch for RHR-752A AND close the valve.

   b. At MCC-6 (CMPT-6J):

      1) Close the breaker for RHR-752B, RHR PUMP B SUCTION.

      2) Insert Key #175 in control switch for RHR-752B AND close the valve.

8. Deenergize The Charging Pumps As Follows:

   a. At 480V BUS E-1, remove the Control Power Fuses for CHARGING PUMP B (CMPT 21B).

   b. At 480V BUS E-2, remove the Control Power Fuses for CHARGING PUMP C (CMPT 23A).

   c. At 480V BUS DS, remove the Control Power Fuses for CHARGING PUMP A (CMPT 33A, Fuse "UP").

CONTINUOUS USE

ATTACHMENT 1

Attachment 1

(Page 4 of 4)

9. Notify Control Room that Attachment 1 is complete.

- END -

CONTINUOUS USE

ATTACHMENT 2

Attachment 2

(Page 1 of 3)

****

CAUTION

Normal Security and Radiation Protection Procedures are not applicable during the performance of this Attachment.

****

1. The critical steps of this Attachment should be performed as rapidly as possible.

2. Obtain the following equipment as required:

   a. Two way radio OR Cell Phone

   b. Flashlight

NOTE

CVC-282 is located above FCV-1930B, STEAM GENERATOR A BLOWDOWN LINE 15 feet above the floor. The blue EOP Tag is fixed to CVC-282 such that it hangs down from the valve near the FCV-1930B operator. The Charging Line enters the CV at Sleeve 17.

3. In Pipe Alley, close CVC-282, CHARGING LINE FLOW ISOL.

4. Notify Control Room that the Critical Steps of Attachment 2 are complete.

CONTINUOUS USE

ATTACHMENT 2

Attachment 2

(Page 2 of 3)

****

CAUTION

The Control Room will be initiating CV Sump Recirculation. This may result in high radiation in the Auxiliary Building.

****

NOTE

- CVC-297A, B, and C are located in the Northwest corner above Seal Inj Filter shield wall.
- CVC-293A, 293C, 292A, and 295 are located in Northwest corner outside Seal Inj Filter shield wall.
- CVC-295A is located in Northwest corner above Seal Inj Filters.
- CVC-309A and 202A are located on West wall adjacent to HCV-121.

5. Verify CLOSED the following valves in the Charging Pump Room:
   a. CVC-297A, RCP "A" SEAL WATER FLOW CONTROL VALVE.
   b. CVC-297B, RCP "B" SEAL WATER FLOW CONTROL VALVE.
   c. CVC-297C, RCP "C" SEAL WATER FLOW CONTROL VALVE.
   d. CVC-293A, SEAL INJECTION FILTER "A" OUTLET.
   e. CVC-293C, SEAL INJECTION FILTER "B" OUTLET.
   f. CVC-292A, SEAL INJECTION FILTER PIC-157 ISOLATION.
   g. CVC-295, SEAL INJECTION FILTER "A" AND "B" BYPASS.
   h. CVC-295A, SEAL INJECTION FILTERS OUTLET VENT.
   i. CVC-309A, HCV-121 BYPASS.
   j. CVC-202A, HCV-121 OUTLET.

CONTINUOUS USE

ATTACHMENT 2

Attachment 2

(Page 3 of 3)

6. Open the following valves at the IVSW Tank Area Manual Header:

   a. IVSW-16, IVSW TO PEN 24, CHARGING LINE ISOLATION.

   b. IVSW-16A, IVSW TO PEN 25, 26, & 27, RCPS SEAL INJECTION.

7. Notify Control Room that Attachment 2 is complete.

- END -

CONTINUOUS USE

ATTACHMENT 3

RAISING CV SUMP PH

(Page 1 of 5)

****

CAUTION

When applying conservatism in determining the amount of NaOH to be added, conservatism should be applied to not exceeding a PH of 10.5 since there is no way of reducing PH until CV radiation levels have lowered.

****

1. Contact Plant Operations Staff To Determine The Amount Of NaOH Needed To Restore PH To Greater Than 8.5

NOTE

- NaOH Tank Capacity is contained in Curve 8.13.
- 1044 gallons is equal to 0% level.

2. Determine Spray Additive Tank Final Level Using Table Below:

SPRAY ADDITIVE TANK LEVEL CALCULATION

Current Level %:_____=_____gallons (Curve 8.13)

subtract desired gallons - _____gallons (Step 1)

gallons remaining in tank _____gallons =

% final level _____% (Curve 8.13)

CONTINUOUS USE

ATTACHMENT 3

RAISING CV SUMP PH

(Page 2 of 5)

* 3.	Check Final Level Calculated In Step 2 - GREATER THAN 0%	Contact Plant Operations Staff to order NaOH from vender. WHEN NaOH inventory has been restored to the Spray Additive Tank, THEN Go To Step 2. Go To procedure Main Body, Step 52.
4.	Check SI Pump Status - STOPPED	Go To Step 12.
5.	Check Time Elapsed Since Rx Tripped - GREATER THAN 73 MINUTES	WHEN 73 minutes have elapsed, THEN Go To Step 6.
6.	Verify Both RHR Pumps - STOPPED	
7.	Close The RHR HX DISCH Valves: • RHR-759A • RHR-759B	
8.	Check BOTH RHR HX DISCH Valves - CLOSED: • RHR-759A • RHR-759B	WHEN both RHR HX DISCH Valves are closed, THEN Go To Step 9. IF either RHR-759A OR RHR-759B can NOT be closed, THEN use the opposite train RHR Pump in Step Step 9 and Go To Step 9.

CONTINUOUS USE

ATTACHMENT 3

RAISING CV SUMP PH

(Page 3 of 5)

9. Establish Recirculation Flow As Follows:	
a. Check RHR-759A - CLOSED	a. Perform the following: 1) Verify CLOSED RHR-759B. 2) Verify RHR PUMP A is stopped. 3) Open SI-863B, RHR LOOP RECIRC. 4) Close SI-863A, RHR LOOP RECIRC. 5) Start RHR PUMP B. 6) Go To Step 10.
b. Open SI-863A, RHR LOOP RECIRC.	b. Perform the following: 1) Verify RHR-759B CLOSED. 2) Open SI-863B, RHR LOOP RECIRC. 3) Close SI-863A. 4) Start RHR PUMP B 5) Go To Step 10.
c. Start RHR PUMP A	c. Perform the following: 1) Verify RHR-759B CLOSED. 2) Open SI-863B, RHR LOOP RECIRC. 3) Close SI-863A. 4) Start RHR PUMP B

CONTINUOUS USE

ATTACHMENT 3

RAISING CV SUMP PH

(Page 4 of 5)

10.	Start One SI Pump	
11.	Check FI-943, SI COLD LEG HEADER FLOW - FLOW INDICATED	Verify the following: • SI-867A AND B - OPEN • SI-870A AND B - OPEN • RCS pressure less than 1350 psig
12.	Perform The Following: a. Start ONE CV Spray Pump b. Open the DISCHARGE valves for the selected CV Spray Pump • CV SPRAY PUMP A • SI-880A • SI-880B • CV SPRAY PUMP B • SI-880C • SI-880D	
13.	Set Spray Additive Tank Flow On FI-949 To Desired Flow Rate	
*14.	Check CV Pressure - GREATER THAN OR EQUAL TO 0 PSIG	Contact Plant Operations Staff to determine a plan for CV pH control. Go To Step 16.
15.	Check Spray Additive Tank Level - BELOW CALCULATED LEVEL	WHEN Spray Additive Tank level lowers below calculated level, THEN Go To Step 16.

CONTINUOUS USE

ATTACHMENT 3

RAISING CV SUMP PH

(Page 5 of 5)

16. Perform The Following To Secure CV Spray:

    a. Verify Spray Additive Tank Isolated As Follows:

    - SI-845A, SAT DISCH - CLOSED
    - SI-845B, SAT DISCH - CLOSED
    - SI-845C, SAT THROTTLING - CLOSED

    b. Check CV Pressure - LESS THAN 4 PSIG

    b. Go To Procedure Main Body, Step 49.

    c. Stop the operating CV Spray Pump

    d. Verify CV SPRAY PUMP DISCH Valves - CLOSED:

    - SI-880A
    - SI-880B
    - SI-880C
    - SI-880D

17. Go To Procedure Main Body, Step 50

- END -

ATTACHMENT 4A

Continuous Action Steps

(Page 1 of 2)

1. IF capability for recirculation can NOT be established, THEN Go To EPP-15, Loss Of Emergency Coolant Recirculation:
   - Establishment of 354 inches in the CV Sump is NOT possible
     OR
   - Establishment of at least one flow path from the CV Sump to the RCS is NOT possible

11. WHEN RWST level is less than 9%, THEN Verify The Following:
    a. SI Pumps - ALL STOPPED
    b. CV Spray Pumps - ALL STOPPED
    c. CV SPRAY PUMP DISCH Valves - CLOSED:
       - SI-880A
       - SI-880B
       - SI-880C
       - SI-880D

42. IF Spray Additive Tank level is NOT greater than 0%, THEN verify Spray Additive Tank isolated as follows:
    - SI-845A, SAT DISCH, CLOSED
    - SI-845B, SAT DISCH, CLOSED
    - SI-845C, SAT THROTTLE VALVE, CLOSED

44. IF ANY condition below occurs, THEN Go To EPP-24, Isolation Of Leakage In The RHR Pump Pit:
    - APP-001-D4, RHR PIT A HI-HI LEVEL - ILLUMINATED
      OR
    - APP-001-D5, RHR PIT B HI-HI LEVEL - ILLUMINATED
      OR
    - EITHER RTGB RHR Pit indication - GREATER THAN 24 INCHES

47. IF indication of RHR Pump cavitation becomes present, THEN Go To Step 57.

48. WHEN RHR sample results are available, THEN perform Step 48.c.

49. WHEN CV Pressure Is Less Than 4 PSIG, THEN perform Step 50.

62. WHEN RHR Pump cavitation has been eliminated, THEN discontinue intermittent operation of the SI AND RHR Pumps.

74: WHEN Supplement O has been completed, THEN check pumps for cavitation.

ATTACHMENT 4A

Continuous Action Steps

(Page 2 of 2)

Attachment 3

Step 3: WHEN NaOH has been received, THEN continue with Attachment 3.

Step 14: IF CV pressure drops below 0 psig before required NaOH has been added, THEN stop CV Spray AND contact staff to determine plan.

ATTACHMENT 4B

Continuous Action Steps

(Page 1 of 2)

1. IF capability for recirculation can NOT be established, THEN Go To EPP-15, Loss Of Emergency Coolant Recirculation:
   - Establishment of 354 inches in the CV Sump is NOT possible
     OR
   - Establishment of at least one flow path from the CV Sump to the RCS is NOT possible

11. WHEN RWST level is less than 9%, THEN Verify The Following:
   a. SI Pumps - ALL STOPPED
   b. CV Spray Pumps - ALL STOPPED
   c. CV SPRAY PUMP DISCH Valves - CLOSED:
      - SI-880A
      - SI-880B
      - SI-880C
      - SI-880D

42. IF Spray Additive Tank level is NOT greater than 0%, THEN verify Spray Additive Tank isolated as follows:
   - SI-845A, SAT DISCH, CLOSED
   - SI-845B, SAT DISCH, CLOSED
   - SI-845C, SAT THROTTLE VALVE, CLOSED

44. IF ANY condition below occurs, THEN Go To EPP-24, Isolation Of Leakage In The RHR Pump Pit:
   - APP-001-D4, RHR PIT A HI-HI LEVEL - ILLUMINATED
     OR
   - APP-001-D5, RHR PIT B HI-HI LEVEL - ILLUMINATED
     OR
   - EITHER RTGB RHR Pit indication - GREATER THAN 24 INCHES

47. IF indication of RHR Pump cavitation becomes present, THEN Go To Step 57.

48. WHEN RHR sample results are available, THEN perform Step 48.c.

49. WHEN CV Pressure Is Less Than 4 PSIG, THEN perform Step 50.

62. WHEN RHR Pump cavitation has been eliminated, THEN discontinue intermittent operation of the SI AND RHR Pumps.

74: WHEN Supplement O has been completed, THEN check pumps for cavitation.

ATTACHMENT 4B

Continuous Action Steps

(Page 2 of 2)

Attachment 3

Step 3: WHEN NaOH has been received, THEN continue with Attachment 3.

Step 14: IF CV pressure drops below 0 psig before required NaOH has been added, THEN stop CV Spray AND contact staff to determine plan.

Facility: HB ROBINSON Task No.: 01000106805

Task Title: PZR Pressure Control Malfunction JPM No.: 2011-2 NRC JPM C

K/A Reference: 010 A2.02 3.9 / 3.9
027 AA1.01 4.0 / 3.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The plant is operating at 100% RTP.
- No equipment is out of service.
- You are the Reactor Operator.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: NONE

General References: AOP-019, Malfunction of RCS Pressure Control, Revision 16.

Handouts: NONE

Initiating Cue: Respond to plant conditions.

Time Critical Task: NO

Validation Time: 8 minutes

SIMULATOR SETUP

1. Reset to IC-808.
2. SCN: 008_NRC_JPM_C
3. Place simulator in run when directed by the Chief Examiner.
4. Execute the malfunction when directed by the Chief Examiner.

(Denote Critical Steps with a check mark)

START TIME: _____

NOTE
Steps 1 and 2 are immediate action steps.

Performance Step: 1 Determine if PZR PORVs should be closed (Step 1)

a. Check PZR pressure – Less than 2335 PSIG

b. Verify Both PZR PORVs - Closed

Standard: Candidate determines that PZR pressure is less than 2335 psig by observing PR-444 Pen 1 and/or PI-444, 445, 455, 456 and/or 457.

Candidate determines that both PZR PORVs are closed by observing the GREEN closed indication illuminated on PCV-455C and 456.

Examiner's Note:

Comment:

Performance Step: 2 Control the normal PZR spray valves and PZR heaters to restore RCS pressure to the desired control band (Step 2)

Standard: Candidate determines that the PZR spray valves are closed by observing the GREEN closed indication on PCV-455A and 455B. Candidate determines the PZR heater status by observing all of the heaters energized on PZR Control Group and PZR Backup Groups A and B RED on indication illuminated.

Examiner's Note:

Comment:

Performance Step: 3 Make a PA announcement for procedure entry (Step 3)

Standard: Candidate makes a PA announcement by using one of the PA handsets and announcing that AOP-019 has been entered.

Examiner's Note:

Comment:

Performance Step: 4 Check PZR Pressure – Under operator control (Step 4)

Standard: Candidate determines that PZR pressure is NOT under his control and proceeds to the RNO step.

RNO step states IF PZR pressure approaches a reactor trip setpoint, THEN trip the reactor and Go To PATH-1 OR EOP-E-0, Reactor Trip or Safety Injection.

- Low PZR Pressure – 1844 psig
- High PZR Pressure – 2376 psig
- OT Delta T – Variable (TR-412)

Examiner's Note:

Comment:

Performance Step: 5 Check Pressurizer Pressure Transmitter PT-444 OR PT-445 – Failed (Step 5)

Standard: Candidate determines that PT-444 and PT-445 are indicating proper PZR pressure and proceeds to the RNO step and proceeds to Step 7.

Examiner's Note:

Comment:

Performance Step: 6 Check PC-444J, PZR PRESS – Controlling properly in AUTO (Step 7)

Standard: Candidate determines that PC-444J is operating properly in AUTO due to current PZR pressure conditions. PC-444J is indicating at the lower end of its range, attempting to raise PZR pressure back to its setpoint.

Examiner's Note:

Comment:

Performance Step: 7 Observe the NOTE prior to Step 11 and Go To Step 11 (Step 8)

.

Standard: Candidate proceeds to the NOTE prior to Step 11.

Examiner's Note:

Comment:

NOTE

The response in the following step needs to be based upon plant conditions at entry into AOP-019 to ensure the correct procedure flowpath is taken.

√ **Performance Step: 8** Check RCS pressure – Less than required for current plant conditions (Step 11)

Standard: Candidate determines that PZR pressure is less than the nominal pressure of 2235 psig by observing PR-444 Pen 1 and/or PI-444, 445, 455, 456 and/or 457.

Examiner's Note:

Comment:

√ **Performance Step: 9** Check PZR pressure – Less than 2205 psig (Step 12)

Examiner's Note: Candidate determines that PZR pressure is less than 2205 psig by observing PR-444 Pen 1 and/or PI-444, 445, 455, 456 and/or 457.

Examiner's Note:

Comment:

Performance Step: 10 Restore pressure to greater than 2205 psig within 2 hours OR be in Mode 2 within 6 hours (Step 13)

Standard: Candidate reads and understands the LCO conditions for the present PZR pressure.

Examiner's Note:

Comment:

Performance Step: 11 Check both PZR Spray Valves – Closed (Step 14)

- PCV-455A
- PCV-455B

Standard: Candidate determines that both PZR Spray valves are closed by observing the GREEN closed indication on PCV-455A and B.

Examiner's Note:

Comment:

Performance Step: 12 Observe the CAUTION prior to Step 20 and Go To Step 20 (Step 15)

Standard: Candidate proceeds to the CAUTION prior to Step 20.

Examiner's Note:

Comment:

CAUTION

With HCV-121, Charging Flow valve closed, throttling seal injection flow will cause the charging pump relief valves to lift.

√ **Performance Step: 13** Perform the following: (Step 20)

a. Check CVC-311, AUX PZR SPRAY valve - Closed

Standard: Candidate determines that CVC-311 is open by observing the RED open indication illuminated on the valve and proceeds to the RNO step.

Examiner's Note:

Comment:

Performance Step: 14 Verify CVC-311 control switch is selected to CLOSE (Step 20.a.RNO)

Standard: Candidate determines that CVC-311 control switch is selected to CLOSE by observing the control switch for valve CVC-311 on the RTGB.

Examiner's Note:

Comment:

√ **Performance Step: 15** IF CVC-311 will NOT close, THEN perform the following (Step 20.a.2.a RNO)

a. Close CVC-460A and CVC-460B, LDTN LINE STOP.

Standard: Candidate closes CVC-460A and B by placing the control switch for the valves in the closed position and observing the GREEN closed indication is illuminated.

Examiner's Note: CVC-460A and B are controlled by a single control switch.

Comment:

√ **Performance Step: 16** IF CVC-311 will NOT close, THEN perform the following (Step 20.a.2.b RNO)

b. Verify only one charging pump is running.

Standard: Candidate stops one of the two running charging pumps by placing the control switch on the RTGB to STOP and observing the GREEN off indication is illuminated.

Examiner's Note: Candidate may place the charging pump speed controller in manual and lower the pump speed to minimum prior to stopping the pump.

Comment:

Performance Step: 16 IF CVC-311 will NOT close, THEN perform the following (Step 20.a.2.c RNO)

c. Place running charging pump controller in MAN and adjust to minimum speed.

Standard: Candidate verifies that the charging pump speed controller is in manual by depressing the MAN pushbutton and depresses the DOWN pushbutton until the speed controller indication is at 0%.

Examiner's Note:

Comment:

√ **Performance Step: 17** IF CVC-311 will NOT close, THEN perform the following (Step 20.a.2.d RNO)

d. Close HCV-121, CHARGING FLOW valve by slowly adjusting controller HIC-121 to 100% demand while maintaining Charging pump discharge pressure less than 2500 PSIG.

Standard: Candidate closes HCV-121 by rotating the pot in the clockwise direction until the pot will no longer turn and the position indication is at 100%.

Examiner's Note: HCV-121 pot is reverse acting – 100% indicates that the valve is closed.

Comment:

END OF TASK

Terminating Cue: **Once these actions are completed, PZR pressure is rising and evaluation of this JPM is complete.**

STOP TIME: _____ _____

2011-2 NRC JPM C

Job Performance Measure No.:

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The plant is operating at 100% RTP.
No equipment is out of service.
You are the Reactor Operator.

INITIATING CUE: Respond to plant conditions.

CONTINUOUS USE

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL
VOLUME 3
PART 5
ABNORMAL OPERATING PROCEDURE

AOP-019

MALFUNCTION OF RCS PRESSURE CONTROL

REVISION 16

AOP-019 Revision 16
Summary of Changes (PRR 464487)

Various Steps	Changed Path-1 to Path-1 or EOP-E-0 in preparation for EOP upgrade. (PRR 464487)

Purpose and Entry Conditions

(Page 1 of 1)

1. PURPOSE

This procedure provides instructions in the event RCS pressure is higher OR lower than required for current plant conditions.

This procedure is applicable in Modes 1, 2, and 3.

2. ENTRY CONDITIONS

This procedure may be entered when RCS pressure deviates from the desired control band due to a fault in pressure control components. (AOP-025 covers Instrument Failure)

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

Steps 1 and 2 are Immediate Action steps.

* 1. Determine If PZR PORVs Should Be Closed:

a. Check PZR pressure - LESS THAN 2335 PSIG

a. Verify OPEN at least one PZR PORV and associated PORV BLOCK Valve:

- PCV-455C AND RC-536

OR

- PCV-456 AND RC-535

WHEN RCS pressure is less than 2335 psig, THEN perform Step 1.b.

Go To Step 2.

b. Verify Both PZR PORVs - CLOSED

b. IF any PZR PORV can NOT be closed, THEN close its PORV BLOCK Valve.

2. Control The Normal PZR Spray Valves AND PZR Heaters To Restore RCS Pressure To The Desired Control Band

3. Make PA Announcement For Procedure Entry

* 4. Check PZR Pressure - UNDER OPERATOR CONTROL

IF PZR Pressure approaches a Reactor Trip Setpoint, THEN trip the Reactor and Go To PATH-1 OR EOP-E-0, Reactor Trip or Safety Injection.

- Low PZR Pressure - 1844 psig
- High PZR Pressure - 2376 psig
- OTΔT - Variable (TR-412)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
* 5.	Check Pressurizer Pressure Transmitter PT-444 OR PT-445 - FAILED.	IF PT-444 OR PT-445 FAIL, THEN Go to AOP-025, RTGB Instrument Failure Go To Step 7
6.	Go To AOP-025, RTGB Instrument Failure	
7.	Check PC-444J, PZR PRESS - OPERATING PROPERLY IN AUTO	Perform the following: a. Place PC-444J, PZR PRESS, in MAN. b. IF PC-444J is operating properly in manual, THEN Go To Step 9. c. IF PC-444J is NOT operating properly in manual, THEN Go To Step 10.
8.	Observe the NOTE prior to Step 11 and Go To Step 11	
9.	Operate PC-444J As Follows:	
	a. Check PZR SPRAY VALVE Controllers - IN AUTO	a. Restore the affected controllers to AUTO.
	b. Check PZR Heaters - IN NORMAL CONFIGURATION	b. Place the heaters in the desired configuration.
	c. Manually adjust PC-444J to maintain PZR pressure.	
	d. Check PZR pressure - UNDER CONTROL	d. Observe the NOTE prior to Step 11 and Go To Step 11
	e. Go To Step 29	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
10.	Control PZR Pressure As Follows:	
	a. Manually control the PZR SPRAY VALVES to maintain PZR pressure: • PCV-455A • PCV-455B	
	b. Manually control PZR Heaters to maintain PZR pressure: • PZR HTR BACK-UP GROUP A • PZR HTR BACK-UP GROUP B	
	c. Check PZR pressure - UNDER CONTROL	c. Observe the NOTE prior to Step 11 and Go To Step 11
	d. Go To Step 29	

NOTE

The response in the following step needs to be based upon plant conditions at entry into AOP-019 to ensure the correct procedure flowpath is taken.

11.	Check RCS Pressure - LESS THAN REQUIRED FOR CURRENT PLANT CONDITIONS	Go To Step 25.
*12.	Check PZR Pressure - LESS THAN 2205 PSIG	Perform the following: • IF pressure lowers to less than 2205 psig, THEN restore pressure within 2 hours OR be in Mode 2 within 6 hours. • Refer to Technical Specification 3.4.1. • Go To Step 14.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
13.	Restore Pressure To Greater Than 2205 PSIG Within 2 HOURS OR Be In Mode 2 Within 6 HOURS	
14.	Check Both PZR SPRAY VALVES - CLOSED • PCV-455A • PCV-455B	Perform the following: a. Place the affected PZR SPRAY VALVE Controller in MAN AND adjust the output to zero. • PCV-455A • PCV-455B b. IF the affected valve will NOT close, THEN Go To Step 16. c. IF the affected valve has closed, THEN observe the CAUTION prior to Step 20 and Go To Step 20.
15.	Observe The CAUTION Prior To Step 20 and Go To Step 20	
*16.	Perform the following: a. Dispatch an Operator to Perform Attachment 1, PZR SPRAY VALVE ISOLATION	
	b. Check PZR Pressure -APPROACHING 1844 PSIG	b. IF PZR Pressure approaches 1844 psig, THEN Go To Step 17. WHEN Attachment 1 has been completed, THEN Go To Step 29.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
17.	Perform the following:	
	a. Check Plant Conditions - IN MODE 1 OR 2	a. Go To Step 18.
	b. Trip the Reactor	
	c. Stop the RCP supplying the affected Spray Valve • RCP B - PCV-455A • RCP C - PCV-455B	
	d. Go To PATH-1 OR EOP-E-0, Reactor Trip or Safety Injection	
18.	Stop The RCP Supplying The Affected Spray Valve • RCP B - PCV-455A • RCP C - PCV-455B	
19.	Perform The Following:	
	a. Check RCP C - RUNNING	a. Maintain PZR level between 30% and 40% to provide adequate PZR spray.
	b. Go To Step 29	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

****

CAUTION

With HCV-121, CHARGING FLOW Valve closed, throttling Seal Injection Flow will cause the Charging Pump Relief Valves to lift.

****

20. Perform the following:

a. Check CVC-311, AUX PZR SPRAY Valve - CLOSED

a. Verify CVC-311 Control Switch is SELECTED TO CLOSE.

1) IF CVC-311 is CLOSED, THEN Go to Step 21.

2) IF CVC-311 will NOT Close, THEN perform the following:

a) Close CVC-460A AND CVC-460B, LTDN LINE STOP.

b) Verify only one Charging Pump is RUNNING.

c) Place running Charging Pump Controller in MAN and adjust to minimum speed.

d) Close HCV-121, CHARGING FLOW Valve by slowly adjusting controller HIC-121 to 100% demand while maintaining Charging Pump Discharge pressure less than 2500 PSIG.

e) Perform Attachment 2, Placing Excess Letdown in Service.

f) Go To Step 29

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
*21.	Check APP-003-F8, PZR LO LVL HTR OFF & LTDN SECURE - EXTINGUISHED	WHEN APP-003-F8 is extinguished, THEN reset PZR Heaters as follows: • Place the control switch for PZR HTR CONTROL GROUP to OFF AND return to the ON position. • Place the control switch for PZR HTR BACK-UP GROUP A to OFF AND return to the AUTO position. • Place the control switch for PZR HTR BACK-UP GROUP B to OFF AND return to the AUTO position.
22.	Determine Heater Capacity As Follows:	
	a. Contact Maintenance and Engineering to check PZR Heater capacity	
	b. Check PZR Heater capacity - REDUCED	b. Go To Step 23.
	c. Dispatch an operator to Containment to throttle the Continuous Spray Valves • RC-524, LOOP "C" CONTINUOUS SPRAY (PCV-455B BYPASS) • RC-525, LOOP "B" CONTINUOUS SPRAY (PCV-455A BYPASS)	
	d. Refer to ITS LCO 3.4.9	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
23.	Check PZR Pressure - STABLE OR TRENDING TO REQUIRED VALUE	Perform the following: a. Evaluate primary plant parameters for indications of RCS leakage. b. IF indication of RCS leakage is present, THEN Go To AOP-016, Excessive Primary Plant Leakage. c. IF leakage is NOT present, THEN Go To Step 5.
24.	Go To Step 29	
25.	Attempt To Stop Pressure Rise With Heater Control As Follows: a. Verify ALL PZR Heaters in the OFF position b. Check PZR pressure - STABLE OR LOWERING c. Maintain PZR pressure using manual heater control d. Go To Step 29	b. Go To Step 26.
26.	Check ΔT between TI-454, PRZR VAPOR TEMP, and TI-123, REGEN HX OUTLET TEMP - LESS THAN 320°F	Perform the following: a. Reduce pressure using one PZR PORV • PCV-455C • PCV-456 b. WHEN PZR pressure is reduced to the desired value, THEN close the open PZR PORV. c. Go To Step 28.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

Supplement K is available for Auxiliary Spray Enhancement if required.

27. Reduce Pressure Using Auxiliary Spray As Follows:

    a. Open CVC-311, AUX PZR SPRAY Valve.

    b. Verify CLOSED the following valves:

    - CVC-310A, LOOP 1 HOT LEG CHG
    - CVC-310B, LOOP 2 COLD LEG CHG

    c. WHEN PZR pressure is reduced to the desired value, THEN stop the pressure reduction as follows:

    1) Open CVC-310B — 1) Open CVC-310A.

    2) Close CVC-311

    d. Maintain PZR pressure using manual heater control

28. Check PZR Pressure - STABLE OR TRENDING TO REQUIRED VALUE — Go To Step 25.

29. Implement The EALs

30. Contact I&C To Make Repairs To The PZR Pressure Control System

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

31. Refer To ITS For Applicable LCOs

    - LCO 3.4.11, PZR PORV
    - TRM 3.4, PZR Spray ΔT
    - LCO 3.4.4 AND 3.4.5, RCS Loops
    - LCO 3.4.1, RCS Pressure
    - LCO 3.4.9, PZR Level

32. Return To Procedure And Step In Effect

- END -

CONTINUOUS USE

ATTACHMENT 1

PZR SPRAY VALVE ISOLATION

(Page 1 of 2)

****

CAUTION

The RCP Bays at power are High Radiation Areas.

****

NOTE

- Entry to high temperature environments is controlled by AP-020, Heat Stress Control Procedure.
- All actions of this attachment are performed locally in the Containment.

1. IF PCV-455A is the affected SPRAY VALVE, THEN Go To Step 2.

   IF PCV-455B is the affected SPRAY VALVE, THEN Go To Step 3.

NOTE

- A flashlight AND adjustable wrench will be required to perform the step below.
- All valves listed below are located in RCP Bay B at the top of the wall separating the Pump Bay from the PZR Cubicle.

2. Perform the following to isolate PCV-455A:

   a. Close RC-525, LOOP "B" CONTINUOUS SPRAY (PCV-455A BYPASS).

   b. Close IA-3800, PCV-455A BOOSTER ISOLATION

   c. Close IA-3627, IA TO PCV-455A I/P ISOLATION

   d. Disconnect the Swagelock Fitting at the PCV-455A Booster for the tubing connection to PCV-455A diaphragm AND vent the air from the top of the PCV-455A diaphragm.

CONTINUOUS USE

ATTACHMENT 1

PZR SPRAY VALVE ISOLATION

(Page 2 of 2)

NOTE

- A flashlight AND adjustable wrench will be required to perform the step below.
- All valves listed below are located in PZR Cubicle on the side of the PZR opposite the wall separating the Pump Bay from the PZR Cubicle.

3. Perform the following to isolate PCV-455B:

   a. Close RC-524, LOOP "C" CONTINUOUS SPRAY (PCV-455B BYPASS).

   b. Close IA-3799, PCV-455B BOOSTER ISOLATION

   c. Close IA-3798, PCV-455B I/P ISOLATION

   d. Disconect the Swagelock Fitting at the PCV-455B Booster for the tubing connection to PCV-455B diaphragm AND vent the air from the top of the PCV-455B diaphragm.

4. Notify the Control Room that Attachment 1 has been completed.

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 2

PLACING EXCESS LETDOWN IN SERVICE

(Page 1 of 2)

1. Verify CC-739, CCW FROM EXCESS LTDN HX - OPEN

2. Verify CVC-389, EXCESS LTDN DIV. - IN THE RCDT POSITION

3. Open CVC-387, EXCESS LTDN STOP

****

CAUTION

IF Excess Letdown Heat Exchanger outlet temperature exceeds 195°F, THEN damage could result.

****

4. Slowly open HIC-137, EXCESS LTDN FLOW

5. Check Excess Letdown Heat Exchanger Outlet Temperature - GREATER THAN 195°F

   IF temperature exceeds 195°F, THEN perform Step 6.

   Observe the NOTE prior to Step 7 and Go To Step 7.

6. Reduce Flow From Excess Letdown Using HIC-137 To Maintain Temperature Less Than 195°F.

NOTE

PZR level will rise if total Charging flow exceeds total Letdown flow AND RCP Seal Leakoff flow.

* 7. Check PZR Level - RISING

   IF PZR Level begins to rise, THEN perform Steps 8 AND 9.

   Go To Step 10.

8. Verify The Running Charging Pump - AT MINIMUM SPEED

CONTINUOUS USE

ATTACHMENT 2

PLACING EXCESS LETDOWN IN SERVICE

(Page 2 of 2)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
9.	Contact Chemistry To Purge The PZR Liquid Sample Line With Full Flow To The VCT Using CP-003, Systems Sampling Procedure	
*10.	Check PZR Level - GREATER THAN 63%	IF PZR level rises to 63%, THEN perform Step 11. Go To Step 12.
11.	Reduce PZR Level Below 63%	Perform the following: a. Be in Mode 3 with the Trip Breakers open within 6 hours. b. Be in Mode 4 within 12 hours.
*12.	Check PZR Level - APPROACHING 91%	IF PZR level approaches 91%, THEN Go To Step 13. Go To Step 14.
13.	Trip The Reactor And Go To PATH-1 OR EOP-E-0, Reactor Trip or Safety Injection	
14.	Inform The CRS That Excess Letdown Is In Service AND That Continuous Action Steps Are In Effect	

- END -

ATTACHMENT 3A

Continuous Action Steps

(Page 1 of 1)

MAIN BODY

1. WHEN RCS pressure is less than 2335 psig, THEN perform Step 1.b

4. IF PZR Pressure approaches a Reactor Trip Setpoint, THEN trip the Reactor and Go To PATH-1 OR EOP-E-0, Reactor Trip or Safety Injection.

5. IF PT-444 OR PT-445 FAIL, THEN Go to AOP-025, RTGB Instrument Failure.

12. IF pressure lowers to less than 2205 psig, THEN restore pressure within 2 hours OR be in Mode 2 within 6 hours.

16. IF PZR Pressure approaches 1844 psig, THEN Go To Step 17.

21. WHEN APP-003-F8 is extinguished, THEN reset PZR Heaters as follows.

ATTACHMENT 2

7. IF PZR Level begins to rise, THEN perform Steps 8 AND 9.

10. IF PZR Level rises to 63%, THEN perform Step 11.

12. IF PZR Level rises to 91%, THEN Go To Step 13.

ATTACHMENT 3B

Continuous Action Steps

(Page 1 of 1)

MAIN BODY

1. WHEN RCS pressure is less than 2335 psig, THEN perform Step 1.b

4. IF PZR Pressure approaches a Reactor Trip Setpoint, THEN trip the Reactor and Go To PATH-1 OR EOP-E-0, Reactor Trip or Safety Injection.

5. IF PT-444 OR PT-445 FAIL, THEN Go to AOP-025, RTGB Instrument Failure.

12. IF pressure lowers to less than 2205 psig, THEN restore pressure within 2 hours OR be in Mode 2 within 6 hours.

16. IF PZR Pressure approaches 1844 psig, THEN Go To Step 17.

21. WHEN APP-003-F8 is extinguished, THEN reset PZR Heaters as follows.

ATTACHMENT 2

7. IF PZR Level begins to rise, THEN perform Steps 8 AND 9.

10. IF PZR Level rises to 63%, THEN perform Step 11.

12. IF PZR Level rises to 91%, THEN Go To Step 13.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	HB ROBINSON		Task No.:	01000109205
Task Title:	Transfer from Bypass to Main Feedwater Regulating Valves		JPM No.:	2011-2 NRC JPM D
K/A Reference:	045 A1.06 059 A4.08	3.3/3.7 3.0/2.9		

Examinee: NRC Examiner: N/A

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Plant startup is in progress IAW GP-005, Power Operation.
- S/G levels are being controlled with the Feedwater Regulating Bypass Valves at ~ 85% open.
- Turbine has been placed in HOLD until Feedwater Control has been transferred to the Feedwater Regulating valves.
- GP-005, Revision 102, is completed up to Step 8.4.21.

Task Standard: Drive control rods in to stabilize reactor power < 10% RTP following the turbine trip.

Required Materials: GP-005, Power Operation, Revision 102
AOP-007, Turbine Trip Below P-8, Revision 11.

General References: GP-005, Power Operation, Revision 102
AOP-007, Turbine Trip Below P-8, Revision 11.

Handouts: GP-005, Power Operation, Revision 102

Initiating Cue: Transfer feedwater control to the Feedwater Regulating Valves IAW GP-005

Time Critical Task: NO

Validation Time: 10 minutes

SIMULATOR SETUP

1. Reset to IC-809
2. Open SCN: 008_11_2_JPM_D
3. Place simulator in run when directed by the examiner.
4. Execute the turbine trip when directed by the examiner.

(Denote Critical Steps with an asterisk *)

START TIME: _____

NOTE

Step 8.4.21 is a continuous action step that should be performed whenever plant conditions require feedwater flow through the FRVs and conditions are suitable for automatic S/G water level control.

Feedwater Regulating Valves should be transferred to Automatic control one at a time.

FCV-1446, CONDENSATE RECIRC, is controlled by FS-1446, COND PMP RECIRC VLV FLOW SWITCH. FS-1446 is set to open FCV-1446 at a flow of 1050 gpm with the valve closing at a condensate system flow of 4200 gpm flow through the GS Condenser and SGBD Heat Exchangers. (ESR 00-00208)

The push button to reset FS-1446 is located in the same enclosure as FS-1446. This enclosure is located approximately 15 feet northwest of FCV-1446 on a concrete column.

Performance Step: 1 WHEN reactor power is 15% to 20%, OR the feedwater regulating bypass valves are at 60% to 90% demand signal, THEN shift each feedwater regulating valve to AUTO as follows: (Step 8.4.21)

a. Check CLOSED FCV-1446, CONDENSER RECIRC.

Standard: Candidate determines that FCV-1446 is closed by observing the GREEN closed indication illuminated on the RTGB.

Examiner's Note: FCV-1446 has Open/Closed indication available on the RTGB but does not have any control switch available.

Comment:

Performance Step: 2 VERIFY feed flow is trending with steam flow and S/G levels are within 1% of program level. (Step 8.4.21.c)

Standard: Candidate determines that feedwater flow and steam flows on each of the S/Gs are trending together for the present plant load by observing the S/G instrumentation.

Candidate determines that the present S/G levels are at ~ 45% which is at the present S/G level program.

Examiner's Note: S/G program level ramps from 39% to 52% from 0 to 20% load based on selected First Stage Pressure.

Examiner's Cue:

Comment:

Performance Step: 3 Depress the AUTO pushbutton on the FRV controller. (Step 8.4.21.d)

IF the respective Feedwater Regulating Bypass valve is NOT closed, THEN slowly close it.

Standard: Candidate depresses the AUTO pushbutton on each of the FRV controllers FCV-478, 488 and 498 and notes that the AUTO light is illuminated.

Candidate rotates the pot on each of the FRV Bypass valves FCV-479, 489 and 499 counterclockwise until the demand position is at 0% and the valve GREEN closed indication is illuminated.

Examiner's Note:

Comment:

Performance Step: 4 VERIFY each FRV in AUTO is maintaining programmed S/G level. (Step 8.4.21.e)

Standard: Candidate determines that the FRVs are operating properly in AUTO by observing that S/G levels are being maintained at ~ 45% and the absence of APP-006- A3, B3 and C3, S/G LVL DEV.

Examiner's Note: APP-006-A3, B3 and C3 alarm setpoints are ± 5% of program level.

When FRVs have been verified to be operating properly, an inadvertent turbine trip will occur.

Booth Operator Cue: **Initiate turbine trip by actuating command [IMF TUR01]**

Comment:

Performance Step: 5 Check turbine trip as follows: (AOP-007, Step 1)

- Both Turbine Stop Valves – CLOSED

OR

- All Governor Valves - CLOSED

Standard: Candidate determines that all turbine valves are closed by observing the GREEN indication illuminated for all of the turbine valves on the EH Status Panel.

Examiner's Note:

Comment:

NOTE

In the steam pressure mode, the steamline PORVs may actuate until reactor power is reduced.

Performance Step: 6 Check Steam Dump to Condenser – ACTUATED (AOP-007, Step 2)

Standard: Candidate determines that steam dump valves to the condenser have been actuated by observing the RED open indication illuminated on Bank 1 of the steam dump valves.

Examiner's Note:

Comment:

Performance Step: 7 Check Main FW Pump status – ANY RUNNING (AOP-007, Step 3)

Standard: Candidate determines that one of the Main FW Pump is running by observing the RED indication illuminated on the operating Main FW Pump.

Examiner's Note:

Comment:

Performance Step: 8 Check reactor power when turbine tripped – Less than 20% (AOP-007, Step 4)

Standard: Candidate determines that the reactor was at 14% power when the turbine tripped by observing recorder NR-45.

Examiner's Cue:

Comment:

* **Performance Step: 9** Check reactor power when turbine tripped – Less than 10% (AOP-007, Step 4)

Standard: Candidate determines that reactor power was NOT less than 10% and proceeds to the RNO step.

Examiner's Note:

Comment:

* **Performance Step: 10** Verify control rods are inserting to reduce reactor power to less than 10% power (AOP-007, Step 5.a RNO)

Standard: Candidate will either drive control rods in in manual by placing the IN-HOLD-OUT lever in the IN position or place the control rods in AUTO and check that the rods are inserting to reduce power to less than 10%.

Examiner's Note:

Comment:

Performance Step: 11 Adjust feedwater control valves to maintain S/G level between 39% and 52% (AOP-007, Step 5.b RNO)

Standard: Candidate checks and/or controls S/G level by monitoring the operation of the FRVs. Candidate may transfer back to the FRV Bypass valves by opening valves FCV-479, 489 and 499 by operating the pots on the valve controls in the clockwise direction.

Examiner's Note:

Comment:

Performance Step: 12 When reactor power is less than 10%, THEN stabilize reactor power between 7% and 10% as follows:(AOP-007,Step 5.c RNO)

- IF required, THEN place rods in M (manual)
- Insert or Withdraw control rods
- Adjust Boron concentration using OP-301, Chemical and Volume Control System (CVCS) Section "RCS Boration Quick Checklist" or "RCS Dilution Quick Checklist"

Standard: Candidate determines that reactor power is less than 10% by monitoring NR-45 for current power level.

Candidate will place the control rods in manual if they were selected to AUTO during the AOP-007 actions.

Candidate will insert or withdraw control rods to stabilize the reactor between 7% and 10% power.

Examiner's Note: **Boron concentration adjustments will not be necessary for the scope of this JPM.**

Comment:

END OF TASK

Terminating Cue: **Reactor power has been verified to be less than 10% power.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM D

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- Plant startup is in progress IAW GP-005, Power Operation.
- S/G levels are being controlled with the Feedwater Regulating Bypass Valves at ~ 85% open.
- Turbine has been placed in HOLD until Feedwater Control has been transferred to the Feedwater Regulating valves.
- GP-005, Revision 102, is completed up to Step 8.4.21.

INITIATING CUE:

Transfer feedwater control to the Feedwater Regulating Valves IAW GP-005

NOTE: Step 8.4.21 is a continuous action step that should be performed whenever plant conditions require Feedwater flow through the FRVs and conditions are suitable for automatic S/G water level control.

Feedwater Regulating Valves should be transferred to automatic control one at a time.

FCV-1446, CONDENSATE RECIRC, is controlled by FS-1446, COND PMP RECIRC VLV FLOW SWITCH. FS-1446 is set to open FCV-1446 at a flow of 1050 gpm with the valve closing at a Condensate System flow of 4200 gpm flow through the GS Condenser and SGBD Heat Exchangers. (ESR 00-00208)

The Push Button to reset FS-1446 is located in the same enclosure as FS-1446. This enclosure is located approximately 15 feet northwest of FCV-1446 on a concrete column.

21. **WHEN** Reactor Power is 15% to 20%, **OR** the Feedwater Regulating Bypass Valves are at 60% to 90% demand signal, **THEN SHIFT** each Feedwater Regulating Valve to AUTO as follows:

    a. **CHECK** CLOSED FCV-1446, CONDENSER RECIRC.

    b. **IF** FCV-1446 does not indicate shut, **THEN PERFORM** the following:

        (1) **DEPRESS AND HOLD** the FS-1446 Push Button. N/A

        (2) **WHEN** FCV-1446 indicates full shut, **THEN** release the FS-1446 Push Button. N/A

CAUTION

Shutting either C-18A, FCV-1446 INLET, or C-18B, FCV-1446 OUTLET, could cause a running Condensate Pump to overheat on a low flow condition **IF** unit load is reduced prior to correcting the problem with FCV-1446.

        (3) **IF** FCV-1446 is failed open **OR** reopens when it should stay closed, **THEN** SHUT either

            – C-18A N/A
            OR
            – C-18B N/A

INIT

8.4.21.b (Continued)

(4) **IF EITHER** C-18A **OR** C-18B were shut in Step 8.4.21.b(3), **THEN HANG** either an OFF NORMAL TAG IAW OPS-NGGC-1308 **OR** a CAUTION TAG IAW OMM-001-9 while continuing with this procedure.

TAG NUMBER N/A N/A

c. **VERIFY** Feed Flow is trending with Steam Flow **AND** S/G Levels are within 1% of program level.

S/G A
S/G B
S/G C

d. **DEPRESS** the AUTO pushbutton on the FRV controller.

FCV-478, FEED REG VALVE "A"
FCV-488, FEED REG VALVE "B"
FCV-498, FEED REG VALVE "C"

– **IF** the respective Feedwater Regulating Bypass Valve is **NOT** closed, **THEN** slowly close it.

FCV-479, FEED REG BYPASS "A"
FCV-489, FEED REG BYPASS "B"
FCV-499, FEED REG BYPASS "C"

e. **VERIFY** each FRV in AUTO is maintaining programmed S/G level.

FCV-478, FEED REG VALVE "A"
FCV-488, FEED REG VALVE "B"
FCV-498, FEED REG VALVE "C"

CONTINUOUS USE

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL
VOLUME 3
PART 5
ABNORMAL OPERATING PROCEDURE

AOP-007

TURBINE TRIP BELOW P-8

REVISION 11

AOP-007, Revision 11
Summary Of Changes (PRR 464464)

Various Steps	Changed Path-1 to Path-1 or EOP-E-0 in preparation for EOP upgrade. (PRR 464464)
Various Steps	As the procedure GP-006 has been changed, made changes to this procedure to reflect that the information is now located in GP-006-1 or 2. (PRR 462905)

Purpose and Entry Conditions

(Page 1 of 1)

1. PURPOSE

   This procedure provides the instructions for response to a Turbine trip below the P-8 interlock (40% NI Power).

2. ENTRY CONDITIONS

   Upon receiving indication that a Turbine trip is required or has occurred below P-8 (40% NI Power).

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
1.	Check Turbine Trip As Follows: BOTH Turbine Stop Valves - CLOSED OR All Governor Valves - CLOSED	Perform the following: a. Manually trip the Turbine by simultaneously depressing the THINK and TURBINE TRIP Pushbuttons. b. IF the Turbine will NOT trip, THEN run back Turbine at maximum rate until the Governor Valves are closed. c. IF the Turbine can NOT be run back, THEN perform one of the the following: • IF the REACTOR TRIP BLOCK P-7 status light is EXTINGUISHED, THEN Trip the Reactor and Go To Path-1 OR EOP-E-0, Reactor Trip or Safety Injection OR • IF the REACTOR TRIP BLOCK P-7 status light is ILLUMINATED, THEN perform the following: • Verify closed ALL MSIVs • Verify closed ALL MSIV BYPs • Go To Step 9

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

In the Steam Pressure Mode, the Steamline PORVs may actuate until Reactor Power is reduced.

* 2.	Check Steam Dump To Condenser - ACTUATED	IF RCS Tavg exceeds 566°F and Steam Dump to the condenser is not actuated, THEN Trip the Reactor and Go To Path-1 OR EOP-E-0, Reactor Trip or Safety Injection
3.	Check Main FW Pump Status - ANY RUNNING	IF the REACTOR TRIP BLOCK P-7 status light is EXTINGUISHED, THEN Trip the Reactor and Go To Path-1 IF the REACTOR TRIP BLOCK P-7 status light is ILLUMINATED, THEN perform the following: a. Verify MDAFW Pumps - RUNNING b. Start SDAFW Pump as necessary c. Control AFW to maintain S/G levels 39% to 52% d. Perform one or both of the following to reduce Reactor power to less than or equal to 3% while continuing. • Manually insert control rods. • Borate using OP-301, Chemical and Volume Control System (CVCS) Section " RCS Boration Quick Checklist" e. Go To Step 9
4.	Check Reactor Power When Turbine Tripped - LESS THAN 20%	Go To Step 7

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
* 5.	Check Reactor Power When Turbine Tripped - LESS THAN 10%	Perform the following: a. Verify control rods are inserting to reduce Reactor Power to less than 10% power b. Adjust feedwater control valves to maintain S/G level between 39% and 52% c. WHEN Reactor Power is less than 10%, THEN stabilize Reactor Power between 7% and 10% as follows IF required, THEN place rods in M (manual) Insert OR Withdraw control rods • Adjust Boron concentration using OP-301, Chemical and Volume Control System (CVCS) Section "RCS Boration Quick Checklist" or "RCS Dilution Quick Checklist" d. Go To Step 9
6.	Go To Step 9	
* 7.	Check Reactor Power - LESS THAN 15%	Perform the following: a. Verify control rods are inserting to reduce Tavg b. WHEN Reactor Power is less than 15%, THEN perform step 8 c. Go To Step 9

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
8.	Stabilize Reactor Power As Follows: a. Verify rod bank selector switch - IN M (Manual) b. Maintain Reactor Power Between 10% and 15% • Insert <u>OR</u> Withdraw control rods • Adjust Boron concentration using OP-301, Chemical and Volume Control System (CVCS) Section "RCS Boration Quick Checklist" or "RCS Dilution Quick Checklist"	
9.	Check PZR PORVs - CLOSED	<u>IF</u> PZR pressure is less than 2335 psig, <u>THEN</u> close PZR PORVs. <u>IF</u> any PZR PORV can <u>NOT</u> be closed, <u>THEN</u> close its PORV BLOCK.
10.	Make PA Announcement For Procedure Entry	
*11.	Check Reactor Shutdown - REQUIRED	
	a. Reactor subcritical as indicated by a sustained -1/3 dpm startup rate	a. <u>IF</u> the Reactor becomes subcritical as indicated by a sustained -1/3 dpm startup rate, <u>THEN</u> perform step 11.b Go To Step 12
	b. Shutdown the Reactor in accordance with GP-006-1, Normal Plant Shutdown From Power Operation To Hot Shutdown, Section "Reactor Shutdown to Subcritical Conditions" while continuing.	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
12.	Check The Following Breakers - OPEN • NORTH OCB BKR 52/9 • SOUTH OCB BKR 52/8 • EXCITER FIELD BREAKER	IF breakers 52/9 AND 52/8 have NOT opened after one minute, THEN Perform the following: a. Manually trip breaker(s) as follows: 1) Depress and hold THINK push button. 2) Momentarily place the breaker control switch in TRIP 3) Release the THINK push button. b. IF breakers 52/9 AND 52/8 have Not tripped, THEN notify the Load Dispatcher of the failure. IF the EXCITER FIELD BREAKER has NOT tripped after 52/8 AND 52/9 have opened, THEN momentarily place the control switch in TRIP.
13.	Stabilize Plant Conditions a. Check steam generator levels - TRENDING 39% TO 52% b. Control PZR heaters and sprays to maintain PZR pressure - BETWEEN 2220 PSIG AND 2250 PSIG c. Control Charging AND Letdown flows to maintain PZR level within 5% of program level	a. Adjust feedwater control valves to maintain level between 39% and 52%
14.	Check Moisture Separator Reheaters - IN SERVICE	Go To Step 16

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
15.	Isolate The Moisture Separator Reheaters As Follows:	
	a. IF the SHUTOFF VALVES are open, THEN place the SHUTOFF VALVES switch in Close	
	b. Place the PURGE VALVES switch in Close	
	c. Check the PURGE and SHUTOFF VALVES closed	c. IF the PURGE and SHUTOFF VALVES can NOT be closed from the RTGB, THEN perform the following: 1) Dispatch personnel to locally close the open valves.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
16.	Align The Feedwater System As Follows:	
	a. Check Main Feedwater - IN SERVICE	a. Go To Step 17
	b. Check Feedwater Regulating Valves - IN SERVICE	b. Adjust the Feedwater Regulating Bypass Valves to maintain S/G level between 35 to 44% Go To Step 16.e
	c. Check Feedwater Regulating Valves In Automatic	c. Place Feedwater Bypass Valves in service as follows: 1) Maintain S/G level between 35 to 44% 2) IF required, THEN slowly open FCV-479, FCV-489, AND FCV-499, Feedwater Regulating Bypass Valves 3) Maintain S/G level by adjusting FCV-479, FCV-489, AND FCV-499, FRV Bypass Valves, while closing FCV-478, FCV-488, AND FCV-498 4) WHEN FCV-478, FCV-488, AND FCV-498 indicate closed, THEN Go To Step 16.e

(CONTINUED NEXT PAGE)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

16. (CONTINUED)

    d. Place Feedwater Bypass Valves in service as follows:

        1) Maintain S/G level between 35 to 44%

        2) Slowly open FCV-479, FCV-489, AND FCV-499, Feedwater Regulating Bypass Valves

        3) WHEN FCV-478, FCV-488, AND FCV-498 indicate closed, THEN place the controllers in MAN

    e. Verify the FW HDR SECTION Valves closed.

        - V2-6A
        - V2-6B
        - V2-6C

17. Check Power Reduction - REQUIRED

    a. Reactor Power - GREATER THAN 3%

    a. Go To Step 20

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
*18.	Check MODE Change Required:	
	a. Plant in MODE 1 at event start	a. Go To Step 19
	b. Check current Reactor Power - LESS THAN OR EQUAL TO 5%	b. WHEN Reactor power is less than or equal to 5%, THEN perform step 18.c Go To Step 19
	c. Verify the following performed: • PA announcement made that MODE 2 has been entered AND • ERFIS MODE indication changed to display - MODE 2	
19.	Perform One Or Both Of The Following To Reduce Reactor Power To Less Than Or Equal To 3% • Manually insert control rods. • Borate using OP-301, Chemical and Volume Control System (CVCS) Section "RCS Boration Quick Checklist"	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

****

CAUTION

Raising power to greater than 5% will result in a MODE change from MODE 2 to MODE 1.

****

20. Maintain Reactor Power between 1% and 3%

    - Insert OR Withdraw control rods
    - Adjust Boron concentration using OP-301, Chemical and Volume Control System (CVCS) Section "RCS Boration Quick Checklist" or "RCS Dilution Quick Checklist"

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
21.	Maintain RCS Temperature As Follows:	
	a. Check steam dumps - IN TAVG MODE	a. Go To Step 21.c
	b. Transfer steam dump to steam pressure mode as follows:	
	1) Perform the following:	
	a) Verify STEAM HEADER PRESS Controller PC-464B is in AUTO.	
	b) Verify PC-464B pot setting is 7.28.	
	c) Place the STEAM DUMP MODE Switch to the STEAM PRESS position.	
	d) Check APP-006-F5, STEAM DUMP ARMED - ILLUMINATED	
	e) Slowly adjust PC-464B pot setting to 7.17.	
	c. Maintain RCS Tavg 547°F to 551°F	
	1) Adjust PC-464B to maintain Tavg 547°F to 551°F	1) Maintain Tavg 547°F to 551°F with Steam Line PORVs

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

****

CAUTION

It may be difficult to hold the Reactor critical due to rapid changes in Xenon following a large power change. If the Reactor can NOT be stabilized due to operating limitations of the reactivity controlling systems, the Reactor shall be shutdown. Time spent with the Reactor critical and the secondary (turbine) secured should be minimized.

****

*22. Determine If The Reactor Should Be Shutdown As Follows:

a. Check the Reactor - STABLE AND CRITICAL

a. IF the Reactor can NOT be maintained stable and critical, THEN shutdown the Reactor in accordance with GP-006-1, Normal Plant Shutdown From Power Operation To Hot Shutdown, while continuing.

Go To Step 23

b. Contact Reactor Engineering To Provide Technical Guidance

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
23.	Check Turbine Oil System Status: • Turbine Bearing Oil Pressure (PI-2096A) - GREATER THAN 6 PSIG • TURNING GEAR AND SEAL OIL BACKUP PUMPS- RUNNING	Perform one of the following: • IF the Lube Oil system is intact, THEN perform the following: a. Start TURNING GEAR AND SEAL OIL BACKUP PUMPS b. IF the TURNING GEAR AND SEAL OIL BACKUP PUMPS will not start, THEN start the EMERG OIL PUMP. OR • IF the Lube Oil system is NOT intact OR Bearing Oil Pressure is less than 6 psig, THEN perform the following: a. Stop Vacuum Pumps. b. Open Vacuum Breakers: 1) Depress and hold THINK push button. 2) Momentarily place the VACUUM BREAKER VALVES 1 & 2 switch in OPEN. 3) WHEN the Vacuum Breaker Valves indicate open, THEN release the THINK push button.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
*24.	Verify BEARING OIL LIFT PUMP Running As Follows:	
	a. Check Turbine Speed - LESS THAN 600 RPM	a. WHEN Turbine Speed is less than 600 rpm, THEN perform Step 24.b. Go To Step 25.
	b. Verify BEARING OIL LIFT PUMP - RUNNING	
25.	Check Status Of Main FW Pumps - ANY RUNNING	Go To Step 27
26.	Go To Step 30	
27.	Check Condensate Pumps - AT LEAST ONE RUNNING	Attempt to start one Condensate Pump as follows: a. Verify CLOSED V5-3, COND PUMP DISCH. b. Momentarily place V5-3 control switch to OPEN. c. Momentarily place one Condensate Pump control switch in START. d. IF the Condensate Pump starts, THEN verify V5-3 goes full open when MAIN FEEDWATER HEADER PRESS (PI-1420) is greater than 300 psig. e. IF the Condensate Pump can NOT be started, THEN Go To Step 29.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

****

CAUTION

The Feedwater Isolation Signal is an Engineering Safety Feature Actuation System (ESFAS) Instrumentation feature as listed in ITS LCO 3.3.2, Table 3.3.2-1, Function 5. Leaving the FEEDWATER ISOLATION OVRD/RESET Key Switches in the OVRD/RESET position blocks the Feedwater Isolation Signal and will result in an ITS LCO 3.0.3 entry if the valves are opened in MODE 1, MODE-2, or MODE 3.

****

NOTE

APP-002-C1, FW ISOL/CV SPRAY OVRD/RESET, will alarm when the FEEDWATER ISOLATION key switches are placed in the OVRD/RESET position. Alarm extinguishment is functional verification that the key switch is restored to NORMAL.

*28. Determine If One Main FW Pump Can Be Started As Follows:

a. Check S/G levels - ALL LESS THAN 75%

a. WHEN all S/G levels are less than 75%, THEN perform Steps 28.b and 29.

Go To Step 30

(CONTINUED NEXT PAGE)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

28. (CONTINUED)

b. Attempt to start one Main FW Pump as follows:

1) Verify Closed the following valves:

a) FW Header Section Valves:

- V2-6A
- V2-6B
- V2-6C

b) Main Feed Regulating Valves

- FCV-478
- FCV-488
- FCV-498

c) Feed Regulation Valve Bypass Valves

- FCV-479
- FCV-489
- FCV-499

2) Momentarily place the Feedwater Isolation Reset Key Switches in the OVRD/RESET position and return to NORM

- STM GEN A
- STM GEN B
- STM GEN C

3) Attempt to start one Main FW Pump

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
29.	Determine If Main Feedwater Control Can Be Established As Follows:	
	a. Check Main Feedwater Status - AT LEAST ONE CONDENSATE PUMP AND ONE MAIN FW PUMP RUNNING	a. Perform the following: 1) Place the unit in Hot Shutdown using GP-006-1, Normal Plant Shutdown From Power Operation To Hot Shutdown while continuing 2) Go To Step 30.
	b. Maintain S/G levels between 35 to 44% using FRV Bypass Valves	
	c. Stop AFW Pumps	
	d. Restore S/G blowdown using OP-406, Steam Generator Blowdown/Wet Layup System, Section "Blowdown To The Flashtank With Heat Recovery Bypassed," as time permits	
30.	Verify Drain Valves - OPEN • DV-1, DV-2, DV-3, and DV-4, MAIN STEAM DRAIN Valves • DV-5, FIRST STAGE DRAIN Valve • DV-6, MOISTURE SEPARATOR A DRAIN Valve • DV-7, MOISTURE SEPARATOR B DRAIN Valve	
31.	Check Total Power Change - LESS THAN 15% REACTOR POWER	Notify Chemistry to sample the RCS for Iodine as required by ITS SR 3.4.16.2. Go To Step 34
32.	Check Steam Generator Blowdown -ALIGNED TO THE FLASHTANK WITH HEAT RECOVERY IN SERVICE	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
33.	Transfer Steam Generator "Blowdown To The Flash Tank With Heat Recovery Bypassed" Using OP-406	
34.	Place The VOLTAGE REGULATOR Control Switch In The OFF Position	
35.	Shutdown Unnecessary Plant Equipment: a. IF the following equipment is not necessary for plant operation, THEN it may be shutdown: • Heater Drain Pumps • Condensate Pumps • Feedwater Pumps b. Shutdown additional equipment as directed by the SM OR CRS.	
36.	Check 4160 Bus 4 Status - SUPPLIED BY STARTUP TRANSFORMER	Contact Engineering to evaluate the cause of the loss of 4160 Bus 4 and to provide instructions for bus recovery. Refer to ITS LCO 3.4.4.
*37.	Check APP-009-F2. TURBINE AT ZERO SPEED - ILLUMINATED	WHEN APP-009-F2 illuminates, THEN perform Step 38. Go To Step 39.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
38.	Check Turning Gear Status: • TURNING GEAR ENGAGED light -ILLUMINATED AND • APP-009-F2, TURBINE AT ZERO SPEED - EXTINGUISHED	Perform one of the following: • IF Bearing Oil Pressure (PI-2096A) is greater than 6 psig AND the Bearing Oil Lift Pump is running, THEN manually engage the Turning Gear as follows: a. Place the TURNING GEAR switch in the OFF position. b. Locally place the TURNING GEAR ENG/DISENG LEVER in the ENGAGED position. c. Place the TURNING GEAR switch in MANUAL. OR • IF the Turning Gear and Bearing Oil Lift Pumps are NOT running, THEN contact Engineering for instructions for placing the Turbine on Turning Gear.
39.	Implement The EALs	
40.	Return To Procedure And Step In Effect	
	- END -	

ATTACHMENT 1A

Continuous Action Steps

(Page 1 of 1)

2. IF RCS Tavg exceeds 566°F and Steam Dump to the condenser is not actuated, THEN Trip the Reactor and Go To Path-1 OR EOP-E-0, Reactor Trip or Safety Injection.

5. WHEN Reactor Power is less than 10%, THEN stabilize Reactor Power between 7% and 10%.

7. WHEN Reactor Power is less than 15%, THEN perform Step 8.

11. IF the Reactor becomes subcritical as indicated by a -1/3 dpm startup rate not due to Operator action, THEN perform step 11.b.

18. WHEN Reactor power is less than or equal to 5%, THEN perform step 18.c.

22. IF the Reactor can NOT be maintained stable and critical, THEN shutdown the Reactor in accordance with GP-006-1.

24. WHEN Turbine Speed is less than 600 rpm, THEN perform Step 24.b.

28. WHEN all S/G levels are less than 75%, THEN perform Steps 28.b and 29.

37. WHEN APP-009-F2 illuminates, THEN perform Step 38.

ATTACHMENT 1B

Continuous Action Steps

(Page 1 of 1)

2. IF RCS Tavg exceeds 566°F and Steam Dump to the condenser is not actuated, THEN Trip the Reactor and Go To Path-1 OR EOP-E-0, Reactor Trip or Safety Injection.

5. WHEN Reactor Power is less than 10%, THEN stabilize Reactor Power between 7% and 10%.

7. WHEN Reactor Power is less than 15%, THEN perform Step 8.

11. IF the Reactor becomes subcritical as indicated by a -1/3 dpm startup rate not due to Operator action, THEN perform step 11.b.

18. WHEN Reactor power is less than or equal to 5%, THEN perform step 18.c.

22. IF the Reactor can NOT be maintained stable and critical, THEN shutdown the Reactor in accordance with GP-006-1.

24. WHEN Turbine Speed is less than 600 rpm, THEN perform Step 24.b.

28. WHEN all S/G levels are less than 75%, THEN perform Steps 28.b and 29.

37. WHEN APP-009-F2 illuminates, THEN perform Step 38.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: HB ROBINSON Task No.: 01000105805

Task Title: Respond to RHR Leakage With the Unit on RHR Cooling JPM No.: 2011-2 NRC JPM E

K/A Reference: 025 AA2.02 3.4 / 3.8

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: __X__

Classroom _____ Simulator __X__ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The plant is in Mode 5.
- RHR is in service for core cooling.
- Charging Pump A is cleared and tagged.

Task Standard: Isolate RHR system to stop leakage to the PRT

Required Materials: AOP-020, Loss of Residual Heat Removal, Revision 32
OP-201, Residual Heat Removal System, Revision 64

General References: AOP-020, Loss of Residual Heat Removal, Revision 32
OP-201, Residual Heat Removal System, Revision 64

Handouts: OP-201, Section 8.2.3 with Steps 8.2.3.1a and 1b completed

Initiating Cue: You are the RO. The CRS has directed you to swap to RHR Pump A in service IAW OP-201, Section 8.2.3 to equalize run time on the pumps.

Time Critical Task: NO

Validation Time: 10 minutes

SIMULATOR SETUP

1. Reset to IC-810
2. "A" Charging Pump inoperable

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 PLACE FC-605, RHR HX BYPASS FLOW in MAN (OP-201, Step 8.2.3.2.a)

Standard: Candidate places FC-605 in manual by depressing the MAN pushbutton on the controller and observing that the MAN light is illuminated and the AUTO light is extinguished.

Examiner's Note:

Comment:

√ **Performance Step: 2** START the Standby RHR Pump (OP-201, Step 8.2.3.2.b)

Standard: Candidate starts RHR Pump A by placing the START / STOP control switch to the START position and observing that the RED on indication is illuminated and the GREEN off indication is extinguished.

Examiner's Note:

Comment:

Performance Step: 3 VERIFY proper operation of RHR Pump previously started on step 8.2.3.2.b (OP-201, Step 8.2.3.2.c)

Standard: Candidate determines that RHR Pump A is operating properly by observing that the proper indication is received, no annunciators are received.

Examiner's Note: When RHR Pump A is started, RHR relief valve RHR-706 opened and is relieving to the PRT. The candidate should note that PZR level is lowering.

Comment:

Performance Step: 4 STOP the previously running RHR Pump (OP-201, Step 8.2.3.2.d)

Standard: Candidate stops RHR Pump B by placing the START / STOP control switch to the STOP position and observing that the GREEN off indication is illuminated and the RED on indication is extinguished.

Examiner's Note:

Comment:

Performance Step: 5 After RHR flow has stabilized as indicated on FI-605, PLACE FC-605, RHR HX BYPASS FLOW, in AUTO AND CHECK FCV-605 for proper operation (OP-201, Step 8.2.3.2.e)

Standard: Candidate places FC-605 in AUTO by depressing the AUTO pushbutton on the controller and observing the AUTO light illuminated and the MAN light extinguished.

Examiner's Note: Candidate will determine that RCS inventory is lowering and enter AOP-020, Loss of Residual Heat Removal (Shutdown Cooling)

Comment:

Performance Step: 6 Check RCS Level – LESS THAN -72 INCHES (69% FULL RANGE RVLIS) (Step 1)

Standard: Candidate determines that RCS level is above -72 inches by observing RCs inventory in the PZR and transitions to Step 1 RNO and proceeds to Step 3.

Examiner's Note:

Comment:

Performance Step: 7 Make PA announcement for procedure entry (Step 3)

Standard: Candidate makes the PA announcement by using an available PA handset and announcing that AOP-020 has been entered due to lowering RCS inventory.

Examiner's Note:

Comment:

NOTE

FRP-S.1 is NOT applicable for this event unless directed by the CSFSTs.

Performance Step: 8 From the RTGB, verify reactor tripped as follows: (Step 4)

- Reactor Trip Main and Bypass Breakers - OPEN
- Rod Position Indication - ZERO
- Rod Bottom Lights - ILLUMINATED

Standard: Candidate verifies that the reactor trip breakers are open by the GREEN open lights illuminated on the reactor trip breakers and no indication available on the reactor trip bypass breakers due to the breakers being racked out with the fuses removed.

Examiner's Note: Rod position indication and rod bottom lights are extinguished due to the rod control system being de-energized with the plant in Mode 5.

Comment:

Performance Step: 9 Check PZR PORV – Failed open from loss of power or malfunction (Step 5).

Standard: Candidate determines that both PZR PORVs are closed by observing the GREEN closed lights illuminated on PCV-455C and 456. Proceeds to RNO and Step 7.

Examiner's Note:

Comment:

Performance Step: 10 Check RCPs – Any running (Step 7)

Standard: Candidate determines that 1 of the RCPs is operating by observing the RED on light above the RTGB control switch for the RCP.

Examiner's Note:

Comment:

Performance Step: 11 Check RCP No. 1 Seal D/P – Less than 210 PSID. (Step 8)

Standard: Candidate determines that all RCP No. 1 seal D/P are greater than 210 PSID by observing PI-156A, PI-155A and PI-154A. Candidate proceeds to Step 8 RNO.

Examiner's Note:

Comment:

Performance Step: 12 Observe the NOTE prior to Step 10 and Go To Step 10. (Step 8 RNO)

.

Standard: Candidate observes the NOTE prior to Step 10 anf proceeds to Step 10.

Examiner's Note:

Comment:

NOTE

The RCS level trend should be carefully evaluated. A loss of RCS inventory as a result of a failed open PZR PORV that has been closed should result in a transition to Section E.

√ **Performance Step: 13** Check RCS level – Lowering (Step 10)

- Pressurizer Level **OR**
- RCS loop standpipe level **OR**
- RVLIS **OR**
- Refueling Cavity Watch report.

Standard: Candidate determines that PZR level is lowering by observing PZR level recorder LR-459 Pen 1 and/or LI-459A, 460, 461 or 462.

Examiner's Note:

Comment:

√ **Performance Step: 14** Verify all letdown flowpaths isolated as follows: (Step 11)

- LCV-460A and B, LTDN LINE STOP valves – Closed.
- HIC-142, PURIFICATION FLOW controller – Adjusted to 0%.
- HIC-137, EXCESS LTDN FLOW controller – Adjusted to 0%.
- CVC-387, EXCESS LTDN STOP – Closed.

Standard: Candidate verifies that the control switches for LCV-460A and B and CVC-387 are placed to the closed position and the GREEN closed indication is illuminated.

Candidate verifies that the pots for HIC-142 and HIC-137 are rotated in the counterclockwise direction until the pot will no longer turn and the indication is showing 0%.

Examiner's Note: LCV-460A and B are both controlled by a single control switch.

Comment:

Performance Step: 15 Check Charging Pump status – All stopped (Step 12).

Standard: Candidate determines that 2 Charging Pumps are running by observing the RED on status lights illuminated and proceeds to Step 12 RNO. Candidate raises the speed on the running Charging pumps to maximum by selecting manual on the pump speed controllers and depressing the UP pushbutton until the speed indicators indicate 100%.
Candidate proceeds to Step 17.

Examiner's Note:

Comment:

Performance Step: 16 Check RCS Level – Lowering (Step 17)

Standard: Candidate determines that PZR level is lowering by observing PZR level recorder LR-459 Pen 1 and/or LI-459A, 460, 461 or 462.

Examiner's Note:

Comment:

Performance Step: 17 Start one additional Charging Pump (Step 18)

Standard: Candidate determines that no additional charging pumps are available and proceeds to Step 24 from the RNO step.

Examiner's Note:

Comment:

Performance Step: 18 Check RCS temperature prior to event start – Less than or equal to 200°F (Step 24)

Standard: Candidate determines that RCS temperature was less than 200°F when the event occurred by observing TR-410, TR-413 and/or Core Exit Thermocouples.

Examiner's Note:

Comment:

√ **Performance Step: 19** Stop RHR Pumps (Step 25)

Standard: Candidate stops the running RHR pump by placing the control switch to the STOP position and observing the GREEN off lights illuminated for both of the RHR pumps.

Examiner's Note:

Comment:

√ **Performance Step: 20** Isolate RHR by closing the following valves: (Step 26)

- RHR-750, RHR LOOP SUPPLY
- RHR-751, RHR LOOP SUPPLY
- RHR-744A, RHR COLD LEG INJ
- RHR-744B, RHR COLD LEG INJ

Standard: Candidate isolates RHR system by placing the control switches for the following valves in the closed position and observing the GREEN closed indication illuminated.

- RHR-750 and 751, RHR LOOP SUPPLY
- RHR-744A and 744B, RHR COLD LEG INJ

Examiner's Note:

Comment:

√ **Performance Step: 21** Verify All RCPs - STOPPED (Step 27)

Standard: Candidate stops the running RCP by placing the control switch to the STOP position and observing the GREEN off lights illuminated for all of the RCPs.

Examiner's Note:

Comment:

END OF TASK

Terminating Cue: **When PZR level is stable or increasing: Evaluation on this JPM is complete.**

STOP TIME: _____

Job Performance Measure No.: 2011-2 NRC JPM E

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The plant is in Mode 5.
- RHR is in service for core cooling.
- Charging Pump A is cleared and tagged.

INITIATING CUE:

You are the RO. The CRS has directed you to swap to RHR Pump A in service IAW OP-201, Section 8.2.3 to equalize run time on the pumps.

8.2.3 Switching RHR Pumps in the Core Cooling Mode

1. Initial Conditions

   a. This revision has been verified to be the latest revision available. Today Date

   b. The prerequisites of Section 4.0 have been completed.

2. Instructions

   a. **PLACE** FC-605, RHR HX BYPASS FLOW in MAN.

   b. **START** the Standby RHR Pump. "A" / "B" (Circle one)

   c. **VERIFY** proper operation of RHR Pump previously started on step 8.2.3.2.b.

   d. **STOP** the previously running RHR Pump. "A" / "B" (Circle one)

   e. After RHR flow has stabilized as indicated on FI-605, **PLACE** FC-605, RHR HX BYPASS FLOW, in AUTO **AND CHECK** FCV-605 for proper operation.

FC-605 AUTO

FCV-605 PROPER OPERATION

CAUTION

When both RHR-757C and RHR-757D are open, 3750 gpm total per running pump as read from FI-605, FI-608A and FI-608B shall **NOT** be exceeded, except as allowed/required by approved test procedures for which total flowrates may be as high as 4200 gpm for one pump or 8400 gpm for two pumps.

RHR pump flowrates of less than 2,800 gpm have been shown to increase pressure and flow fluctuations and should be avoided when plant conditions permit. This does **NOT** apply during recirculation operation. (ACR 91-078)

f. **ADJUST** FC-605 in AUTO to maintain RHR Flow 3500 to 3750 GPM. ____

	Initials	Name (Print)	Date
Performed by:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Approved by: _____ _____
Shift Manager Date

CONTINUOUS USE

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL
VOLUME 3
PART 5
ABNORMAL OPERATING PROCEDURE

AOP-020

LOSS OF RESIDUAL HEAT REMOVAL (SHUTDOWN COOLING)

REVISION 32

AOP-020, Revision 32
Summary of Changes PRR 432553

General:	Throughout the procedure, changed SSO to SM and CRSS to CRS (Editorial)
	Throughout the procedure, changed increase and decrease to variations of raise and lower. (Editorial)
	Throughout the procedure, added nomenclature for flow and pressure instruments and valves. (Editorial) (PRR 430310)
	Throughout the procedure, added a cooldown rate limit to steps which stated "establish cooldown." (PRR 430310)
Entry Conditions	Added loss of instrument bus to the entry conditions. A loss of Instrument Bus 6 or Instrument Bus 8 may not have an immediate affect on RHR operation but will adversely affect FCV-605 and HIC-758 operation.
Main Body	
Steps 5 & 6	Removed the actions associated with a failed open PORV as a result of a loss of power to PT-500/PT-501 from OLD step 5 RNO and made the action into two steps. Provided an RNO to close the PORV Block valve. (PRR 383281)
Steps 7, 8, & 9	Added steps to check RCPs running and a C/A step to support stopping running RCPs if insufficient seal d/p is not available. (PRR 431685)
Note 10	Added a note to alert the operator that the failed open PORV resulted in a loss of mass from the RCS. If the PORV is closed, the transition should be made to Section E.
Step 13	Added additional detail for establishing boric acid addition. (PRR 430310)

AOP-020, Revision 32
Summary of Changes PRR 432553
Continued

Main Body (Continued)

Steps 18 &21	Added "additional" to the steps regarding starting charging pumps.
Steps 28a RNO & 30a RNO	Modified the step to state adjust and provided a minimum VCT level. Maintaining a minimum VCT level will maintain Charging Flow within the makeup system capacity. (PRR 430310)
Step 28c RNO	Split the step with two actions into two steps. (Editorial) (PRR 430310)
Section A Note 4	Added a note to remind the operators that it may be necessary to completely refill the Reactor Vessel before Core Exit Thermocouples start to lower. (PRR 293036)
Step 11b and 12b	Changed step to Verify one SI Pump - RUNNING fromStart one SI Pump based upon comments from a CDBI inspection. (PRR 240036)
Step 12c	Changed step to have SI-866B be the first choice for Hot Leg Injection based upon injection into Loop 2 versus Loop 3, which is where the Pzr Surge Line connects to the RCS. (PRR 293076)
Step 21	Added indications for RHR Pump Air binding. (PRR 430310)
Section B	
Step 4	Incorporated portions of step 3 into step 4 so the requirements for closing the SFP Gate Valve are in the same step. (PRR 264089)
Step 5	New step added to Refer to AOP-036 if SFP Lo Level Alarm is received. (PRR 375167)
Step 20	Added the values for normal refueling cavity level to the step. (PRR 430310)

AOP-020, Revision 32
Summary of Changes PRR 432553
Continued

Section B (Continued)

Step 22	Added indications for RHR Pump Air binding. (PRR 430310)

Section C

Note 7	New Note to remind the operator that LOOP 2 Hot Leg Injection is preferred. (PRR 293076)
Step 7a RNO	Added PZR Safety Valve or PZR Manway removed. based upon plant conditions, a PORV could be under maintenance in this plant condition. (PRR 430310)
Step 7c RNO and 10a	Changed step to Verify one SI Pump - RUNNING from "Start one SI Pump based upon comments from a CDBI inspection. (PRR 240036)
Step 7d RNO	Changed step to have SI-866B be listed first for Hot Leg Injection based upon injection into Loop 2 versus Loop 3, which is where the Pressurizer Surge line connects to the RCS. (PRR 293076)
Step 9 RNO	Added PZR Safety Valve or PZR Manway removed. based upon plant conditions, a PORV could be under maintenance in this plant condition. (PRR 430310)
Step 15	Added indications for RHR Pump Air binding. (PRR 430310)
Step 20e	Added "as directed by the GP in effect" to the step. (PRR 430310)

Section D

Step 12b and 13b	Changed step to Verify one SI Pump - RUNNING from "Start oneSI Pump" based upon comments from a CDBI inspection. (PRR 240036)

Section D (Continued)

Step 13c	Changed step to have SI-866B be the first choice for Hot Leg Injection based upon injection into Loop 2 versus Loop 3, which is where the Pzr Surge Line connects to the RCS. (PRR 293076)
Step 23	Added cooldown rate limits to the step. Based upon the potential to be in natural circulation. (PRR 430310)
Step 24 & 37	Added indications for RHR Pump Air binding. (PRR 430310)
Step 26e & 40e	Added additional guidance for adjusting PC-145 to address the lower limit of pressure for RCP operation. (PRR 430310)
Step 43d	Added "as directed by the GP in effect" to the step. (PRR 430310)

Section E

Step 2	Added a new step to check for a PORV LTOPP being defeated. (PRR 383281)
Note 3	This is a note that states the power supplies for PT-500 and PT-501. (PRR 383281)
Steps 3 & 4	These steps were added to the procedure to make sure that the LTOPP system gets restored when power is restored to the pressure instruments. (PRR 383281)
Note 6	New note to provide additional clarity regarding step 6.
Step 6	Revised the step wording to more clearly describe the intent of the step. RNO changed to provide action for OMM-033 closure.
Step 11	Added loss of instrument bus to the step.

Section E (Continued)

Step 13 RNO	Changed the transition in the RNO to step 43 based upon multiple comments. (PRR 383281)
Step 14	New step added to ensure that IA Compressors and Battery Chargers are restored to prevent future problems from a loss of air or DC. CDBI Inspection Comment. If a charging was running, it is restarted. (PRR 240036)
Note 15	This note clarifies what an IDLE RHR Pump is in the following steps. (PRR 432553)
Steps 15, 16, & 17	These steps support restoration of an IDLE RHR Pump if one is aligned per GP-002 or GP-007. (PRR 432553)
Step 18f RNO	Added instructions to start a standby RHR Pump in the step. (PRR 398103)
Step 18h	Added guidance to restore FC-605 to automatic (PRR 455770)
Step 18d and 18j	New steps added to close and reopen HCV-142 (HIC-142) (PRR 216797)
Step 21	Added loss of instrument bus to the RNP to support conditions where the further actions are needed but the low flow alarm was not illuminated.
Notes 24	Added multiple notes regarding the power supply for FC-605 M/A Station, FC-605 Controller, FT-605, and HIC-758. The RNO addresses powering the instruments. (PRR 430310 PRR 408570)
Step 24a	Added instructions to check for power available to controllers and indicator and actions to perform if the components are de-energized. (PRR 408570, PRR 430310)

AOP-020, Revision 32
Summary of Changes PRR 432553
Continued

Section E (Continued)

Step 25	New step to restore FCV-605 to auto mode along with a prompt for other controllers.
Step 29	Added HIC-758 to the step as a potential means to maintain RCS Temperature.
Step 43d RNO	Added a step to implement DSP-009, which will provide RHR Total flow indication with FT-605 de-energized. (PRR 383281)
Step 52	Added guidance to restore FC-605 to auto.
Step 63b and 64b	Changed step to Verify one SI Pump - RUNNING from Start One SI Pump based upon comments from a CDBI inspection. (PRR 240036)
Step 64c	Changed step to have SI-866B be the first choice for Hot Leg Injection based upon injection into Loop 2 versus Loop 3, which is where the Pzr Surge Line connects to the RCS. (PRR 293076)
Attachment 1	Added a note before step 3 to state that RHR-754A is operated by a reach rod and care must be taken to ensure correct position. (PRR 409565)
Attachment 2	Added a note before step 3 to state that RHR-754B is operated by a reach rod and care must be taken to ensure correct position. (PRR 409565)

Attachment 3

Step 6b and 14c	Changed step to have SI-866B be the first choice for Hot Leg Injection based upon injection into Loop 2 versus Loop 3, which is where the Pzr Surge Line connects to the RCS. (PRR 293076)
Step 8 RNO	Added PZR Safety Valve or PZR Manway removed. based upon plant conditions, a PORV could be under maintenance in this plant condition. (PRR 430310)
Step 13b and 14b	Changed step to Verify one SI Pump - RUNNING from Start one SI Pump based upon comments from a CDBI inspection. (PRR 240036)
Attachment 10	Attachment 10 is a new attachment to support aligning an Idle RHR Pump for service if the pump is "idled" per GP-002 or GP-007. (PRR 432553)
Attachments 11A and 11B	Updated Continuous Action Attachment numbers and Step Numbers based upon new attachment 10 and new C/A steps.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

1. PURPOSE

This procedure provides the instructions necessary to mitigate the loss of RHR in all conditions for which RHR can be aligned to provide shutdown cooling. This includes loss of RHR cooling for reasons such as RCS leakage, loss of power, loss of Service Water or Component Cooling Water, RHR pump cavitation, and inadequate RHR flow or abnormal reductions in RHR cooling.

This procedure is applicable in Modes 4, 5, and 6 when fuel is in the vessel.

2. ENTRY CONDITIONS

Direct entry from any condition resulting in a loss of RHR pump(s), RHR pump cavitation, abnormal RHR flow or temperature control, loss of instrument bus, or excessive loss of RCS inventory while RHR is aligned for shutdown cooling.

As directed by the following other procedures:

- AOP-005, Radiation Monitoring System, when a low level in the SFP exists due to an RCS leak with the SFP GATE VALVE open.
- AOP-014, Component Cooling Water System Malfunction, resulting in stopping of the RHR Pumps while in CSD.
- AOP-016, Excessive Primary Plant Leakage, if less than 200°F and leakage exceeds Charging Capacity.
- AOP-017, Loss Of Instrument Air, if the loss of Instrument Air has affected core cooling while on RHR.

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
* 1.	Check RCS Level - LESS THAN -72 INCHES (69% FULL RANGE RVLIS)	IF RCS Level becomes less than -72 inches (69% FULL RANGE RVLIS), THEN verify BOTH RHR Pumps stopped. Go To Step 3.
2.	Verify BOTH RHR Pumps - STOPPED	
3.	Make PA Announcement For Procedure Entry	

NOTE

FRP-S.1 is NOT applicable for this event unless directed by the CSFSTs.

4.	From The RTGB, Verify Reactor Tripped As Follows: • REACTOR TRIP MAIN AND BYP - OPEN • Rod Position indication - ZERO • Rod Bottom lights - ILLUMINATED	IF the reactor does NOT trip, THEN dispatch an Operator to the Rod Drive MG Set Room to Open REACTOR TRIP BREAKERS A AND B.
5.	Check PZR PORV - FAILED OPEN FROM LOSS OF POWER OR MALFUNCTION	Go To Step 7
6.	Place LTOPP Arming Switch in NORMAL • PT-500 - PZR PORV PCV-456 OR • PT-501 - PZR PORV PCV-455C	Close the PORV Block valve. • RC-535, PORV BLOCK OR • RC-536, PORV BLOCK
7.	Check RCPs - ANY RUNNING	Observe the NOTE prior to Step 10 and Go To Step 10

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
* 8.	Check RCP No. 1 Seal D/P - LESS THAN 210 PSID.	IF RCP No. 1 Seal D/P lowers to less than 210 psid, THEN perform Step 9. Observe the NOTE prior to Step 10 and Go To Step 10
9.	Stop Any Running RCP(s)	

NOTE

The RCS Level trend should be carefully evaluated. A loss of RCS inventory as a result of a failed open PZR PORV that has been closed should result in a transition to Section E.

10.	Check RCS Level - LOWERING: • Pressurizer level OR • RCS loop standpipe level OR • RVLIS OR • Refueling Cavity Watch report	IF the event does NOT involve a continuing loss of Inventory, THEN Go To Section E, Loss Of RHR Flow Or Temperature Control. IF RHR Pumps have been stopped due to loss of Inventory, THEN Go To Step 11.
11.	Verify All Letdown Flowpaths Isolated As Follows: • LCV-460A & B, LTDN LINE STOP Valves - CLOSED • HIC-142, PURIFICATION FLOW Controller - ADJUSTED TO 0% • HIC-137, EXCESS LTDN FLOW Controller - ADJUSTED TO 0% • CVC-387, EXCESS LTDN STOP - CLOSED	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
12.	Check Charging Pump Status - ALL STOPPED	Raise speed on the running Charging Pump to maximum. Go To Step 17.
13.	Establish Charging Flow As Follows:	
	a. Check VCT Level - GREATER THAN 12.5 INCHES	a. Perform the following: 1) Verify OPEN LCV-115B, EMERG MU TO CHG SUCT. 2) Verify CLOSED LCV-115C, VCT OUTLET. 3) Go To Step 13.e.
	b. Verify RCS makeup concentration set to value greater than current RCS boron. 1) FCV-113A, BORIC ACID FLOW Controller - POT SET AT 10.0 2) FCV-113A, BORIC ACID FLOW Controller - IN AUTO	
	c. Verify LCV-115C, VCT OUTLET - OPEN	
	d. Verify LCV-115B, EMERG MU TO CHG SUCT - CLOSED	
	e. Verify HIC-121, CHARGING FLOW Controller - ADJUSTED TO 0% (OPEN)	
	f. Verify CVC-310B, LOOP 2 COLD LEG CHG - OPEN	f. Verify OPEN CVC-310A, LOOP 1 HOT LEG CHG.
14.	Start One Charging Pump	
15.	Observe charging flow on FI-122A	
16.	Raise Speed On The Running Charging Pump To Maximum	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
17.	Check RCS Level - LOWERING	IF the RHR System is still in service, THEN Go To AOP-016, Excessive Primary Plant Leakage. IF the operating RHR Pump has been stopped, THEN Go To Step 24.
18.	Start One Additional Charging Pump	IF no other Charging Pumps are available, THEN Go To Step 24.
19.	Raise Speed On The Running Charging Pump To Maximum	
20.	Check RCS Level - LOWERING	IF the RHR System is still in service, THEN Go To AOP-016, Excessive Primary Plant Leakage. IF the operating RHR Pump has been stopped, THEN Go To Step 24.
21.	Start One Additional Charging Pump	IF no other Charging Pumps are available, THEN Go To Step 24.
22.	Raise Speed On The Running Charging Pump To Maximum	
23.	Check RCS Level - LOWERING	IF the RHR System is still in service, THEN Go To AOP-016, Excessive Primary Plant Leakage.
24.	Check RCS Temperature Prior To Event Start - LESS THAN OR EQUAL TO 200°F	Go To AOP-033, Shutdown LOCA.
25.	Stop RHR Pumps	
26.	Isolate RHR By Closing The Following Valves: • RHR-750, RHR LOOP SUPPLY • RHR-751, RHR LOOP SUPPLY • RHR-744A, RHR COLD LEG INJ • RHR-744B, RHR COLD LEG INJ	
27.	Verify All RCPs - STOPPED	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
*28.	Check Charging Pump Suction - ALIGNED TO VCT	IF RWST level lowers to 9%, THEN perform the following: a. Adjust total charging flow to maintain VCT level - GREATER THAN 20 INCHES. b. Verify OPEN LCV-115C, VCT OUTLET. c. Verify CLOSED LCV-115B, EMERG MU TO CHG SUCT d. Verify CLOSED CVC-358, RWST TO CHARGING PUMP SUCTION. Observe NOTE prior to Step 31 and Go To Step 31.
*29.	Check VCT Level - LESS THAN 12.5 INCHES	IF VCT level lowers to less than 12.5 inches, THEN perform Step 30. Observe NOTE prior to Step 31 and Go To Step 31.
30.	Align Charging Pump Suction From The RWST As Follows:	
	a. Check RWST level - GREATER THAN 9%	a. Perform the following: 1) Adjust total charging flow to maintain VCT level - GREATER THAN 20 INCHES. 2) Observe NOTE prior to Step 31 and Go To Step 31.
	b. At the RTGB, verify OPEN LCV-115B, EMERG MU TO CHG SUCT	b. Verify OPEN CVC-358, RWST TO CHARGING PUMP SUCTION, prior to continuing.
	c. Verify CLOSED LCV-115C, VCT OUTLET	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

The intent of this procedure is to maintain the CV Purge in service if the Equipment Hatch is not installed.

31. Initiate CV Closure Using OMM-033, CV Closure

32. Dispatch An Operator To Open The Breakers For Containment Sump Pumps A and B:

- CV SUMP PUMP A - MCC-2
- CV SUMP PUMP B - MCC-1

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

NOTE

The RCS Loops are considered filled if the RCS is capable of being pressurized such that a secondary heat sink can be established through natural circulation.

****

CAUTION

Changes in RCS pressure may result in inaccuracies in RCS Loop Standpipe indications.

****

33. Check RCS Level Prior To Event Start - BELOW -36 INCHES

Perform the following:

a. Implement the EALs.

b. Notify the SM OR STA that Attachment 9, Potential Technical Specifications, is available for reference.

c. IF the Reactor Vessel Head is removed, THEN Go To Section B, Loss Of RHR Inventory - Vessel Head Off.

d. IF the Reactor Vessel Head is installed AND the RCS Loops NOT filled, THEN Go To Section C, Loss Of RHR Inventory - Vessel Head On.

e. IF the RCS Loops are filled, THEN Go To Section D, Loss Of RHR Inventory - Level Stable Or Rising.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

34. Perform the following:

    a. Implement the EALs

    b. Notify the SM OR STA that Attachment 9, Potential Technical Specifications, is available for reference

    c. Go To Section A, Loss Of RHR While At Reduced Inventory

- END -

Facility:	HB ROBINSON	Task No.:	01007100101
Task Title:	Restore PRT to Normal Operating Conditions	JPM No.:	2011-2 NRC JPM F
K/A Reference:	007 A1.01 2.9 / 3.1		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The plant is at 100% RTP.
- PRT HI/LO Level alarm (APP-003-D3) has been received.
- Cause of the low level is known leakage from the PRT to the RCDT.
- PRT level is stable at 67%.
- ERFIS computer is inoperable for power supply replacement.

Task Standard:
- PRT level restored to normal band.
- RC-519B hydraulic lock relieved.

Required Materials: None

General References: OP-103, PRESSURIZER RELIEF TANK CONTROL SYSTEM, Rev. 19

Handout: OP-103 with Step 8.2.2.1a, b and c signed off.

Initiating Cue: Restore PRT level to normal IAW OP-103, PRESSURIZER RELIEF TANK CONTROL SYSTEM.

Time Critical Task: NO

Validation Time: 5 minutes

SIMULATOR SETUP

1. Reset to IC-811
2. Activate SCN: 008_11_2_NRC_JPM_F
3. Verify PRT conditions as follows: 117°F temperature, 67% level and 3 psig pressure.
4. Turn off all ERFIS Display Screens.
5. Initiate APP-036-J4, ERFIS TROUBLE, annunciator.
6. Place the simulator in FREEZE.
7. Place simulator in RUN when directed by the examiner.

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain a copy of the appropriate procedure.

Standard: Reviews OP-103 handout.

Examiner's Cue: **Provide the handout.**

Comment:

CAUTION

Operating two Primary Water Pumps can cause inadvertent filling Of the RCS if the RCS is depressurized and vented through a PORV when two Primary Water Pumps are operating. Water may Makeup to the RCS via the PRT spargers if the PRT is filled Faster that it can vent.

√ **Performance Step: 2** Verify a Primary Water Pump is OPERATING. (Step 8.2.2.2)

Standard: Candidate starts "A" or "B" Primary Water Pump by placing the control switch to START and observes that the RED on indication is illuminated.

Examiner's Note:

Comment:

√ **Performance Step: 3** Open RC-519A & B, PW TO CV ISO. (Step 8.2.2.3)

Standard: Candidate opens valves RC-519A and RC-519B by placing the control switch in the open position and observing that the RED open indication is illuminated for both valves.

Booth Operator's Cue: **AFTER RC-519B INDICATES OPEN, INSERT THE FOLLOWING:**

- **IOR doCNMAA0212D ON (OVERRIDES THE "OPEN" LIGHT ON).**
- **IOR doCNMAOO086J OFF (OVERRIDES THE PHASE A STATUS PANEL LIGHT OFF).**

Comment:

√ **Performance Step: 4** Open RC-519C, PW TO PRT ISO. (Step 8.2.2.4)

Standard: Candidate opens valve RC-519C by placing the control switch to the open position and observing that the RED open indication is illuminated.

Comment:

Performance Step: 5 Monitor PRT level for rising level. (Step 8.2.2.5)

Standard: Candidate monitors LI-470 for a rising level while filling the PRT.

Examiner's Note:

Comment:

√ **Performance Step: 6** IF the expected rise in level does NOT occur, THEN stop filling and investigate. (Step 8.2.2.6)

Standard: Candidate observes that rise in PRT is occurring and step can be marked as N/A.

Evaluator NOTE:

Comment:

NOTE
Increasing PRT level will cause PRT pressure to rise, possibly to the high pressure alarm setpoint of 5 psig.

Performance Step: 7 WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 8.2.2.7)

a. Stop the Primary Water Pump.

Standard: Candidate stops the Primary Water Pump by placing the switch in the AUTO or STOP position and observing the GREEN off indication illuminated.

Examiner's Note: **Depending on the Primary Water Pump used for this JPM, the pump control may be returned to either the AUTO or STOP position.**

Comment:

√ **Performance Step: 8** WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 8.2.2.7)

b. Verify one Primary Water pump is in AUTO.

Standard: Candidate verifies that one of the Primary Water Pump control switches is placed in the AUTO position.

Examiner's Note: **The Primary Water Pump that supports the VCT Auto Makeup system is selected to AUTO.**

Comment:

Performance Step: 9 WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 8.2.2.7)

c. Close RC-519A and B.

Standard: Candidate closes RC-519A and B by placing the control switch to the closed position and observing that the GREEN closed indication is illuminated.

Examiner's Note: **Malfunction will result in valve RC-519B having a hydraulic lock and valve will have dual indication.**

Comment:

Performance Step: 10 WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 8.2.2.7)

d. Close RC-519C.

Standard: Candidate closes valve RC-519C by placing the control switch to the close position and observing that the GREEN closed indication is illuminated.

Examiner's Note:

Booth Operator's Cue: **Delete the overrides for valve RC-519B open indication and valves RC-519A and B CIV Phase A indication when valve RC-519C is closed.**
[aet 008_JPM_F_Remove_RC519B_OR]

Comment:

Performance Step: 11 IF PRT level is greater than or equal to 83% OR PRT temperature is greater than 120°F, THEN lower the PRT level in accordance with the appropriate section of this procedure, Draining the PRT When Pressurizer Temperature is Greater Than Or Equal to 200°F OR Draining the PRT When Pressurizer Temperature is Less Than 200°F. (Step 8.2.2.8)

Standard: Candidate determines that PRT level is less than 83% and marks the step as N/A.

Examiner's Note:

Comment:

Performance Step: 12 IF RC-519A or RC-519B do NOT fully close, THEN relieve the hydraulic lock in accordance with the Relieving Hydraulic Lock on RC-519A AND RC-519B section of this procedure. (Step 8.2.2.9)

Standard: Candidate determines that valve RC-519B did not close and proceeds to Section 8.4.1 of OP-103.

Examiner's Note:

Comment:

NOTE
The RCS System Engineer will need to be notified when the following section is performed to relieve hydraulic lock on RC-519A and RC-519B for engineering trending purposes.

Performance Step: 13 Verify the following initial conditions are satisfied: (Step 8.4.1.1.a)

a. RC-519A and B, PW TO CV ISO, control switch is in CLOSE position and one OR both valves indicate in mid position.

Standard: Candidate determines that the control switch for valves RC-519A and RC-519B is in the closed position and valve RC-519B has dual indication by observing the RED and GREEN valve position indication illuminated.

Comment:

√ **Performance Step: 14** Verify the following initial conditions are satisfied: (Step 8.4.1.1.b)

b. The Post Accident Sampling System is NOT in operation.

Standard: Candidate determines that the PASS is not in operation by contacting the E&C Technician.

Examiner's Cue: **Inform the candidate that the PASS is not in operation.**

Comment:

Performance Step: 15 IF RC-519B is indicating in mid position, THEN cycle RC-519C, PW TO PRT ISO. (Step 8.4.1.2)

Standard: Candidate cycles valve RC-519B by placing the valve control switch in the open position and returning the control switch to the closed position. Candidate observes that the dual indication for valve RC-519B has cleared and the valve now indicates closed.

Examiner's Note:

Comment:

END OF TASK

Terminating Cue: **When applicant reports/verifies RC-519A and RC-519B closed: Evaluation on this JPM is complete.**

STOP TIME: _____ _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM F

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The plant is at 100% RTP.
- PRT HI/LO Level alarm (APP-003-D3) just actuated.
- Cause of the low level is known leakage from the PRT to the RCDT.
- PRT level is stable at 67%.

INITIATING CUE:

Restore PRT level to normal IAW OP-103, PRESSURIZER RELIEF TANK CONTROL SYSTEM.

Progress Energy

M
Multiple Use

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 2

OPERATING PROCEDURE

OP-103

PRESSURIZER RELIEF TANK CONTROL SYSTEM

REVISION 19

SUMMARY OF CHANGES
PRR: 00429505
OP-103, Rev 19

STEP	REVISION CHANGES
Throughout	Updated format of CAUTION and NOTE boxes - Editorial
8.2.1.4	Reworded NOTE prior to step to read "Instrument Air is isolated to Containment during a Containment Phase A Isolation signal. PCV-1716 must be RESET OR placed in OVERRIDE per the EOP Network in order to re-align Instrument Air to Containment." (PRR 429505) Editorial
8.2.2 8.4.1 8.4.3	Added signoff lines for Performer and Approver (PRR 429910) Editorial

TABLE OF CONTENTS

SECTION PAGE

1.0 PURPOSE

1.1 This procedure provides the checklist and instructions for normal and infrequent operation of the Pressurizer Relief Tank Control System.

2.0 REFERENCES

2.1 Updated FSAR, Section 5.4, Component and Subsystem Design

2.2 Improved Technical Specifications LCO 3.6.3

2.3 Operating Procedures

2.3.1 OP-701, Waste Disposal - Liquid

2.3.2 OP-702, Waste Disposal - Gas

2.3.3 OP-703, Gas Analyzer

2.3.4 OP-905, Instrument and Station Air System

2.3.5 OP-907, Compressed Gas System

2.3.6 OP-915-1, Demineralized and Primary Water

2.4 SD-001, Reactor Coolant System

2.5 5379-1971, Reactor Coolant System-Flow Diagram

2.6 EE 92-177, Evaluation of "Hydraulic Lock" Associated with CV Isolation Valves RC-519A & B

2.7 SER 93-007, Pressurizer Relief Tank Overpressurization

2.8 PLP-037, Conduct of Infrequently Performed Tests or Evolutions and Pre-Job Briefs

2.9 ESR 96-00608, PRT Internal Coating Evaluation

2.10 ESR 94-00273, Hydraulic Lock RC-519A and B.

2.11 PGN Technical Manual 727-907-77, Crane Chem Pump.

3.0 RESPONSIBILITIES

3.1 The performance of this procedure is the responsibility of qualified Operations personnel.

4.0 PREREQUISITES

4.1 The N_2 Supply System is available to supply nitrogen to the PRT in accordance with OP-907.

4.2 The Primary Water System is available to supply makeup to the PRT in accordance with OP-915-1.

4.3 The Waste Gas System is available to receive off gas from the PRT in accordance with OP-702.

4.4 Instrument and Station Air is available to supply N_2, Primary Water and PRT valves in accordance with OP-905.

4.5 The Liquid Waste Disposal System is aligned to receive the Reactor Coolant Drain Pumps discharge in accordance with OP-701.

4.6 The Gas Analyzer is in service in accordance with OP-703.

5.0 PRECAUTIONS AND LIMITATIONS

5.1 The Pressurizer Relief Tank temperature should be maintained less than or equal to 120°F.

5.2 A Nitrogen over pressure of 3 psig should be maintained in the PRT to prevent the formation of an explosive Hydrogen-Oxygen mixture.

5.3 If the PRT Hydrogen or Oxygen concentration exceeds 4% by volume, the PRT should be vented in accordance with OP-703.

5.4 When the Pressurizer temperature is greater than 200°F, the level in the PRT should not be allowed to exceed the high level alarm setpoint of 83% in order to minimize the possibility of thermal shocking the Pressurizer Safeties and PORVs, which could cause the Safeties and/or the PORVs to leak by or possibly inadvertently open. (SER 93-007)

5.5 This procedure has been screened in accordance with PLP-037 criteria and determined not applicable (N/A) to PLP-037.

6.0 SPECIAL TOOLS AND EQUIPMENT

N/A

7.0 ACCEPTANCE CRITERIA

N/A

8.0 INSTRUCTIONS

8.1 STARTUP

Refer to GP-001.

8.2 NORMAL OPERATION

8.2.1 Draining the PRT When Pressurizer Temperature is Greater Than Or Equal to 200°F

1. Verify the following initial conditions are satisfied:

NOTES: PRT temperatures of greater than 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)

Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

a. All the Prerequisites of Section 4.0 are complete.

b. The Pressurizer temperature is greater than or equal to 200°F **AND** PRT level is above 70%.

c. Primary Water addition to the PRT is **NOT** in progress. (SER 93-007)

NOTE: The following step is a continuous action step and should be performed when conditions are met.

2. **IF** the PRT temperature is greater than or equal to 160°F, **THEN** Go To Step 8.2.1.6.

NOTE: Placing RC-523, PRT DRAIN, control switch in OPEN also opens LCV-1003B, RCDT PUMP "B" SUCTION, and starts REACTOR COOLANT DRAIN TANK PUMP "B" if the control switches are in AUTO.

3. **IF** the normal drain path via the RCDT is available, **AND** a Containment Phase A Isolation signal is **NOT** present, **THEN** perform the following:

   a. Open RC-523, PRT DRAIN.

   b. **WHEN** PRT level returns to between 70% and 74%, **THEN** close RC-523.

NOTE: Instrument Air is isolated to Containment during a Containment Phase A Isolation signal. PCV-1716 must be RESET **OR** placed in OVERRIDE per the EOP Network in order to re-align Instrument Air to Containment.

4. **IF** the normal drain path via the RCDT is **NOT** available, **OR** a Containment Phase A Isolation signal is present, **THEN** perform the following when Instrument Air has been restored to the valves below:

   a. Open WD-1708, RCDT DRAIN TO CV SUMP.

   b. Place LCV-1003B, RCDT PUMP “B” SUCTION, to the CLOSE position.

   c. Open RC-523, PRT DRAIN.

   d. **WHEN** PRT level returns to between 70% and 74%, **THEN** perform the following:

      1) Close RC-523.

      2) Close WD-1708.

      3) Place LCV-1003B, RCDT PUMP “B” SUCTION, to the AUTO position

5. **IF** PRT temperature is greater than 120°F, **THEN** add Primary Water to the PRT in accordance with this procedure.

CAUTION

Pumping PRT contents through Containment Isolation valves following a PRT temperature increase in excess of 160°F can cause failure of the valves to seat due to debris accumulation from a failed PRT liner. (ESR 96-00608)

6. **IF** the PRT temperature has been greater than or equal 160°F **AND** the liner has **NOT** been satisfactorily evaluated, **THEN** perform the following:

   a. Verify CV Sump equipment aligned as follows:

      1) CV Sump Pump breakers OPEN.
         - CV SUMP PUMP "A" on MCC 2 in CMPT 3M
         - CV SUMP PUMP "B" on MCC 1 in CMPT 5H

      2) CV Sump Pump Discharge valves CLOSED
         - WD-1728, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION
         - WD-1723, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION

   b. Open WD-1708, RCDT DRAIN TO CV SUMP.

   c. Place LCV-1003B, RCDT PUMP "B" SUCTION, to the CLOSE position.

   d. Open RC-523, PRT DRAIN.

   e. **WHEN** PRT level returns to between 70% and 74%, **THEN** perform the following:

      1) Close RC-523.

      2) Close WD-1708.

      3) Place LCV-1003B, RCDT PUMP "B" SUCTION, to the AUTO position

   f. Place a Caution Tag on RC-523 switch that reads "If the PRT requires draining it shall be aligned to the CV sump only", This caution will remain in effect until the PRT internal coating evaluation is complete.

   g. Consult RESS for a PRT internal coating evaluation.

CHK (✓)

8.2.2 Adding Primary Water to the PRT

1. Verify the following initial conditions are satisfied:

NOTE:

PRT temperatures of greater than 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)

Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

a. All the Prerequisites of Section 4.0 are complete.

b. Pressurizer Relief Tank level is less than 80%.

c. Draining the PRT is **NOT** in progress. (SER 93-007)

CAUTION

Operating two Primary Water Pumps can cause inadvertent filling of the RCS if the RCS is depressurized and vented through a PORV when two Primary Water Pumps are operating. Water may makeup to the RCS via the PRT spargers if the PRT is filled faster than it can vent.

2. Verify a Primary Water Pump is OPERATING.

3. Open RC-519A & B, PW TO CV ISO.

4. Open RC-519C, PW TO PRT ISO.

5. Monitor PRT level for rising level.

6. **IF** the expected rise in level does **NOT** occur, **THEN** stop filling **AND** investigate.

N/A

CHK (✓)

NOTE: Increasing PRT level will cause PRT pressure to rise, possibly to the high pressure alarm setpoint of 5 psig.

7. **WHEN** PRT level is between 70% and 80%, **THEN** perform the following:

   a. Stop the Primary Water Pump. Sa

   b. Verify one Primary Water pump is in AUTO. Sa

   c. Close RC-519A & B. Sa

   d. Close RC-519C. Sa

8. **IF** PRT level is greater than or equal to 83% **OR** PRT temperature is greater than 120°F, **THEN** lower the PRT level in accordance with the appropriate Section of this procedure, Draining the PRT When Pressurizer Temperature is Greater Than Or Equal to 200°F **OR** Draining the PRT When Pressurizer Temperature is Less Than 200°F. N/A

9. **IF** RC-519A or RC-519B do **NOT** fully close, **THEN** relieve the hydraulic lock in accordance with the Relieving Hydraulic Lock on RC-519A **AND** RC-519B Section of this procedure. Sa

Performed By: _____ _____ _____

_____ _____ _____

_____ _____ _____

Approved By: _____ _____
Shift Manager Date

8.2.3 Relieving Pressure From the PRT

1. Verify the following initial conditions are satisfied:

   a. All the Prerequisites of Section 4.0 are complete.

   b. Pressurizer Relief Tank Pressure is above 3 psig.

NOTE:	High Pressure alarm actuates at 5 psig and the rupture disc ruptures at 100 psig.

2. Open RC-549, PRT VENT.

3. **IF** required to maintain proper Vent Header pressure, **THEN** verify a Waste Gas Compressor starts.

4. **WHEN** desired PRT pressure is reached **OR** PRT pressure reaches 3 psig, **THEN** close RC-549.

8.3 SHUTDOWN

8.3.1 None Applicable

CHK (✓)

8.4 INFREQUENT OPERATION

NOTE: The RCS System Engineer **WILL** need to be **NOTIFIED WHEN** the following section is **PERFORMED** to relieve hydraulic lock on RC-519A **AND** RC-519B for Engineering Trending Purposes.

8.4.1 Relieving Hydraulic Lock on RC-519A **AND** RC-519B

1. Verify the following initial conditions are satisfied:

   a. RC-519A & B, PW TO CV ISO, control switch is in the CLOSE position and one **OR** both valves indicate in mid position. N/A

   b. The Post Accident Sampling System is **NOT** in operation. N/A

2. **IF** RC-519B is indicating in mid position, **THEN** cycle RC-519C, PW TO PRT ISO. N/A

3. **IF** RC-519A is indicating in mid position, **THEN** perform the following:

NOTE: Power Panel 27 is located on the west side of the PASS panel.

   a. Verify neither Primary Water Pump is OPERATING. N/A

   b. Close breaker 15 on Power Panel 27. N/A

   c. Open HCV-4176, CDT ISOLATION. N/A

   d. Open HCV-4174, PZR RELIEF TANK ISOLATION. N/A

   e. Close HCV-4176, CDT ISOLATION. N/A

   f. Close HCV-4174, PZR RELIEF TANK ISOLATION. N/A

   g. Open breaker 15 on Power Panel 27. N/A

4. **IF** RC-519A **OR** RC-519B is still indicating mid position, **THEN** declare the valve out of service **AND** refer to ITS LCO 3.6.3. N/A

Performed By: _____ _____ _____

_____ _____ _____

Approved By: _____ _____
Shift Manager Date

8.4.2 Draining the PRT When Pressurizer Temperature is Less Than 200°F

1. Verify the following initial conditions are satisfied:

   a. All the Prerequisites of Section 4.0 are complete.

   b. The Pressurizer temperature is less than 200°F.

NOTE: The following step is a continuous action step and should be performed when conditions are met.

2. **IF** the PRT temperature is greater than or equal to 160°F, **THEN** Go To Step 8.2.1.6.

NOTE: Placing RC-523, PRT DRAIN, control switch in OPEN also opens LCV-1003B, RCDT PUMP "B" SUCTION, and starts REACTOR COOLANT DRAIN TANK PUMP "B" if the control switches are in AUTO.

3. Open RC-523, PRT DRAIN.

4. **WHEN** the desired PRT level is reached, **THEN** close RC-523.

NOTE:	If this task is performed under non-outage conditions, communications via cellular phone or walkie-talkie between the Auxiliary building and Containment may not be possible.

8.4.3 Venting The RCDT Pumps

1. Verify the following initial conditions are satisfied:

   a. All the Prerequisites of Section 4.0 are complete. ____

   b. At least one RCDT pump requires venting. ____

   c. RCDT level is greater than 7%. ____

   d. At least two personnel are available to coordinate actions between the Waste Disposal Panel and Containment. ____

   e. The SSO has given permission to perform this task. ____

2. Contact Radiation Control Personnel to schedule a briefing for this task. ____

3. Station an individual with communications to the Containment **AND** the Control Room to coordinate activities and monitor RCDT level. ____

4. Attach a hose **OR** poly sleeving from the Pump Discharge Pressure Indicator drain valve for the pump to be vented to the nearest floor drain:

   – RCDT PUMP A - PI-1018A DRAIN. ____

   – RCDT PUMP B - PI-1018B DRAIN. ____

5. At the appropriate MCC, open the breaker(s) for the RCDT Pump to be vented:

   – RCDT PUMP A - MCC-2 (CMPT 5M). ____

   – RCDT PUMP B - MCC-1 (CMPT 2M). ____

CHK (✓)

6. Close the discharge valve for the RCDT pump to be vented:

   – WD-1726, RCDT PUMP "A" DISCHARGE ____

   – WD-1727, RCDT PUMP "B" DISCHARGE ____

7. At the Waste Disposal Panel, open the suction valve for the RCDT Pump to be vented.

   – RCDT PUMP A - LCV-1003A, RCDT PUMP "A" SUCTION ____

   – RCDT PUMP B - LCV-1003B, RCDT PUMP "B" SUCTION ____

8. Open the pressure indicator drain valve for the RCDT pump to be vented:

   – RCDT PUMP A - PI-1018A DRAIN. ____

   – RCDT PUMP B - PI-1018B DRAIN. ____

9. **WHEN** a steady flow of water has been vented from the pump, **THEN** close the pressure indicator drain valve:

   – RCDT PUMP A - PI-1018A DRAIN. ____

   – RCDT PUMP B - PI-1018B DRAIN. ____

10. At the Waste Disposal panel, close the suction valve for the RCDT Pump vented:

    – RCDT PUMP A - LCV-1003A, RCDT PUMP "A" SUCTION ____

    – RCDT PUMP B - LCV-1003B, RCDT PUMP "B" SUCTION ____

11. Open the discharge valve for the RCDT pump to be vented:

    – WD-1726, RCDT PUMP "A" DISCHARGE ____

    – WD-1727, RCDT PUMP "B" DISCHARGE ____

CHK (✓)

12. At the appropriate MCC, close the breaker(s) for the RCDT Pump(s) that were opened:

    – RCDT PUMP A - MCC-2 (CMPT 5M). ____

    – RCDT PUMP B - MCC-1 (CMPT 2M). ____

13. At the Waste Disposal panel, restore the suction valve for the RCDT Pump vented to the AUTO position:

    – RCDT PUMP A - LCV-1003A, RCDT PUMP "A" SUCTION ____

    – RCDT PUMP B - LCV-1003B, RCDT PUMP "B" SUCTION ____

14. At the Waste Disposal Panel, start the affected RCDT Pump **AND** observe pump discharge pressure behavior in the CV. ____

15. **IF** the pump shows signs of cavitation **OR** air binding, **THEN** stop the pump and perform the following:

    a. Initiate action for Maintenance to remove the vent plugs from the pump to vent air from the pump in accordance with the Technical Manual. ____

    b. **WHEN** Maintenance venting of the pump is complete, restore the pump to normal automatic operation. ____

NOTE:	The hose or sleeving used for this task may **NOT** be left in the CV accept as approved and directed by PLP-006, Containment Vessel Inspection/Closeout.

16. Remove the hose **OR** poly sleeving that was attached to the pressure indicator drain at the RCDT Pump(s). ____

17. Inform the CRSS that the RCDT Pump(s) have been vented. ____

Performed By: _____ _____ _____

_____ _____ _____

_____ _____ _____

Approved By: _____ _____
Shift Manager Date

9.0 RECORDS

A completed Attachment 10.1 is a required record generated by this procedure.

10.0 ATTACHMENTS

10.1 Pressurizer Relief Tank Control Valve Checklist

ATTACHMENT 10.1
Page 1 of 5

PRESSURIZER RELIEF TANK CONTROL VALVE CHECKLIST

CONTINUOUS USE

This revision has been verified to be the latest revision available.

_____ ____
Date

Date Completed: _____

	Initials	Name	Date
Performed By:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Approved By: _____ _____
Shift Manager Date

RTGB

VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	INIT	TAG ATTD	VERI
RC-519A	PW TO CV ISO	CLOSED		N/A	
RC-519B	PW TO CV ISO	CLOSED		N/A	
RC-519C	PW TO PRT ISO	CLOSED		N/A	
RC-549	PRT VENT	CLOSED		N/A	
RC-523	PRT DRAIN	CLOSED		N/A	

PRESSURIZER RELIEF TANK CONTROL VALVE CHECKLIST

WDBR Panel

VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	INIT	TAG ATTD	VERI
RC-516	PRT TO GAS ANALYZER	CLOSED		N/A	
RC-553	PRT TO GAS ANALYZER	CLOSED		N/A	
RC-550	PRT NITROGEN SUPPLY	OPEN/ CLOSED (1)		N/A	

(1) GP-008 closes RC-550 prior to placing the standpipe in service. RC-550 is required to be closed whenever the standpipe is in service. GP-001 opens RC-550 after the RCS standpipe is removed from service. Circle the required position based on standpipe status.

PRESSURIZER RELIEF TANK CONTROL VALVE CHECKLIST

Pipe Alley

VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	INIT	TAG ATTD	VERI
RC-516[2]	PRT TO GAS ANALYZER	OPERABLE			
RC-519A[2]	PRIMARY WATER TO PRESSURIZER RELIEF TANK	OPERABLE			
RC-519B[2]	PRIMARY WATER TO PRESSURIZER RELIEF TANK	OPERABLE			
RC-553[2]	PRT TO GAS ANALYZER	OPERABLE			
RC-550[2]	PRT NITROGEN SUPPLY	OPERABLE			
RC-519D	PRIMARY WATER TO PRESSURIZER RELIEF TANK DRAIN	LOCKED CLOSED			
		CAP INSTALLED		N/A	
PCV-473	NITROGEN SUPPLY TO PRT REGULATING VALVE	SET TO 3 PSIG			
HCV-4179	PW TO PRT	OPEN			

[2] Verify EOP/DSP blue or green tag attached.

PRESSURIZER RELIEF TANK CONTROL VALVE CHECKLIST

Containment

VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	INIT	TAG ATTD	VERI
RC-611	PCV-480 ISOLATION	OPEN			
RC-517	PRT VENT	CLOSED			
		FLANGE INSTALLED		N/A	
RC-518A	PRT NITROGEN SUPPLY VENT	CLOSED			
RC-519C	PRIMARY WATER TO PRESSURIZER RELIEF TANK	OPERABLE			
RC-519E	PRIMARY WATER SUPPLY TO CV 2ND LEVEL & OP DECK	OPEN			
RC-519F	PRIMARY WATER TO CV 2ND LEVEL	CLOSED			
RC-519G	PRIMARY WATER TO OPERATING DECK	CLOSED			
RC-519H	PRIMARY WATER TO PRT DRAIN	CLOSED			

PRESSURIZER RELIEF TANK CONTROL VALVE CHECKLIST

Containment (Continued)

VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	INIT	TAG ATTD	VERI
RC-523	PRT DRAIN TO RCDT PUMP	OPERABLE			
RC-549	PRT VENT	OPERABLE			
RC-519I	PRIMARY WATER TO CV 2ND LEVEL AND DRAIN	OPEN			
RC-521A	PRT PRESS PT-472 & PRT LEVEL LT-470 ISOLATION	OPEN			
RC-521B	PRT LEVEL LT-470 ISOLATION	OPEN			
	LT-470 DRAIN	CLOSED			
		CAP INSTALLED		N/A	
	LT-470 VENT	CLOSED			
		CAP INSTALLED		N/A	
	PT-472 THIRD ISOLATION	OPEN			
	PT-472 LINE VENT	CLOSED			
	PT-472 SECOND ISOLATION	OPEN			
	PT-472 FIRST ISOLATION	OPEN			
	PT-472 FIRST DRAIN	CLOSED			
	PT-472 SECOND DRAIN	CLOSED			
RC-523A	PRESSURIZER RELIEF TANK DRAIN	CLOSED			
		CAP INSTALLED		N/A	
RC-587	PRT NITROGEN SUPPLY	OPEN			

Facility:	HB ROBINSON	Task No.:	01015100501
Task Title:	Remove Source Range Instrument From Service	JPM No.:	2011-2 NRC JPM G
K/A Reference:	015 A4.03 3.8 / 3.9		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The plant is in Mode 3 at 547°F.
- Source Range Channel N-31 has failed and has been declared inoperable by the CRS.

Task Standard: N-31 removed from service IAW OWP-011, NI-5.

Required Materials: OWP-011, NI-5

General References: OWP-011, Nuclear Instrumentation, Revision 22

Handouts: OWP-011, NI-5

Initiating Cue: The CRS has directed you to remove N-31 from service IAW OWP-011, NI-5.

Time Critical Task: NO

Validation Time: 6 minutes

SIMULATOR SETUP

1. Reset to IC-812
2. No SCN required.

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Remove NI-31 from ERFIS SCAN: NIN0031A – REMOVED (OWP-011, NI-5, 1st Step)

Standard: Candidate removes the point from ERFIS scan by performing the following steps:

Delete the ERFIS point from scan

- Access the Delete function by typing DR (Delete/Restore).
- Click on DELETE SCAN
- Enter NIN0031A

Examiner's Note:

Comment:

√ **Performance Step: 2** AUDIO COUNT RATE CHANNEL – CHANNEL SELECTOR switch: Selected to SR 32 (OWP-011, NI-5, 2nd Step)

Standard: Candidate places the Audio Count Rate Channel Selector switch to the SR 32 position and notes the proper audio count rate.

Examiner's Note: **This switch must be pulled out to rotate between the different positions.**

Comment:

Performance Step: 3 START UP RATE CHANNEL SELECT Switch – Selected to NI____ (OWP-011, NI-5, 3rd Step)

Standard: Candidate determines that the Startup Rate Channel selector switch is NOT selected to N-31.

Examiner's Note: **The Startup Rate Selector switch is normally selected to one of the Intermediate Range Channels N-35 or N-36 and is NOT affected by the Source Range failure.**

Comment:

√ **Performance Step: 4** LEVEL: TRIP Switch: BYPASS (OWP-011, NI-5, 4th Step)

Standard: Candidate rotates the Level Trip Bypass switch on the N-31 drawer front to the Bypass position.

Examiner's Note: **APP-005-D4, NIS TRIP / DROP ROD BYPASS, will be received when the level trip switch is positioned to the bypass position.**

Level Trip Bypass will be illuminated on the front of the N-31 drawer.

Comment:

Performance Step: 5 NIS TRIP BYPASS NI-31 Status Light: ILLUM (OWP-011, NI-5, 5th Step)

Standard: Candidate observes that the 2X2 status light on the RTGB is illuminated.

Examiner's Note: **NIS TRIP BYPASS NI-31 Status Light was illuminated when the N-31 Bypass switch was selected to Bypass position.**

Comment:

√ **Performance Step: 6** HIGH FLUX AT SHUTDOWN Switch: BLOCK (OWP-011, NI-5, 6th Step)

Standard: Candidate rotates the High Flux at Shutdown switch on the N-31 drawer front to the BLOCK position.

Examiner's Note: **APP-005-B1, HI FLUX AT SHUTDOWN ALARM BLOCK, annunciator will be received on the RTGB.**

Comment:

END OF TASK

Terminating Cue: **When Source Range Channel N-31 has been removed from service IAW OWP-011, NI-5, evaluation on this JPM is complete.**

STOP TIME: _____ _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM G

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The plant is in Mode 3 at 547°F.
- Source Range Channel N-31 has failed and has been declared inoperable by the CRS.

INITIATING CUE:

The CRS has directed you to remove N-31 from service IAW OWP-011, NI-5.

NI-31, Source Range

1. This revision has been verified to be the latest revision available.

   _____ (Print) _____ _____
   Name Signature Date

2. System: NI Work Request No:_____

3. Component: NI-31, Source Range

4. Scope of Work:

   Perform maintenance on Nuclear Instrument NI-31.

5. Testing required on redundant equipment prior to rendering component inoperable:

   N/A

6. Precaution:

   1) Refer to ITS Table 3.3.1-1 for Source Range applicability and operability requirements when not in the Refueling condition (MODE 6)

   2) Reference ITS LCO 3.9.2 during Refueling Operations (MODE 6).

   3) Removal of control power fuses below P-6 will cause a reactor trip signal.

   4) This OWP has been screened in accordance with PLP-037 criteria and determined to be a Case Three activity.

7. Valve/Breaker/Switch lineup has been completed. _____/_____
   Signature Date

8. Clearance Issued (If applicable) Clearance No:_____

9. I&C Maintenance lineup complete. N/A / N/A
   Signature Date

10. Clearance removed and Valve/Breaker/ Switch lineup restored to normal. _____/_____
    Signature Date

11. Source Range NI-31 has been declared operable. _____/_____
    Signature Date

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE	INIT	RESTORED POSITION	INIT
SOURCE RANGE CHANNEL NI-31				
REMOVE NI-31 from ERFIS SCAN: NIN0031A	REMOVED	____	RESTORED	____
AUDIO COUNT RATE CHANNEL - CHANNEL SELECTOR Switch	Selected to SR 32	____		
START UP RATE CHANNEL SELECT Switch *	NI _____	____		
LEVEL TRIP Switch	BYPASS	____	NORMAL	____
NIS TRIP BYPASS NI-31 Status Light	ILLUM	____	EXTNG	____
HIGH FLUX AT SHUTDOWN Switch	BLOCK	____	NORMAL IF SHUTDOWN OR BLOCK	____

* Switch should be selected to an NI which is **NOT** removed from service.

Facility:	HB ROBINSON	Task No.:	01000106705
Task Title:	Respond To A Loss Of CCW To The RCP Motor Coolers	JPM No.:	2011-2 NRC JPM H

K/A Reference:

008 K1.02	3.3/3.4
008 K3.03	4.1/4.2
026 AK3.03	4.0/4.2

Examinee: NRC Examiner: N/A

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Plant is at 100% RTP.

No equipment is out of service.

You are the Reactor Operator.

Task Standard: Actions taken to ensure the RCPs are NOT damaged. AOP-014, Section D actions completed with the exception of referring to Tech Specs and implementing the EALs.

Required Materials: AOP-014 Main Body and Section D

General References: APP-001-A8, CCW to CRDM LO FLOW
APP-001-B1, RCP BRG COOL WTR LO FLOW
APP-001-D1, RCP THERM BAR COOL WTR LO FLOW
AOP-014, Section D - CCW System Low Flow OR High Temperature

Handouts: AOP-014 Main Body and Section D

Initiating Cue: Respond to plant events.

Time Critical Task: NO

Validation Time: 6 Minutes

SIMULATOR SETUP

1. Reset to IC-813
2. Open SCN: 008_JPM_NRC_H
3. Place simulator in run when directed by the examiner.
4. Execute the CCW failure when directed by the examiner.

(Denote Critical Steps with an asterisk *)

START TIME: _____

Performance Step: 1	Candidate refers to APP-001-A8, B1 and/or D1.
Standard:	Candidate observes RCP bearing temperatures are rising and valve CC-716B indicates closed. Candidate takes action for loss of CCW to RCPs and enters AOP-014, CCW System Malfunction
Examiner's Note:	
Comment:	

AOP-014, MAIN BODY

Performance Step: 2	Implement The EALs. (Step 1)
Standard:	Candidate notifies the SM of EAL implementation.
Examiner's Note:	Candidate is NOT responsible for implementing the EALs
Examiner's Cue:	**Respond as the SM that you will implement the EALs.**
Comment:	

Performance Step: 3 Make PA Announcement for procedure entry (Step 2).

Standard: Candidate makes PA announcement for entry into AOP-014.

Examiner's Note:

Comment:

NOTE

A loss of inventory may be indicated by a report of leakage or lowering of surge tank level.

CCW Pump discharge pressure less than 78 psig will cause an alarm.

CCW low flow is defined as less than 2200 gal per pump.

CCW high temperature is defined as greater than 105°F or greater than 125°F if in Mode 3.

Performance Step: 4 Go To Appropriate Section For Indicated Malfunction (Step 3)

Standard: Candidate proceeds to AOP-014, Section D based on high temperature or low flow.

Examiner's Note:

Comment:

AOP-014, Section D

Performance Step: 5	Monitor RCP temperatures using ERFIS Group Display RCP LOG or RCP Temperature Recorder TR-448 (Step 1)
Standard:	Candidate observes rising motor bearing temperatures by displaying GD RCP LOG on ERFIS or monitors TR-448.
Examiner's Note:	**Candidate may notice CC-716B closure at any time and may dispatch an Operator for local valve operation.**
BOOTH OPERATOR CUE:	**If dispatched to locally open valve CC-716B, report the valve is stuck on the closed seat and will not open manually.**
Comment:	

Performance Step: 6	Check APP-001-B1 RCP BRG COOL WTR LO FLOW extinguished. (Step 2)
Standard:	Candidate observes that APP-001-B1, RCP BRG COOL WTR LO FLOW is NOT extinguished and goes to RNO Step 2.
Examiner's Note:	
Comment:	

Performance Step: 7 Verify CC-716A, CC-716B, and CC-730 open: (RNO Step 2.)

Standard: Candidate verifies CC-716A and CC-730 open and attempts to open CC-716B. Determines that CCW flow CANNOT be restored and proceeds to Step 4.

Examiner's Note: The failure of CC-716B may have already been addressed.

Booth Operator Cue: **See JPM Performance Step 5 for local operator actions if directed to manually open valve CC-716B.**

Comment:

Performance Step: 8 Determine if reactor trip is required as follows:
Check Reactor – Critical. (Step 4.a)

Standard: Candidate determines that the reactor is at 100% RTP and is critical.

Examiner's Cue:

Comment:

* **Performance Step: 9** Verify Reactor - TRIPPED (Step 4.b)

Standard: Candidate trips the reactor by depressing either of the 2 reactor trip pushbuttons on the RTGB.

Examiner's Note: **Candidate will state the actions that the reactor has been tripped;**
Reactor trip and bypass breakers open,
All IRPI indicate that rods are on the bottom,
All rod bottom lights are illuminated,
Neutron flux is lowering,
Reactor is tripped.

Comment:

* **Performance Step: 10** Stop ALL affected RCPs (Step 4.c)

Standard: Candidate will stop all of the RCPs by placing the RTGB control switches in the STOP position and observing the GREEN OFF indication for the RCP breakers.

Examiner's Note:

Comment:

Performance Step: 11 Go To PATH-1 while continuing with this procedure. (Step 4.d)

Standard: Candidate informs CRS to enter PATH-1 while he continues in AOP-014.

Examiner's Cue: **Acknowledge as the CRS that you and the BOP will continue in PATH-1 and the RO will continue in AOP-014.**

Comment:

END OF TASK

Terminating Cue: **All RCPs have been secured and task is completed.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM H

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

Plant is at 100% RTP.

No equipment is out of service.

You are the Reactor Operator.

INITIATING CUE:

Respond to plant events.

CONTINUOUS USE

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL
VOLUME 3
PART 5
ABNORMAL OPERATING PROCEDURE

AOP-014

COMPONENT COOLING WATER SYSTEM MALFUNCTION

REVISION 30

AOP-014, Revision 30
Summary of Changes (PRR 473133)

Section A

Steps 5 & 19	Changed Path-1 to Path-1 or EOP-E-0 in preparation for EOP upgrade. (PRR 473133)
Step 70 RNO 3	Changed step to GP-006-1 or 2 (PRR 473409)

Section B

Step 6d	Changed Path-1 to Path-1 or EOP-E-0 in preparation for EOP upgrade. (PRR 473133)

Section C

Step 4d	Changed Path-1 to Path-1 or EOP-E-0 in preparation for EOP upgrade. (PRR 473133)

Section D

Step 4d	Changed Path-1 to Path-1 or EOP-E-0 in preparation for EOP upgrade. (PRR 473133)

Purpose and Entry Conditions

(Page 1 of 1)

1. PURPOSE

This procedure provides the instructions necessary to mitigate abnormal conditions associated with Component Cooling Water (CCW) or any reduction in cooling to components served by the CCW System. Instructions for mitigating leakage into and out of the CCW system are also provided.

NOTE

This procedure assumes valid indications are present. This procedure should NOT be entered for transmitter failures.

2. ENTRY CONDITIONS

a. Any abnormal condition associated with the CCW System as indicated by:

- Improper Surge Tank Level
- Low Flow
- High CCW Temperature
- Unacceptable System Leakage

b. From AOP-005, Radiation Monitoring System, following an alarm on radiation monitor R-17 AND a confirmed rise in CCW Surge Tank level.

c. From APP-001 on a loss of CCW flow to the RCPs.

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

1. Implement The EALs

2. Make PA Announcement For Procedure Entry

NOTE

- A loss of inventory may be indicated by a report of leakage or lowering of surge tank level.
- CCW Pump discharge pressure less than 78 psig will cause an alarm.
- CCW low flow is defined as less than 2200 gal per pump
- CCW high temperature is defined as greater than 105°F or greater than 125°F if in Mode 3.

3. Go To Appropriate Section For Indicated Malfunction:

Loss Of CCW Inventory	Go To Section A
Rising CCW inventory OR R-17 Alarming	Go To Section B
CCW Pump Discharge Pressure Low	Go To Section C
CCW System Low Flow OR High Temperature	Go To Section D

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
4.	Determine If CCW Parameters Are Normal:	
	a. Check RCS temperature - LESS THAN 350°F	a. Perform one of the following: • IF CCW HX outlet temperature is greater than 105°F, THEN Go To Step 3. OR • IF CCW HX outlet temperature is less than 105°F, THEN Go To Step 4.c.
	b. Check CCW HX outlet temperature - LESS THAN 125°F	b. Go To Step 3.
	c. Check CCW HX outlet temperature - STABLE OR DECREASING	c. Go To Step 3.
	d. Check APP-001-F5, CCW PMP LO PRESS - EXTINGUISHED	d. Go To Step 3.
5.	Refer To Technical Specifications For Applicable LCOs • T.S. 3.4.17 - Chemical and Volume Control System (CVCS) • T.S. 3.5.2 - ECCS - Operating • T.S. 3.5.3 - ECCS - Shutdown • T.S. 3.6.6 - Containment Spray and Cooling Systems • T.S. 3.7.6 - Component Cooling Water (CCW) System	
6.	Return to Procedure And Step In Effect	

- END -

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION D

CCW SYSTEM LOW FLOW OR HIGH TEMPERATURE

(Page 1 of 7)

1. Monitor RCP Temperatures Using One Of The Following:

- ERFIS group display RCP LOG

OR

- RCP temperature recorder, TR-448

MOTOR BEARING	RCP A		RCP B		RCP C	
UPPER THRUST	PT.2	TE-417A	PT.9	TE-427A	PT.16	TE-437A
LOWER THRUST	PT.3	TE-417B	PT.10	TE-427B	PT.17	TE-437B
UPPER GUIDE	PT.4	TE-418A	PT.11	TE-428A	PT.18	TE-438A
LOWER GUIDE	PT.5	TE-419	PT.12	TE-429	PT.19	TE-439

2. Check APP-001-B1, RCP BRG COOL WTR LO FLOW - EXTINGUISHED

Verify the following CCW Valves open:

- CC-716A, CCW TO RCP ISO
- CC-716B, CCW TO RCP ISO NO
- CC-730, BRG OUTLET ISO

IF CCW to the RCP(s) can NOT be restored, THEN Go To Step 4.

* 3. Check ANY RCP Motor Bearing Temperature - GREATER THAN 200°F

IF any RCP Motor Bearing temperature exceeds 200°F, THEN perform Step 4

Go To Step 5

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION D

CCW SYSTEM LOW FLOW OR HIGH TEMPERATURE

(Page 2 of 7)

4. Determine If Reactor Trip Is Required As Follows:

   a. Check Reactor - CRITICAL

      a. Perform the following:

         1) Verify Control Rods - TRIPPED

         2) Stop ALL Affected RCPs.

         3) IF Control Rods were inserted on the trip, THEN perform the following:

            a) IF RCS temperature is greater than OR equal to 350°F, THEN Go To Step 4.d.

            b) IF RCS temperature is less than 350°F, THEN Go To Step 5.

         4) IF Control Rods were already inserted, THEN Go To Step 5.

   b. Verify Reactor - TRIPPED

   c. Stop ALL Affected RCPs

   d. Go To Path-1 OR EOP-E-0, Reactor Trip or Safety Injection, While Continuing With This Procedure

5. Check CCW HX OUTLET Temperature - GREATER THAN 105°F

   Go To Step 17.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION D

CCW SYSTEM LOW FLOW OR HIGH TEMPERATURE

(Page 3 of 7)

****

CAUTION

If only one SW Pump is running, it is subject to runout until the following step is completed.

****

6. Check SW Header Pressure AND Transition To Steps Indicated By The Table Below:

SW PRESSURE CONDITION	STEP
LESS THAN 40 PSIG	7
GREATER THAN 50 PSIG	8
BETWEEN 40 PSIG AND 50 PSIG	11

7. Raise SW Pressure As Follows:

a. Start additional SW Pumps as necessary to obtain at least 40 psig SW Header pressure

a. IF ALL available SW Pumps are running AND at least 40 psig can NOT be obtained, THEN isolate SW to the Turbine Building by closing:

- V6-16C, SW TURB BLDG ISO

OR

- V6-16A AND V6-16B, SW TURB BLDG SUPPLY

b. Check SW Header pressure - GREATER THAN 50 PSIG

b. Go To Step 11.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION D

CCW SYSTEM LOW FLOW OR HIGH TEMPERATURE

(Page 4 of 7)

8.	Reduce SW Pressure As Follows:	
	a. Check number of SW Pumps Running - GREATER THAN 2	a. WHEN personnel are available, THEN locally perform Attachment 10, Throttling CCW Heat Exchanger SW Valves, while continuing with this procedure. Go To Step 11.
	b. Stop 1 Pump	
	c. Check SW Header Pressure - GREATER THAN 50 PSIG	c. Go To Step 8.e.
	d. Go To Step 8.a	
	e. Check SW Header pressure - GREATER THAN 40 PSIG	e. WHEN personnel are available, THEN locally perform Attachment 10, Throttling CCW Heat Exchanger SW Valves, while continuing with this procedure.
9.	Check SW To Turbine Building Status - ISOLATED	Go To Step 11.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION D

CCW SYSTEM LOW FLOW OR HIGH TEMPERATURE

(Page 5 of 7)

10. Shutdown Secondary Systems As Follows:

    a. Close all MSIVs AND MSIV BYPASS Valves

    b. Break vacuum to the Condenser as follows:

        1) Depress AND hold the THINK Button

        2) Open VACUUM BREAKER VALVES:

            - MS-70A
            - MS-70B

        3) WHEN Vacuum Breaker Valves are Open, THEN Release the THINK Button

    c. Verify The Following Equipment - STOPPED:

        - FW PUMP A AND B
        - COND PUMP A AND B
        - HEATER DRAIN PUMP A AND B
        - GOV FLUID PUMP A AND B
        - VACUUM PUMP A AND B

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION D

CCW SYSTEM LOW FLOW OR HIGH TEMPERATURE

(Page 6 of 7)

11.	Reduce Heat Loads On The CCW System As Necessary To Maintain Temperature	
	a. Stop Waste Gas Compressor(s)	
	b. Secure excess letdown	
	c. Check RHR - IN CORE COOLING MODE	c. Go To Step 11.e.
	d. Minimize RCS cooldown rate	
	e. Reduce number of Charging Pumps in service	
	f. Throttle CC-775, CC FROM SPENT FUEL PIT HX BUTTERFLY, to maintain SFP temperature between 115°F and 120°F (located East of Heat Exchanger 9 foot above floor)	
12.	Check CCW Temperature - • LESS THAN 105°F AND • STABLE OR LOWERING	Go To Step 14.
13.	Go To The MAIN BODY, Step 4, Of This Procedure	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION D

CCW SYSTEM LOW FLOW OR HIGH TEMPERATURE

(Page 7 of 7)

14. Check CCW Temperature Based On RCS Temperature - GREATER THAN LIMITS USING TABLE BELOW

    Go To the MAIN BODY, Step 4, of this procedure.

RCS TEMPERATURE	CCW TEMPERATURE
GREATER THAN 350°F	105°F
LESS THAN 350°F	125°F

15. Check Plant Status - AT POWER

    Go To the MAIN BODY, Step 4, of this procedure.

16. Initiate An Operability Determination For Components Cooled By CCW

17. Check RCP B OR C - RUNNING

    Go To the MAIN BODY, Step 4, of this procedure.

18. Check RCP B - RUNNING

    Place PCV-455A, PZR SPRAY 444G, Controller to MAN AND adjust controller output to ZERO.

19. Check RCP C - RUNNING

    Perform the following:

    a. Place PCV-455B, PZR SPRAY 444H, Controller to MAN AND adjust controller output to ZERO.

    b. Maintain PZR level between 30% and 40% to provide adequate PZR spray.

20. Go To The MAIN BODY, Step 4, Of This Procedure

- END -

Facility:	HB ROBINSON	Task No.:	01344100205
Task Title:	Align Deepwell Pump D to supply cooling water to CCW Heat Exchangers	JPM No.:	2011-2 NRC JPM I
K/A Reference:	076 A2.01 (3.5/3.7) 076 G2.1.30 (4.4/4.0)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Plant is in Mode 3 following a reactor trip from 100% RTP
- An attack on the RNP site has resulted in a loss of the Startup Transformer and the Intake Structure.
- EDG B tripped while starting.
- EPP-28, Loss of Ultimate Heat Sink, is in progress.
- MSIVs and MSIV Bypass valves have been closed.
- EPP-28, Attachment 6, Deepwell Cooling to one of the available EDGs, has been completed for EDG A.

Task Standard: Align Deepwell Pump D to supply cooling to Component Cooling Water Heat Exchangers.

Required Materials: EPP-28, Attachment 7

General References: EPP-28, Loss of Ultimate Heat Sink, Revision 10

Handouts:	EPP-28, Attachment 7
Initiating Cue:	The CRS has directed you to align Deepwell Pump D to supply the cooling water to the Component Cooling Water Heat Exchangers IAW EPP-28, Attachment 7.
Time Critical Task:	NO
Validation Time:	12 minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with a check mark)

START TIME: _____

CAUTION
The calculated maximum time a CCW Heat Exchanger may operate without cooling to preclude adverse system effects is less than 60 minutes.

NOTE
A locked valve key is required for steps below.

√ **Performance Step: 1** Establish Aux Building SW Drain path as follows: (Att.7, Step 1)

a. Unlock and close SW-23, SW RETURN FROM AUXILIARY BUILLDING

Standard: Candidate **simulates** unlocking and closing valve SW-23 by rotating the valve handwheel in the clockwise direction until the closed stop is reached and the position indicator is pointing to CLOSE position.

Examiner's NOTE: **SW-23 is a butterfly valve.**

Examiner's CUE: **Valve SW-23 indicates closed.**

Comment:

√ **Performance Step: 2** Establish Aux Building SW Drain path as follows: (Att.7, Step 1)

b. Close SW-739, CCW HEAT EXCHANGER 'A' RETURN

Standard: Candidate **simulates** closing valve SW-739 by rotating the valve handwheel in the clockwise direction until the closed stop is reached and the position indicator is pointing to CLOSE position.

Examiner's NOTE: **SW-739 is a butterfly valve.**

Examiner's CUE: **Valve SW-739 indicates closed.**

Comment:

√ **Performance Step: 3** Establish Aux Building SW Drain path as follows: (Att.7, Step 1)

c. Close SW-740, CCW HEAT EXCHANGER 'B' RETURN

Standard: Candidate **simulates** closing valve SW-740 by rotating the valve handwheel in the clockwise direction until the closed stop is reached and the position indicator is pointing to CLOSE position.

Examiner's NOTE: **SW-740 is a butterfly valve.**

Examiner's CUE: **Valve SW-740 indicates closed.**

Comment:

Performance Step: 4 Establish Aux Building SW Drain path as follows: (Att.7, Step 1)

d. Close the DIESEL SW RETURN valve for the in service EDG

- SW-88, DIESEL "A" RETURN

Standard: Candidate determines that valve SW-88 is closed by attempting to rotate the valve handwheel in the clockwise direction.

Examiner's NOTE: **Valve SW-88 was placed in the closed position during the performance of EPP-28, Attachment 6.**

Examiner's CUE: **Valve SW-88 is closed.**

Comment:

√ **Performance Step: 5** At the in-service EDG, throttle the EDG ALTERNATE COOLING RETURN valve 5.5 turns in the close direction (4 turns open) (Att. 7, Step 2)

- SW-968, EDG A ALTERNATE COOLING RETURN

Standard: Candidate **simulates** closing valve SW-968 5.5 turns by rotating the valve handwheel in the clockwise direction 5.5 turns.

Examiner's NOTE: **Valve SW-968 was opened fully during the performance of EPP-28, Attachment 6.**

Examiner's CUE: **Report that valve SW-968 valve has been rotated in the clockwise position for 5.5 turns.**

Comment:

√ **Performance Step: 6** Open bypass for the normal EDG cooling valve for the in service EDG: (Att. 7, Step 3)

- "A" EDG: SW-87, TCV-1660 BYPASS

Standard: Candidate **simulates** opening valve SW-87 by rotating the valve handwheel in the counterclockwise direction until the valve comes to a hard stop and stem is extended.

Examiner's NOTE:

Examiner's CUE: **Report that valve SW-87 handwheel has come to a hard stop and the valve stem is extended.**

Comment:

Performance Step: 7 Open the in-service DIESEL TEMP CONTROL VALVE outlet: (Att. 7, Step 4)

- SW-86, TCV-1660 OUTLET (A EDG)

Standard: Candidate **simulates** opening valve SW-86 by rotating the valve handwheel in the counterclockwise direction and observing the stem rising from the operator until the valve no longer rotates in the counterclockwise direction and the stem is extended.

Examiner's NOTE:

Examiner's CUE: **Report that valve SW-86 handwheel has come to a hard stop and the valve stem is extended.**

Comment:

√ **Performance Step: 8** Establish CCW HX Cooling as follows: (Att. 7, Step 5)

a. Open SW-268, CCW HEAT EXCHANGER 'A' RETURN VENT.

b. Observe flow from the vent.

c. Close SW-268.

Standard: Candidate **simulates** opening valve SW-268 by rotating the valve handwheel in the counterclockwise direction and observing water flow from the valve. Once venting is complete, close valve SW-268 by rotating the valve handwheel in the clockwise direction until the valve comes to a hard stop and the water ceases to flow.

Examiner's NOTE:

Examiner's CUE: **Report that water is flowing when valve SW-268 is open and the water has stopped flowing when the valve is closed.**

Comment:

√ **Performance Step: 9** Establish CCW HX Cooling as follows: (Att. 7, Step 5)

d. Open SW-257, CCW HEAT EXCHANGER 'B' RETURN VENT.

e. Observe flow from the vent.

f. Close SW-257.

Standard: Candidate **simulates** opening valve SW-257 by rotating the valve handwheel in the counterclockwise direction and observing water flow from the valve. Once venting is complete, close valve SW-257 by rotating the valve handwheel in the clockwise direction until the valve comes to a hard stop and the water ceases to flow.

Examiner's NOTE:

Examiner's CUE: **Report that water is flowing when valve SW-257 is open and the water has stopped flowing when the valve is closed.**

Comment:

√ **Performance Step: 10** Establish CCW HX Cooling as follows: (Att. 7, Step 5)

g. Open EACH CCW HEAT EXCHANGER RETURN Valve 1 Turn:

- SW-739
- SW-740

Standard: Candidate **simulates** opening valves SW-739 and SW-740 by rotating the handwheel in the counterclockwise direction 1 turn each.

Examiner's NOTE:

Examiner's CUE: **Valves SW-739 and SW-740 have been opened 1 turn each.**

Comment:

NOTE

- **The next two steps are intended to maintain CCW temperature less than 125°F while at the same time maintaining less than 1325 gpm total flow from Deep Well Pump "D". This flow rate can be observed by either maintaining SW pressure greater than 18 psig at the CCW Heat Exchanger OR reading the well water flow indicator located in the EDG Room (FE-11135 or FE-11136).**
- **Note that subsequent steps will cut in additional SW flow to several components (20 to 30 gpm), therefore some margin to 18 psig must be maintained.**

√ **Performance Step: 11** Throttle SW-739 AND SW-740 in equal increments to maintain CCW temperature less than 125°F. (Att. 7, Step 6)

Standard: Candidate **simulates** throttling valves SW-739 and SW-740 open by rotating the valve handwheels in the counterclockwise direction and monitoring the CCW temperature.

Examiner's NOTE: **CCW temperature in NOT available in the CCW Room and the candidate will have to communicate with the Control Room for the temperature to be monitored.**

Examiner's CUE: **Report that CCW temperature is 117°F and stable following the throttling of valves SW-739 and SW-740 open 3 turns each.**

Comment:

√ **Performance Step: 12** Control SW pressure at the CCW Heat Exchanger as follows: (Att. 7, Step 7)

a. Throttle SW-739 AND SW-740 in equal increments to maintain SW pressure greater than 18 psig.

Standard: Candidate **simulates** throttling valves SW-739 and 740 by rotating the valve handwheels in the clockwise direction and observing the pressure indication at PI-1619A and B rising.

Examiner's NOTE: **Flow element FE-11136 is located in EDG A Room on the east side of the diesel. The flow indicator is 0-150 inches water column range with a mark of 1325 GPM on the indicator for excessive flow.**

SW pressure indicators PI-1619A and B are located at the south end of the CCW HXs adjacent to valves SW-739 and 740.

Examiner's CUE: **Report that SW pressure is currently at 17 psig.**

Report SW pressure has risen to 20 psig once valves SW-739 and SW-740 have been throttled closed 1 turn each.

Comment:

Performance Step: 14 Inform the Control Room that CCW cooling has been established. (Att. 7, Step 8)

Standard: Candidate notifies the Control Room that EPP-28, Attachment 7 has been completed for establishing CCW cooling.

Examiner's NOTE:

Examiner's CUE: **Respond as the Control Room that CCW cooling has been established.**

Comment:

END OF TASK

Terminating Cue: **CCW cooling has been established IAW EPP-28, Attachment 7; Evaluation of this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM I

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- Plant is in Mode 3 following a reactor trip from 100% RTP
- An attack on the RNP site has resulted in a loss of the Startup Transformer and the Intake Structure.
- EDG B tripped while starting.
- EPP-28, Loss of Ultimate Heat Sink, is in progress.
- MSIVs and MSIV Bypass valves have been closed.
- EPP-28, Attachment 6, Deepwell Cooling to one of the available EDGs, has been completed for EDG A.

INITIATING CUE:

The CRS has directed you to align Deepwell Pump D to supply the cooling water to the Component Cooling Water Heat Exchangers IAW EPP-28, Attachment 7.

ATTACHMENT 7

ESTABLISHING CCW COOLING

(Page 1 of 3)

****

CAUTION

The calculated maximum time a CCW Heat Exchanger may operate without cooling to preclude adverse system effects is less than 60 minutes.

****

NOTE

A locked valve key is required for steps below.

1. Establish Aux Building SW Drain Pathway As Follows:

   a. Unlock and Close SW-23, SW RETURN FROM AUXILIARY BUILDING.

   b. Close SW-739, CCW HEAT EXCHANGER "A" RETURN.

   c. Close SW-740, CCW HEAT EXCHANGER "B" RETURN.

   d. Close the DIESEL SW RETURN valve for the in service EDG:

      - SW-88, DIESEL "A" RETURN

      OR

      - SW-92, DIESEL "B" RETURN

2. At the in-service EDG, throttle the EDG ALTERNATE COOLING RETURN valve 5.5 turns in the close direction (4 turns open):

   - SW-966, EDG B ALTERNATE COOLING RETURN

   OR

   - SW-968, EDG A ALTERNATE COOLING RETURN

ATTACHMENT 7

ESTABLISHING CCW COOLING

(Page 2 of 3)

3. Open Bypass For The Normal EDG cooling valve for the in service EDG:

   - "A" EDG: SW-87, TCV-1660 BYPASS

   OR

   - "B" EDG: SW-91, TCV-1661 BYPASS

4. Open the in-service DIESEL TEMP CONTROL VALVE outlet:

   - SW-90, TCV-1661 OUTLET (B EDG)

   OR

   - SW-86, TCV-1660 OUTLET (A EDG)

5. Establish CCW HX Cooling As Follows:

   a. Open SW-268, CCW HEAT EXCHANGER "A" RETURN VENT.

   b. Observe flow from the vent.

   c. Close SW-268.

   d. Open SW-257, CCW HEAT EXCHANGER "B" RETURN VENT.

   e. Observe flow from the vent.

   f. Close SW-257.

   g. Open EACH CCW HEAT EXCHANGER RETURN Valve 1 Turn:

      - SW-739
      - SW-740

ATTACHMENT 7

ESTABLISHING CCW COOLING

(Page 3 of 3)

NOTE

- The next two steps are intended to maintain CCW temperature less than 125°F while at the same time maintaining less than 1325 gpm total flow from Deep Well Pump "D". This flow rate can be observed by either maintaining SW pressure greater than 18 psig at the CCW Heat Exchanger OR reading the well water flow indicator located in the EDG Room (FE-11135 or FE-11136).
- Note that subsequent steps will cut in additonal SW flow to several components (20 to 30 gpm), therefore some margin to 18 psig must be maintained.

6. Throttle SW-739 AND SW-740 in equal increments to maintain CCW Temperature less than 125°F

7. Control SW pressure at the CCW Heat Exchanger as follows:

   a. Throttle SW-739 AND SW-740 in equal increments to maintain SW pressure greater than 18 psig.

8. Inform the Control Room that CCW cooling Has been established.

- END -

Facility:	HB ROBINSON	Task No.:	01000110805
Task Title:	Startup of Dedicated Shutdown UPS Inverter IAW OP-602	JPM No.:	2011-2 NRC JPM J
K/A Reference:	062 G2.1.20 4.6 / 4.6		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- DS UPS has been removed from service for maintenance.
- Maintenance has been completed and the UPS is ready to be restored to service.
- OP-602, Section 8.1.4, Steps 1a, 1b, 1c and 1d have been completed.

Task Standard: OP-602, Section 8.1.4 has been completed with the DS UPS in service.

Required Materials: OP-602, Revision 56.

General References: OP-602, Dedicated Shutdown System, Revision 56.

Initiating Cue: The CRS has directed you to restore the DS UPS to service IAW OP-602, Section 8.1.4, beginning at Step 8.1.4.2.

Time Critical Task: NO

Validation Time: 6 minutes

(Denote Critical Steps with an asterisk *)

START TIME: _____

Performance Step: 1	Verify OPEN all breakers on DS UPS Inverter (Step 8.1.4.2.a) - DC INPUT Breaker - Inverter Output Breaker - Sync Reference AC Input Breaker
Standard:	Candidate simulates verifying the DC Input Breaker, Inverter Output Breaker and Sync Reference AC Input Breaker are open by ensuring that the breaker operating handles are in the down position. obtains all of the required equipment specified in the step.
Examiner's Cue:	**Inform the operator that all of the breakers are in the open position.**
Comment:	
Performance Step: 2	VERIFY the Manual Bypass Switch is in the Bypass to Load position (Step 8.1.4.2.b)
Standard:	Candidate **simulates** verifying that the switch is in the BYPASS TO LOAD position (Operating handle positioned to the RIGHT)
Examiner's Cue:	**Inform the operator that the Manual Bypass Switch is positioned to the BYPASS TO LOAD position.**
Comment:	

* **Performance Step: 3** CLOSE DC Input Breaker (Step 8.1.4.2.c)

Standard: Candidate simulates closing the DC Input Breaker by placing the breaker operating handle in the up position.

Examiner's Cue: **Inform the operator that the DC Input Breaker is closed.**

Comment:

* **Performance Step: 4** CLOSE Sync Reference AC Input Breaker (Step 8.1.4.2.d)

Standard: Candidate **simulates** closing the Sync Reference AC Input Breaker by placing the breaker operating handle in the up position.

Examiner's Cue: **Inform the operator that the Sync Reference AC Input Breaker is closed.**

Comment:

* **Performance Step: 5** WHEN greater than 30 seconds have elapsed after closing the DC Input Breaker, THEN CLOSE the Inverter Output Breaker (Step 8.12.4.2.e)

Standard: Candidate **simulates** closing the Inverter Output Breaker by placing the breaker operating handle in the up position.

Examiner's Cue: **Inform the operator that the Inverter Output Breaker is closed.**

Comment:

Performance Step: 6 VERIFY In Sync light illuminated (green) (Step 8.1.4.2.f)

Standard: Candidate observes the GREEN In Sync light illuminated on the inverter.

Examiner's Cue: **Inform the candidate that the In Sync GREEN light is illuminated.**

Comment:

*	**Performance Step: 7**	TRANSFER Manual Bypass Switch to Normal Operation Position (Step 8.1.4.2.g)
	Standard:	Operator **simulates** placing the MANUAL BYPASS SWITCH to the NORMAL OPERATION position by rotating the switch to the LEFT position. .
	Examiner's Cue:	**Inform the candidate that the MANUAL BTPASS SWITCH has been placed in the NORMAL OPERATION position.**
	Comment:	

Performance Step: 8	CHECK Inverter Supplying Load light illuminated (green) (Step 8.1.4.2.h)
Standard:	Candidate observes the GREEN Inverter Supplying Load light illuminated on the inverter.
Examiner's Cue:	**Inform the candidate that the Inverter Supplying Load GREEN light is illuminated.**
Comment:	

Performance Step: 9	CHECK Bypass Source Supplying Load light extinguished (Step 8.1.4.2.i)
Standard:	Candidate observes the AMBER Bypass Source Supplying Load light extinguished on the inverter.
Examiner's Cue:	**Inform the candidate that the Bypass Source Supplying Load AMBER light is extinguished.**
Comment:	

Performance Step: 10 PRESS Alarm Reset Pushbutton (Step 8.1.4.2.j)

Standard: Operator simulates depressing the ALARM RESET pushbutton (S1) on the inverter.

Examiner's Cue: **Inform the operator that the ALARM RESET pushbutton has been depressed and all alarms are extinguished.**

Comment:

Performance Step: 11 CHECK Inverter AC Output Voltage 116 to 124 volts AC (Step 8.1.4.2.k)

Standard: Operator observes the INVERTER AC OUTPUT VOLT meter for the appropriate voltage.

Examiner's Cue: **Inform the operator that the INVERTER AC OUTPUT VOLT meter indicates 121 Volts AC.**

Examiner's Note:

Comment:

END OF TASK

Termination Cue: DS UPS Inverter has been returned to service IAW OP-602.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM J

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- DS UPS has been removed from service for maintenance.
- Maintenance has been completed and the UPS is ready to be restored to service.
- OP-602, Section 8.1.4, Steps 1a, 1b, 1c and 1d have been completed.

INITIATING CUE:

The CRS has directed you to restore the DS UPS to service IAW OP-602, Section 8.1.4, beginning at Step 8.1.4.2.

INIT

8.1.4 Startup of DS Uninterruptible Power Supply (UPS) Inverter

1. Initial Conditions

NOTE: This section has been screened IAW PLP-037 criteria and determined to be not applicable to PLP-037.

a. This revision has been verified to be the latest revision available. _____ Date ____

b. Power Panel 51 is energized. ____

c. CKT 2, 5 KVA Inverter, on DS Distribution Panel "A" CLOSED. ____

d. Power Supply "A" is in service. ____

2. Instructions

a. **VERIFY** OPEN all breakers on DS UPS Inverter.

- DC Input Breaker OPEN ____
- Inverter Output Breaker OPEN ____
- Sync Reference AC Input Breaker OPEN ____

b. **VERIFY** the Manual Bypass Switch is in the Bypass to Load position. ____

c. **CLOSE** DC Input Breaker. ____

d. **CLOSE** Sync Reference AC Input Breaker. ____

8.1.4.2 (Continued) INIT

e. **WHEN** greater than 30 seconds have elapsed after closing the DC Input Breaker, **THEN CLOSE** the Inverter Output Breaker. ____

f. **VERIFY** In Sync light illuminated (green). ____

g. **TRANSFER** Manual Bypass Switch to Normal Operation Position. ____

h. **CHECK** Inverter Supplying Load light illuminated (green). ____

i. **CHECK** Bypass Source Supplying Load light extinguished. ____

j. **PRESS** Alarm Reset Pushbutton. ____

k. **CHECK** Inverter AC Output Voltage 116 to 124 volts AC. ____

	Initials	Name (Print)	Date
Performed By:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Approved By: _____ _____
Shift Manager Date

WORKSHEET

Facility:	HB ROBINSON	Task No.:	01000101905
Task Title:	Respond to Control Room Inaccessibility	JPM No.:	2011-2 NRC JPM K
K/A Reference:	068 AA1.06 4.1 / 4.2		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

START JPM AT THE INSIDE AUXILIARY OPERATORS OFFICE

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Control Room has been evacuated due to a fire in the Control Room kitchen.
- The Shift Manager has implemented AOP-004, Control Room Inaccessibility.
- Charging Pumps B and C are operating.
- You are the Balance of Plant Operator.

Task Standard: AOP-004, Attachment 1, is complete with PZR level being controlled with the band specified.

Required Materials: AOP-004, Revision 19.

General References: AOP-004, Revision 19.

Initiating Cue: The SM directs you to perform the local actions contained in AOP-004, Attachment 1 for the Auxiliary Building Operator.

Time Critical Task: NO

Validation Time: 20 minutes

(Denote Critical Steps with an asterisk *)

START TIME: _____

Performance Step: 1	Obtain the following equipment: (Step 1) At the Old Fire Equipment Building: -Two-way radio -Flashlight -Locked valve keys -Locked high rad area key
Standard:	Candidate obtains all of the required equipment specified in the step.
Examiner's Cue:	**Inform the operator that he has all of the specified equipment.**
Comment:	

Performance Step: 2 Verify all of the following breakers – OPEN (Step 2)

- REACTOR TRIP BREAKER A
- REACTOR TRIP BREAKER B
- BYPASS BREAKER A
- BYPASS BREAKER B

Standard: Candidate **simulates** depressing the trip button on the REACTOR TRIP and BYPASS BREAKERS A AND B and notes that GREEN OPEN flag appears in the breaker status window.

Examiner's Cue: **Inform the operator that the GREEN OPEN flag appears in the breaker status window.**

Comment:

Performance Step: 3 Notify the SM/CRS that the reactor has been tripped. (Step 3)

Standard: Candidate notifies the SM/CRS that the reactor has been tripped.

Examiner's Cue: **Respond as the SM that you understand that the reactor has been tripped.**

Comment:

NOTE

If the Control Room was evacuated due to a fire, the ventilation system is de-energized to prevent increasing the amount of oxygen available to support combustion.

Performance Step: 4 Check Control Room Status – CONTROL ROOM EVACUATED DUE TO FIRE (Step 4)

Standard: Candidate determines that Control Room was evacuated due to a fire in the Control Room kitchen as stated in the initial conditions.

Examiner's Cue: **NONE**

Comment:

* **Performance Step: 5** Open the following breakers at MCC-16: (Step 5)

- CONTROL ROOM AIR CONDITIONER, HVA-1A (CMPT 2F)
- CONTROL ROOM AIR CLEANING UNIT, HVE-19A (CMPT 4H)

Standard: Operator locates the breakers for HVA-1A and HVE-19A on MCC-16 and **simulates** opening the breakers by positioning the breaker handle to the down position and the loss of breaker indication.

Examiner's Note: **SAF-NGGC-2175, Attachment 2, Sheet 3 of 5 for Motor Control Centers (MCC's) (600V or less) specifies that operating breakers with the doors closed is a Hazard Category 0 and refers to Attachment 3.**
Attachment 3, Hazard Category 0 requires 100% Untreated Natural Fabric Long sleeve shirt and pants along with undergarments made from natural fabric and Safety Glasses or Goggles.
If needed, PPE for electrical safety is located in a locker adjacent to the Inside Auxiliary Operator's office area.

Examiner's Cue: **Breakers have been positioned to the down position and the RED and GREEN lights are extinguished.**

If electrical safety PPE is requested, discussion of the PPE required and its location can satisfy the PPE requirements.

Comment:

* **Performance Step: 6** Open the following breakers at MCC-18: (Step 6)

- CONTROL ROOM AIR CONDITIONER, HVA-1B (CMPT 2F)
- CONTROL ROOM AIR CLEANING UNIT, HVE-19B (CMPT 4H)

Standard: Operator locates the breakers for HVA-1B and HVE-19B on MCC-18 and **simulates** opening the breakers by positioning the breaker handle to the down position and the loss of breaker indication.

Examiner's Cue: **Breakers have been positioned to the down position and the RED and GREEN lights are extinguished.**

Comment:

* **Performance Step: 7** Open breaker V1-8A, SDAFW PUMP STEAM ISOLATION, at MCC-5 (CMPT 16F) (Step 7)

Standard: Operator **simulates** opening the breaker for V1-8A on MCC-5 by moving the breaker handle in the down position and noting the loss of breaker indication.

Examiner's Cue: **Breaker has been positioned to the down position and the RED and GREEN lights are extinguished.**

Comment:

* **Performance Step: 8** Open the following breakers at MCC-10: (Step 8)

-V2-14A, SDAFW PUMP TO S/G A (CMPT 3C)

-V2-16A, MDAFW PUMP HEADER DISCHARGE TO S/G A (NORMAL POWER) (CMPT 4C)

-V2-16B, MDAFW PUMP HEADER DISCHARGE TO S/G B (CMPT 4F)

-V2-14C, SDAFW PUMP DISCHARGE TO S/G C (CMPT 4M)

Standard: Operator **simulates** opening the breakers for V2-14A, V2-16A, V2-16B and V2-14C on MCC-10 by moving the breaker handles in the down position and noting the loss of breaker indication.

Examiner's Cue: **Breakers have been positioned to the down position and the RED and GREEN lights are extinguished.**

Comment:

Performance Step: 9 Notify the SM/CRS that breakers for the following valves have been opened: (Step 9)

V1-8A, V2-14A, V2-14C, V2-16A, V2-16B.

Standard: Operator notifies the SM that the breakers for valves V1-8A, V2-14A, V2-14C, V2-16A, and V2-16B have been opened.

Examiner's Cue: **Respond as the SM that you understand that the breakers have been opened.**

Comment:

Performance Step: 10 Check with SM/CRS LCV-115C breaker – OPEN (Step 10)

Standard: Operator notifies the SM and requests the status of the breaker for valve LCV-115C.

Examiner's Cue: **Respond as the SM that the breaker for LCV-115C has been reported as open.**

Comment:

* **Performance Step: 11** Open CVC-358, RWST TO CHARGING PUMP SUCTION, in the Charging Pump Room. (Step 11)

Standard: Operator **simulates** opening valve CVC-358 by rotating the operating handle 90 degrees.

Examiner's Cue: **Inform the operator that the valve has been opened by rotating the valve operating handle 90 degrees.**

Examiner's Note: **CVC-358 is located in the Charging Pump Room approximately 7 feet from floor level on the west side of Charging Pump B. Operator will probably need a ladder to reach the valve or can describe where a ladder can be obtained (CCW Pump Room).**

Comment:

*** Performance Step: 12** Verify LCV-115C, VOLUME CONTROL TANK OUTLET in the Charging Pump Room – CLOSED (Step 12)

Standard: Operator **simulates** closing valve LCV-115C by declutching the motor and rotating the valve handwheel in the clockwise direction until the valve handwheel no longer turns.

Examiner's Cue: **Inform the operator that the declutching lever has been engaged and the valve has been closed.**

Examiner's Note: **Valve LCV-115C is located above the floor level of the Charging Pump Room on a platform between Charging Pumps B and C. Operator should be able to describe the operation of the valve from the floor level.**

Comment:

NOTE

Steps 13 through 20 are performed at the Charging Pump Room Control Panel or Local Control Panel for Charging Pumps on the South Wall of the Charging Pump Room unless otherwise noted.

*** Performance Step: 13** Place the following transfer switches – IN LOCAL. (Step 13)

- CHARGING PUMP A TRANSFER SW
- CHARGING PUMP B TRANSFER SW
- CHARGING PUMP C TRANSFER SW

Standard: Operator **simulates** placing the Charging Pump LOCAL/REMOTE switches on the Charging Pump Room Control Panel to the LOCAL position by rotating the pistol grip switches.

Examiner's Cue: **Inform the operator that the Charging Pump LOCAL/REMOTE switches has been placed in LOCAL.**

Comment:

*** Performance Step: 14** Verify only one Charging Pump – RUNNING (Step 14)

Standard: Operator **simulates** operating the START / STOP pushbutton controls to ensure that only one Charging Pump is operating by observing the RED running indication on only one pump is illuminated. Diverse indications provided are the noise in the room and observation of the pump rotating.

Examiner's Note: **The candidate will have to stop one of the running charging pumps by depressing the STOP pushbutton and observing the GREEN stop light illuminated.**

Examiner's Cue: **If asked, inform the operator that B and C Charging Pumps are operating prior to any simulated actions.**

Comment:

Performance Step: 15	Check neutron flux NI-51 SOURCE RANGE indication – LESS THAN 1E05 CPS (Step 15)
Standard:	Operator observes the NI-51 indicator on the Charging Pump Room Control Panel to determine the present reading.
Examiner's Cue:	**Inform the operator that NI-51 indicates 5E03 CPS.**
Comment:	
Performance Step: 16	Observe the NOTE prior to Step 18 and Go To Step 18. (Step 16)
Standard:	Operator observes the NOTE and proceeds to Step 18.
Examiner's Cue:	**NONE**
Comment:	

NOTE

Starting duty limitations allow four Charging Pump starts per hour and require a minimum of five minutes between starts.

* **Performance Step: 17** Control PZR level from the Charging Pump Room as follows: (Step 18)

a. Place the selector switch for the running Charging Pump on the CHARGING PUMP SPEED CONTROLLER to MAN

b. Turn the Speed Control Knob counter-clockwise to lower Charging Pump speed to minimum

c. Check PZR level – GREATER THAN 71%

d. Stop the running Charging Pump

Standard: Operator **simulates** placing the Charging Pump Speed Controller to MAN by rotating the switch from AUTO to MAN.

Operator **simulates** rotating the speed control knob counter-clockwise to lower the Charging Pump speed to minimum.

Operator observes PZR level indicator to obtain present reading.

Operator responds to reported PZR level by **simulating** stopping the running Charging Pump.

Examiner's Cue: **Inform the operator that the Charging Pump Speed Controller has been placed in MAN.**

Inform the operator that the speed control knob has been rotated counter-clockwise and Charging Pump speed is at minimum.

Inform the operator that PZR level is at 75%.

Comment:

END OF TASK

Termination: AOP-004, Attachment 1 actions have been performed to maintain RCS inventory within the prescribed control band.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM K

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- Control Room has been evacuated due to a fire in the Control Room kitchen.
- The Shift Manager has implemented AOP-004, Control Room Inaccessibility.
- You are the Balance of Plant Operator.

INITIATING CUE:

The SM directs you to perform the local actions contained in AOP-004, Attachment 1 for the Auxiliary Building Operator.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

(Page 1 of 9)

1. Obtain The Following Equipment:

   - At the Old Fire Equipment Building:
     - Two-way radio
     - Flashlight
     - Locked valve keys
     - Locked high rad area key

2. Verify All Of The Following Breakers - OPEN

   - REACTOR TRIP BREAKER A
   - REACTOR TRIP BREAKER B
   - BYPASS BREAKER A
   - BYPASS BREAKER B

   Trip open the following MG Set Output Breakers:

   a. GENERATOR A CIRCUIT BREAKER

   b. GENERATOR B CIRCUIT BREAKER

3. Notify The SM/CRS That The Reactor Has Been Tripped

NOTE

If the Control Room was evacuated due to a fire, the ventilation system is de-energized to prevent increasing the amount of oxygen available to support combustion.

4. Check Control Room Status - CONTROL ROOM EVACUATED DUE TO FIRE

   Go To Step 7.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

(Page 2 of 9)

5. Open The Following Breakers At MCC-16:

   - CONTROL ROOM AIR CONDITIONER, HVA-1A (CMPT 2F)
   - CONTROL ROOM AIR CLEANING UNIT, HVE-19A (CMPT 4H)

6. Open The Following Breakers At MCC-18:

   - CONTROL ROOM AIR CONDITIONER, HVA-1B (CMPT 2F)
   - CONTROL ROOM AIR CLEANING UNIT, HVE-19B (CMPT 4H)

7. Open Breaker V1-8A, SDAFW PUMP STEAM ISOLATION, At MCC-5 (CMPT 16F)

8. Open The Following Breakers At MCC-10:

   - V2-14A, SDAFW PUMP TO S/G A (CMPT 3C)
   - V2-16A, MDAFW PUMP HEADER DISCHARGE TO S/G A (NORMAL POWER) (CMPT 4C)
   - V2-16B, MDAFW PUMP HEADER DISCHARGE TO S/G B (CMPT 4F)
   - V2-14C, SDAFW PUMP DISCHARGE TO S/G C (CMPT 4M)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

(Page 3 of 9)

9.	Notify The SM/CRS That Breakers For The Following Valves Have Been Opened: • V1-8A • V2-14A • V2-14C • V2-16A • V2-16B	
*10.	Check with SM/CRS LCV-115C Breaker - OPEN.	Notify SM/CRS to inform you when LCV-115C breaker is open. WHEN LCV-115C breaker is open, THEN perform Steps 11 and 12. Go To Step 13.
11.	Open CVC-358, RWST TO CHARGING PUMP SUCTION, In The Charging Pump Room.	
12.	Verify LCV-115C, VOLUME CONTROL TANK OUTLET In The Charging Pump Room - CLOSED	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

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NOTE

Steps 13 through 20 are performed at the Charging Pump Room Control Panel or Local Control Panel for Charging Pumps on the South wall of the Charging Pump Room unless otherwise noted.

13. Place The Following Transfer Switches - IN LOCAL

    - CHARGING PUMP A TRANSFER SW
    - CHARGING PUMP B TRANSFER SW
    - CHARGING PUMP C TRANSFER SW

14. Verify Only One Charging Pump - RUNNING

15. Check Neutron Flux NI-51 SOURCE RANGE Indication - LESS THAN 10^5 CPS

    IF 30 minutes have elapsed since the Reactor Trip AND neutron flux is greater than 10^5 CPS, THEN Go To Step 17.

    Observe the NOTE prior to Step 22 and Go To Step 22.

16. Observe The NOTE Prior To Step 18 and Go To Step 18

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

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17.	Perform The Following To Raise The Quantity Of Borated Water In The RCS:	
	a. Place the selector switch on CHARGING PUMP SPEED CONTROLLER to MAN	
	b. Turn the Speed Control Knob clockwise to raise Charging Pump speed to maximum	
	c. Check PZR Level On LI-607D-1 - GREATER THAN 81%	c. WHEN PZR Level is greater than 81%, THEN Go To Step 17.d. Observe the NOTE prior to Step 22 and Go To Step 22.
	d. Stop the running Charging Pump	
	e. Go To Step 19	

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

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NOTE

Starting duty limitations allow four Charging Pump starts per hour and require a minimum of five minutes between starts.

*18.	Control PZR Level From The Charging Pump Room As Follows:	
	a. Place the selector switch for the running Charging Pump on CHARGING PUMP SPEED CONTROLLER to MAN	
	b. Turn the Speed Control Knob counter-clockwise to lower Charging Pump speed to minimum	
	c. Check PZR level - GREATER THAN 71%	c. WHEN PZR level is greater than 71%, THEN stop the running Charging Pump AND Go To Step 19. Go To Step 21.
	d. Stop the running Charging Pump	
*19.	Check PZR level - LESS THAN 24%	WHEN PZR level lowers to less than 24%, THEN perform Step 20. Go To Step 21.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

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20. Raise PZR Level As Follows:

    a. Place a different CHARGING PUMP SPEED CONTROLLER to MAN

    b. Turn the Speed Control Knob for the Charging Pump counter-clockwise to lower speed to minimum

    c. Start the Charging Pump

21. Notify The SM/CRS That PZR Level Is Being Controlled Between 24% And 71%

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

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NOTE

If an additional operator is not available, the Auxiliary Building Operator is expected to periodically monitor PZR pressure in the Charging Pump Room AND operate PZR Heaters in the Rod Control Room.

*22. Check PZR Pressure Indicated On PI-607-E1 In The Charging Pump Room - BETWEEN 2200 PSIG AND 2250 PSIG

Perform the following:

a. Contact the SM/CRS and request an additional operator with a radio.

b. Station the additional operator in the Rod Control Room to operate PZR Backup Heaters AND establish radio contact.

c. Direct the operation of the PZR Backup Heaters as follows:

1) Place the LOCAL/REMOTE switches for the PZR Backup Group Heaters at their respective EMERG-CONTR-STA in the LOCAL position.

2) Operate the PZR Heaters using the START/STOP Pushbuttons.

d. WHEN the PZR pressure is being controlled between 2200 psig and 2250 psig, THEN perform Step 23.

23. Notify The SM/CRS That PZR Pressure Is Being Controlled Between 2200 PSIG And 2250 PSIG

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

CONTINUOUS USE

ATTACHMENT 1

AUXILIARY BUILDING OPERATOR

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24. Go To Step 15

- END -