

Catawba Nuclear Station

JPM A

Dec. 2010 NRC Exam

JPM A

**Perform Controlled Restart of NV pump 1A
per AP/1/A/5500/021 Encl. 6**

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EVALUATION SHEET

Task: Complete AP/1/A/5500/021 Encl. 6 (NV Pump 1A Controlled Restart)

Alternate Path: None

Facility JPM #: New

Safety Function: 1 **Title:** Chemical and Volume Control System

K/A 004 A4.08 Ability to manually operate and/or monitor in the control room: Charging

Rating(s): 3.8 / 3.4 **CFR:** 41.7/45.5 to 45.8

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator ☒ In-Plant _____ Perform ☒ Simulate _____

References: AP/1/A/5500/021 (Loss of Component Cooling) Encl. 6

Task Standard: Applicant manually starts 1A NV pump and establishes 32 gpm total sealwater flow with 1NV-309 in AUTO.

Validation Time: 10 minutes **Time Critical:** Yes _____ No ☒

Applicant: _____
NAME Docket # Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 168.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	VLV-KC001F KC1A AUX BLDG NONESS RTN HDR FAIL TO POSITION	0				
	VLV-KC003F KC3A RX BLDG NONESS RTN HDR FAIL TO POSITION	0				
	VLV-KC002F KC2B AUX BLDG NONESS RTN HDR FAIL TO POSITION	1				
	VLV-KC004F KC18B RX BLDG NONESS RTN HDR FAIL TO POSITION	1				
	VLV-KC012F KC230A TRAIN 1A SPLY TO RX BLDG FAIL TO POSITION	0				
	VLV-KC005F KC50A TRN A SUP TO AUX BLDG NON FAIL TO POSITION	0				
	VLV-KC011F KC228B TRAIN 1B SPLY TO RX BLDG FAIL TO POSITION	1				
	VLV-KC007F KC53B TRN B SUP TO AUX BLDG NON FAIL TO POSITION	1				
	MAL-KC001A KC PUMP 1A1 FAILURE	Both				
	MAL-KC001B KC PUMP 1A2 FAILURE	Both				
	Place red tag sticker on 1B NV pump.					

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

INITIAL CONDITIONS:

1. Unit 1 is operating at 100% power.
2. 1B NV pump has been tagged out for seal maintenance.
3. AP/1/A/5500/021 (Loss of Component Cooling) has been entered. During performance of AP/21 both 'A' train KC pumps failed to start. NV pump 1A was secured due to increasing bearing temperatures while YD (Drinking Water) was being aligned. YD to NV pump 1A lineup is complete per Encl. 4.

INITIATING CUES:

1. The CRS has directed you to restart NV pump 1A and establish proper sealwater flow by completing Encl. 6 (NV pump 1A Controlled Restart) of AP/1/A/5500/021 (Loss of Component Cooling).

EXAMINER NOTE: After reading Initiating Cue, provide the applicant with a copy of AP/1/A/5500/021 Encl. 6.

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STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1:</u> 1. Manually open 1NV-309 (Seal Water Injection Flow) to full open.</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the [M] button on controller for 1NV-309, and depresses the increase on the controller to 100 percent to fully open the valve.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> 2. Manually close 1NV-294 (NV Pmps A&B Disch Flow Ctrl).</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the [M] button on controller for 1NV-294, and depresses the decrease demand button on the controller to 0 percent to fully close the valve.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 3:</u> 3. Start NV pump 1A aux oil pump.</p> <p><u>STANDARD:</u></p> <p>Applicant starts the 1A NV pump aux oil pump by depressing the red ON pushbutton and determining the red ON light is lit and the green OFF light is dark.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 4. Start NV pump 1A.</p> <p><u>STANDARD:</u></p> <p>Applicant starts the 1A NV pump by depressing the red ON pushbutton and determining the red ON light is lit and the green OFF light is dark.</p> <p>Step is critical since it must be performed to establish normal charging system lineup. This is the only NV pump available to be started at this time.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> 5. Stop NV pump 1A aux oil pump.</p> <p><u>STANDARD:</u></p> <p>Applicant stops the 1A NV pump aux oil pump by depressing the green OFF pushbutton and verifying the green OFF light lit and red ON light dark.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 6:</u> 6. Verify charging header is aligned to NC loop as follows:</p> <ul style="list-style-type: none"> <input type="checkbox"/> a. 1NV-312A (Chrg Line Cont Isol) - OPEN <input type="checkbox"/> b. 1NV-314B (Chrg Line Cont Isol) - OPEN <input type="checkbox"/> c. Verify one of the following valves - OPEN <ul style="list-style-type: none"> <input type="checkbox"/> 1NV-32B (NV Supply To Loop A Isol) OR <input type="checkbox"/> 1NV-39A (NV Supply To Loop D Isol). <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant determines valves 1NV-312A and 1NV-314B red OPEN lights are lit, and green CLSD lights are dark. Applicant also determines that 1NV-32B red OPEN light is lit and green CLSD light is dark.</p> <p><u>COMMENTS:</u></p>	<p><input type="checkbox"/> SAT</p> <p><input type="checkbox"/> UNSAT</p>
<p><u>STEP 7:</u> 7. Throttle 1NV-294 (NV Pmps A&B Disch Flow Ctrl) to establish greater than 32 GPM "N/R CHRG LN FLOW".</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant increases the valve demand on the controller for 1NV-294 to establish greater than 32 gpm on the N/R CHRG LN FLOW meter.</p> <p>This step is critical because unless the applicant establishes greater than 32 gpm charging line flow, establishing 32 gpm sealwater flow would not be possible.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p><input type="checkbox"/> SAT</p> <p><input type="checkbox"/> UNSAT</p>

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<p><u>STEP 8:</u> 8. Verify the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> "TOTAL SEAL WTR FLOW" - GREATER THAN 32 GPM <input type="checkbox"/> 1NV-309 (Seal Water Injection Flow) - IN AUTO. <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant determines that TOTAL SEAL WTR FLOW is less than 32 gpm and transitions to the RNO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 9:</u> 8 RNO: Perform the following:</p> <ul style="list-style-type: none"> a. Slowly throttle 1NV-309 (Seal Water Injection Flow) to establish 32 GPM "TOTAL SEAL WTR FLOW". b. Place 1NV-309 in auto. <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant decreases demand on controller for 1NV-309 to throttle closed the valve to increase TOTAL SEAL WTR FLOW to 32 gpm. Once 32 gpm is established then applicant depresses the A pushbutton on the controller for 1NV-309 to place it in automatic.</p> <p>This step is critical to achieve proper operating results and to meet the JPM standard.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 10:</u> 9. Verify Pzr level - GREATER THAN 17%.</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines that pressurizer level on 1NCP5164 <u>OR</u> 1NCP5153 <u>OR</u> 1NCP5174 is reading greater than 17%.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 11:</u> 10. Control charging to stabilize Pzr level greater than 17%.</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant manually throttles 1NV-294 as necessary to maintain pressurizer level greater than 17%.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 12:</u> 11. Return this enclosure to the Control Room Supervisor.</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant returns the enclosure to the CRS. JPM complete.</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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INITIAL CONDITIONS:

1. Unit 1 is operating at 100% power.
2. 1B NV pump has been tagged out for seal maintenance.
3. Unit 1 experienced a spurious closure of the KC 'A' train non-essential header cross connect valves. AP/1/A/5500/021 (Loss of Component Cooling) has been entered. During performance of AP/21 both 'A' train KC pumps failed to start. NV pump 1A was secured due to increasing bearing temperatures while YD (Drinking Water) was being aligned. YD to NV pump 1A lineup is complete per Encl. 4.

INITIATING CUES:

1. The CRS has directed you to restart NV pump 1A and establish proper sealwater flow by completing Encl. 6 (NV pump 1A Controlled Restart) of AP/1/A/5500/021 (Loss of Component Cooling).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- ___ 1. **Manually open 1NV-309 (Seal Water Injection Flow) to full open.**
 - ___ 2. **Manually close 1NV-294 (NV Pmps A&B Disch Flow Ctrl).**
 - ___ 3. **Start NV pump 1A aux oil pump.**
 - ___ 4. **Start NV pump 1A.**
 - ___ 5. **Stop NV pump 1A aux oil pump.**
 6. **Verify charging header is aligned to NC loop as follows:**
 - ___ a. 1NV-312A (Chrg Line Cont Isol) - OPEN.
 - ___ b. 1NV-314B (Chrg Line Cont Isol) - OPEN.
 - c. Verify one of the following valves - OPEN:
 - ___ • 1NV-32B (NV Supply To Loop A Isol)
 - OR
 - ___ • 1NV-39A (NV Supply To Loop D Isol).
 - ___ 7. **Throttle 1NV-294 (NV Pmps A&B Disch Flow Ctrl) to establish greater than 32 GPM "N/R CHRG LN FLOW".**
 8. **Verify the following:**
 - ___ • "TOTAL SEAL WTR FLOW" - GREATER THAN 32 GPM
 - ___ • 1NV-309 (Seal Water Injection Flow) - IN AUTO.
- Perform the following:**
- ___ a. Slowly throttle 1NV-309 (Seal Water Injection Flow) to establish 32 GPM "TOTAL SEAL WTR FLOW".
 - ___ b. Place 1NV-309 in auto.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

___ 9. **Verify Pzr level - GREATER THAN 17%.**

Perform the following:

- ___ a. **IF** Pzr level is less than 17% due to NC leak, **THEN GO TO** AP/1/A/5500/010 (Reactor Coolant Leak).
- ___ b. Maintain charging flow less than 180 GPM.
- ___ c. Increase charging flow to restore Pzr level greater than 17%.
- ___ d. Do not continue in this procedure until Pzr level is greater than 17%.

___ 10. **Control charging to stabilize Pzr level greater than 17%.**

___ 11. **Return this enclosure to the Control Room Supervisor.**

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Transfer ECCS to Cold Leg Recirc

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EVALUATION SHEET

Task: Transfer ECCS to Cold Leg Recirc per EP/1/A/500/ES-1.3 (Transfer to Cold Leg Recirculation) steps 1-5.

Alternate Path: Yes. 1NI-184B (ND pump 1B Cont Sump Suct) is closed and requires RNO action to open the valve. 1B ND pump will be secured and will require RNO action to start the pump.

Facility JPM #: NI-088

Safety Function: 2 **Title:** Emergency Core Cooling System

K/A 006 A3.08 Ability to monitor automatic operation of the ECCS, including: Automatic transfer of ECCS flowpaths

Rating(s): 4.2 / 4.3 **CFR:** 41.7/45.5

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator X In-Plant _____ Perform X Simulate _____

References: EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirculation)

Task Standard: EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirculation) steps 1 through 5 are performed. The FWST is isolated with the NV and NI pumps having suction aligned from the ND pumps and injecting into the cold legs.

Validation Time: 15 minutes **Time Critical:** Yes _____ No X

Applicant: NAME Docket # Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 169.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	VLV-NI037F NI184B CNMT SUMP LINE 1B ISOL (STEM) FAIL TO POSITION	0				
	MAL-NC013A NC COLD LEG A LEAK	27.5				
	VLV-FW006A FW55B ND PUMP B SUCT FROM FWST FAIL AUTO ACTIONS	Active				
	VLV-NI037F NI184B CNMT SUMP LINE 1B ISOL (STEM) FAIL TO POSITION	0				3
	VLV-NI037A NI184B CNMT SUMP LINE 1B ISOL (STEM) FAIL AUTO ACTIONS	Active				
	Set Event 3 x11O395g					3

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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INITIAL CONDITIONS:

1. A LOCA has occurred on Unit 1.
2. 1AD-9 D/8 (FWST 2/4 LO LEVEL) has just alarmed.

INITIATING CUE:

1. The CRS has directed you, as the BOP, to transfer ECCS to Cold Leg Recirculation by performing EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation) steps 1 through 5.

Examiner Note: After reading Initiating Cue, provide the applicant with a copy of EP/1/A/5000/ES-1.3

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STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1:</u> 1. Monitor Enclosure 1 (Foldout Page).</p> <p><u>STANDARD:</u></p> <p><u>EXAMINER CUE:</u> "The OATC will monitor enclosure 1."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>CAUTION: S/I recirculation flow to NC System must be maintained at all times.</p> <p>NOTE: Steps 2 through 8 should be performed without delay. CSF should not be implemented until directed by this procedure.</p>	
<p><u>STEP 2:</u> 2. Verify at least one of the following annunciators - LIT:</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1AD-20, B/3 "CONT. SUMP LEVEL >3.3 ft"</p> <p style="margin-left: 40px;">OR</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1AD-21, B/3 "CONT. SUMP LEVEL >3.3 ft"</p> <p><u>STANDARD:</u></p> <div style="background-color: #cccccc; padding: 5px; margin: 5px 0;">Applicant determines that at least one of the annunciators are lit.</div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 3:</u> 3. Verify KC flow to ND heat exchangers - GREATER THAN 5000 GPM.</p> <p><u>STANDARD:</u></p> <p>Applicant verifies KC flow to 1A and 1B ND heat exchangers is greater than 5000 GPM on 1KCP5670 and 1KCP5680.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 4. Ensure S/I - RESET:</p> <p>a. ECCS.</p> <p>b. D/G load sequencers.</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the ECCS TRN A(B) RESET pushbuttons and verifies yellow RESET lights are lit. Applicant depresses the DG 1A(B) LOAD SEQ RESET pushbuttons and verifies the yellow RESET lights are lit.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> 4c. <u>IF AT ANY TIME</u> a B/O occurs, <u>THEN</u> restart S/I equipment previously on.</p> <p><u>STANDARD:</u></p> <p>Applicant acknowledges the IF AT ANY TIME step.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 6:</u> 5. Align S/I system for recirc as follows:</p> <p>a. Verify following valves - OPEN:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1NI-185A (ND Pump 1A Cont Sump Suct). <input type="checkbox"/> 1NI-184B (ND Pump 1B Cont Sump Suct). <p><u>STANDARD:</u></p> <p>Applicant determines the red OPEN light is lit for 1NI-185A. Applicant determines the green CLSD light is lit for 1NI-184B and transitions to the RNO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 7:</u> 5a. RNO Perform the following:</p> <p>1) Manually open affected valve(s).</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the red OPEN pushbutton on 1NI-184B and determines the valve will not open manually.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 8:</u> 5a. RNO 2) IF valve(s) will not open, THEN:</p> <p style="padding-left: 40px;">a) Stop the ND pump(s) associated with a closed containment sump suction valve(s).</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant depresses the green OFF pushbutton for 1B ND pump and determines the green OFF light is lit and the red ON light is dark.</p> <p>This step is critical because if the ND pump is not secured now, it will lose its suction source in the next step, and pump damage may occur.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 9:</u> 5a RNO 2b) : Close the associated ND pump(s) suction valve from the FWST:</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1FW-27A (ND Pump 1A Suct From FWST)</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1FW-55B (ND Pump 1B Suct From FWST).</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant depresses the green CLOSE pushbutton for 1FW-55B and determines the green CLSD light is lit and the red OPEN light is dark.</p> <p>This step is critical because if 1FW-55B is not closed then an interlock will not be met allowing 1NI-184B to be opened in the next step.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p>STEP 10: 5a RNO 2c) <u>WHEN</u> the ND pump(s) suction valve from the FWST is closed, <u>THEN</u> perform the following:</p> <p style="margin-left: 40px;">(1) Attempt to manually open affected containment sump suction valve(s).</p> <p style="margin-left: 80px;"><input type="checkbox"/> 1NI-185A (ND Pump 1A Cont Sump Suct)</p> <p style="margin-left: 80px;"><input type="checkbox"/> 1NI-184B (ND Pump 1B Cont Sump Suct).</p> <p><u>STANDARD:</u></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">Applicant depresses the red OPEN pushbutton for 1NI-184B and determines the red OPEN light is lit and the green CLSD light is dark.</div> <p>This step is critical because 1NI-184B must be opened in order for the 1B ND pump to be restarted later in the procedure.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 11: 5a RNO 2c) (2) <u>IF</u> affected containment sump suction valve will not open, <u>THEN</u> dispatch two operators to open affected valve(s):</p> <p><u>STANDARD:</u></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">Applicant determines that this step is N/A. 1NI-184B is now open.</div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 12:</u> 5a RNO 3) IF both containment sump suction valves are closed, THEN:</p> <p><u>STANDARD:</u></p> <p>Applicant determines that this step is N/A. Both containment sump suction valves are now open.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 13:</u> 5b. Verify following valves - CLOSED:</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1FW-27A (ND Pump 1A Suct From FWST)</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1FW-55B (ND Pump 1B Suct From FWST).</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant verifies green CLSD lights are lit and red OPEN lights are dark on 1FW-27A and 1FW-55B.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u> 5c. Verify ND pumps - ON.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant determines that 1A ND pump red ON light is lit and green OFF light is dark, and 1B ND pump green OFF light is lit and red ON light is dark and transitions to the RNO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 15:</u> 5c RNO Perform the following:</p> <p style="padding-left: 40px;">1) Start ND pump(s) with suction aligned to an open containment sump suction valve.</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines that 1NI-184B is open and depresses the red ON pushbutton for 1B ND pump and verifies the red ON light is lit and the green OFF light is dark.</p> <p>This step is critical because all available ND pumps should be running to aid in providing suction to the other ECCS pumps.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16:</u> 5c RNO 2) IF no ND pump can be started OR no ND train can be aligned for recirc, THEN:</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines that this step is N/A. Both ND pumps are running.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 17:</u> 5d Isolate NI pump miniflow as follows:</p> <p style="padding-left: 40px;">1) Verify NC pressure - LESS THAN 1620 PSIG.</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines NC pressure is less than 1620 PSIG.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 18:</u> 5d 2) Close the following valves:</p> <p style="padding-left: 40px;"> <input type="checkbox"/> 1NI-115A (NI Pump 1A Miniflow Isol) <input type="checkbox"/> 1NI-144A (NI Pump 1B Miniflow Isol). </p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant depresses the green CLOSE pushbuttons on 1NI-115A and 1NI-144A and verifies the green CLSD lights are lit and red OPEN lights are dark.</p> <p>This step is critical to ensure proper valve lineup for cold leg recirc.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
<p><u>STEP 19:</u> 5d 3) Place "PWR DISCON FOR 1NI-147B" switch in "ENABLE".</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant rotates "PWR DISCON FOR 1NI-147B" switch clockwise to the "ENABLE" position.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
<p><u>STEP 20:</u> 5d 4) Close 1NI-147B (NI Pump Miniflow Hdr To FWST Isol).</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant depresses the green CLOSE pushbutton and verifies the green CLSD light lit and red OPEN light dark.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 21:</u> 5e. Close the following valves:</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1ND-32A (ND Train 1A Hot Leg Inj Isol)</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1ND-65B (ND Train 1B Hot Leg Inj Isol).</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant depresses the green CLOSE pushbutton on 1ND-32A and 1ND-65B and verifies the green CLSD lights are lit and red OPEN lights are dark.</p> <p>This step is critical to ensure proper valve lineup for cold leg recirc.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
<p><u>STEP 22:</u> 5f. Verify at least one of the following NV pumps miniflow valves - CLOSED:</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1NV-203A (NV Pumps A&B Recirc Isol)</p> <p style="margin-left: 40px;">OR</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1NV-202B (NV Pmps A&B Recirc Isol).</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant verifies green CLSD lights are lit and red OPEN lights are dark on 1NV-203A or 1NV-202B.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 23:</u> 5g. Align ND train discharges to NI and NV pump suctions as follows:</p> <p>1) Open the following valves:</p> <p><input type="checkbox"/> 1NI-332A (NI Pump Suct X-Over From ND)</p> <p><input type="checkbox"/> 1NI-333B (NI Pump Suct From ND).</p> <p><u>STANDARD:</u></p> <p>Applicant verifies red OPEN lights are lit and green CLSD lights are dark on 1NI-332A and 1NI-333B.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 24:</u> 5g 2) Ensure 1NI-334B (NI Pump Suct X-Over From ND) - OPEN.</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the red OPEN pushbutton on 1NI-334B and verifies the red OPEN light is lit and green CLSD light is dark.</p> <p>This step is critical to ensure proper valve lineup for cold leg recirc.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 25:</u> 5g 3) Open the following valves:</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1ND-28A (ND Supply To NV & 1A NI Pmps)</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1NI-136B (ND Supply To NI Pump 1B).</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant depresses the red OPEN pushbutton on 1ND-28A and 1NI-136B and verifies the red OPEN lights are lit and green CLSD lights are dark.</p> <p>This step is critical to ensure proper valve lineup for cold leg recirc.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 26:</u> 5h. Isolate FWST from NV and NI pumps as follows:</p> <p style="padding-left: 40px;">1) Place "PWR DISCON FOR 1NI-100B" switch in "ENABLE".</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant rotates "PWR DISCON FOR 1NI-100B" switch clockwise to the "ENABLE" position.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 27:</u> 5h 2) Close 1NI-100B (NI Pmps Suct From FWST).</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the green CLOSE pushbutton on 1NI-100B and verifies the green CLSD light is lit and the red OPEN light is dark.</p> <p>This step is critical to ensure proper valve lineup for cold leg recirc.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 28:</u> 5h 3) Close the following valves:</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1NV-252A (NV Pumps Suct From FWST)</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1NV-253B (NV Pumps Suct From FWST).</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the green CLOSE pushbuttons on 1NV-252A and 1NV-253B and verifies the green CLSD lights are lit and the red OPEN lights are dark.</p> <p>This step is critical to ensure proper valve lineup for cold leg recirc.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 29:</u> 5i. Verify proper recirc flow as follows:</p> <p><input type="checkbox"/> "NV S/I FLOW" - INDICATING FLOW</p> <p><input type="checkbox"/> NI pumps - INDICATING FLOW</p> <p><input type="checkbox"/> ND pumps - INDICATING FLOW.</p> <p><u>STANDARD:</u></p> <p>Applicant verifies recirc flow from all running ECCS pumps.</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A LOCA has occurred on Unit 1.
2. 1AD-9 D/8 (FWST 2/4 LO LEVEL) has just alarmed.

INITIATING CUES:

1. The CRS has directed you, as the BOP, to transfer ECCS to Cold Leg Recirculation by performing EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation) steps 1 through 5.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

C. Operator Actions

___ 1. Monitor Enclosure 1 (Foldout Page).

CAUTION S/I recirculation flow to NC System must be maintained at all times.

- NOTE**
- Steps 2 through 8 should be performed without delay.
 - CSF should not be implemented until directed by this procedure.

2. Verify at least one of the following annunciators - LIT:

- ___ • 1AD-20, B/3 "CONT. SUMP LEVEL >3.3 ft"

OR

- ___ • 1AD-21, B/3 "CONT. SUMP LEVEL >3.3 ft".

Perform the following:

a. Ensure S/I - RESET:

- ___ 1) ECCS.
- ___ 2) D/G load sequencers.
- ___ 3) **IF AT ANY TIME** a B/O occurs, **THEN** restart S/I equipment previously on.

b. Ensure the following valves - CLOSED:

- ___ • 1FW-27A (ND Pump 1A Suct From FWST)
- ___ • 1FW-55B (ND Pump 1B Suct From FWST).

c. **IF** valve(s) will not close, **THEN**:

- ___ 1) Stop associated ND pump(s).
- 2) Depress the following "DEFEAT" pushbutton(s) for affected train(s):
- ___ • "C-LEG RECIR FWST TO CONT SUMP SWAP TRN A"
- ___ • "C-LEG RECIR FWST TO CONT SUMP SWAP TRN B".
- ___ 3) Close the associated ND pump(s) containment sump suction valve(s).

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

2. (Continued)

- ___ d. **IF** FWST level less than 37% due to FWST puncture, **THEN RETURN TO** procedure and step in effect.
- ___ e. **IF** both NS pumps are off, **THEN GO TO** Step 2 RNO g.
- ___ f. **IF** either of the following annunciators are lit:
 - ___ • 1AD-20, B/2 "CONT. SUMP LEVEL >2.5 ft"
 - OR
 - ___ • 1AD-21, B/2 "CONT. SUMP LEVEL >2.5 ft",- ___ **THEN GO TO** Step 3.
- ___ g. **IF** all of the following conditions met:
 - ___ • FWST level - LESS THAN 8%
 - ___ • NC temperature - GREATER THAN 200°F
 - ___ • Containment Spray - PREVIOUSLY IN SERVICE
 - ___ • Indicated containment sump level - GREATER THAN 0.5 FT.- ___ **THEN GO TO** Step 3.
- ___ h. **IF** a valid red **OR** orange path procedure is in effect, **THEN RETURN TO** procedure in effect.
- ___ i. **IF** both "CONT. SUMP LEVEL >3.3 ft" annunciators on 1AD-20 and 1AD-21 dark, **THEN** stop all pumps taking suction from the containment sump.
- ___ j. **GO TO** EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirculation).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

___ 3. Verify KC flow to ND heat exchangers -
GREATER THAN 5000 GPM.

___ Establish KC flow to affected ND Hx(s).

4. Ensure S/I - RESET:

___ a. ECCS.

a. Perform the following:

___ 1) IF either reactor trip breaker is
closed, THEN dispatch operator to
open Unit 1 reactor trip breakers.

___ 2) WHEN reactor trip breakers open,
THEN reset ECCS.

___ b. D/G load sequencers.

b. Dispatch operator to open affected
sequencer(s) control power breaker:

___ • 1EDE-F01F (Diesel Generator Load
Sequencer Panel 1DGLSA) (AB-577,
BB-46, Rm 496)

___ • 1EDF-F01F (Diesel Generator Load
Sequencer Panel 1DGLSB) (AB-560,
BB-46, Rm 372).

___ c. IF AT ANY TIME a B/O occurs, THEN
restart S/I equipment previously on.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. **Align S/I system for recirc as follows:**

a. Verify following valves - OPEN:

- ___ • 1NI-185A (ND Pump 1A Cont Sump Suct)
- ___ • 1NI-184B (ND Pump 1B Cont Sump Suct).

a. Perform the following:

- ___ 1) Manually open affected valve(s).
- ___ 2) **IF** valve(s) will not open, **THEN**:
 - ___ a) Stop the ND pump(s) associated with a closed containment sump suction valve(s).
 - ___ b) Close the associated ND pump(s) suction valve from the FWST:
 - ___ • 1FW-27A (ND Pump 1A Suct From FWST)
 - ___ • 1FW-55B (ND Pump 1B Suct From FWST).

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

c) **WHEN** the ND pump(s) suction valve from the FWST is closed, **THEN** perform the following:

(1) Attempt to manually open affected containment sump suction valve(s).

— • 1NI-185A (ND Pump 1A Cont Sump Suct)

— • 1NI-184B (ND Pump 1B Cont Sump Suct).

(2) **IF** affected containment sump suction valve will not open, **THEN** dispatch two operators to open affected valve(s):

— • 1NI-185A (ND Pump 1A Cont Sump Suct)
(AB-545, EE-FF, 52-53, Rm 217)

— • 1NI-184B (ND Pump 1B Cont Sump Suct)
(AB-545, FF-GG, 52-53, Rm 217).

3) **IF** both containment sump suction valves are closed, **THEN**:

— a) **IF** a valid red **OR** orange path procedure is in effect, **THEN RETURN TO** procedure in effect.

— b) **GO TO** EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirculation).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

b. Verify following valves - CLOSED:

- ___ • 1FW-27A (ND Pump 1A Suct From FWST)
- ___ • 1FW-55B (ND Pump 1B Suct From FWST).

b. Perform the following:

- ___ 1) Manually close affected valve(s).
- ___ 2) **IF** valve(s) will not close, **THEN**:
 - ___ a) Stop associated ND pump(s).
 - ___ b) Depress the following "DEFEAT" pushbutton(s) for affected train(s):
 - ___ • "C-LEG RECIR FWST TO CONT SUMP SWAP TRN A"
 - ___ • "C-LEG RECIR FWST TO CONT SUMP SWAP TRN B".
 - ___ c) Close the associated ND pump(s) containment sump suction valve(s).
 - ___ d) **IF** both containment sump suction valves are closed, **THEN**:
 - ___ (1) **IF** a valid red **OR** orange path procedure is in effect, **THEN RETURN TO** procedure in effect.
 - ___ (2) **GO TO** EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirculation).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

___ c. Verify ND pumps - ON.

c. Perform the following:

- ___ 1) Start ND pump(s) with suction aligned to an open containment sump suction valve.
- ___ 2) **IF** no ND pump can be started **OR** no ND train can be aligned for recirc, **THEN**:
 - ___ a) **IF** a valid red **OR** orange path procedure is in effect, **THEN** **RETURN TO** procedure in effect.
 - ___ b) **GO TO** EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirculation).

d. Isolate NI pump miniflow as follows:

- ___ 1) Verify NC pressure - LESS THAN 1620 PSIG.

1) Perform the following:

- ___ a) Stop NI pumps.
- ___ b) **WHEN** pressure is less than 1620 PSIG, **THEN** start NI pumps.

2) Close the following valves:

- ___ • 1NI-115A (NI Pump 1A Miniflow Isol)
- ___ • 1NI-144A (NI Pump 1B Miniflow Isol).
- ___ 3) Place "PWR DISCON FOR 1NI-147B" switch in "ENABLE".
- ___ 4) Close 1NI-147B (NI Pump Miniflow Hdr To FWST Isol).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

e. Close the following valves:

- ___ • 1ND-32A (ND Train 1A Hot Leg Inj Isol)
- ___ • 1ND-65B (ND Train 1B Hot Leg Inj Isol).

f. Verify at least one of the following NV pumps miniflow valves - CLOSED:

- ___ • 1NV-203A (NV Pumps A&B Recirc Isol)

OR

- ___ • 1NV-202B (NV Pmps A&B Recirc Isol).

f. Perform the following:

- ___ 1) **IF** 1NI-9A (NV Pmp C/L Inj Isol) **AND** 1NI-10B (NV Pmp C/L Inj Isol) are closed, **THEN** maintain charging flow greater than 60 GPM.

2) Close the following valves:

- ___ • 1NV-203A (NV Pumps A&B Recirc Isol)
- ___ • 1NV-202B (NV Pmps A&B Recirc Isol).

g. Align ND train discharges to NI and NV pump suctions as follows:

1) Open the following valves:

- ___ • 1NI-332A (NI Pump Suct X-Over From ND)
- ___ • 1NI-333B (NI Pump Suct From ND).

___ 2) Ensure 1NI-334B (NI Pump Suct X-Over From ND) - OPEN.

3) Open the following valves:

- ___ • 1ND-28A (ND Supply To NV & 1A NI Pmps)
- ___ • 1NI-136B (ND Supply To NI Pump 1B).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

h. Isolate FWST from NV and NI pumps as follows:

— 1) Place "PWR DISCON FOR 1NI-100B" switch in "ENABLE".

— 2) Close 1NI-100B (NI Pmps Suct From FWST).

3) Close the following valves:

— • 1NV-252A (NV Pumps Suct From FWST)

— • 1NV-253B (NV Pumps Suct From FWST).

— 2) Dispatch operator to close 1NI-100B (NI Pmps Suct From FWST) (AB-552, HH-JJ, 53-54, Rm 234).

3) Perform the following:

a) **IF** 1NV-252A (NV Pumps Suct From FWST) cannot be closed, **THEN** dispatch operator to perform the following:

— (1) Open 1EMXA-R04A (NV Pump Suction From FWST Motor (1NV252A)) (AB-577, FF-54, Rm 478).

— (2) Close 1NV-252A (NV Pumps Suct From FWST) (AB-554, HH-53, Rm 234) (Ladder needed).

b) **IF** 1NV-253B (NV Pumps Suct From FWST) cannot be closed, **THEN** dispatch operator to perform the following:

— (1) Open 1EMXJ-R03A (NV Pump Suction From FWST Motor (1NV253B)) (AB-560, GG-56, Rm 330).

— (2) Close 1NV-253B (NV Pumps Suct From FWST) (AB-554, HH-JJ, 53-54, Rm 234) (Ladder needed).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

i. Verify proper recirc flow as follows:

- ___ • "NV S/I FLOW" - INDICATING FLOW
- ___ • NI pumps - INDICATING FLOW
- ___ • ND pumps - INDICATING FLOW.

___ i. **IF** any S/I pump on without a suction flowpath, **THEN** stop affected pump(s).

6. **WHEN FWST level decreases to 11% (1AD-9, E/8 "FWST LO-LO LEVEL" alarm lit), THEN perform the following:**

- ___ a. Stop NS Pumps.
- ___ b. Align NS for recirc. **REFER TO** Enclosure 2 (Aligning NS for Recirculation).

7. **IF any NS pump in service with suction aligned to FWST, THEN perform the following:**

- ___ a. Ensure appropriate operator is in possession of Enclosure 2 (Aligning NS for Recirculation).
- ___ b. Designate operator to ensure NS pumps immediately secured when FWST level decreases to 11% **OR** 1AD-9, E/8 "FWST LO-LO LEVEL" alarm lit.
- ___ c. **IF** time and manpower permit, **THEN** notify designated operator to review Enclosure 2 (Aligning NS for Recirculation) for current plant conditions.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. **Verify criteria for initiation of ND aux containment spray:**

___ a. Containment pressure - GREATER THAN 3 PSIG.

a. Perform the following:

___ 1) **IF AT ANY TIME** containment pressure exceeds 3 PSIG, **THEN** perform Step 8.

___ 2) Observe Caution prior to Step 9 and **GO TO** Step 9.

___ b. Time since reactor trip - GREATER THAN 50 MIN.

b. Perform the following:

___ 1) Designate someone to notify Control Room Supervisor when 50 min from reactor trip has elapsed.

___ 2) **WHEN** the time since reactor trip is greater than 50 min, **THEN** perform Step 8.

___ 3) Observe Caution prior to Step 9 and **GO TO** Step 9.

c. Verify the following valves - CLOSED:

___ • 1NS-43A (ND Pmp 1A To Cont Spray Hdr)

___ • 1NS-38B (ND Pmp 1B To Cont Spray Hdr).

___ c. Observe Caution prior to Step 9 and **GO TO** Step 9.

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**Depressurize the NC System During Natural
Circulation**

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EVALUATION SHEET

Task: Depressurize the NC system during natural circulation by performing EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown) steps 10 and 11.

Alternate Path: None

Facility JPM #: NC-081

Safety Function: 3 **Title:** Pressurizer Pressure Control System

K/A 010 A4.01 Ability to manually operate and/or monitor in the control room: PZR spray valves.

Rating(s): 4.0 / 3.8 **CFR:** 41.7/45.5 to 45.8

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator X In-Plant _____ Perform X Simulate _____

References: EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown)

Task Standard: NC system is depressurized to 1905 psig using NV aux. spray. Status lights "MAIN STEAM ISOL TRAIN A/B BLOCKED" and "PZR LO PRESS S/I TRAIN A/B BLOCKED" are lit. Pressure is under the control of the operator near 1905 psig.

Validation Time: 12 minutes **Time Critical:** Yes _____ No X

Applicant: NAME Docket # Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 170.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	Reset to 100% IC, Trip the reactor and all four NC Pumps. Perform applicable actions of E-0, ES-0.1, transition to ES-0.2 and FREEZE sim. Write to snap					

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Plant cooldown is in progress per EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown).
2. NC pressure is approx. 2120 PSIG and NC temperature is approx. 532°F.
3. The OATC is controlling S/G levels and the steam dumps for the cooldown.

INITIATING CUES:

1. The CRS instructs you to depressurize the NC system to 1905 PSIG and to block the low steam pressure Main Steam Isolation signals and the pressurizer low pressure S/I signals per steps 10 and 11 of ES-0.2. The CRS asks you to ensure you are maintaining NC pressure under your control.

Examiner Note: After reading cue, provide the applicant with a copy of EP/1/A/5000/ES-0.2 pages 9-11.

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STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1:</u> 10. Depressurize NC System to 1905 PSIG as follows:</p> <p style="padding-left: 40px;">a. Verify letdown - IN SERVICE.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant determines that letdown valves 1NV-1A, 1NV-2A, 1NV-10, and 1NV-849 are open and letdown flow on 1NVP5530 indicates flow.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> 10b. Verify power to 1NV-37A (NV Supply To Pzr Aux Spray) - AVAILABLE.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant verifies that indication is available for 1NV-37A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 3:</u> 10c. Depressurize NC System using NV aux spray as follows:</p> <p>1) Ensure the following valves - CLOSED:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1NC-27 (Pzr Spray Ctrl Frm Loop A) <input type="checkbox"/> 1NC-29 (Pzr Spray Ctrl Frm Loop B) <input type="checkbox"/> 1NV-39A (NV Supply To Loop D Isol) <input type="checkbox"/> 1NV-32B (NV Supply To Loop A Isol). <p><u>STANDARD:</u></p> <p>Applicant determines that valve controllers for 1NC-27 and 1NC-29 show 0% demand. Applicant determines that 1NV-39A green CLSD light is lit and red OPEN light is dark. Applicant determines that 1NV-32B green CLSD light is dark, and depresses the green CLOSE pushbutton and verifies the green CLSD light is lit and red OPEN light is dark.</p> <p>This step is critical because all the valves listed need to be closed to use NV aux spray.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 10c. 2) Maintain charging flow less than 180 GPM.</p> <p><u>STANDARD:</u></p> <p>Applicant manually controls 1NV-294 throughout the remainder of the JPM to prevent charging flow from exceeding 180 GPM on 1NVP5630.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 5:</u> 10c. 3) Throttle 1NV-37A (NV Supply To Pzr Aux Spray) and charging flow as required to depressurize the NC System to 1905 PSIG.</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the red OPEN and green CLOSE pushbuttons as necessary to throttle 1NV-37A to depressurize the NC system. Applicant monitors pressurizer pressure decreasing toward 1905 PSIG.</p> <p>This step is critical because 1NV-37A must be throttled open in order to decrease primary system pressure.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>CAUTION If PZR pressure increases to greater than 1955 PSIG, then Main Steam Isolation and PZR low pressure S/I circuits will automatically unblock.</p>	
<p><u>STEP 6:</u> 11. WHEN "P-11 PZR S/I BLOCK PERMISSIVE" status light (1SI-18) is lit, THEN:</p> <p>a. Depress "BLOCK" pushbuttons for both trains of:</p> <p><input type="checkbox"/> ECCS steam pressure</p> <p><input type="checkbox"/> ECCS Pzr pressure.</p> <p><u>STANDARD:</u></p> <p>After determining that "P-11 PZR S/I BLOCK PERMISSIVE" status light on 1SI-18 is lit, applicant depresses the white BLOCK pushbuttons for ECCS TRN A(B) PZR PRESS and ECCS TRN A(B) STM PRESS and verifies the white BLOCKED lights are lit.</p> <p>This step is critical because subsequent depressurization later in the procedure would cause an unwanted SI signal to be generated.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 7:</u> 11b. Verify the following status lights on 1SI-13 - LIT:</p> <p><input type="checkbox"/> Main Steam Isol Train A and B Blocked</p> <p><input type="checkbox"/> Pzr Lo Press S/I Train A and B Blocked.</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the status lights are lit.</p> <p><u>NOTE TO EXAMINER:</u> Applicant attempts to stabilize NC pressure at approximately 1905 PSIG.</p> <p><u>COMMENTS:</u></p> <p>END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Plant cooldown is in progress per EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown).
2. NC pressure is approx. 2120 psig and NC temperature is approx. 532 degrees F.
3. The OATC is controlling S/G levels and the steam dumps for the cooldown.

INITIATING CUES:

1. The CRS instructs you to depressurize the NC system to 1905 psig and to block the low steam pressure Main Steam Isolation signals and the pressurizer low pressure S/I signals per steps 10 and 11 of ES-0.2. The CRS asks you to ensure you are maintaining NC pressure under your control.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10. **Depressurize NC System to 1905 PSIG
as follows:**

___ a. Verify letdown - IN SERVICE.

a. Perform the following:

___ 1) Establish letdown. **REFER TO**
AP/1/A/5500/12 (Loss Of
Charging Or Letdown).

2) **IF** normal letdown cannot be
established, **THEN:**

___ a) Depressurize NC System to
1905 PSIG with one Pzr PORV.

___ b) Observe Caution prior to Step 11
and **GO TO** Step 11.

___ b. Verify power to 1NV-37A (NV Supply To
Pzr Aux Spray) - AVAILABLE.

b. Perform the following:

___ 1) Depressurize NC System to less
than 1905 PSIG using one Pzr
PORV.

___ 2) Maintain NC pressure less than
1905 PSIG.

___ 3) Observe Caution prior to Step 11
and **GO TO** Step 11.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10. (Continued)

c. Depressurize NC System using NV aux spray as follows:

1) Ensure the following valves -
CLOSED:

___ • 1NC-27 (Pzr Spray Ctrl Frm Loop A)

___ • 1NC-29 (Pzr Spray Ctrl Frm Loop B)

___ • 1NV-39A (NV Supply To Loop D Isol)

___ • 1NV-32B (NV Supply To Loop A Isol).

___ 2) Maintain charging flow less than 180 GPM.

___ 3) Throttle 1NV-37A (NV Supply To Pzr Aux Spray) and charging flow as required to depressurize the NC System to 1905 PSIG.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION If Pzr pressure increases to greater than 1955 PSIG, then Main Steam Isolation and PZR low pressure S/I circuits will automatically unblock.

11. **WHEN "P-11 PZR S/I BLOCK PERMISSIVE" status light (1SI-18) is lit, THEN:**

a. Depress "BLOCK" pushbuttons for both trains of:

- ☐ • ECCS steam pressure
- ☐ • ECCS Pzr pressure.

b. Verify the following status lights on 1SI-13 - LIT:

- ☐ • Main Steam Isol Train A and B Blocked
- ☐ • Pzr Lo Press S/I Train A and B Blocked.

12. **Maintain the following plant conditions:**

- ☐ • NC pressure at 1905 PSIG
- ☐ • Pzr level between 25% and 76%.
- ☐ • Cooldown rate based on NC T-Colds less than 50°F in an hour
- ☐ • NC temperature and pressure within limits. **REFER TO** Unit One Revised Data Book, Figures 44 and 45.

13. **Monitor NC System cooldown as follows:**

- ☐ • Core exit T/Cs - DECREASING
- ☐ • All NC T-Hots - DECREASING
- ☐ • NC subcooling based on core exit T/Cs - INCREASING.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- ___ 14. **IF AT ANY TIME** the cooldown rate must be increased to greater than 50°F in an hour, **THEN GO TO EP/1/A/5000/ES-0.3** (Natural Circulation Cooldown With Steam Void In Vessel).

CAUTION Depressurizing the NC System with a stagnant NC loop will result in void formation when NC pressure reaches saturation pressure in the stagnant loop.

15. Initiate NC System depressurization as follows:

___ a. Verify all CRD vent fans - ON.

a. Perform the following:

___ 1) Maintain NC subcooling based on core exit T/Cs greater than 100°F.

___ 2) **GO TO** Step 15.c.

___ b. Maintain NC subcooling based on core exit T/Cs greater than 50°F.

___ c. Verify letdown - IN SERVICE.

c. Perform the following:

___ 1) Depressurize using one Pzr PORV to maintain required subcooling.

___ 2) **GO TO** Step 16.

___ d. Verify power to 1NV-37A (NV Supply To Pzr Aux Spray) - AVAILABLE.

d. Perform the following:

___ 1) Depressurize using one Pzr PORV to maintain required subcooling.

___ 2) **GO TO** Step 16.

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Establish NC System Bleed And Feed

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EVALUATION SHEET

Task: Establish NC system Feed and Bleed per EP/1/A/5000/FR-H.1

Alternate Path: Yes

Facility JPM #: NC-046

Safety Function: 4P **Title:** Reactor Coolant System (RCS)

K/A 002 A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of heat sinks

Rating(s): 4.3 / 4.6 **CFR:** 41.5/43.5/45.3/45.5

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator ☒ In-Plant _____ Perform ☒ Simulate _____

References: EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink)

Task Standard: Aligns S/I feed path using NI and NV pumps and opens 1NC-32B and 1NC-34A PZR PORVs to establish NC system bleed path.

Validation Time: 15 minutes **Time Critical:** Yes _____ No ☒

Applicant: NAME _____ Docket # _____ Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 172.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	XMT-NV011 FNV_6080 BORON INJ FLOW TO DCS/MCB/OAC (NVAA6080)	0				
	MAL-CA003A CAPT SA2 FAILS TO START	Active				
	MAL-CA003B CAPT SA5 FAILS TO START	Active				
	MAL-CA004A FAILURE OF CA PUMP A TO START	Both				
	MAL-CA004B FAILURE OF CA PUMP B TO START	Both				
	MAL-NI001B NI PUMP B FAILURE	Auto				
	OVR-ISE043 SAFETY INJECTION INITIATE PB TRN B	Off				

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A reactor trip has occurred on Unit 1 due to a loss of both Main Feedwater pumps. The CA system will not function. Attempts to restart the CFPT's have been unsuccessful.
2. EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink) has been entered due to a "RED PATH" for the Heat Sink critical safety function while performing EP/1/A/5000/ES-0.1 (Reactor Trip Response).
3. Bleed and Feed initiation criteria has been met.

INITIATING CUES:

1. The CRS instructs you to initiate NC system bleed and feed per steps 20-24 of EP/1/A/5000/FR-H.1. Inform the CRS when the feed and bleed path has been initiated and verified.

Examiner Note: After reading cue, provide the applicant with a copy of EP/1/A/5000/FR-H.1 pages 27-31.

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STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p>STEP 1: 19. Perform Steps 20 through 24 quickly to establish NC heat removal by NC bleed and feed.</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant acknowledges this step.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: 20. Ensure all NC pumps - OFF.</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant depresses the green OFF pushbuttons for 1A, 1B, 1C, and 1D NC pumps on 1MC-10 and verifies the green OFF lights are lit and red ON lights are dark.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 3: 21. Initiate S/I.</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant depresses the red train 'A' and 'B' "SAFETY INJECTION INITIATE" pushbuttons and verifies the red "SAFETY INJECTION ACTUATED" status light is lit on 1SI-13 or "ECCS TRN A(B)" yellow reset lights are dark on 1MC-11.</p> <p>This step is critical to start the NI pumps and align the valves required to initiate an NC system feed path.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 4:</u> 22. Verify NC System feed path as follows:</p> <p style="padding-left: 40px;">a. Verify the following pumps - ON:</p> <p style="padding-left: 80px;"><input type="checkbox"/> At least one NV pump</p> <p style="padding-left: 80px;"><input type="checkbox"/> At least one NI pump.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant determines that at least one NV pump and one NI pump are running.</p> <p><u>EXAMINER NOTE:</u> Applicant may start 1B NI pump and 1B NV pump at this time due to it being a failed auto action. If not, the procedure will direct starting these pumps in the upcoming steps.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> 22b. Verify "NV S/I FLOW" – INDICATING FLOW.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant determines that 1NVP6080 (NV S/I FLOW) on 1MC-3 indicates 0 GPM and transitions to the RNO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 6:</u> 22b RNO Perform the following:</p> <p style="padding-left: 40px;">1) Ensure the following pumps - ON:</p> <p style="padding-left: 80px;"><input type="checkbox"/> NV Pumps</p> <p style="padding-left: 80px;"><input type="checkbox"/> NI Pumps.</p> <p><u>STANDARD:</u></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> Applicant ensures that all NV pumps and NI pumps are running by depressing the red ON pushbuttons for any non running pump, and verifying the red ON lights are lit and green OFF lights are dark for all pumps. </div> <p><u>EXAMINER NOTE:</u> These pumps may have been previously manually started in earlier step due to it being a failed auto action.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 7:</u> 22b RNO 2) IF at least one NV pump in service, THEN perform the following:</p> <p style="padding-left: 40px;">a) Ensure the following valves - OPEN:</p> <p style="padding-left: 80px;"><input type="checkbox"/> 1NV-252A (NV Pumps Suct From FWST)</p> <p style="padding-left: 80px;"><input type="checkbox"/> 1NV-253B (NV Pumps Suct From FWST).</p> <p><u>STANDARD:</u></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> Applicant verifies the red OPEN lights lit and green CLSD lights dark on 1NV-252A and 1NV-253B. </div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 8:</u> 22b RNO 2b) Ensure the following valves - CLOSED:</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1NV-188A (VCT Otlt Isol)</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1NV-189B (VCT Otlt Isol).</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines that the green CLSD light is lit and red OPEN light is dark on 1NV-188A. Applicant determines that the green CLSD light is dark for 1NV-189B, and depresses the green CLOSE pushbutton and verifies the green CLSD light is lit and the red OPEN light is dark.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 9:</u> 22b RNO 2c) Ensure the following valves - OPEN:</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1NI-9A (NV Pmp C/L Inj Isol)</p> <p style="margin-left: 40px;"><input type="checkbox"/> 1NI-10B (NV Pmp C/L Inj Isol).</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines the red OPEN light is lit and green CLSD light is dark on 1NI-9A. Applicant determines that the red OPEN light is dark for 1NI-10B, and depresses the red OPEN pushbutton and verifies the red OPEN light is lit and the green CLSD light is dark.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p>STEP 10: 22b RNO 3) <u>IF</u> NI Pump 1A is in service, <u>THEN</u> ensure the following valves - OPEN:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1NI-103A (NI Pump 1A Suct) <input type="checkbox"/> 1NI-118A (NI Pump 1A C-Leg Inj Isol) <input type="checkbox"/> 1NI-162A (NI To C-Legs Inj Hdr Isol) <input type="checkbox"/> 1NI-100B (NI Pmps Suct From FWST). <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; border: 1px solid #ccc;"> Applicant determines that the red OPEN lights are lit and green CLSD lights are dark on valves 1NI-103A, 1NI-118A, 1NI-162A, and 1NI-100B. </div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 11: 22b RNO 4) <u>IF</u> NI Pump 1B is in service, <u>THEN</u> ensure the following valves - OPEN:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1NI-135B (NI Pump 1B Suct) <input type="checkbox"/> 1NI-150B (NI Pump 1B C-Leg Inj Isol) <input type="checkbox"/> 1NI-162A (NI To C-Legs Inj Hdr Isol) <input type="checkbox"/> 1NI-100B (NI Pmps Suct From FWST). <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; border: 1px solid #ccc;"> Applicant verifies that the red OPEN light is lit and green CLSD light is dark on valves 1NI-135B, 1NI-150B, 1NI-162A, and 1NI-100B. </div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 12:</u> 22b RNO 5) <u>IF</u> no feed path can be aligned, <u>THEN</u>:</p> <p><u>STANDARD:</u></p> <p>Applicant determines that a feed path does exist and this step is N/A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u> 23. Establish NC System bleed path as follows:</p> <p style="padding-left: 40px;">a. Ensure all Pzr PORV isolation valves - OPEN.</p> <p><u>STANDARD:</u></p> <p>Applicant determines the RED lights are lit and GREEN lights are dark on valves 1NC-31B, 1NC-35B, and 1NC-33A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u> 23b. Select "OPEN" on the following PZR PORVs:</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1NC-34A (PZR PORV)</p> <p style="padding-left: 40px;"><input type="checkbox"/> 1NC-32B (PZR PORV).</p> <p><u>STANDARD:</u></p> <p>Applicant rotates switches for 1NC-34A and 1NC-32B, clockwise to the OPEN position and verifies RED lights are lit and GREEN lights are dark on both valves.</p> <p>This step is critical because it establishes an NC system Bleed path.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 15:</u> 23c. Align N2 to the Pzr PORVs by opening the following valves:</p> <div style="margin-left: 40px;"> <input type="checkbox"/> 1NI-438A (Emer N2 From CLA A To 1NC-34A) <input type="checkbox"/> 1NI-439B (Emer N2 From CLA B To 1NC-32B). </div> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;">Applicant depresses the red OPEN pushbutton and verifies red OPEN light lit and green CLSD light dark on valves 1NI-438A and 1NI-439B.</div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16:</u> 23d. Verify power to all Pzr PORV isolation valves - AVAILABLE.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;">Applicant verifies indicating lights lit on 1NC-31B, 1NC-35B, and 1NC-33A.</div> <p><u>COMMENTS:</u></p> <p style="text-align: center; margin-top: 20px;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A reactor trip has occurred on Unit 1 due to a loss of both Main Feedwater pumps. The CA system will not function. Attempts to restart the CFPT's have been unsuccessful.
2. EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink) has been entered due to a "RED PATH" for the Heat Sink critical safety function while performing EP/1/A/5000/ES-0.1 (Reactor Trip Response).
3. Bleed and Feed initiation criteria has been met.

INITIATING CUES:

1. The CRS instructs you to initiate NC system bleed and feed per steps 20-24 of EP/1/A/5000/FR-H.1. Inform the CRS when the feed and bleed path has been initiated and verified.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

___ 20. **Ensure all NC pumps - OFF.**

___ 21. **Initiate S/I.**

22. **Verify NC System feed path as follows:**

a. Verify the following pumps - ON:

- ___ • At least one NV pump
- ___ • At least one NI pump.

a. Perform the following for affected train(s):

- ___ 1) Reset ECCS.
- ___ 2) Reset D/G load sequencer.
- ___ 3) Start pumps.
- ___ 4) **IF AT ANY TIME** a B/O occurs, **THEN** restart S/I equipment previously on.
- ___ 5) **IF** at least one NV pump in service, **THEN GO TO** Step 22.b.
- 6) **IF** all the following conditions are met, **THEN GO TO** Step 22.b:
 - ___ • At least one NI Pump - ON
 - ___ • Time between reactor trip and implementation of this procedure - GREATER THAN 90 MINUTES.
- ___ 7) Continue attempts to restore NV and NI to service.
- ___ 8) **RETURN TO** Step 6.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

22. (Continued)

___ b. Verify "NV S/I FLOW" - INDICATING FLOW.

b. Perform the following:

1) Ensure the following pumps - ON:

- ___ • NV Pumps
- ___ • NI Pumps.

2) **IF** at least one NV pump in service, **THEN** perform the following:

a) Ensure the following valves - OPEN:

- ___ • 1NV-252A (NV Pumps Suct From FWST)
- ___ • 1NV-253B (NV Pumps Suct From FWST).

b) Ensure the following valves - CLOSED:

- ___ • 1NV-188A (VCT Otlt Isol)
- ___ • 1NV-189B (VCT Otlt Isol).

c) Ensure the following valves - OPEN:

- ___ • 1NI-9A (NV Pmp C/L Inj Isol)
- ___ • 1NI-10B (NV Pmp C/L Inj Isol).

3) **IF** NI Pump 1A is in service, **THEN** ensure the following valves - OPEN:

- ___ • 1NI-103A (NI Pump 1A Suct)
- ___ • 1NI-118A (NI Pump 1A C-Leg Inj Isol)
- ___ • 1NI-162A (NI To C-Legs Inj Hdr Isol)
- ___ • 1NI-100B (NI Pmps Suct From FWST).

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

22. (Continued)

4) **IF** NI Pump 1B is in service, **THEN**
ensure the following valves - OPEN:

- ___ • 1NI-135B (NI Pump 1B Suct)
- ___ • 1NI-150B (NI Pump 1B C-Leg Inj Isol)
- ___ • 1NI-162A (NI To C-Legs Inj Hdr Isol)
- ___ • 1NI-100B (NI Pmps Suct From FWST).

5) **IF** no feed path can be aligned,
THEN:

- ___ a) Continue attempts to establish feed path.
- ___ b) **RETURN TO** Step 6.

23. **Establish NC System bleed path as follows:**

- ___ a. Ensure all Pzr PORV isolation valves - OPEN.
- b. Select "OPEN" on the following PZR PORVs:
 - ___ • 1NC-34A (PZR PORV)
 - ___ • 1NC-32B (PZR PORV).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23. (Continued)

c. Align N₂ to the Pzr PORVs by opening the following valves:

- ___ • 1NI-438A (Emer N2 From CLA A To 1NC-34A)
- ___ • 1NI-439B (Emer N2 From CLA B To 1NC-32B).

___ d. Verify power to all Pzr PORV isolation valves - AVAILABLE.

c. Perform the following:

- ___ 1) Ensure Phase B containment isolation signals - RESET.
- ___ 2) Ensure 1VI-77B (VI Cont Isol) - OPEN.
- ___ 3) **IF** VI pressure less than 85 PSIG, **THEN** dispatch operator to ensure proper VI compressor operation.

d. Perform the following:

- 1) Dispatch operator to restore power to affected Pzr PORV isolation valve(s):
 - ___ • 1EMXD-F02C (PORV Isol Motor (1NC31B)) (AB-560, BB-50, Rm 372)
 - ___ • 1EMXC-F03C (Pressurizer Power Operated Relief Isol. Valve 1NC33A) (AB-577, BB-50, Rm 496)
 - ___ • 1EMXD-F05A (PORV Isol Motor (1NC35B)) (AB-560, BB-50, Rm 372).
- 2) **WHEN** power is restored, **THEN**:
 - ___ a) OPEN Pzr PORV isolation valves.
 - ___ b) Ensure two Pzr PORVs and associated Pzr PORV isolation valves - OPEN.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

24. **Verify the following valves - OPEN:**

- ☐ • 1NC-31B (PZR PORV Isol)
- ☐ • 1NC-32B (PZR PORV)
- ☐ • 1NC-33A (PZR PORV Isol)
- ☐ • 1NC-34A (PZR PORV).

Perform the following:

- ☐ a. Ensure Phase B containment isolation signals - RESET.
- ☐ b. Ensure 1VI-77B (VI Cont Isol) - OPEN.
- ☐ c. **IF** VI pressure less than 85 PSIG, **THEN** dispatch operator to ensure proper VI compressor operation.
- ☐ d. Ensure the following valves - OPEN:
 - ☐ • 1NC-35B (PZR PORV Isol)
 - ☐ • 1NC-36B (PZR PORV).
- ☐ e. Ensure two Pzr PORVs and associated Pzr PORV isolation valves - OPEN.
- ☐ f. **IF** two Pzr PORV flow paths are open, **THEN GO TO** Step 25.
- ☐ g. Align A Train vent path by opening the following valves:
 - ☐ • 1NC-250A (Rx Head Vent Block)
 - ☐ • 1NC-251B (Rx Head Vent).

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

24. (Continued)

h. **IF** A Train vent path cannot be aligned,
THEN align B train vent path as follows:

1) Ensure the following valves -
CLOSED:

- ___ • 1NC-250A (Rx Head Vent Block)
- ___ • 1NC-251B (Rx Head Vent).

2) Dispatch operator to close the
following breakers:

- ___ • 1EMXL-F10C (Reactor Vessel
Head Vent Motor (1NC252B))
(AB-560, BB-47, Rm 372)
- ___ • 1EMXS-F03E (Reactor Vessel
Head Vent Motor (1NC253A))
(AB-577, BB-49, Rm 496).

3) OPEN the following valves:

- ___ • 1NC-252B (Rx Head Vent Block)
- ___ • 1NC-253A (Rx Head Vent).

i. Align any low pressure water source to
intact S/G(s) using the following
sources:

- ___ • Hotwell pump
- ___ • RN
- ___ • CA (gravity feed)
- ___ • RF. **REFER TO** Enclosure 4
(Aligning Alternate Water Source
to S/G(s)).

___ j. **IF** no low pressure water source can be
aligned, **THEN GO TO** Step 25.

___ k. Depressurize at least one intact S/G to
atmospheric pressure using S/G PORV
to inject the low pressure water source.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

25. **WHEN manpower AND time permits, THEN verify proper system alignments as follows:**

- ___ • **REFER TO** Enclosure 5 (System Verification Following S/I Actuation).
- ___ • Notify Unit 2 operator to perform Enclosure 6 (Opposite Unit Ventilation Verification).

26. **Maintain NC System heat removal as follows:**

- ___ • Maintain S/I flow
- ___ • Maintain two Pzr PORVs - OPEN.

27. **Ensure S/I - RESET:**

- ___ a. ECCS.

- a. Perform the following:

- ___ 1) **IF** either reactor trip breaker is closed, **THEN** dispatch operator to open Unit 1 reactor trip breakers.
- ___ 2) Concurrently implement Enclosure 11 (ECCS Master Reset) while continuing with this procedure.

- ___ b. D/G load sequencers.

- b. Dispatch operator to open affected sequencer(s) control power breaker:

- ___ • 1EDE-F01F (Diesel Generator Load Sequencer Panel 1DGLSA) (AB-577, BB-46, Rm 496)
- ___ • 1EDF-F01F (Diesel Generator Load Sequencer Panel 1DGLSB) (AB-560, BB-46, Rm 372).

- ___ c. **IF AT ANY TIME** a B/O occurs, **THEN** restart S/I equipment previously on.

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Restore Power to 1ETA From Offsite Power

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EVALUATION SHEET

Task: Restore power to 1ETA from offsite power per EP/1/A/5000/ECA-0.0 (Loss of All AC Power).

Alternate Path: Yes

Facility JPM #: EP-010

Safety Function: 6 **Title:** AC Electrical Distribution

K/A 062 A2.05 Ability to (a) predict the impacts of the following malfunctions or operations on the AC distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Methods for energizing a dead bus.

Rating(s): 2.9 / 3.3 **CFR:** 41.5/43.5/45.3/45.13

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator X In-Plant _____ Perform X Simulate _____

References: EP/1/A/5000/ECA-0.0 (Loss of All AC Power)

Task Standard: Restore normal offsite power to 1ETA from the switchyard.

Validation Time: 15 minutes **Time Critical:** Yes _____ No X

Applicant: _____ Time Start: _____
NAME Docket # Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 175.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	MAL-DG001A D/G 1A FAILS TO START	Active				
	MAL-DG001B D/G 1B FAILS TO START	Active				
	MAL-EQB003A LOSS OF D/G 1A SEQUENCER CTRL PWR	Active				
	MAL-EQB003B LOSS OF D/G 1B SEQUENCER CTRL PWR	Active				
	LOA-EP067 600V LC ELXA BKR ELXA-4B	Close	10			2
	LOA-EP069 600V LC ELXC BKR ELXC-4B	Close	20			2

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 1 has experienced a Loss Of All AC power.
2. It is desired to restore normal power to 1ETA from offsite power through 1ATC.
3. The TCC has verified adequate switchyard voltage and grid reliability.
4. The load shed of 1ETA has been completed and all lockout relays on 1ETA have been reset.

INITIATING CUES:

1. The CRS instructs you to align normal power to 1ETA by completing Enclosure 8 of EP/1/A/5000/ECA-0.0.

EXAMINER NOTE: After reading cue, provide the applicant with a copy of EP/1/A/5000/ECA-0.0 Enclosure 8.

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STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1:</u> 1. Verify the following 1ETA lockout relays - RESET:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 86N (1ETA 03 Cubicle) <input type="checkbox"/> 86B (1ETA 03 Cubicle) <input type="checkbox"/> 86S (1ETA 04 Cubicle) <input type="checkbox"/> 86D (1ETA 19 Cubicle). <p><u>STANDARD:</u></p> <p>Per the initial conditions the applicant determines that all lockout relays have been reset.</p> <p><u>EXAMINER CUE:</u> If asked, "1ETA lockout relays are reset."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> 2. <u>IF AT ANY TIME</u> it becomes apparent this enclosure will not be successful, <u>THEN</u> perform the following:</p> <p><u>STANDARD:</u></p> <p>Applicant flags this step and continues with the procedure.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> 3. <u>IF</u> 1ATC energized, <u>THEN</u> GO TO Step 15.</p> <p><u>STANDARD:</u></p> <p>Applicant determines that 1ATC is not energized.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 4:</u> 4. IF 6.9 KV buss 1TA energized, THEN GO TO Step 14.</p> <p><u>STANDARD:</u></p> <p>Applicant determines that 1TA is not energized.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> 5. IF transformer 1T2A energized, THEN GO TO Step 13.</p> <p><u>STANDARD:</u></p> <p>Applicant determines that 1T2A is not energized.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 6:</u> 6. Notify Transmission Control Center (TCC), using one of the following methods, to coordinate attempts to restore power:</p> <p><input type="checkbox"/> Outside line:</p> <p><input type="checkbox"/> 704-382-9404</p> <p><input type="checkbox"/> 704-382-9411</p> <p><input type="checkbox"/> 704-382-4413</p> <p><input type="checkbox"/> 704-382-9403</p> <p><input type="checkbox"/> 704-399-9744.</p> <p><input type="checkbox"/> Two-way radio.</p> <p><u>STANDARD:</u></p> <p>Applicant contacts TCC using any of the listed methods.</p> <p><u>EXAMINER CUE:</u> Repeat back information provided by the examinee.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p>STEP 7: 7. Notify TCC to verify adequate switchyard voltage and grid reliability.</p> <p>STANDARD:</p> <p>Applicant verifies with TCC or uses information given on the cue sheet.</p> <p>EXAMINER CUE: If asked, "The TCC has verified adequate switchyard voltage and grid reliability."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 8: 8. Ensure both main transformer's MODs - CLOSED.</p> <p>STANDARD:</p> <p>Applicant determines that both main transformer MODs red CLSD lights are lit.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 9: 9. Verify both turbine generator breakers - OPEN.</p> <p>STANDARD:</p> <p>Applicant determines that both turbine generator breakers green OPEN lights are lit.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 10:</u> 10. Prepare the 6.9 KV busses for power restoration as follows:</p> <p>a. Dispatch operator to ensure breakers for all de-energized motor loads on following 6.9 KV busses - OPEN:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1TA <input type="checkbox"/> 1TB <input type="checkbox"/> 1TC <input type="checkbox"/> 1TD. <p><u>STANDARD:</u></p> <p>Applicant dispatches an operator to open all de-energized motor loads on all 6.9 KV busses.</p> <p><u>EXAMINER CUE:</u> "Operators have been dispatched."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 11:</u> 10b. Place switches for the following pumps in the "OFF" position:</p> <ul style="list-style-type: none"> <input type="checkbox"/> All de-energized hotwell pumps <input type="checkbox"/> All de-energized condensate booster pumps. <p><u>STANDARD:</u></p> <p>Applicant places the switches for all hotwell and condensate booster pumps to the OFF position.</p> <p>This step is critical to allow an orderly restoration of loads upon restoration of power.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 12:</u> 10c. Depress the OFF pushbutton for all de-energized KR pumps.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;"> Applicant depresses the green OFF pushbutton on 'A' and 'C' KR pumps and verifies the green OFF light is lit and the red ON light is dark. </div> <p><u>EXAMINER NOTE:</u> 'B' KR pump is energized from Unit 2.</p> <p>This step is critical to allow an orderly restoration of loads upon restoration of power.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u> 11. Do not continue in this procedure until all de-energized 6.9 KV motor load breakers are open.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;"> Applicant does not continue until all de-energized 6.9 KV motor load breakers are open. </div> <p><u>EXAMINER CUE:</u> "NEO reports that all de-energized 6.9 KV motor load breakers are open."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>NOTE</u> Zone A or B lockout will occur if at least one main transformer cooling circuit is not restored within 15 minutes of re-energizing the main transformer.</p>	

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 14:</u> 12. Energize 6.9 KV busses as follows:</p> <p style="padding-left: 40px;">a. Announce "Energizing Unit 1 main power. All personnel stand clear."</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant makes announcement using plant paging system.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 15:</u> 12b. Verify the following unit tie PCBs - CLOSED:</p> <p style="padding-left: 40px;"><input type="checkbox"/> PCB 15 <input type="checkbox"/> PCB 18.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant determines that the PCBs red CLSD lights are dark and transitions to the RNO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16:</u> 12b RNO Perform the following:</p> <p style="padding-left: 40px;">1) IF unit tie PCB(s) disconnects - OPEN, THEN return PCB(s) to operation. REFER TO OP/0/A/6350/010 (Operation of Station Breakers and Disconnects).</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant determines this step is N/A.</p> <p><u>EXAMINER CUE:</u> If asked, "Disconnects have not been opened."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 17:</u> 12b RNO 2) <u>WHEN</u> unit tie PCB(s) returned to operation, <u>THEN</u> close the following unit tie PCBs:</p> <p style="padding-left: 40px;"> <input type="checkbox"/> PCB 15 <input type="checkbox"/> PCB 18. </p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant depresses the red CLOSE pushbutton and verifies the red CLSD lights are lit for PCBs 15 and 18.</p> <p>This step is critical because it is part of the normal lineup from offsite power to 1ETA.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 18:</u> 12b RNO 3) <u>IF</u> PCB(s) will not close, <u>THEN</u> notify TCC to close affected PCB(s).</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant determines this step is N/A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 19:</u> 13. Verify 1TA - ENERGIZED.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant determines that 1TA is not energized and transitions to the RNO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 20:</u> 13 RNO Perform the following:</p> <p style="padding-left: 40px;">a. <u>IF</u> not previously performed, <u>THEN</u> dispatch operator to ensure breakers for all motor loads on 6.9 KV buss 1TA - OPEN:</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 2px;">Applicant determines this step is N/A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 21:</u> 13 RNO b. Ensure switches for the following pumps in the "OFF" position:</p> <p style="padding-left: 40px;"><input type="checkbox"/> "HTWL PUMP 1A"</p> <p style="padding-left: 40px;"><input type="checkbox"/> "CM BSTR PUMP 1A"</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 2px;">Applicant determines that this step was previously performed.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 22:</u> 13 RNO c. Place "7KV BUS 1TA MODE SEL" switch in "MAN A & TIE".</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 2px;">Applicant places the switch "7KV BUS 1TA MODE SEL" in the "MAN A & TIE" position.</p> <p>This step is critical because if not performed then closure of "7KV FDR FRM 1T2A" in the next step would not be possible.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 23:</u> 13 RNO d. Close "7KV 1TA FDR FRM 1T2A".</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the red CLOSE pushbutton on "7KV 1TA FDR FRM 1T2A" and verifies the red CLSD light is lit and green OPEN light is dark.</p> <p>This step is critical because it is part of the normal lineup from offsite power to 1ETA.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 24:</u> 13 RNO e. <u>IF</u> "7KV 1TA FDR FRM 1T2A" fails to close, <u>THEN</u> dispatch operator to close 1TA-05 (Normal A Incoming Feeder From XFMR 1T2A). REFER TO Enclosure 32 (Local Operation of 6900V Bus Breakers).</p> <p><u>STANDARD:</u></p> <p>Applicant determines that this step is N/A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 25:</u> 14. Verify 1ATC - ENERGIZED.</p> <p><u>STANDARD:</u></p> <p>Applicant verifies that 1ATC is energized.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 26:</u> 15. Verify 1ETA-03 (Normal Incoming Feeder From Xfmr 1ATC) - RACKED IN.</p> <p><u>STANDARD:</u></p> <p>Applicant uses status lights or cue to verify 1ETA-03 is racked in.</p> <p><u>EXAMINER CUE:</u> If asked, "1ETA-03 is racked in."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 27:</u> 16. Do not continue in this enclosure until:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 4KV XFMR 1ATC – ENERGIZED <input type="checkbox"/> 1ETA-03 (Normal Incoming Feeder From Xfmr 1ATC) - RACKED IN. <input type="checkbox"/> Load shed of 1ETA – COMPLETE <input type="checkbox"/> The following 1ETA lockout relays - RESET: <ul style="list-style-type: none"> <input type="checkbox"/> 86N (1ETA 03 Cubicle) <input type="checkbox"/> 86B (1ETA 03 Cubicle) <input type="checkbox"/> 86S (1ETA 04 Cubicle) <input type="checkbox"/> 86D (1ETA 19 Cubicle). <p><u>STANDARD:</u></p> <p>Applicant determines all conditions are met and continues in the procedure.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 28:</u> 17. Energize 1ETA as follows:</p> <p style="padding-left: 40px;">a. Close "ETA NORM FDR FRM ATC".</p> <p><u>STANDARD:</u></p> <div style="background-color: #cccccc; padding: 5px;"> Applicant depresses the red CLOSE pushbutton on "ETA NORM FDR FRM ATC" and verifies the red CLSD light lit and green OPEN light dark. </div> <p>This step is critical because it is part of the normal lineup from offsite power to 1ETA.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 29:</u> 17b. Verify 1ETA - ENERGIZED.</p> <p><u>STANDARD:</u></p> <div style="background-color: #cccccc; padding: 5px;"> Applicant determines 1ETA is energized by viewing OAC graphics or by line volts indication on 1MC-8. </div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 30:</u> 18. Notify dispatched operator to close the following load center normal incoming breakers from 1ETA:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1ELXA-4B (Normal Incoming Breaker Fed From Xfmr 1ETXA) (AB-577, AA-47, Rm 496) <input type="checkbox"/> 1ELXC-4B (Normal Incoming Breaker Fed From Xfmr 1ETXC) (AB-577, AA-46, Rm 496) <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant notifies dispatched operator to close load center breakers 1ELXA-4B and 1ELXC-4B.</p> <p><u>EXAMINER NOTE:</u> Simulator operator will insert EVENT 2.</p> <p><u>EXAMINER CUE:</u> When all indicating lights on the KC system on 1MC-11 are lit, then tell examinee "Operator reports that 1ELXA-4B and 1ELXC-4B are closed."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 31:</u> 19. GO TO Section C. (Operator Actions), Step 38.</p> <p><u>STANDARD:</u></p> <p><u>EXAMINER CUE:</u> "The CRS will continue to direct actions of ECA-0.0. This JPM is complete."</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 1 has experienced a Loss Of All AC power.
2. It is desired to restore normal power to 1ETA from offsite power through 1ATC.
3. The TCC has verified adequate switchyard voltage and grid reliability.
4. The load shed of 1ETA has been completed and all lockout relays on 1ETA have been reset.

INITIATING CUES:

1. The CRS instructs you to align normal power to 1ETA by completing Enclosure 8 of EP/1/A/5000/ECA-0.0.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. **Verify the following 1ETA lockout relays - RESET:**

- ☐ • 86N (1ETA 03 Cubicle)
- ☐ • 86B (1ETA 03 Cubicle)
- ☐ • 86S (1ETA 04 Cubicle)
- ☐ • 86D (1ETA 19 Cubicle).

NOTE

It is acceptable to continue in this enclosure if discrepancies are expected to be resolved.

- ☐ **Consider alternate alignment options. REFER TO Section C. (Operator Actions), Step 18.**

2. **IF AT ANY TIME it becomes apparent this enclosure will not be successful, THEN perform the following:**

- ☐ a. Notify Control Room Supervisor of status.
- ☐ b. Return to Section C. (Operator Actions), Step 18.

☐ 3. **IF 1ATC energized, THEN GO TO Step 15.**

☐ 4. **IF 6.9 KV buss 1TA energized, THEN GO TO Step 14.**

☐ 5. **IF transformer 1T2A energized, THEN GO TO Step 13.**

6. **Notify Transmission Control Center (TCC), using one of the following methods, to coordinate attempts to restore power:**

• Outside line:

- ☐ • 704-382-9404
- ☐ • 704-382-9411
- ☐ • 704-382-4413
- ☐ • 704-382-9403
- ☐ • 704-399-9744.
- ☐ • Two-way radio.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

___ 7. **Notify TCC to verify adequate switchyard voltage and grid reliability.**

___ **Do not continue in this enclosure until switchyard voltage and grid reliability have been verified.**

___ 8. **Ensure both main transformer's MODs - CLOSED.**

___ 9. **Verify both turbine generator breakers - OPEN.**

___ **Open both turbine generator breakers.**

10. **Prepare the 6.9 KV busses for power restoration as follows:**

a. Dispatch operator to ensure breakers for all de-energized motor loads on following 6.9 KV busses - OPEN:

- ___ • 1TA
- ___ • 1TB
- ___ • 1TC
- ___ • 1TD.

b. Place switches for the following pumps in the "OFF" position:

- ___ • All de-energized hotwell pumps
- ___ • All de-energized condensate booster pumps.

___ c. Depress the OFF pushbutton for all de-energized KR pumps.

___ 11. **Do not continue in this procedure until all de-energized 6.9 KV motor load breakers are open.**

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE Zone A or B lockout will occur if at least one main transformer cooling circuit is not restored within 15 minutes of re-energizing the main transformer.

12. **Energize 6.9 KV busses as follows:**

___ a. Announce "Energizing Unit 1 main power. All personnel stand clear."

b. Verify the following unit tie PCBs - CLOSED:

- ___ • PCB 15
- ___ • PCB 18.

b. Perform the following:

- ___ 1) **IF** unit tie PCB(s) disconnects - OPEN, **THEN** return PCB(s) to operation. **REFER TO** OP/0/A/6350/010 (Operation of Station Breakers and Disconnects).
- 2) When unit tie PCB(s) returned to operation, **THEN** close the following unit tie PCBs:
 - ___ • PCB 15
 - ___ • PCB 18.
- ___ 3) **IF** PCB(s) will not close, **THEN** notify TCC to close affected PCB(s).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

___ 13. **Verify 1TA - ENERGIZED.**

Perform the following:

- ___ a. **IF** not previously performed, **THEN** dispatch operator to ensure breakers for all motor loads on 6.9 KV buss 1TA - OPEN:
- b. Ensure switches for the following pumps in the "OFF" position:
 - ___ • "HTWL PUMP 1A"
 - ___ • "CM BSTR PUMP 1A"
- ___ c. Place "7KV BUS 1TA MODE SEL" switch in "MAN A & TIE".
- ___ d. Close "7KV 1TA FDR FRM 1T2A".
- ___ e. **IF** "7KV 1TA FDR FRM 1T2A" fails to close, **THEN** dispatch operator to close 1TA-05 (Normal A Incoming Feeder From XFMR 1T2A). **REFER TO** Enclosure 32 (Local Operation of 6900V Bus Breakers).

___ 14. **Verify 1ATC - ENERGIZED.**

Perform the following:

- ___ a. Close "4KV XFMR 1ATC FDR".
- ___ b. **IF** "4KV XFMR 1ATC FDR" fails to close, **THEN** dispatch operator to close 1TA-04 (6900/4160 VAC XFMR 1ATC). **REFER TO** Enclosure 32 (Local Operation of 6900V Bus Breakers).

___ 15. **Verify 1ETA-03 (Normal Incoming Feeder From Xfmr 1ATC) - RACKED IN.**

- ___ **Dispatch operator to align 1ETA to 1ATC. REFER TO** Enclosure 19 (Align 1ETA to 1ATC Local Actions).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

16. **Do not continue in this enclosure until:**

- ☐ • 4KV XFMR 1ATC - ENERGIZED
- ☐ • 1ETA-03 (Normal Incoming Feeder From Xfmr 1ATC) - RACKED IN.
- ☐ • Load shed of 1ETA - COMPLETE
- ☐ • The following 1ETA lockout relays - RESET:
 - ☐ • 86N (1ETA 03 Cubicle)
 - ☐ • 86B (1ETA 03 Cubicle)
 - ☐ • 86S (1ETA 04 Cubicle)
 - ☐ • 86D (1ETA 19 Cubicle).

17. **Energize 1ETA as follows:**

☐ a. Close "ETA NORM FDR FRM ATC".

a. Perform the following:

- ☐ 1) Notify dispatched operator to manually close 1ETA-03 (Normal Incoming Feeder From Xfmr 1ATC). **REFER TO** Enclosure 31 (Local Operation of 4160V Bus Breakers).
- ☐ 2) **WHEN** notified by dispatched operator Enclosure 31 (Local Operation of 4160V Bus Breakers) is complete, **THEN GO TO** Step 17.b.
- ☐ 3) Do not continue with this enclosure until Enclosure 31 (Local Operation of 4160V Bus Breakers) is complete.

☐ b. Verify 1ETA - ENERGIZED.

☐ b. Consider alternate alignment options. **GO TO** Section C. (Operator Actions), Step 18.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18. **Notify dispatched operator to close the following load center normal incoming breakers from 1ETA:**

- ___ • 1ELXA-4B (Normal Incoming Breaker Fed From Xfmr 1ETXA) (AB-577, AA-47, Rm 496)
- ___ • 1ELXC-4B (Normal Incoming Breaker Fed From Xfmr 1ETXC) (AB-577, AA-46, Rm 496)

___ 19. **GO TO Section C. (Operator Actions), Step 38.**

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**Ensure Proper Feedwater Isolation On A
Reactor Trip**

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EVALUATION SHEET

Task: Ensure proper feedwater isolation following a reactor trip per step 6 of EP/1/A/5000/ES-0.1 (Reactor Trip Response).

Alternate Path: Yes. CF isolation status light for 1D S/G is not lit requiring RNO actions to mitigate. Feed flow to S/G's is 0 GPM and will require RNO actions to start CA pumps as necessary to provide adequate flow.

Facility JPM #: CF-002

Safety Function: 4S **Title:** Main Feedwater System

K/A 059 K4.19 Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Automatic feedwater isolation of MFW.

Rating(s): 3.2 / 3.4 **CFR:** 41.7

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator X In-Plant _____ Perform X Simulate _____

References: EP/1/A/5000/ES-0.1 (Reactor Trip Response)

Task Standard: Status light for "S/G D CF CONT ISOL VLVS CLSD" lit and feed flow is established to maintain at least one S/G N/R level greater than 11% **OR** total feed flow greater than 450 GPM.

Validation Time: 5 minutes **Time Critical:** Yes _____ No X

Applicant: _____
NAME Docket # Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____
NAME SIGNATURE DATE

COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 173.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	MAL-ISE007A AUTO CF ISOL SIGNAL TRN A	Block				
	MAL-ISE007B AUTO CF ISOL SIGNAL TRN B	Block				
	MAL-CA007D S/G TEMPERING VLV CA188 FAILURE	Open				
	MAL-CA004A FAILURE OF CA PUMP A TO START	Auto				
	MAL-CA004B FAILURE OF CA PUMP B TO START	Auto				
	VLV-CA030A SA2 CA PMP TURB STM SPLY VL FAIL AUTO ACTIONS	Active				
	VLV-CA031A SA5 CA PMP TURB STM SPLY VL FAIL AUTO ACTIONS	Active				
	MAL-CA007D S/G TEMPERING VLV CA188 FAILURE	Open				
	OVR-ISE006C CNT FW ISOL TRN A INIT PB	Off				
	OVR-ISE008C CNT FW ISOL TRN B INIT PB	Off				

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A reactor trip has occurred on Unit 1 due to a loss of both Main Feedwater pumps. EP/1/A/5000/ES-0.1 (Reactor Trip Response) has been implemented.

INITIATING CUES:

1. The CRS instructs you to perform step 6 of EP/1/A/5000/ES-0.1 to verify feedwater status.

Examiner Note: After reading cue, provide the applicant with a copy of EP/1/A/5000/ES-0.1 page 4.

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START TIME: _____

<p><u>STEP 1:</u> 6. Verify feedwater status as follows: a. T-Avg - LESS THAN 564°F.</p> <p><u>STANDARD:</u></p> <p>Applicant determines Tavg is less than 564°F by use of NC Loop A/B/C/D Lo Tavg channels I/II/III/IV status lights lit on 1SI-7, <u>OR</u> on NC Loop A/B/C/D Tavg meters on 1MC-5, <u>OR</u> on Selected Tavg chart recorder on 1MC-1.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> 6b. All Feedwater Isolation status lights (1SI-5) - LIT.</p> <p><u>STANDARD:</u></p> <p>Applicant determines "S/G A (B) (C) CF CONT ISOL VLVS CLSD" status lights are lit, and "S/G D CF CONT ISOL VLVS CLSD" status light is DARK on 1SI-5. Applicant should transition to the RNO.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 3:</u> 6b. RNO 1) Manually initiate Feedwater Isolation.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant depresses the CF ISOL TRN A/B red INITIATE pushbutton and verifies red INIT lights are lit and yellow RST lights are dark on 1MC-2. </div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 6b. RNO 2) <u>IF</u> proper status light indication is not obtained, <u>THEN</u> manually close valves.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant depresses and holds green CLOSE pushbutton for 1CF-60 and verifies green CLSD light is lit and red OPEN light is dark. Applicant depresses green CLOSE pushbutton for 1CA-188 and verifies green CLSD light is lit and red OPEN light is dark. Applicant depresses the M pushbutton on valves 1CF-55 and 1CF-57, then depresses the decrease demand pushbuttons to fully close the valves. </div> <p><u>EXAMINER NOTE:</u> S/G D CF CONT ISOL VLVS CLSD status light on 1SI-5 will now be lit.</p> <p>Step is critical since these valves must be manually closed to provide a proper feedwater isolation.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 5:</u> 6c. Total feed flow to S/G(s) – GREATER THAN 450 GPM.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;">Applicant determines feed flow to S/G's is zero gpm and transitions to the RNO.</div> <p><u>EXAMINER CUE:</u> If applicant addresses a RED path on the Heat Sink critical safety function, "The STA and OSM will validate the red path."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 6:</u> 6c. RNO Establish feed flow to maintain at least one S/G N/R level greater than 11% OR total feed flow greater than 450 GPM using one of the following:</p> <div style="margin-left: 40px;"> <input type="checkbox"/> CA pumps OR <input type="checkbox"/> Main Feedwater System. REFER TO OP/1/A/6250/001 (Condensate and Feedwater System). </div> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;">Applicant starts 1A and/or 1B CA pumps to achieve at least 450 gpm flow to one or more S/G's.</div> <p><u>COMMENTS:</u></p> <p style="text-align: center; margin-top: 20px;">END OF TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A reactor trip has occurred on Unit 1 due to a loss of both Main Feedwater pumps. EP/1/A/5000/ES-0.1 (Reactor Trip Response) has been implemented.

INITIATING CUES:

1. The CRS instructs you to perform step 6 of EP/1/A/5000/ES-0.1 to verify feedwater status.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE Enclosure 2 (NC Temperature Control) shall remain in effect until subsequent steps provide alternative NC temperature control guidance.

___ 5. **Control NC temperature. REFER TO Enclosure 2 (NC Temperature Control).**

6. **Verify feedwater status as follows:**

___ a. T-Avg - LESS THAN 564°F.

a. Perform the following:

___ 1) **WHEN** T-Avg is less than 564°F, **THEN** perform Steps 6.b and 6.c.

___ 2) **GO TO** Step 6.c.

___ b. All Feedwater Isolation status lights (1SI-5) - LIT.

b. Perform the following:

___ 1) Manually initiate Feedwater Isolation.

___ 2) **IF** proper status light indication is not obtained, **THEN** manually close valves.

___ c. Total feed flow to S/G(s) - GREATER THAN 450 GPM.

c. Establish feed flow to maintain at least one S/G N/R level greater than 11% **OR** total feed flow greater than 450 GPM using one of the following:

___ • CA pumps

OR

___ • Main Feedwater System. **REFER TO** OP/1/A/6250/001 (Condensate and Feedwater System).

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**Place KC In Parallel Operation Per
OP/1/A/6400/005**

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EVALUATION SHEET

Task: Place the KC system in parallel operation per OP/1/A/6400/005 Encl. 4.4.

Alternate Path: None.

Facility JPM #: New

Safety Function: 8 **Title:** Component Cooling Water System

K/A 008 A4.01 Ability to manually operate and/or monitor in the control room: CCW indications and controls.

Rating(s): 3.3 / 3.1 **CFR:** 41.7 / 45.5

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator X In-Plant _____

Perform X Simulate _____

References: OP/1/A/6400/005 Encl. 4.4.

Task Standard: KC pump 1B1 is started and 1B KC HX OTLT MODE switch is placed in the "KC TEMP" position to place KC in parallel operation.

Validation Time: 10 minutes **Time Critical:** Yes _____ No X

Applicant: NAME Docket # Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 174.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	Reset to 100% IC with 1A2 KC pump in service.					

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. A work list item from work control to place KC on Unit 1 in parallel operation in preparation for Aux Safeguards Testing early on next shift.

INITIATING CUES:

1. The CRS instructs you to place KC in parallel operation by performing Encl. 4.4 of OP/1/A/6400/005. You are to start 1B1 KC pump. Initial conditions have previously been verified and signed off. You are to begin at step 2.7.
2. IV is waived for this JPM.

Examiner Note: After reading cue, provide the applicant with a copy of OP/1/A/6400/005 Encl. 4.4.

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START TIME: _____

STEP 1: 2.7 **IF** placing KC Train 1B in parallel operation with KC Train 1A with the trains cross-connected, complete the following steps:

___ SAT

___ UNSAT

NOTE: RN System minimum flow protection is normally established using an idle KC train.

2.7.1 Complete the following steps to ensure the RN System has miniflow protection:

2.7.1.1 IF a Unit 2 KC Hx discharge valve is in the "MINIFLOW" position, perform the following:

A. Ensure the associated inlet valve is open:

▫ 2RN-287A (KC Hx 2A Inlet Isol)

▫ 2RN-347B (KC Hx 2B Inlet Isol)

STANDARD:

Applicant asks Unit 2 operator to verify which KC heat exchanger is in service and whether its respective heat exchanger inlet valve is open.

Examiner Cue: "2B KC heat exchanger is in the "MINIFLOW" position and 2RN-347B is open."

COMMENTS:

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<p><u>STEP 2:</u> 2.7.1.1 B. Ensure a complete RN flow path exists from the RN Pumps through the applicable Hx to the discharge.</p> <p><u>STANDARD:</u></p> <p>Applicant determines RN system is in normal lineup and has a flowpath through 2B KC heat exchanger to the discharge by looking at the OAC graphic.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> 2.7.1.2 IF no Unit 2 KC Hxs are available for RN miniflow, establish miniflow per OP/0/A/6400/006 C (Nuclear Service Water System) as necessary to maintain RN flow \geq 8600 gpm per operating RN Pump.</p> <p><u>STANDARD:</u></p> <p>Applicant determines this step is N/A. 2B KC heat exchanger is available for miniflow.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 2.7.2 Ensure 1RN-347B (KC Hx 1B Inlet Isol) is open.</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the red OPEN light lit and green CLSD light dark on 1RN-347B.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 5: 2.7.3 Ensure "KC HX 1B OTLT MODE" is in "KC TEMP".</p> <p>STANDARD:</p> <p>Applicant rotates "KC HX 1B OTLT MODE" switch counter-clockwise to the "KC TEMP" position.</p> <p>This step is critical because starting a pump in this train with RN flow elevated through the KC heat exchanger, could cause letdown temperature to decrease rapidly causing a reactivity excursion due to the increased affinity for boron in the letdown demineralizers.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 6: 2.7.4 IF letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System) perform the following: (R.M.)</p> <p>2.7.4.1 Place 1KC-132 (Letdn Hx Otlr Temp Ctrl) in manual.</p> <p>STANDARD:</p> <p>Applicant depresses the M button on the control station for 1KC-132.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 7: 2.7.4.2 WHILE 1KC-132 (Letdn Hx Otlr Temp Ctrl) is in manual during the train swap adjust as required to maintain letdown temperature stable.</p> <p>STANDARD:</p> <p>This is a continuous action step. Through the rest of the procedure the applicant will manually throttle 1KC-132 to stabilize letdown temperature.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 8: 2.7.4.3 Record position of 1NV-153A (Letdn Hx Otlt 3-Way Vlv). Recorded position _____</p> <p>STANDARD:</p> <p>Applicant records position of 1NV-153A to be the AUTO/DEMIN position.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 9: 2.7.4.4 IF letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers will be bypassed while shifting KC Pumps. Person notified _____</p> <p>STANDARD:</p> <p>Applicant contacts Primary Chemistry and informs them that the demineralizers will be bypassed.</p> <p>EXAMINER CUE: "This is Steve in Primary Chemistry. I understand that the letdown demineralizers will be bypassed while shifting KC pumps."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 10: 2.7.4.5 IF letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers will be bypassed while shifting KC Pumps. Person notified _____</p> <p>STANDARD:</p> <p>Applicant contacts Radiation Protection and informs them that the demineralizers will be bypassed.</p> <p>EXAMINER CUE: "This is Gary in Radiation Protection. I understand that the letdown demineralizers will be bypassed while shifting KC pumps."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 11: 2.7.4.6 Place 1NV-153A (Letdn Hx Oflt 3-Way Vlv) in the "VCT" position.</p> <p>STANDARD:</p> <p>Applicant rotates switch for 1NV-153A counter-clockwise to the VCT position and verifies white light lit and red light dark.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>CAUTION: 5700 gpm discharge header flow per operating KC Pump shall NOT be exceeded.</p>	

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<p><u>STEP 12:</u> 2.7.5 Start either KC Train 1B pump:</p> <p style="padding-left: 40px;"> <input type="checkbox"/> "KC PUMP B1" OR <input type="checkbox"/> "KC PUMP B2" </p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Per initiating cue, applicant will start 1B1 KC pump by depressing the red ON pushbutton and verifying red ON light lit and green OFF light dark.</p> <p>This step is critical because one 'B' KC pump has to be started to place KC in parallel operation per the JPM standard.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u> 2.7.6 IF letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System), WHEN KC flow and temperature have stabilized perform the following: (R.M.)</p> <p style="padding-left: 40px;">2.7.6.1 Return 1NV-153A (Letdn Hx Otlt 3-Way Vlv) to the position recorded in Step 2.7.4.3.</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc; padding: 5px;">Applicant will rotate switch for 1NV-153A clockwise to the DEMIN position, verifying the RED light lit and WHITE light dark, and then return the switch to the AUTO position.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 14: 2.7.6.2 IF letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers have been restored to service. Person notified _____</p> <p>STANDARD:</p> <p>Applicant contacts Primary Chemistry and lets them know that the demineralizers have been returned to service.</p> <p>EXAMINER CUE: "This is Steve with Primary Chemistry. I understand that the letdown demineralizers have been returned to service."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 15: 2.7.6.3 IF letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers have been restored to service. Person notified _____</p> <p>STANDARD:</p> <p>Applicant contacts Radiation Protection and lets them know that the demineralizers have been returned to service.</p> <p>EXAMINER CUE: "This is Gary with Radiation Protection. I understand that the letdown demineralizers have been returned to service."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 16:</u> 2.7.6.4 Return 1KC-132 (Letdn Hx Otlt Temp Ctrl) to auto.</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the A pushbutton on controller for 1KC-132.</p> <p><u>EXAMINER CUE:</u> "Another operator will finish the procedure. This JPM is complete."</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>
--	---------------------------------

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. A work list item from work control to place KC on Unit 1 in parallel operation in preparation for Aux Safeguards Testing early on next shift.

INITIATING CUES:

1. The CRS instructs you to place KC in parallel operation by performing Encl. 4.4 of OP/1/A/6400/005. You are to start 1B1 KC pump. Initial conditions have previously been verified and signed off. You are to begin at step 2.7.
2. IV is waived for this JPM.

Duke Energy
Catawba Nuclear Station
Component Cooling System

Procedure No.

OP/1/A/6400/005

Revision No.

112

Electronic Reference No.

CN005FM6

Continuous Use

PERFORMANCE

***** UNCONTROLLED FOR PRINT *****

(ISSUED) - PDF Format

**Operation Of Additional KC Pumps/Parallel
Operation****1. Initial Conditions**

- ____ 1.1 Review the Limits and Precautions.
- ____ 1.2 Verify one train of KC is operating per Enclosure 4.1 (System Startup).
- ____ 1.3 Notify Radwaste Chemistry of the intent to change the current KC system pump lineup.
Person notified _____
- ____ 1.4 **IF** in Mode 1 or 2, ensure R3 reactivity management controls established per SOMP 01-02 (Reactivity Management). (R.M.)

2. Procedure

- ____ 2.1 **IF** the KC System is in single pump operation with the idle pump in the operating train available **AND** KC flow requirements are > 5700 gpm, perform the following:
- ____ 2.1.1 Ensure the appropriate miniflow valve is closed:
- ☐ 1KC-C37A (Train A Miniflow Isol)
 - ☐ 1KC-C40B (Train B Miniflow Isol)
- ____ 2.1.2 **IF** KC flow is > 5700 gpm, start the idle pump in the operating loop:
- ☐ "KC PUMP A1"
 - ☐ "KC PUMP A2"
 - OR
 - ☐ "KC PUMP B1"
 - ☐ "KC PUMP B2"

NOTE: One pump running is preferred as long as flow is < 5700 gpm.

- ____ 2.2 **IF** both KC pumps in the operating train are running **AND** flow in the operating train is < 5700 gpm, perform the following:
- ____ 2.2.1 **IF** required, throttle KC flow to the inservice KF heat exchanger as necessary to prevent KC pump runoff:
- ☐ 1KC-149 (KF Hx 1A Cool Wtr Oflt)
 - ☐ 1KC-156 (KF Hx 1B Cool Wtr Oflt)

**Operation Of Additional KC Pumps/Parallel
Operation**

_____ 2.2.2 Stop one of the operating pumps:

☐ "KC PUMP A1"

☐ "KC PUMP A2"

OR

☐ "KC PUMP B1"

☐ "KC PUMP B2"

_____ 2.2.3 Perform the following for the KF cooling loops that are in service:

☐ Adjust 1KC-149 (KF Hx 1A Cool Wtr Oflt) flow controller on 1MC11 to 3000 gpm or as necessary to maintain Spent Fuel Pool temperature < 125°F.

☐ Adjust 1KC-156 (KF Hx 1B Cool Wtr Oflt) flow controller on 1MC11 to 3000 gpm or as necessary to maintain Spent Fuel Pool temperature < 125°F.

_____ 2.3 **IF** additional KC flow is needed **AND** both pumps in the operating loop are running **OR** KC is in single pump operation with the idle pump in the operating train **NOT** available, place KC in parallel operation per Step 2.4, 2.5, 2.7 or 2.8 as applicable.

_____ 2.4 **IF** placing KC Train 1A in parallel operation with KC Train 1B with the trains cross-connected, complete the following steps:

NOTE: RN System minimum flow protection is normally established using an idle KC train.

2.4.1 Complete the following steps to ensure the RN System has miniflow protection:

_____ 2.4.1.1 **IF** a Unit 2 KC Hx discharge valve is in the "MINIFLOW" position, perform the following:

_____ A. Ensure the associated inlet valve is open:

☐ 2RN-287A (KC Hx 2A Inlet Isol)

☐ 2RN-347B (KC Hx 2B Inlet Isol)

_____ B. Ensure a complete RN flow path exists from the RN Pumps through the applicable Hx to the discharge.

_____ 2.4.1.2 **IF** no Unit 2 KC Hxs are available for RN miniflow, establish miniflow per OP/0/A/6400/006 C (Nuclear Service Water System) as necessary to maintain RN flow \geq 8600 gpm per operating RN Pump.

_____ 2.4.2 Ensure 1RN-287A (KC Hx 1A Inlet Isol) is open.

_____ 2.4.3 Ensure "KC HX 1A OTLT MODE" is in "KC TEMP".

**Operation Of Additional KC Pumps/Parallel
Operation**

- _____ 2.4.4 **IF** letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System) perform the following: (R.M.)
- _____ 2.4.4.1 Place 1KC-132 (Letdn Hx Otlr Temp Ctrl) in manual.
- _____ 2.4.4.2 **WHILE** 1KC-132 (Letdn Hx Otlr Temp Ctrl) is in manual during the train swap adjust as required to maintain letdown temperature stable.
- _____ 2.4.4.3 Record position of 1NV-153A (Letdn Hx Otlr 3-Way Vlv).
Recorded position _____
- _____ 2.4.4.4 **IF** letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers will be bypassed while shifting KC Pumps.
Person notified _____
- _____ 2.4.4.5 **IF** letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers will be bypassed while shifting KC Pumps.
Person notified _____
- _____ 2.4.4.6 Place 1NV-153A (Letdn Hx Otlr 3-Way Vlv) in the "VCT" position.

CAUTION: 5700 gpm discharge header flow per each operating KC pump shall **NOT** be exceeded.

- _____ 2.4.5 Start either KC Train 1A pump:
- ☐ "KC PUMP A1"
OR
☐ "KC PUMP A2"

**Operation Of Additional KC Pumps/Parallel
Operation**

- _____ 2.4.6 **IF** letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System), **WHEN** KC flow and temperature have stabilized perform the following: (R.M.)
- _____ 2.4.6.1 Return 1NV-153A (Letdn Hx Otlt 3-Way Vlv) to the position recorded in Step 2.4.4.3.
- _____ 2.4.6.2 **IF** letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers have been restored to service. Person notified _____
- _____ 2.4.6.3 **IF** letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers have been restored to service. Person notified _____
- _____ 2.4.6.4 Return 1KC-132 (Letdn Hx Otlt Temp Ctrl) to auto.

NOTE: One pump running is preferred as long as flow is < 5700 gpm.

- _____ 2.4.7 **IF** KC flow requirement in the Train 1A header is > 5700 gpm, perform the following:
- _____ 2.4.7.1 Ensure 1KC-C37A (Train A Miniflow Isol) is closed.
- _____ 2.4.7.2 Start the remaining KC Train 1A pump:
- ☐ "KC PUMP A1"
- ☐ "KC PUMP A2"
- _____ 2.4.8 **IF** KC flow requirement in the Train 1A header is < 5700 gpm **AND** it is desired to place the second Train 1A Pump in service, perform the following:
- _____ 2.4.8.1 Start the remaining KC Train 1A pump:
- ☐ "KC PUMP A1"
- ☐ "KC PUMP A2"
- _____ 2.4.8.2 Ensure minimum flow requirements are met.

**Operation Of Additional KC Pumps/Parallel
Operation**

NOTE: At this point, KC Train 1A and 1B are in parallel service.

_____ 2.4.9 **IF** RN miniflow was established per Step 2.4.1.2, **WHEN** no longer needed, secure unneeded flow paths.

_____ 2.4.10 **IF** Train 1A is to be secured, leaving Train 1B in service as per Enclosure 4.1 (System Startup), go to Step 2.6.

_____ 2.5 **IF** placing KC Train 1A in parallel operation with KC Train 1B with the trains **NOT** cross-connected, complete the following steps:

NOTE: RN System minimum flow protection is normally established using an idle KC train.

2.5.1 Complete the following steps to ensure the RN System has miniflow protection:

_____ 2.5.1.1 **IF** a Unit 2 KC Hx discharge valve is in the "MINIFLOW" position, perform the following:

_____ A. Ensure the associated inlet valve is open:

☐ 2RN-287A (KC Hx 2A Inlet Isol)

☐ 2RN-347B (KC Hx 2B Inlet Isol)

_____ B. Ensure a complete RN flow path exists from the RN Pumps through the applicable Hx to the discharge.

_____ 2.5.1.2 **IF** no Unit 2 KC Hxs are available for RN miniflow, establish miniflow per OP/0/A/6400/006 C (Nuclear Service Water System) as necessary to maintain RN flow \geq 8600 gpm per operating RN Pump.

_____ 2.5.2 Ensure 1RN-287A (KC Hx 1A Inlet Isol) is open.

_____ 2.5.3 Ensure "KC HX 1A OTLT MODE" is in "KC TEMP".

_____ 2.5.4 Ensure 1KC-56A (KC To ND Hx 1A Sup Isol) is closed.

**Operation Of Additional KC Pumps/Parallel
Operation**

CAUTION: 5700 gpm discharge header flow per each operating KC pump shall **NOT** be exceeded.

_____ 2.5.5 Start either KC Train 1A pump:

☐ "KC PUMP A1"

OR

☐ "KC PUMP A2"

_____ 2.5.6 Ensure 1KC-C37A (Train A Miniflow Isol) opens.

NOTE: One pump running is preferred as long as flow is < 5700 gpm.

_____ 2.5.7 **IF** KC flow requirement in the Train 1A header is > 5700 gpm, perform the following:

_____ 2.5.7.1 Ensure 1KC-C37A (Train A Miniflow Isol) is closed.

_____ 2.5.7.2 **IF** Train 1A header flow is > 5700 gpm, start the remaining KC Train 1A pump.

☐ "KC PUMP A1"

☐ "KC PUMP A2"

_____ 2.5.8 **IF** KC flow requirement in the Train 1A header is < 5700 gpm **AND** it is desired to place the second Train 1A Pump in service, perform the following:

_____ 2.5.8.1 Start the remaining KC Train 1A pump:

☐ "KC PUMP A1"

☐ "KC PUMP A2"

_____ 2.5.8.2 Ensure minimum flow requirements are met.

_____ 2.5.9 **IF** RN miniflow was established per Step 2.5.1.2, **WHEN** no longer needed, secure unneeded flow paths.

NOTE: At this point, KC Train 1A and 1B are in parallel service with KC Train 1A isolated from the Aux and Rx Bldg Non-Ess Headers.

**Operation Of Additional KC Pumps/Parallel
Operation**

2.6 **IF** Train 1A is to be secured, leaving Train 1B in service as per Enclosure 4.1 (System Startup), complete the following steps:

2.6.1 Notify Radwaste Chemistry of the intent to change the current KC system pump lineup.

Person notified _____

2.6.2 **IF** KC Trains 1A and 1B are **NOT** cross-connected, ensure that any component required to support unit operation is **NOT** being cooled by KC Train 1A.

2.6.3 Adjust the following flow controllers on 1MC11 to zero gpm flow:

- ☐ 1KC-149 (KF Hx 1A Cool Wtr Otlft)
- ☐ 1KC-156 (KF Hx 1B Cool Wtr Otlft)

2.6.4 Stop all KC Train 1A pumps:

- ☐ "KC PUMP A1"
- ☐ "KC PUMP A2"

2.6.5 Place "KC HX 1A OTLT MODE" in "MINIFLOW".

2.6.6 Perform the following for the KF cooling loops that are in service:

- ☐ Adjust 1KC-149 (KF Hx 1A Cool Wtr Otlft) flow controller on 1MC11 to 3000 gpm or as necessary to maintain Spent Fuel Pool temperature < 125°F.
- ☐ Adjust 1KC-156 (KF Hx 1B Cool Wtr Otlft) flow controller on 1MC11 to 3000 gpm or as necessary to maintain Spent Fuel Pool temperature < 125°F.

NOTE: One pump running is preferred as long as flow is < 5700 gpm.

2.6.7 **IF** KC flow requirements are < 5700 gpm **AND** both KC Train 1B pumps are running, stop either KC Train 1B pump:

- ☐ "KC PUMP B1"
- OR
- ☐ "KC PUMP B2"

NOTE: At this point, KC Train 1B is in service as per Enclosure 4.1 (System Startup).

2.6.8 **IF** RN flow has been established through components other than the Unit 2 KC Hx's for RN miniflow, secure unneeded flow paths.

**Operation Of Additional KC Pumps/Parallel
Operation**

- _____ 2.7 **IF** placing KC Train 1B in parallel operation with KC Train 1A with the trains cross-connected, complete the following steps:

NOTE: RN System minimum flow protection is normally established using an idle KC train.

- 2.7.1 Complete the following steps to ensure the RN System has miniflow protection:

- _____ 2.7.1.1 **IF** a Unit 2 KC Hx discharge valve is in the "MINIFLOW" position, perform the following:

- _____ A. Ensure the associated inlet valve is open:

- ☐ 2RN-287A (KC Hx 2A Inlet Isol)
☐ 2RN-347B (KC Hx 2B Inlet Isol)

- _____ B. Ensure a complete RN flow path exists from the RN Pumps through the applicable Hx to the discharge.

- _____ 2.7.1.2 **IF** no Unit 2 KC Hxs are available for RN miniflow, establish miniflow per OP/0/A/6400/006 C (Nuclear Service Water System) as necessary to maintain RN flow \geq 8600 gpm per operating RN Pump.

- _____ 2.7.2 Ensure 1RN-347B (KC Hx 1B Inlet Isol) is open.

- _____ 2.7.3 Ensure "KC HX 1B OTLT MODE" is in "KC TEMP".

**Operation Of Additional KC Pumps/Parallel
Operation**

- _____ 2.7.4 **IF** letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System) perform the following: (R.M.)
- _____ 2.7.4.1 Place 1KC-132 (Letdn Hx Otlr Temp Ctrl) in manual.
- _____ 2.7.4.2 **WHILE** 1KC-132 (Letdn Hx Otlr Temp Ctrl) is in manual during the train swap adjust as required to maintain letdown temperature stable.
- _____ 2.7.4.3 Record position of 1NV-153A (Letdn Hx Otlr 3-Way Vlv).
Recorded position _____
- _____ 2.7.4.4 **IF** letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers will be bypassed while shifting KC Pumps.
Person notified _____
- _____ 2.7.4.5 **IF** letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers will be bypassed while shifting KC Pumps.
Person notified _____
- _____ 2.7.4.6 Place 1NV-153A (Letdn Hx Otlr 3-Way Vlv) in the "VCT" position.

CAUTION: 5700 gpm discharge header flow per operating KC Pump shall **NOT** be exceeded.

- _____ 2.7.5 Start either KC Train 1B pump:
- ☐ "KC PUMP B1"
OR
☐ "KC PUMP B2"

**Operation Of Additional KC Pumps/Parallel
Operation**

- _____ 2.7.6 **IF** letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System), **WHEN** KC flow and temperature have stabilized perform the following: (R.M.)
- _____ 2.7.6.1 Return 1NV-153A (Letdn Hx Otlr 3-Way Vlv) to the position recorded in Step 2.7.4.3.
- _____ 2.7.6.2 **IF** letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers have been restored to service. Person notified _____
- _____ 2.7.6.3 **IF** letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers have been restored to service. Person notified _____
- _____ 2.7.6.4 Return 1KC-132 (Letdn Hx Otlr Temp Ctrl) to auto.

NOTE: One pump running is preferred as long as flow is < 5700 gpm.

- _____ 2.7.7 **IF** KC flow requirement in the Train 1B header is > 5700 gpm, perform the following:
- _____ 2.7.7.1 Ensure 1KC-C40B (Train B Miniflow Isol) is closed.
- _____ 2.7.7.2 Start the remaining KC Train 1B pump:
- ☐ "KC PUMP B1"
- ☐ "KC PUMP B2"
- _____ 2.7.8 **IF** KC flow requirement in the Train 1B header is < 5700 gpm **AND** it is desired to place the second Train 1B Pump in service, perform the following:
- _____ 2.7.8.1 Start the remaining KC Train 1B pump:
- ☐ "KC PUMP B1"
- ☐ "KC PUMP B2"
- _____ 2.7.8.2 Ensure minimum flow requirements are met.

**Operation Of Additional KC Pumps/Parallel
Operation**

NOTE: At this point, KC Train 1A and 1B are in parallel service.

_____ 2.7.9 **IF** RN miniflow was established per Step 2.7.1.2, **WHEN** no longer needed, secure unneeded flow paths.

_____ 2.7.10 **IF** Train 1B is to be secured, leaving Train 1A in service as per Enclosure 4.1 (System Startup), go to Step 2.9.

_____ 2.8 **IF** placing KC Train 1B in parallel operation with KC Train 1A with the trains **NOT** cross-connected, complete the following steps:

NOTE: RN System minimum flow protection is normally established using an idle KC train.

2.8.1 Complete the following steps to ensure the RN System has miniflow protection:

_____ 2.8.1.1 **IF** a Unit 2 KC Hx discharge valve is in the "MINIFLOW" position, perform the following:

_____ A. Ensure the associated inlet valve is open:

☐ 2RN-287A (KC Hx 2A Inlet Isol)

☐ 2RN-347B (KC Hx 2B Inlet Isol)

_____ B. Ensure a complete RN flow path exists from the RN Pumps through the applicable Hx to the discharge.

_____ 2.8.1.2 **IF** no Unit 2 KC Hxs are available for RN miniflow, establish miniflow per OP/0/A/6400/006 C (Nuclear Service Water System) as necessary to maintain RN flow \geq 8600 gpm per operating RN Pump.

_____ 2.8.2 Ensure 1RN-347B (KC Hx 1B Inlet Isol) is open.

_____ 2.8.3 Ensure "KC HX 1B OTLT MODE" is in "KC TEMP".

_____ 2.8.4 Ensure 1KC-81B (KC To ND Hx 1B Sup Isol) is closed.

**Operation Of Additional KC Pumps/Parallel
Operation**

CAUTION: 5700 gpm discharge header flow per operating KC Pump shall **NOT** be exceeded.

_____ 2.8.5 Start either KC Train 1B pump:

☐ "KC PUMP B1"

OR

☐ "KC PUMP B2"

_____ 2.8.6 Ensure 1KC-C40B (Train B Miniflow Isol) opens

NOTE: One pump running is preferred as long as flow is < 5700 gpm.

_____ 2.8.7 **IF** KC flow requirement in the Train 1B header is > 5700 gpm, perform the following:

_____ 2.8.7.1 Ensure 1KC-C40B (Train B Miniflow Isol) is closed.

_____ 2.8.7.2 **IF** Train 1B header flow is > 5700 gpm, start the remaining KC Train 1B pump.

☐ "KC PUMP B1"

☐ "KC PUMP B2"

_____ 2.8.8 **IF** KC flow requirement in the Train 1B header is < 5700 gpm **AND** it is desired to place the second Train 1B Pump in service, perform the following:

_____ 2.8.8.1 Start the remaining KC Train 1B pump:

☐ "KC PUMP B1"

☐ "KC PUMP B2"

_____ 2.8.8.2 Ensure minimum flow requirements are met.

_____ 2.8.9 **IF** RN miniflow was established per Step 2.8.1.2, **WHEN** no longer needed, secure unneeded flow paths.

NOTE: At this point, KC Train 1A and 1B are in parallel service with KC Train 1B isolated from the Aux and Rx Bldg Non-Ess Headers.

**Operation Of Additional KC Pumps/Parallel
Operation**

- _____ 2.9 **IF** Train 1B is to be secured, leaving Train 1A in service as per Enclosure 4.1 (System Startup), complete the following steps.
- _____ 2.9.1 Notify Radwaste Chemistry of the intent to change the current KC system pump lineup.
Person notified _____
- _____ 2.9.2 **IF** KC Trains 1A and 1B are **NOT** cross-connected, ensure that any component required to support unit operation is **NOT** being cooled by KC Train 1B.
- _____ 2.9.3 Adjust the following flow controllers on 1MC11 to zero gpm flow:
- ☐ 1KC-149 (KF Hx 1A Cool Wtr Otlr)
 - ☐ 1KC-156 (KF Hx 1B Cool Wtr Otlr)
- _____ 2.9.4 Stop all KC Train 1B pumps:
- ☐ "KC PUMP B1"
 - ☐ "KC PUMP B2"
- _____ 2.9.5 Place "KC HX 1B OTLT MODE" in "MINIFLOW".
- _____ 2.9.6 Perform the following for the KF cooling loops that are in service:
- ☐ Adjust 1KC-149 (KF Hx 1A Cool Wtr Otlr) flow controller on 1MC11 to 3000 gpm or as necessary to maintain Spent Fuel Pool temperature < 125°F.
 - ☐ Adjust 1KC-156 (KF Hx 1B Cool Wtr Otlr) flow controller on 1MC11 to 3000 gpm or as necessary to maintain Spent Fuel Pool temperature < 125°F.

NOTE: One pump running is preferred as long as flow is < 5700 gpm.

- _____ 2.9.7 **IF** KC flow requirements are < 5700 gpm **AND** both KC Train 1A pumps are running, stop either KC Train 1A pump:
- ☐ "KC PUMP A1"
 - OR
 - ☐ "KC PUMP A2"

NOTE: At this point, KC Train 1A is in service as per Enclosure 4.1 (System Startup).

- _____ 2.9.8 **IF** RN flow has been established through components other than the Unit 2 KC Hx's for RN miniflow, secure unneeded flow paths.
- 2.10 Do **NOT** file this enclosure in the Control Copy folder of this procedure.

Catawba Nuclear Station

JPM H

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JPM H

**Increase Level In The PRT Using
OP/1/A/6150/004 Encl. 4.2**

Catawba Nuclear Station
JPM H
Dec. 2010 NRC Exam

EVALUATION SHEET

Task: Increase level in the PRT to 72% and vent to reduce PRT pressure using OP/1/A/6150/004 (Pressurizer Relief Tank) Encl. 4.2 and Encl. 4.5.

Alternate Path: None.

Facility JPM #: New.

Safety Function: 5 **Title:** Pressurizer Relief Tank / Quench Tank System

K/A 007 A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank water level within limits.

Rating(s): 2.9 / 3.1 **CFR:** 41.5 / 45.5

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator X In-Plant _____ Perform X Simulate _____

References: OP/1/A/6150/004 (Pressurizer Relief Tank) Enclosures 4.2 and 4.5.

Task Standard: Increase PRT level to 72% and decrease PRT pressure to below 6 PSIG.

Validation Time: 10 minutes **Time Critical:** Yes _____ No X

=====

Applicant: NAME Docket # Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

=====

COMMENTS

Catawba Nuclear Station

JPM H

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Reset to IC # 171.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. Ensure simulator setup per table below.
6. Place simulator in RUN and acknowledge any alarms.
7. ENSURE "Extra Operator" is present in the simulator.
8. Place simulator in FREEZE until Examiner cue is given.

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	LOA-NC015 NC48 - PRT GAS SAMPLE VESSEL BYP	.40		10		1
	LOA-NC015 NC48 - PRT GAS SAMPLE VESSEL BYP	0		10		3
	Lower PRT Level to approx 66% and increase PRT pressure to 5.1psig then freeze					

Catawba Nuclear Station
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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. PRT level is low at
2. PRT pressure is reading 5.2 PSIG.

INITIATING CUES:

1. CRS directs you to increase PRT level to 72% per OP/1/A/6150/004 (Pressurizer Relief Tank) Encl. 4.2.
2. Initial conditions have been previously verified and signed off.
3. Valves are aligned per Enclosures 4.7 and 4.8 of OP/1/A/6150/004.

EXAMINER NOTE: After reading initiating cue, provide applicant with a copy of OP/1/A/6150/004 Encl. 4.2 with the initial conditions signed off.

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START TIME: _____

<p><u>STEP 1:</u> 2.1 Ensure valves are aligned per Enclosure 4.7 (Valve Checklist).</p> <p><u>STANDARD:</u></p> <p>Per initiating cue, the applicant determines that this step is met.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> 2.2 Ensure valves are independently verified per Enclosure 4.8 (Independent Verification Valve Checklist).</p> <p><u>STANDARD:</u></p> <p>Per initiating cue, the applicant determines that this step is met.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 3:</u> 2.3 IF level in the PRT is to be raised, complete the following steps:</p> <p style="margin-left: 40px;">2.3.1 Open the following valves to align the RMWST to the PRT:</p> <ul style="list-style-type: none"> • 1NC-58A (PRT Spray Supply Isol) • 1NC-56B (RMW Pump Disch Cont Isol) <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant depresses the red OPEN pushbutton on 1NC-58A and 1NC-56B and verifies the red OPEN lights are lit and green CLSD lights are dark. </div> <p>This step is critical because these valves need to be opened to align a flowpath for makeup to the PRT.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 2.3.2 Start a Reactor Makeup Water pump:</p> <ul style="list-style-type: none"> • "RX M/U WTR PUMP 1A" <li style="text-align: center;">OR • "RX M/U WTR PUMP 1B" <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant turns switch for 1A <u>or</u> 1B reactor makeup water pump clockwise to the ON position and verifies red light lit and green light dark. </div> <p>This step is critical to provide makeup flow to the PRT.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 5: 2.3.3 IF at any time while raising PRT level PRT pressure increases to 6 psig, as indicated on 1NCP-5130 (PRT Press, complete the following steps:</p> <p style="padding-left: 40px;">2.3.3.1 Stop the reactor makeup water pump.</p> <p>EXAMINER NOTE: When PRT pressure increases to > 6 PSIG the applicant will perform the following.</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines that PRT pressure has increased above 6 PSIG and stop the reactor makeup water pump started in the previous step.</p> <p>This step is critical to setup normal PRT lineup prior to venting.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
<p>STEP 6: 2.3.3.2 Close the following valves:</p> <ul style="list-style-type: none"> • 1NC-58A (PRT Spray Supply Isol) • 1NC-56B (RMW Pump Disch Cont Isol) <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant depresses the green CLOSE pushbutton and verifies the green CLSD light is lit and the red OPEN light is dark for 1NC-58A and 1NC-56B.</p> <p>This step is critical to setup normal PRT lineup prior to venting.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>

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<p><u>STEP 7:</u> 2.3.3.3 Vent the PRT per Enclosure 4.5 (Venting the Pressurizer Relief Tank).</p> <p><u>STANDARD:</u></p> <p>Applicant describes obtaining a copy of Enclosure 4.5 of OP/1/A/6150/004.</p> <p><u>EXAMINER CUE:</u> Provide applicant a copy of Enclosure 4.5.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>EXAMINER NOTE:</u> The following steps are from Enclosure 4.5 to vent the PRT.</p>	
<p><u>STEP 8:</u> 1. Initial Conditions of Encl. 4.5</p> <p>1.1 Review the Limits and Precautions.</p> <p><u>STANDARD:</u></p> <p>Applicant reviews the limits and precautions.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 9: 1.2 Verify the PRT is in operation per Enclosure 4.1 (Establishing Normal Operating Conditions).</p> <p>STANDARD:</p> <p>Applicant will check the control copy of this OP for verification that system is aligned per Enclosure 4.1.</p> <p>EXAMINER CUE: "PRT is in operation per Enclosure 4.1."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 10: 1.3 Verify the WG System is available for PRT venting per OP/0/A/6500/003 (Radwaste Chemistry Operating Procedure for the Gaseous Waste (WG) System).</p> <p>STANDARD:</p> <p>Applicant will check control copy of OP/0/A/6500/003 for system availability for PRT venting.</p> <p>EXAMINER CUE: "Waste Gas System is available for PRT venting per OP/0/A/6500/003."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 11: 2.1 IF pressure in the PRT is greater than 8 psig, lower level in the PRT per Enclosure 4.2 (Adjusting Pressurizer Relief Tank Level) until pressure is less than 8 psig.</p> <p>STANDARD:</p> <p>Applicant determines that this step is N/A.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 12: 2.2 IF the GN System is the N2 supply, close 1GN-96 (N2 Supply To Unit 1 PRT) (AB-543, EE-543, Rm 217).</p> <p>STANDARD:</p> <p>EXAMINER CUE: "GN system is the N2 supply."</p> <p>Applicant will dispatch an operator to locally close 1GN-96.</p> <p>EXAMINER CUE: "1GN-96 is closed."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 13: 2.3 <u>IF</u> Waste Gas Shutdown Decay Tank "B" is the N2 supply, notify Radwaste Chemistry to isolate the flow path.</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0; padding: 5px;">Per previous step, applicant determines that this step is N/A.</p> <p>EXAMINER CUE: If asked, "Waste Gas Decay Tank B is not the N2 supply to the PRT."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 14: 2.4 Notify Radwaste Chemistry to align the WG System for venting the PRT to the WG System per OP/0/A/6500/003 (Radwaste Chemistry Operating Procedure for the Gaseous Waste (WG) System). Person notified _____</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant notifies Radwaste Chemistry to align the WG system for venting the PRT to the WG system per OP/0/A/6500/003.</p> <p>EXAMINER CUE: "This is Steve in Radwaste Chemistry. I understand that I need to align the WG system for venting the PRT to the WG system."</p> <p>EXAMINER CUE: "Time compression. This is Steve with Radwaste Chemistry. The WG system is aligned for venting the PRT."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 15:</u> 2.5 Verify the following valves are open:</p> <ul style="list-style-type: none">• 1NC-53B (N2 To PRT Cont Isol)• 1NC-54A (N2 To PRT Cont Isol) <p><u>STANDARD:</u></p> <p>Applicant verifies the red OPEN light lit and green CLSD light dark on 1NC-53B and 1NC-54A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16:</u> 2.6 Coordinate the following step with Radwaste Chemistry.</p> <p><u>STANDARD:</u></p> <p>Applicant coordinates steps with Radwaste Chemistry.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>NOTE: In the following step, opening 1NC-48 (PRT Gas Smpl Vessel Byp) too fast may result in tripping the WG Compressor.</p>	

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<p>STEP 17: 2.7 While in contact with Radwaste, <u>slowly</u> open 1NC-48 (PRT Gas Smpl Vessel Byp) (AB-551, CC-52, Rm 250) to vent the PRT.</p> <p>STANDARD:</p> <p>Applicant dispatches operator to Rm 250 to slowly open 1NC-48.</p> <p>EXAMINER CUE: "Operator has been dispatched."</p> <p>EXAMINER NOTE: Booth operator will insert Event 1 to throttle open 1NC-48.</p> <p>EXAMINER CUE: "Time compression. 1NC-48 is throttled open."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 18: 2.8 IF Step 2.1 was performed, establish PRT level at 75% per Enclosure 4.2 (Adjusting Pressurizer Relief Tank Level).</p> <p>STANDARD:</p> <p>Applicant determines that this step is N/A.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 19: 2.9 WHEN the desired PRT pressure is reached, close 1NC-48 (PRT Gas Smpl Vessel Byp).</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">When desired pressure is reached, applicant will direct dispatched operator to close 1NC-48.</p> <p><u>EXAMINER NOTE:</u> When PRT pressure decreases to 3 PSIG, then PRT pressure regulating valve from the GN system (1NC-52) will maintain pressure at 3 PSIG.</p> <p><u>EXAMINER NOTE:</u> Booth operator will insert Event 3 to close 1NC-48.</p> <p><u>EXAMINER CUE:</u> "1NC-48 is closed."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 20: 2.10 Notify Radwaste Chemistry that venting of the PRT is complete.</p> <p><u>STANDARD:</u></p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant notifies Radwaste Chemistry that PRT venting is complete.</p> <p><u>EXAMINER CUE:</u> "This is Steve in Radwaste Chemistry. I understand that PRT venting is complete."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 21:</u> 2.11 <u>IF</u> necessary, repressurize the PRT as follows:</p> <p><u>STANDARD:</u></p> <div style="background-color: #cccccc; padding: 2px; margin: 5px 0;">Applicant should determine that this step is N/A.</div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>NOTE: At this point, the PRT has been returned to normal alignment per Enclosure 4.1 (Establishing Normal Operating Conditions).</p>	
<p><u>STEP 22:</u> 2.12 Do <u>NOT</u> file this enclosure in the Control Copy folder of this procedure.</p> <p><u>STANDARD:</u></p> <div style="background-color: #cccccc; padding: 2px; margin: 5px 0;">Applicant would route this enclosure.</div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>EXAMINER NOTE:</u> Applicant will now return to Enclosure 4.2 step 2.3.3.4.</p>	

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<p><u>STEP 23:</u> 2.3.3.4 WHEN PRT pressure has been reduced to 3 psig, return to Step 2.3.1.</p> <p><u>STANDARD:</u></p> <p>Applicant returns to step 2.3.1.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 24:</u> 2.3.1 Open the following valves to align the RMWST to the PRT:</p> <ul style="list-style-type: none"> • 1NC-58A (PRT Spray Supply Isol) • 1NC-56B (RMW Pump Disch Cont Isol) <p><u>STANDARD:</u></p> <p>Applicant depresses the red OPEN pushbutton and verifies the red OPEN light lit and green CLSD light dark on valves 1NC-58A and 1NC-56B.</p> <p>This step is critical because these valves need to be opened to align a flowpath for makeup to the PRT.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 25:</u> 2.3.2 Start a Reactor Makeup Water pump:</p> <ul style="list-style-type: none"> • "RX M/U WTR PUMP 1A" <li style="text-align: center;">OR • "RX M/U WTR PUMP 1B" <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant turns control switch for 1A or 1B reactor makeup water pump in the clockwise direction to the ON position and verifies the red light lit and green light dark.</p> <p>This step is critical to provide makeup flow to the PRT.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
<p><u>STEP 26:</u> 2.3.3 IF at any time while raising PRT level PRT pressure increases to 6 psig, as indicated on 1NCP-5130 (PRT Press, complete the following steps:</p> <p><u>STANDARD:</u></p> <p style="background-color: #cccccc;">Applicant determines that this step does not apply now and continues with the enclosure.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>

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<p>STEP 27: 2.3.4 WHEN the desired level is reached, stop the reactor makeup water pump.</p> <p>STANDARD:</p> <p>When 72 % level in the PRT is reached, applicant stops the reactor makeup water pump started in step 2.3.2 and verifies the green light lit and red light dark.</p> <p>This step is critical to return the PRT to a normal lineup per Encl. 4.1.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p><input type="checkbox"/> SAT</p> <p><input type="checkbox"/> UNSAT</p>
<p>STEP 28: 2.3.5 Close the following valves:</p> <ul style="list-style-type: none"> • 1NC-58A (PRT Spray Supply Isol) • 1NC-56B (RMW Pump Disch Cont Isol) <p>STANDARD:</p> <p>Applicant depresses the green CLOSE pushbutton and verifies the red OPEN light dark and green CLSD light lit on valves 1NC-58A and 1NC-56B.</p> <p>This step is critical to return the PRT to a normal lineup per Encl. 4.1.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p><input type="checkbox"/> SAT</p> <p><input type="checkbox"/> UNSAT</p>

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<p><u>STEP 29:</u> 2.3.6 Align the reactor makeup water pump used in this section as required per OP/1/A/6150/009 (Boron Concentration Control).</p> <p><u>STANDARD:</u></p> <p>Applicant places reactor makeup water pump control switch stopped in step 2.3.4 in the AUTO position.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 30:</u> 2.4 IF level in the PRT is to be lowered, complete the following steps:</p> <p><u>STANDARD:</u></p> <p>Applicant determines that this step is N/A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 31:</u> 2.5 Do NOT file this enclosure in the Control Copy folder of this procedure.</p> <p><u>STANDARD:</u></p> <p>Applicant will route the enclosure.</p> <p><u>COMMENTS:</u></p> <p>END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. PRT level is low at
2. PRT pressure is reading 5.2 PSIG.

INITIATING CUES:

1. CRS directs you to increase PRT level to 72% per OP/1/A/6150/004 (Pressurizer Relief Tank) Encl. 4.2.
2. Initial conditions have been previously verified and signed off.
3. Valves are aligned per Enclosures 4.7 and 4.8 of OP/1/A/6150/004.

Duke Energy
Catawba Nuclear Station
Pressurizer Relief Tank

Procedure No.

OP/1/A/6150/004

Revision No.

026

Electronic Reference No.

CN005FKQ

Continuous Use

PERFORMANCE

***** UNCONTROLLED FOR PRINT *****

(ISSUED) - PDF Format

1. Initial Conditions

- _____ 1.1 Review the Limits and Precautions.
- _____ 1.2 **IF** level is to be increased, verify Reactor Makeup Water is available per OP/1/A/6200/012 (Reactor Makeup Water).
- _____ 1.3 **IF** level is to be decreased, verify draining the deep end of the refueling cavity per OP/1/A/6200/013 (Filling, Draining, and Purification of Refueling Cavity) is **NOT** in progress.
- _____ 1.4 **IF** level is to be decreased, verify the NCDT is in operation per OP/1/A/6500/014 (Operations Controlled Liquid Waste Systems).
- _____ 1.5 **IF** level is to be decreased, verify one of the following:
 - An N₂ overpressure is being supplied to the PRT.
 - The PRT is vented through 1NC-101 (N₂ To PRT Test Vent).
 - The PRT is vented through 1NC-51 (PZR Relief Tank Vent To Atmosphere Isol).

2. Procedures

- _____ 2.1 Ensure valves are aligned per Enclosure 4.7 (Valve Checklist).
- _____ 2.2 Ensure valves are independently verified per Enclosure 4.8 (Independent Verification Valve Checklist).
- _____ 2.3 **IF** level in the PRT is to be raised, complete the following steps:
 - 2.3.1 Open the following valves to align the RMWST to the PRT:
 - _____ • 1NC-58A (PRT Spray Supply Isol)
 - _____ • 1NC-56B (RMW Pump Disch Cont Isol)
 - _____ 2.3.2 Start a Reactor Makeup Water pump:
 - "RX M/U WTR PUMP 1A"
 - OR
 - "RX M/U WTR PUMP 1B"

Enclosure 4.2

OP/1/A/6150/004

Page 2 of 2

Adjusting Pressurizer Relief Tank Level

- _____ 2.3.3 **IF** at any time while raising PRT level PRT pressure increases to 6 psig, as indicated on 1NCP-5130 (PRT Press, complete the following steps:
- _____ 2.3.3.1 Stop the reactor makeup water pump.
- _____ 2.3.3.2 Close the following valves:
- _____ • 1NC-58A (PRT Spray Supply Isol)
 - _____ • 1NC-56B (RMW Pump Disch Cont Isol)
- _____ 2.3.3.3 Vent the PRT per Enclosure 4.5 (Venting the Pressurizer Relief Tank).
- _____ 2.3.3.4 **WHEN** PRT pressure has been reduced to 3 psig, return to Step 2.3.1.
- _____ 2.3.4 **WHEN** the desired level is reached, stop the reactor makeup water pump.
- _____ 2.3.5 Close the following valves:
- _____ • 1NC-58A (PRT Spray Supply Isol)
 - _____ • 1NC-56B (RMW Pump Disch Cont Isol)
- _____ 2.3.6 Align the reactor makeup water pump used in this section as required per OP/1/A/6150/009 (Boron Concentration Control).
- _____ 2.4 **IF** level in the PRT is to be lowered, complete the following steps:
- _____ 2.4.1 Notify Radwaste Chemistry that the PRT level will be lowered.
Person notified _____
- _____ 2.4.2 Open 1NC-107 (PRT To NCDT Pmps Suct).
- _____ 2.4.3 **WHEN** the desired level is reached, close 1NC-107 (PRT To NCDT Pmps Suct).
- 2.5 Do **NOT** file this enclosure in the Control Copy folder of this procedure.

Duke Energy
Catawba Nuclear Station
Pressurizer Relief Tank

Procedure No.

OP/1/A/6150/004

Revision No.

026

Electronic Reference No.

CN005FKQ

Continuous Use

PERFORMANCE

***** UNCONTROLLED FOR PRINT *****

(ISSUED) - PDF Format

1. Initial Conditions

- 1.1 Review the Limits and Precautions.
- 1.2 Verify the PRT is in operation per Enclosure 4.1 (Establishing Normal Operating Conditions).
- 1.3 Verify the WG System is available for PRT venting per OP/0/A/6500/003 (Radwaste Chemistry Operating Procedure for the Gaseous Waste (WG) System).

2. Procedure

- 2.1 **IF** pressure in the PRT is greater than 8 psig, lower level in the PRT per Enclosure 4.2 (Adjusting Pressurizer Relief Tank Level) until pressure is less than 8 psig.
- 2.2 **IF** the GN System is the N₂ supply, close 1GN-96 (N₂ Supply To Unit 1 PRT) (AB-543, EE-543, Rm 217).
- 2.3 **IF** Waste Gas Shutdown Decay Tank "B" is the N₂ supply, notify Radwaste Chemistry to isolate the flow path.
Person notified _____
- 2.4 Notify Radwaste Chemistry to align the WG System for venting the PRT to the WG System per OP/0/A/6500/003 (Radwaste Chemistry Operating Procedure for the Gaseous Waste (WG) System).
Person notified _____
- 2.5 Verify the following valves are open:
 - • 1NC-53B (N₂ To PRT Cont Isol)
 - • 1NC-54A (N₂ To PRT Cont Isol)
- 2.6 Coordinate the following step with Radwaste Chemistry.
Person notified _____

NOTE: In the following step, opening 1NC-48 (PRT Gas Smpl Vessel Byp) too fast may result in tripping the WG Compressor.

- 2.7 While in contact with Radwaste, slowly open 1NC-48 (PRT Gas Smpl Vessel Byp) (AB-551, CC-52, Rm 250) to vent the PRT.
- 2.8 **IF** Step 2.1 was performed, establish PRT level at 75% per Enclosure 4.2 (Adjusting Pressurizer Relief Tank Level).
- 2.9 **WHEN** the desired PRT pressure is reached, close 1NC-48 (PRT Gas Smpl Vessel Byp).

Enclosure 4.5

Venting the Pressurizer Relief Tank

OP/1/A/6150/004

Page 2 of 2

- ____ 2.10 Notify Radwaste Chemistry that venting of the PRT is complete.
Person notified _____

NOTE: If the Primary System is being opened, the PRT shall **NOT** be repressurized.

- ____ 2.11 **IF** necessary, repressurize the PRT as follows:

____ 2.11.1 **IF** the GN System is available, open 1GN-96 (N₂ Sup To Unit 1 PRT) (AB-543, EE-53, Rm 217) to supply N₂ overpressure to the PRT.

____ 2.11.2 **IF** the GN System is unavailable, notify Radwaste Chemistry to align Waste Gas Shutdown Decay Tank "B" to supply N₂ overpressure to the PRT.
Person notified _____

____ 2.11.3 Verify the PRT pressure is being maintained at 3 psig.

NOTE: At this point, the PRT has been returned to normal alignment per Enclosure 4.1 (Establishing Normal Operating Conditions).

- 2.12 Do **NOT** file this enclosure in the Control Copy folder of this procedure.

Catawba Nuclear Station

JPM I

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JPM I

Start MG Set 1A Per OP/1/A/6150/008

Catawba Nuclear Station
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EVALUATION SHEET

Task: Start MG set 1A per OP/1/A/6150/008 (Rod Control) Encl. 4.2.

Alternate Path: None.

Facility JPM #: IRE-103

Safety Function: 1 **Title:** Control Rod Drive System

K/A 001 A4.08 Ability to manually operate and/or monitor in the control room: operation of rod control M/G sets and control panel.

Rating(s): 3.7 / 3.4 **CFR:** 41.7 / 45.5 to 45.8

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator _____ In-Plant X Perform _____ Simulate X

References: OP/1/A/6150/008 (Rod Control) Encl. 4.2 (First Motor-Generator Startup)

Task Standard: M/G set 1A placed in service with the Motor and Generator circuit breakers closed and voltage at 260V.

Validation Time: 10 minutes **Time Critical:** Yes _____ No X

=====

Applicant: NAME _____ Docket # _____ Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

Catawba Nuclear Station

JPM I

Dec. 2010 NRC Exam

READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 1 startup is in progress.
2. All sign-offs for Mode 2 are complete.

INITIATING CUES:

1. The CRS instructs you to start M/G set 1A per Encl. 4.2 of OP/1/A/6150/008 (Rod Control).
2. The initial conditions of Encl. 4.2 have been satisfied.

EXAMINER NOTE: After reading the initiating cue, provide applicant with a copy of OP/1/A/6150/008 Encl. 4.2 with the initial conditions signed off.

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START TIME: _____

<p><u>STEP 1:</u> 3.1 Ensure the M-G set "VOLTAGE ADJUST" potentiometer is set at the mid point.</p> <p><u>STANDARD:</u></p> <p>Applicant verifies the white line in the upper left corner is aligned with "5" on the "Voltage Adjust Potentiometer".</p> <p><u>EXAMINER NOTE:</u> There is a locking device on the potentiometer.</p> <p><u>EXAMINER CUE:</u> "Voltage adjust is set at midpoint."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> 3.2 Verify the "SYNCHRONIZE" switch is in the "OFF" position.</p> <p><u>STANDARD:</u></p> <p>Applicant determines the key alignment tab is in line with the OFF position.</p> <p><u>EXAMINER CUE:</u> "SYNCHRONIZE switch is in the OFF position."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 3:</u> 3.3 Ensure the voltmeter switch is in position "A-B".</p> <p><u>STANDARD:</u></p> <p>Applicant places the voltmeter switch handle to the "A-B" position.</p> <p><u>EXAMINER CUE:</u> "Voltmeter switch handle is in the A-B position."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 3.4 Ensure the ammeter switch is in position "A".</p> <p><u>STANDARD:</u></p> <p>Applicant places the ammeter switch handle to position "A".</p> <p><u>EXAMINER CUE:</u> "Ammeter switch handle is in position A."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 5: 3.5 For the M-G set to be put in operation, turn the "MOTOR" circuit breaker control switch to the "CLOSE" position.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;"> Applicant turns the "MOTOR" circuit breaker control switch to the "CLOSE" position for 1A M/G set and verifies the red CLOSED light lit and green OPEN light dark. </div> <p><u>EXAMINER CUE:</u> "M/G set 1A red CLOSED light is lit, there is a sound of breaker closing, and M/G set is heard coming up to speed."</p> <p>This step is critical because it starts the M/G set motor.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 6: 3.6 Allow 15 seconds to obtain full rated speed.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;"> Applicant waits 15 seconds before continuing. </div> <p><u>EXAMINER CUE:</u> "15 seconds have elapsed."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>NOTE: If this procedure is being performed to support an uncoupled run of the M-G Set motor only, then the remaining steps of this enclosure may be N/A'd.</p> <p>Step 2.7.1 may be signed off after releasing the "GEN. FIELD FLASH" pushbutton.</p>	

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<p>STEP 7: 3.7 Establish initial field voltage as follows:</p> <p>3.7.1 Depress and hold the "GEN. FIELD FLASH" pushbutton until the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Generator voltage increases to approximately 260 volts on "GENERATOR LINE VOLTS" voltmeter. <input type="checkbox"/> Generator voltage stabilizes. <p>STANDARD:</p> <p style="background-color: #e0e0e0;">Applicant depresses and holds the "GEN FIELD FLASH" pushbutton, looks for voltage to increase to 260 volts, and for voltage to stabilize.</p> <p>EXAMINER CUE: "GEN FIELD FLASH button has been depressed. Generator voltage is 260 volts and stable on the GENERATOR LINE VOLTS voltmeter."</p> <p>This step is critical because it flashes the generator field necessary for the M/G set to produce proper voltage.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 8: 3.7.2 IF necessary, turn the "VOLTAGE ADJUST" to obtain 260 VAC on the "GENERATOR LINE VOLTS" voltmeter.</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0;">Applicant verifies generator voltage has increased to 260 volts on "GENERATOR LINE VOLTS" voltmeter.</p> <p>EXAMINER CUE: "GENERATOR LINE VOLTS indicates 260 volts."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 9: 3.8 Turn the "GENERATOR" circuit breaker control switch to the "CLOSE" position.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant rotates the "GENERATOR" circuit breaker control switch to the CLOSE position and verifies the red CLOSED light is lit and green OPEN light is dark. </div> <p><u>EXAMINER CUE:</u> "GENERATOR circuit breaker red CLOSED light is lit."</p> <p>This step is critical because it closes the generator breaker, placing the M/G set in service.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 10: 3.9 File this enclosure in the Control Copy folder of this procedure.</p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant states they will file the enclosure in the Control Copy folder of the procedure. </div> <p><u>EXAMINER CUE:</u> "Enclosure has been filed in the proper folder."</p> <p><u>COMMENTS:</u></p> <p style="text-align: center; margin-top: 20px;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 1 startup is in progress.
2. All sign-offs for Mode 2 are complete.

INITIATING CUES:

1. The CRS instructs you to start M/G set 1A per Encl. 4.2 of OP/1/A/6150/008 (Rod Control).
2. The initial conditions of Encl. 4.2 have been satisfied.

Duke Energy
Catawba Nuclear Station
Rod Control

Procedure No.

OP/1/A/6150/008

Revision No.

058

Electronic Reference No.

CN005FKS

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Enclosure 4.2
First Motor-Generator Set Startup

OP/1/A/6150/008
Page 1 of 2

1. Limits and Precautions

- 1.1 Two or more control rod drive ventilation fans shall be in operation when either reactor coolant temperature is $\geq 350^{\circ}\text{F}$ or control rod drive mechanisms are energized.
- 1.2 Prior to operation of CRDMs, NC System must be filled and vented with NC System pressure > 300 psig.
- 1.3 If the Rod Control System is capable of rod withdrawal with the Unit in Mode 3, then at least three RCS loops shall be in operation. Refer to TS 3.4.5.

2. Initial Conditions

- 2.1 Verify both M-G Sets are de-energized by the following circuit breakers tripped as shown by the green indicating lights: {PIP 96-1045}
 - ☐ M/G Set 1A "MOTOR" breaker
 - ☐ M/G Set 1A "GENERATOR" breaker
 - ☐ M/G Set 1B "MOTOR" breaker
 - ☐ M/G Set 1B "GENERATOR" breaker
- 2.2 Verify both generator breakers are in their respective compartments and "RACKED IN".
- 2.3 Verify that the red flags in the relay compartments for the following are **NOT** showing:
 - ☐ "M/G Set 1A" (Generator No. 1)
 - ☐ "M/G SET 1B" (Generator No. 2)
- 2.4 **IF** the red relay flags are showing, then:
 - ☐ 2.4.1 Depress the "RELAY FLAG RESET" pushbutton.
 - ☐ 2.4.2 Reset the red flag shown in the Relay compartment.
 - ☐ 2.4.3 Reset the "OC TRIP SWITCH" on the Generator Breaker to clear the flags.

3. Procedure

- 3.1 Ensure the M-G set "VOLTAGE ADJUST" potentiometer is set at the mid point.
- 3.2 Verify the "SYNCHRONIZE" switch is in the "OFF" position.
- 3.3 Ensure the voltmeter switch is in position "A-B".
- 3.4 Ensure the ammeter switch is in position "A".

First Motor-Generator Set Startup

- 3.5 For the M-G set to be put in operation, turn the "MOTOR" circuit breaker control switch to the "CLOSE" position.
- 3.6 Allow 15 seconds to obtain full rated speed.

NOTE:

- If this procedure is being performed to support an uncoupled run of the M-G Set motor only, then the remaining steps of this enclosure may be N/A'd.
- Step 3.7.1 may be signed off after releasing the "GEN. FIELD FLASH" pushbutton.

3.7 Establish initial field voltage as follows:

- 3.7.1 Depress and hold the "GEN. FIELD FLASH" pushbutton until the following:
- ☐ Generator voltage increases to approximately 260 volts on "GENERATOR LINE VOLTS" voltmeter.
 - ☐ Generator voltage stabilizes.

3.7.2 **IF** necessary, turn the "VOLTAGE ADJUST" to obtain 260 VAC on the "GENERATOR LINE VOLTS" voltmeter.

3.8 Turn the "GENERATOR" circuit breaker control switch to the "CLOSE" position.

3.9 File this enclosure in the Control Copy folder of this procedure.

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JPM J
Place 1B Hydrogen Recombiner In Service

**Catawba Nuclear Station
JPM J
Dec. 2010 NRC Exam**

EVALUATION SHEET

Task: Place 1B hydrogen recombiner in service per OP/1/A/6450/010 (Containment Hydrogen Control System) Encl. 4.10.

Alternate Path: None.

Facility JPM #: VX-025

Safety Function: 5 **Title:** Hydrogen Recombiner and Purge Control System

K/A 028 A2.01 Malfunctions or operations on the HRPS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Hydrogen recombiner power setting, determined by using plant data book.

Rating(s): 3.4 / 3.6 **CFR:** 41.5 / 43.5 / 45.3 / 45.13

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator _____ In-Plant X Perform _____ Simulate X

References: OP/1/A/6450/010 (Containment Hydrogen Control System) encl. 4.10.

Task Standard: Hydrogen recombiner 1B is placed in service with the Power Adjust "POT" set to approximately 58 KW per figure 10 in the revised Data Book.

Validation Time: 15 minutes **Time Critical:** Yes _____ No X

=====

Applicant: NAME Docket # Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

=====

COMMENTS

**Catawba Nuclear Station
JPM J
Dec. 2010 NRC Exam**

READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A LOCA has occurred on Unit 1.
2. Hydrogen Recombiner 1A is tagged out for maintenance.

INITIATING CUES:

1. The CRS directs you to place Hydrogen Recombiner 1B in service at the required power per OP/1/A/6450/010 (Containment Hydrogen Control System) Encl. 4.10, steps 2.1 through 2.3.
2. All initial conditions are complete.
3. Containment hydrogen concentration is 5%.
4. Containment pressure is 4.5 PSIG.

EXAMINER NOTE: After reading cue provide applicant with a copy of OP/1/A/6450/010 (Containment Hydrogen Control System) Encl. 4.10 with the initial conditions signed off.

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START TIME: _____

<p>STEP 1: 3.1 Ensure the H2 Skimmer Fans running per Enclosure 4.13 (Emergency Manual Operation of the H2 Skimmer Fans).</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant can sign this step off after providing EXAMINER CUE.</p> <p>EXAMINER CUE: "1A and 1B Hydrogen Skimmer fans are in operation."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>CAUTION: The maximum electric hydrogen recombiner heater temperature is 1400°F.</p> <p>NOTE:</p> <ol style="list-style-type: none"> 1. Temperature stabilization may take up to 5 hours. The heater temperatures are considered stabilized when the channels are within 60°F of each other and the average temperature is $\geq 1225^{\circ}\text{F}$. (CNM-1399.36-0010) 2. Hydrogen Recombiner Heater 1A Temperature is monitored from 1VXCR5000 (Train A Hydrogen Recombiner Heater Temperature Recorder) located on 1ELCP0299 (AB-577, DD-52, Rm 494). 3. 1VXCR5000 is a touch screen video monitor. Touching the screen while in screen saver mode will display the main menu. The thermocouple temperatures will be displayed when the "Digital" icon is selected. The "Return" icon on the lower left of the screen returns to the main menu. 	
<p>STEP 2: 3.2 IF placing Hydrogen Recombiner 1A in service, perform the following at 1ELCP0139 (1A Hydrogen Recombiner Control Panel) (AB-577, DD-52, Rm 494):</p> <p>STANDARD:</p> <p style="background-color: #e0e0e0; padding: 5px;">Applicant determines that this step is N/A.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 3: 3.3 <u>IF</u> placing Hydrogen Recombiner 1B in service, perform the following at 1ELCP0140 1B Hydrogen Recombiner Control Panel) (AB-560, DD-52, Rm 370):</p> <p style="margin-left: 40px;">▫ 3.3.1 Ensure the "POWER OUT SWITCH" is in the "OFF" position.</p> <p>STANDARD:</p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant determines per initiating cue that 1B Hydrogen Recombiner will be placed in service and proceeds to Rm 370. Applicant ensures the POWER OUT SWITCH is in the OFF position on 1ELCP0140. </div> <p>EXAMINER CUE: "The POWER OUT SWITCH is in the OFF position."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 4: 3.3.2 Ensure the "POWER ADJUST" potentiometer is set to zero (000).</p> <p>STANDARD:</p> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> Applicant ensures the POWER ADJUST potentiometer is set to zero (000). </div> <p>EXAMINER CUE: "The POWER ADJUST pot is set to zero (000)."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 5: 3.3.3 <u>IF</u> the "POWER IN AVAILABLE" light is DARK, ensure 1EMXL-F07C (1B Electric Hydrogen Recombiner Power Supply Panel) (AB-560, BB-47) is in the "ON" position:</p> <p><u>STANDARD:</u></p> <p>Applicant determines the white POWER IN AVAILABLE light is lit, and from EXAMINER CUE will determine this step is N/A.</p> <p><u>EXAMINER CUE:</u> "The white POWER IN AVAILABLE light is lit."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 6: 3.3.4 Place the "POWER OUT SWITCH" in the "ON" position.</p> <p><u>STANDARD:</u></p> <p>Applicant places the POWER OUT SWITCH up to the ON position.</p> <p>This step is critical because it supplies power to the 1B Hydrogen Recombiner.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 7:</u> 3.3.5 Verify that the red indicating light is lit.</p> <p><u>STANDARD:</u></p> <p>Applicant verifies that the red light on the switch plate is lit.</p> <p><u>EXAMINER CUE:</u> "Red light on the switch plate is lit."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 8:</u> 3.3.6 Slowly turn the "POWER ADJUST" potentiometer clockwise until 5 KW is indicated on the "POWER OUT" meter.</p> <p><u>STANDARD:</u></p> <p>Applicant adjusts the potentiometer clockwise until 5 KW is indicated on the "POWER OUT" meter.</p> <p><u>EXAMINER CUE:</u> "The POWER OUT meter is indicating 5 KW."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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JPM J
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<p><u>STEP 9:</u> 3.3.7 Maintain a 5 KW output for 10 minutes.</p> <p><u>STANDARD:</u></p> <p>Applicant maintains 5 KW power output for 10 minutes.</p> <p><u>EXAMINER CUE:</u> "Using time compression, 10 minutes has elapsed."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 10:</u> 3.3.8 Slowly advance the "POWER ADJUST" setting until an output of 10 KW is obtained on the "POWER OUT" meter.</p> <p><u>STANDARD:</u></p> <p>Applicant adjusts the potentiometer clockwise until 10 KW is indicated on the "POWER OUT" meter.</p> <p><u>EXAMINER CUE:</u> "The POWER OUT meter indicates 10 KW."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 11:</u> 3.3.9 Maintain a 10 KW output for 10 minutes.</p> <p><u>STANDARD:</u></p> <p>Applicant maintains a 10 KW power output for 10 minutes.</p> <p><u>EXAMINER CUE:</u> "Using time compression, 10 minutes has elapsed."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 12:</u> 3.3.10 Advance the "POWER ADJUST" setting until an output of 20 KW is obtained on the "POWER OUT" meter.</p> <p><u>STANDARD:</u></p> <p>Applicant adjusts the potentiometer clockwise until 20 KW is indicated on the "POWER OUT" meter.</p> <p><u>EXAMINER CUE:</u> "The POWER OUT meter indicates 20 KW."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP 13: 3.3.11 Maintain a 20 KW output for 5 minutes.

STANDARD:

Applicant maintains a 20 KW power output for 5 minutes.

EXAMINER CUE: "Using time compression, 5 minutes have elapsed."

COMMENTS:

___ SAT

___ UNSAT

Catawba Nuclear Station

JPM J

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- STEP 14:** 3.3.12 Determine Hydrogen Recombiner 1B power setting as follows:
- 3.3.12.1 Determine KW value from Figure 10 of the Unit One Revised Data Book.
- 3.3.12.2 H2 concentration (1MC7) _____ %
- 3.3.12.3 **IF** H2 concentration is > 3.5%, add 4KW to calculation.
- 3.3.12.4 Calculate KW as follows:
- $$\frac{\text{3.3.12.1}}{\text{3.3.12.1}} + \frac{\text{3.3.12.3}}{\text{3.3.12.3}} = \text{_____ KW}$$

STANDARD:

Applicant determines proper setting from figure 10 of the Revised Data Book.

EXAMINER NOTE: Provide applicant with a copy of Revised Data Book figure 10.

EXAMINER NOTE: Applicant should determine proper power setting should be approximately 58 KW.

This step is critical because it determines the proper power output going to the Hydrogen Recombiner for the given containment pressure.

COMMENTS:

**CRITICAL
STEP**

___ SAT

___ UNSAT

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<p>STEP 15: 3.3.13 Advance the "POWER ADJUST" setting until the "POWER OUT" meter indicates the value calculated in 3.3.12.4. Adjust POWER ADJUST as necessary to maintain this output.</p> <p>STANDARD:</p> <div style="background-color: #cccccc; padding: 5px; margin: 10px 0;">Applicant adjusts the potentiometer until 58 KW is indicated on the "POWER OUT" meter.</div> <p>EXAMINER CUE: "The POWER OUT meter indicates approximately 58 KW."</p> <p>This step is critical because it sets the proper power output to the Hydrogen Recombiner that was calculated in the previous step.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 16: 3.3.14 Notify NCO that Hydrogen Recombiner 1B is now in service. Person notified _____</p> <p>STANDARD:</p> <div style="background-color: #cccccc; padding: 5px; margin: 10px 0;">Applicant notifies Unit 1 control room that 1B Hydrogen Recombiner is in service.</div> <p>EXAMINER CUE: "Unit 1 Control room, this is Greg. I understand that 1B Hydrogen Recombiner is in service. Another operator will complete this enclosure. This JPM is complete."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>END OF TASK</p>	

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A LOCA has occurred on Unit 1.
2. Hydrogen Recombiner 1A is tagged out for maintenance.

INITIATING CUES:

1. The CRS directs you to place Hydrogen Recombiner 1B in service at the required power per OP/1/A/6450/010 (Containment Hydrogen Control System) encl. 4.10, steps 2.1 through 2.3.
2. All initial conditions are complete.
3. Containment hydrogen concentration is 5%.
4. Containment pressure is 4.5 PSIG.

Duke Energy
Catawba Nuclear Station
Containment Hydrogen Control Systems

Procedure No.

OP/1/A/6450/010

Revision No.

042

Electronic Reference No.

CN005FMC

Continuous Use

PERFORMANCE

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Enclosure 4.10
Operation of the Hydrogen Recombiners
Following a LOCA

OP/1/A/6450/010
Page 1 of 7

1. Limits and Precautions

- 1.1 Hydrogen concentrations greater than 3.5% are combustible.
- 1.2 The maximum electric hydrogen recombiners heater temperature is 1400°F.
- 1.3 Coordination with TSC and OSC is required prior to performing the following enclosures:
 - Enclosure 4.9 (Operation of the Containment Hydrogen Analyzers Following a LOCA)
 - Enclosure 4.10 (Operation of the Hydrogen Recombiners Following a LOCA)
 - Enclosure 4.12 (Operation of the Containment Hydrogen Purge System Following a LOCA)
- 1.4 Hydrogen Recombiners and Hydrogen Ignitors are **NOT** operated with hydrogen concentration $\geq 6\%$ without TSC approval.

2. Initial Conditions

- 2.1 Verify operation of the Hydrogen Recombiner is required per appropriate emergency procedures.
- 2.2 Request RP coverage due to increasing radiation levels at Hydrogen Recombiner panels during a LOCA.
Person notified _____

3. Procedure

- 3.1 Ensure the H₂ Skimmer Fans running per Enclosure 4.13 (Emergency Manual Operation of the H₂ Skimmer Fans).

Enclosure 4.10
Operation of the Hydrogen Recombiners
Following a LOCA

OP/1/A/6450/010
Page 2 of 7

CAUTION: Hydrogen Recombiners are NOT operated with hydrogen concentration $\geq 6\%$ without TSC approval.

- NOTE:**
1. If desired to place both Hydrogen Recombiners in service, Steps 3.2 and 3.3 may be performed in conjunction.
 2. If desired to place both Hydrogen Recombiners in service, use additional Enclosure 4.11 (Hydrogen Recombiner Heater Temperature Log).
 3. Placing Hydrogen Recombiner 1A in service is preferred for ALARA consideration.

3.2 **IF** placing Hydrogen Recombiner 1A in service, perform the following at 1ELCP0139 (1A Hydrogen Recombiner Control Panel) (AB-577, DD-52, Rm 494):

☐ 3.2.1 Ensure the "POWER OUT SWITCH" is in the "OFF" position.

☐ 3.2.2 Ensure the "POWER ADJUST" potentiometer is set to zero (000).

3.2.3 **IF** the "POWER IN AVAILABLE" light is DARK, ensure 1EMXK-F07C (1A Electric Hydrogen Recombiner Power Supply Panel) (AB-577, BB-47) is in the "ON" position:

☐ 3.2.4 Place the "POWER OUT SWITCH" in the "ON" position

☐ 3.2.5 Verify that the red indicating light is lit.

☐ 3.2.6 Slowly turn the "POWER ADJUST" potentiometer clockwise until 5 KW is indicated on the "POWER OUT" meter.

☐ 3.2.7 Maintain a 5 KW output for 10 minutes.

☐ 3.2.8 Slowly advance the "POWER ADJUST" setting until an output of 10 KW is obtained on the "POWER OUT" meter.

☐ 3.2.9 Maintain a 10 KW output for 10 minutes.

☐ 3.2.10 Advance the "POWER ADJUST" setting until an output of 20 KW is obtained on the "POWER OUT" meter.

☐ 3.2.11 Maintain a 20 KW output for 5 minutes.

**Operation of the Hydrogen Recombiners
Following a LOCA**

3.2.12 Determine Hydrogen Recombiner 1A power setting as follows:

_____ 3.2.12.1 Determine KW value from Figure 10 of the Unit One Revised Data Book. _____ KW VALUE

_____ 3.2.12.2 H₂ concentration (1MC7) _____ %

_____ 3.2.12.3 **IF** H₂ concentration is > 3.5%, add 4KW to calculation.

_____ 3.2.12.4 Calculate KW as follows:
$$\frac{\text{Step 3.2.12.1}}{\text{Step 3.2.12.3 or N/A}} + \frac{\text{Step 3.2.12.3 or N/A}}{\text{Step 3.2.12.3 or N/A}} = \text{_____ KW}$$

_____ 3.2.13 Advance the "POWER ADJUST" setting until the "POWER OUT" meter indicates the value calculated in 3.2.12.4. Adjust "POWER ADJUST" as necessary to maintain this output.

_____ 3.2.14 Notify NCO that Hydrogen Recombiner 1A is now in service.
Person notified _____

CAUTION: The maximum electric hydrogen recombiner heater temperature is 1400°F.

- NOTE:**
1. Temperature stabilization may take up to 5 hours. The heater temperatures are considered stabilized when the channels are within 60°F of each other and the average temperature is ≥ 1225°F. (CNM-1399.36-0010)
 2. Hydrogen Recombiner Heater 1A Temperature is monitored from 1VXCR5000 (Train A Hydrogen Recombiner Heater Temperature Recorder) located on 1ELCP0299 (AB-577, DD-52, Rm 494).
 3. 1VXCR5000 is a touch screen video monitor. Touching the screen while in screen saver mode will display the main menu. The thermocouple temperatures will be displayed when the "Digital" icon is selected. The "Return" icon on the lower left of the screen returns to the main menu.

- ☐ 3.2.15 Record hourly the Hydrogen Recombiner 1A Heater Temperature for each of the three thermocouples on Enclosure 4.11 (Hydrogen Recombiner Heater Temperature Log) until stabilized.

Operation of the Hydrogen Recombiners
Following a LOCA

- ☐ 3.2.16 **WHEN** the Hydrogen Recombiner Heater 1A Temperature has stabilized per Enclosure 4.11 (Hydrogen Recombiner Heater Temperature Log), perform the following:
- _____ 3.2.16.1 **IF** the thermocouples are inaccurate, proceed to Step 3.2.17.
- ☐ 3.2.16.2 Adjust "POWER ADJUST" potentiometer as necessary to maintain recombination temperature of 1225-1400°F as read on 1VXCR5000 (Train A Hydrogen Recombiner Heater Temperature Recorder).
- ☐ 3.2.16.3 Verify the "POWER OUT" meter indicates \geq the value calculated in Step 3.2.12.4
- 3.2.17 Every 24 hours, measure containment hydrogen concentration **AND** adjust recombinder power for the duration of recombinder operation as follows:
- _____ 3.2.17.1 Determine KW value from Figure 10 of the Unit One Revised Data Book. _____ KW VALUE
- _____ 3.2.17.2 H₂ concentration (1MC7) _____ %
- _____ 3.2.17.3 **IF** H₂ concentration has increased by .5% **OR** is $> 3.5\%$, add 4KW to calculation.
- _____ 3.2.17.4 Calculate KW as follows:
- $$\frac{\text{Step 3.2.17.1}}{\text{Step 3.2.17.1}} + \frac{\text{Step 3.2.17.3 or N/A}}{\text{Step 3.2.17.3 or N/A}} = \text{_____ KW}$$
- _____ 3.2.17.5 Advance the "POWER ADJUST" setting until the "POWER OUT" meter indicates the value calculated in 3.2.17.4. Adjust "POWER ADJUST" as necessary to maintain this output.
- ☐ 3.2.17.6 Monitor Hydrogen Recombiner Heater Temperature per Steps 3.2.15 and 3.2.16 to prevent temperature from exceeding 1400°F.

**Operation of the Hydrogen Recombiners
Following a LOCA**

3.3 **IF** placing Hydrogen Recombiner 1B in service, perform the following at 1ELCP0140 1B Hydrogen Recombiner Control Panel) (AB-560, DD-52, Rm 370):

☐ 3.3.1 Ensure the "POWER OUT SWITCH" is in the "OFF" position.

☐ 3.3.2 Ensure the "POWER ADJUST" potentiometer is set to zero (000).

3.3.3 **IF** the "POWER IN AVAILABLE" light is DARK, ensure 1EMXL-F07C (1B Electric Hydrogen Recombiner Power Supply Panel) (AB-560, BB-47) is in the "ON" position:

☐ 3.3.4 Place the "POWER OUT SWITCH" in the "ON" position.

☐ 3.3.5 Verify that the red indicating light is lit.

☐ 3.3.6 Slowly turn the "POWER ADJUST" potentiometer clockwise until 5 KW is indicated on the "POWER OUT" meter.

☐ 3.3.7 Maintain a 5 KW output for 10 minutes.

☐ 3.3.8 Slowly advance the "POWER ADJUST" setting until an output of 10 KW is obtained on the "POWER OUT" meter.

☐ 3.3.9 Maintain a 10 KW output for 10 minutes.

☐ 3.3.10 Advance the "POWER ADJUST" setting until an output of 20 KW is obtained on the "POWER OUT" meter.

☐ 3.3.11 Maintain a 20 KW output for 5 minutes.

3.3.12 Determine Hydrogen Recombiner 1B power setting as follows:

3.3.12.1 Determine KW value from Figure 10 of the Unit One Revised Data Book.

3.3.12.2 H₂ concentration (1MC7) _____ %

3.3.12.3 **IF** H₂ concentration is > 3.5%, add 4KW to calculation.

3.3.12.4 Calculate KW as follows:

$$\frac{\text{Step 3.3.12.1}}{\text{Step 3.3.12.3 or N/A}} + \frac{\text{Step 3.3.12.3 or N/A}}{\text{Step 3.3.12.3 or N/A}} = \text{_____ KW}$$

3.3.13 Advance the "POWER ADJUST" setting until the "POWER OUT" meter indicates the value calculated in 3.3.12.4. Adjust "POWER ADJUST" as necessary to maintain this output.

3.3.14 Notify NCO that Hydrogen Recombiner 1B is now in service.
 Person notified _____

Enclosure 4.10
Operation of the Hydrogen Recombiners
Following a LOCA

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CAUTION: The maximum electric hydrogen recombiner heater temperature is 1400°F.

- NOTE:**
1. Temperature stabilization may take up to 5 hours. The heater temperatures are considered stabilized when the channels are within 60°F of each other and the average temperature is $\geq 1225^{\circ}\text{F}$. (CNM-1399.36-0010)
 2. Hydrogen Recombiner Heater 1B Temperature is monitored from 1VXCR5500 (Train B Hydrogen Recombiner Heater Temperature Recorder) located on 1ELCP0300 (AB-560, DD-52, Rm 370).
 3. 1VXCR5500 is a touch screen video monitor. Touching the screen while in screen saver mode will display the main menu. The thermocouple temperatures will be displayed when the "Digital" icon is selected. The "Return" icon on the lower left of the screen returns to the main menu.

- ☐ 3.3.15 Record hourly the Hydrogen Recombiner Heater 1B Temperature for each of the three thermocouples on Enclosure 4.11 (Hydrogen Recombiner Heater Temperature Log), until stabilized.
- ☐ 3.3.16 **WHEN** the Hydrogen Recombiner Heater 1B Temperature has stabilized per Enclosure 4.11 (Hydrogen Recombiner Heater Temperature Log), perform the following:
- _____ 3.3.16.1 **IF** the thermocouples are inaccurate, proceed to Step 3.3.17.
- ☐ 3.3.16.2 Adjust "POWER ADJUST" potentiometer as necessary to maintain recombination temperature of 1225-1400°F as read on 1VXCR5500 (Train B Hydrogen Recombiner Heater Temperature Recorder).
- ☐ 3.3.16.3 Verify the "POWER OUT" meter indicates \geq the value calculated in Step 3.3.12.4.

Enclosure 4.10
Operation of the Hydrogen Recombiners
Following a LOCA

OP/1/A/6450/010
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3.3.17 Every 24 hours, measure containment hydrogen concentration **AND** adjust recombining power for the duration of recombining operation as follows:

_____ 3.3.17.1 Determine KW value from Figure 10 of the Unit One Revised Data Book. _____ KW VALUE

_____ 3.3.17.2 H₂ concentration (1MC7) _____ %

_____ 3.3.17.3 **IF** H₂ concentration has increased by .5% **OR** is > 3.5%, add 4KW to calculation.

_____ 3.3.17.4 Calculate KW as follows:
$$\frac{\text{Step 3.3.17.1}}{\text{Step 3.3.17.3 or N/A}} + \frac{\text{Step 3.3.17.3 or N/A}}{\text{Step 3.3.17.3 or N/A}} = \text{_____ KW}$$

_____ 3.3.17.5 Advance the "POWER ADJUST" setting until the "POWER OUT" meter indicates the value calculated in 3.3.17.4. Adjust "POWER ADJUST" as necessary to maintain this output.

☐ 3.3.17.6 Monitor Hydrogen Recombiner Heater Temperature per Steps 3.3.15 and 3.3.16 to prevent temperature from exceeding 1400°F.

_____ 3.4 **IF** operation of Hydrogen Recombiner 1A is no longer required, perform the following on panel 1ELCP0139 (1A Hydrogen Recombiner Power Control Panel):

_____ 3.4.1 Turn the "POWER ADJUST" potentiometer on the control panel to zero (000).

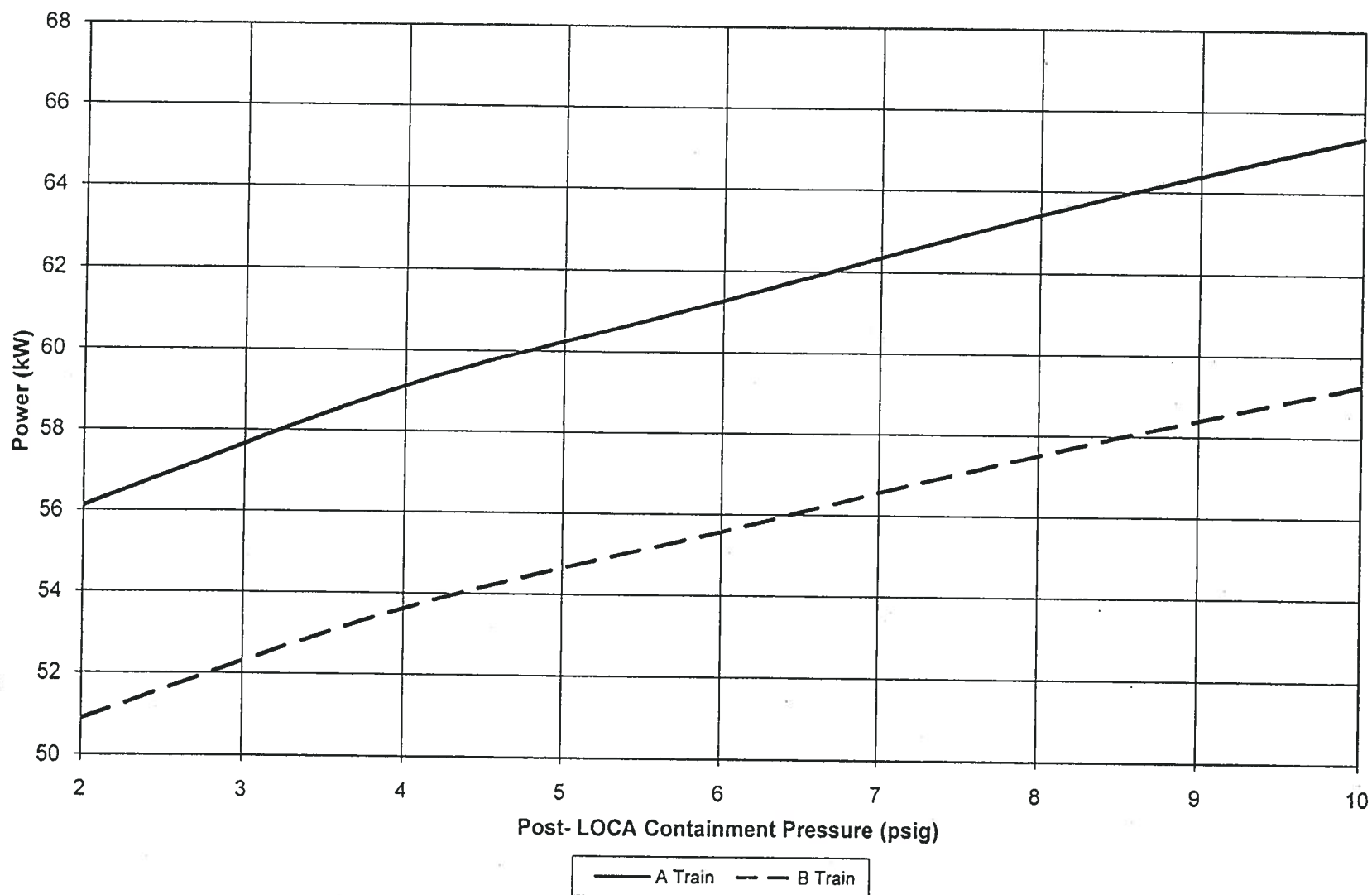
_____ 3.4.2 Place the "POWER OUT SWITCH" on the control panel in the "OFF" position.

_____ 3.5 **IF** operation of Hydrogen Recombiner 1B is no longer required, perform the following on panel 1ELCP0140 (1B Hydrogen Recombiner Power Control Panel):

_____ 3.5.1 Turn the "POWER ADJUST" potentiometer on the control panel to zero (000).

_____ 3.5.2 Place the "POWER OUT SWITCH" on the control panel in the "OFF" position.

3.6 Do **NOT** file this enclosure in the Control Copy folder of this procedure.



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**JPM K
2B D/G Start Using AP/2/A/5500/007**

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Dec. 2010 NRC Exam**

EVALUATION SHEET

Task: 2B D/G local start using AP/2/A/5500/007 (Loss of Normal Power).

Alternate Path: Yes.

Facility JPM #: DG3-009

Safety Function: 6 **Title:** Emergency Diesel Generators

K/A 064 A4.01 Ability to manually operate and/or monitor in the control room: Local and remote operation of the ED/G.

Rating(s): 4.0 / 4.3 **CFR:** 41.7 / 45.5 to 45.8

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator _____ In-Plant X Perform _____ Simulate X

References: AP/2/A/5500/007 (Loss of Normal Power) Encl. 11.

Task Standard: 2B D/G started locally. When it is discovered that no cooling water is available, the D/G is shutdown.

Validation Time: 16 minutes **Time Critical:** Yes _____ No X

=====

Applicant: NAME _____ Docket # _____ Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

=====

COMMENTS

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 2 has experienced a loss of all AC power to 2ETB.
2. The reason for the loss of AC power has been corrected.
3. 2ETB load shed is complete.

INITIATING CUES:

1. The control room has instructed you to energize 2ETB from 2B D/G by performing AP/2/A/5500/007 (Loss of Normal Power) Enclosure 11.
2. Peer checks have been waived for this task.

EXAMINER NOTE: After reading initiating cue, provide applicant with a copy of AP/2/A/5500/007 (Loss of Normal Power) Enclosure 11.

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START TIME: _____

<p><u>STEP 1:</u> 1. Obtain the following:</p> <p><input type="checkbox"/> Key #757 (2A/2B D/G Test Start Switch) from WCC Key Locker</p> <p><input type="checkbox"/> Flashlight.</p> <p><u>STANDARD:</u></p> <p>Applicant states that they would obtain key #757 from the WCC and a flashlight.</p> <p><u>EXAMINER CUE:</u> "Key #757 and flashlight have been obtained."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2:</u> 2. Do not continue in this enclosure until notified that load shed of 2ETB is complete.</p> <p><u>STANDARD:</u></p> <p>Applicant determines from initiating cue that the load shed is complete.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 3:</u> 3. Locally start D/G 2B as follows:</p> <p style="padding-left: 40px;">a. Notify Control Room Operator to place the "D/G 2B CTRL LOCATION" switch on 2MC11 in the "LOCAL" position.</p> <p><u>STANDARD:</u></p> <p style="background-color: #d3d3d3; padding: 5px;">Applicant notifies the control room to place 2B D/G control location to the LOCAL position.</p> <p><u>EXAMINER CUE:</u> When requested "Control room operator reports that 2B D/G control location is in the LOCAL position."</p> <p>This step is critical because it must be performed in order for the D/G to be started locally.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> 3b. <u>IF</u> unable to transfer diesel to Local Control, <u>THEN</u> actuate the "CONTROL ROOM OVERRIDE" at the breakglass station on 2DGCPB.</p> <p><u>STANDARD:</u></p> <p style="background-color: #d3d3d3; padding: 5px;">Applicant determines that this step is N/A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 5: 3c. Place the key in the "MANUAL TEST START" keyswitch and turn to the "START" position.</p> <p>STANDARD:</p> <p>Applicant places key in the MANUAL TEST START keyswitch and rotates the key clockwise to the START position. Applicant listens for the D/G to start and come up to normal rated speed.</p> <p>EXAMINER CUE: "The Diesel has started."</p> <p>This step is critical because it must be performed to locally start the D/G and meet the JPM standard.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 6: 3d. Ensure "SPEED CONTROL" is adjusted to obtain frequency of between 58.8 and 61.2 Hz.</p> <p>STANDARD:</p> <p>Applicant locates the D/G frequency meter and indicates they are looking for between 58.8 and 61.2 Hz.</p> <p>EXAMINER CUE: "Frequency is reading 60 Hz."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p>STEP 7: 3e. Ensure "VOLTAGE CONTROL" is adjusted to obtain "D/G VOLTAGE" between 4160 and 4600 Volts.</p> <p>STANDARD:</p> <p>Applicant locates the D/G voltage meter and explains that he is looking for voltage to be between 4160 and 4600 Volts.</p> <p>EXAMINER CUE: "Voltage is 4000 Volts."</p> <p>After examiner cue is given, applicant uses the VOLTAGE CONTROL RAISE pushbutton to increase voltage into the desired band.</p> <p>EXAMINER CUE: "Voltage is 4200 Volts."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 8: 4. WHEN the D/G is running, THEN close "DIESEL GENERATOR 2B" breaker.</p> <p>STANDARD:</p> <p>Applicant indicates that the D/G is running at proper frequency and voltage, and closes 2B D/G breaker by depressing the red CLOSE pushbutton and verifying the red CLSD light is lit and green OPEN light is dark on DIESEL GEN BKR 2ETB18 CLOSE/TRIP switch.</p> <p>EXAMINER CUE: "Red CLSD light is lit."</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 9:</u> 5. <u>IF</u> D/G breaker will not close, <u>THEN:</u></p> <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;">Applicant determines that this step is N/A.</div> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 10:</u> 6. Close the following essential load center normal incoming breakers:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 2ELXB-4B (Normal Incoming Breaker Fed From Xfmr 2ETXB) (AB-560, AA-67, Rm 362) <input type="checkbox"/> 2ELXD-4B (Normal Incoming Breaker Fed from Xfmr 2ETXD) (AB-560, AA-68, Rm 362). <p><u>STANDARD:</u></p> <div style="background-color: #e0e0e0; padding: 5px; margin: 5px 0;">Applicant closes breakers 2ELXB-4B and 2ELXD-4B by rotating the CLOSE/TRIP handles clockwise to the CLOSE position and verifying the red light is lit and green light dark for these breakers and hearing the breaker closing.</div> <p><u>EXAMINER CUE:</u> "Breakers are closed."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 11:</u> 7. Ensure RN flow through the KD Hx as follows:</p> <p style="padding-left: 40px;">a. Verify 2RN-292B (2B D/G Hx Inlet Isol) (DB-562, BB-76) - OPEN.</p> <p><u>STANDARD:</u></p> <p style="background-color: #d3d3d3; padding: 5px;">Applicant checks the position indicator on 2RN-292B pointing to OPEN.</p> <p><u>EXAMINER CUE:</u> "Position indicator is pointing to CLOSED."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 12:</u> 7b. <u>IF</u> 2RN-292B (2B D/G Hx Inlet Isol) does not open, <u>THEN</u> perform the following:</p> <p style="padding-left: 40px;">1) Open 2EMXF-F01A (2B Diesel Generator Hx Inlet Isol Motor (2RN292B)) (DB-556, CC-75).</p> <p><u>STANDARD:</u></p> <p style="background-color: #d3d3d3; padding: 5px;">Applicant explains inserting locking tab, rotating the breaker handle counter-clockwise to the OFF position, and pulling the locking tab back out on 2EMXF-F01A.</p> <p><u>EXAMINER CUE:</u> "Breaker switch is pointing to the OFF position."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 13:</u> 7b. 2) Manually open 2RN-292B (2B D/G Hx Inlet Isol).</p> <p><u>STANDARD:</u></p> <p>Applicant explains obtaining a ladder, engages the manual operation clutch, and turns valve handwheel on 2RN-292B counter-clockwise direction to open the valve.</p> <p><u>EXAMINER CUE:</u> "Valve is NOT moving. 2RN-292B position indicator still shows CLOSED."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u> 8. <u>IF</u> RN flow cannot be established, <u>THEN</u>:</p> <p>a. Stop D/G 2B by depressing "STOP" on 2DECPB.</p> <p><u>STANDARD:</u></p> <p>Applicant depresses the STOP pushbutton on 2DECPB to stop the D/G.</p> <p><u>EXAMINER CUE:</u> "D/G has been secured."</p> <p>This step is critical because it prevents damaging the D/G due to a lack of cooling water supply.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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<p><u>STEP 15:</u> 8b. Notify the Control Room Supervisor of status.</p> <p><u>STANDARD:</u></p> <p>Applicant calls the CRS at x5164 and informs him that 2B D/G has been secured due to no cooling water flow being available.</p> <p><u>EXAMINER CUE:</u> Examiner repeats back information given.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16:</u> 8c. Return this enclosure to the Control Room Supervisor.</p> <p><u>STANDARD:</u></p> <p>Applicant explains returning the enclosure to the CRS.</p> <p><u>EXAMINER CUE:</u> "The CRS has taken the enclosure. This JPM is complete."</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Unit 2 has experienced a loss of all AC power to 2ETB.
2. The reason for the loss of AC power has been corrected.
3. 2ETB load shed is complete.

INITIATING CUES:

1. The control room has instructed you to energize 2ETB from 2B D/G by performing AP/2/A/5500/007 (Loss of Normal Power) Enclosure 11.
2. Peer checks have been waived for this task.

1. **Obtain the following:**

- ___ • Key #757 (2A/2B D/G Test Start Switch) from WCC Key Locker
- ___ • Flashlight.

___ 2. **Do not continue in this enclosure until notified that load shed of 2ETB is complete.**

3. **Locally start D/G 2B as follows:**

- ___ a. Notify Control Room Operator to place the "D/G 2B CTRL LOCATION" switch on 2MC11 in the "LOCAL" position.
- ___ b. **IF** unable to transfer diesel to Local Control, **THEN** actuate the "CONTROL ROOM OVERRIDE" at the breakglass station on 2DGCPB.
- ___ c. Place the key in the "MANUAL TEST START" keyswitch and turn to the "START" position.
- ___ d. Ensure "SPEED CONTROL" is adjusted to obtain frequency of between 58.8 and 61.2 Hz.
- ___ e. Ensure "VOLTAGE CONTROL" is adjusted to obtain "D/G VOLTAGE" between 4160 and 4600 Volts.

___ 4. **WHEN the D/G is running, THEN close "DIESEL GENERATOR 2B" breaker.**

5. **IF D/G breaker will not close, THEN:**

- ___ a. Stop D/G 2B by depressing "STOP" on 2DECPB.
- ___ b. Coordinate the following with the Control Room Supervisor:
 - ___ • Inform Control Room Supervisor of D/G 2B status
 - ___ • Inform Control Room Supervisor of intention to perform Enclosure 19 (D/G 2B Manual Breaker Closure)
 - ___ • **IF** manpower available, **THEN** arrange for additional operator(s) to staff the diesel panel.
- ___ c. **GO TO** Enclosure 19 (D/G 2B Manual Breaker Closure).
- ___ d. Do not continue in this enclosure.

6. **Close the following essential load center normal incoming breakers:**

- ☐ • 2ELXB-4B (Normal Incoming Breaker Fed From Xfmr 2ETXB) (AB-560, AA-67, Rm 362)
- ☐ • 2ELXD-4B (Normal Incoming Breaker Fed from Xfmr 2ETXD) (AB-560, AA-68, Rm 362).

7. **Ensure RN flow through the KD Hx as follows:**

- ☐ a. Verify 2RN-292B (2B D/G Hx Inlet Isol) (D2B-567, AA-76) - OPEN.
- b. IF 2RN-292B (2B D/G Hx Inlet Isol) does not open, THEN perform the following:
 - ☐ 1) Open 2EMXF-F01A (2B Diesel Generator Hx Inlet Isol Motor (2RN292B)) (D2B-556, CC-75).
 - ☐ 2) Manually open 2RN-292B (2B D/G Hx Inlet Isol).

8. IF RN flow cannot be established, THEN:

- ☐ a. Stop D/G 2B by depressing "STOP" on 2DECPB.
- ☐ b. Notify the Control Room Supervisor of status.
- ☐ c. Return this enclosure to the Control Room Supervisor.

☐ 9. **Notify Control Room Operator to place the "D/G 2B CTRL LOCATION" switch on 2MC11 in the "CTRL-RM" position.**

☐ 10. **Close 2VN-2 (2B D/G Exhaust Silencer Drain) (DB-557, BB-73).**

11. **Ensure the following:**

- ☐ • "LO PUMP & HEATER" indicating light - OFF
- ☐ • "JW PUMP & HEATER" indication light - OFF
- ☐ • "DIESEL BLDG GEN VENT FAN 2B1" - ON
- ☐ • "DIESEL BLDG GEN VENT FAN 2B2" - ON.

☐ 12. **Monitor D/G operating parameters.**