PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SYSTEMS

JPM I

LESSON TITLE: Bypassing RWCU Filter Demineralizers

LESSON NUMBER: JPM I

REVISION NO: 00

RECOMMENDED BY: Curt Robert
Instructor/Developer DATE

CONCURRENCE BY: _____
Line Superintendent/Supervisor DATE

APPROVED BY: _____
Superintendent/Supervisor Training DATE

SAFETY CONSIDERATIONS:

1. Operating equipment and energized electrical equipment hazards.
2. Hearing protection is required in this area when equipment is operating.
3. Safety Glasses, Hard Hat, and approved footwear must be worn while in the area of this JPM.

EVALUATOR NOTES: (Do not read to performer)

1. The applicable procedure section **WILL** be provided to the performer, once it is demonstrated he/she knows the correct procedure.
2. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.

Read the following to the JPM performer.

TASK CONDITIONS:

1. Unit One (1) has experienced a plant transient that resulted in a Group 1 isolation and reactor scram.
2. The Main Condenser is not available as a Heat Sink.
3. Safety Relief Valves (SRVs) have failed.
4. Reactor Vessel Control Procedure (EOP-01-RVCP) and Alternate Emergency Depressurization Procedure (EOP-01-AEDP) are being executed.
5. RWCU pump B, and RWCU Filter Demineralizer B are in service. RWCU pump A, and RWCU Filter Demineralizer A are shutdown.
6. A Control Operator (CO) is standing by ready to assist if any actions need to be performed in the Unit One (1) Control Room.

INITIATING CUE:

You are directed by the Unit SCO to perform the AO actions to Bypass the RWCU Filter Demineralizers per 0EOP-01-SEP-07. Inform the SCO when 0EOP-01-SEP-07 actions are complete.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.

Step 1 – Obtain current revision of 0EOP-01-SEP-07.

Obtains current revision of 0EOP-01-SEP-07.

SAT/UNSAT*

TIME START _____

NOTE: Since only B RWCU Filter Demineralizer (F/D) is in service the examinee perform Section 2 – Removing the only on-line F/D from service.

PROMPT: If asked the status of G31-Z002-FC-74B state that 74B is in MANUAL.

Step 1 – ENSURE F/D B FLOW controller G31-Z002-FC-74B is in "MAN".

Verifies that G31-Z002-FC-74B is in "MAN" by observing slide all the way to the right.

****CRITICAL STEP**SAT/UNSAT***

NOTE: Examinee will establish communications with the control room with a radio.

PROMPT: Once contacted as Control Operator inform examinee that you will OPEN Filter Bypass Valve, G31-F044 as he CLOSES the Effluent Flow Control Valve.

PROMPT: As found Hold Pump is OFF, (GREEN light ON, RED light OFF) and F/D B FLOW controller G31-Z002-FC-74B indicates 110 gpm.

Provide indication of lowering flow as *EFFLUENT FLOW CONTROL VALVE, G31-Z002-FCV-66B* throttle CLOSED with a pointer.

Hold Pump will start at 50-60 gpm indicated by GREEN light OFF, RED light ON.

Step 2a. – THROTTLE CLOSED EFFLUENT FLOW CONTROL VALVE, G31-Z002-FCV-66B, using the manual thumbwheel on F/D B FLOW controller G31-Z002-FC-74B. (PERFORMED simultaneously with CO opening the Filter Bypass Valve)

THROTTLES CLOSED EFFLUENT FLOW CONTROL VALVE, G31-Z002-FCV-66B, rotating the manual thumbwheel on F/D B FLOW controller G31-Z002-FC-74B to the left until flow indicates 50 -60 gpm and the Filter Hold Pump starts.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Simulate with a pointer indicated flow on G31-Z002-FC-74B lowering below 50 gpm while the Hold Pump discharge valve strokes OPEN, (4 sec. after Hold Pump starts).

As examinee adjusts thumbwheel in response to low flow indicate flow being restored to 60 gpm.

Step 3 – MAINTAIN flow steady at approximately 60 gpm.

Adjusts manual thumbwheel on F/D B FLOW controller G31-Z002-FC-74B appropriately to maintain 60 gpm flow.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: 4 seconds after the Hold Pump starts HOLDING PUMP DISCHARGE VALVE, G31-Z002-AO-74B strokes OPEN and indication is GREEN light is OFF, RED light is ON.

As the examinee adjusts flow simulate indicated flow on G31-Z002-FC-74B with a pointer.

Step 4 – WHEN HOLDING PUMP DISCHARGE VALVE, G31-Z002-AO-14B, is fully open, THEN REDUCE filter flow to 0 gpm.

Verifies that HOLDING PUMP DISCHARGE VALVE, G31-Z002-AO-14B, is fully open, THEN REDUCES filter flow to 0 gpm by rotating thumbwheel to the left.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: RED HOLD light ON. RED Filter light OFF.

Step 5 – DEPRESS the HOLD START push button.

DEPRESSES the HOLD START push button for B F/D.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: After examinee PLACES the INFLUENT & EFFLUENT switch for B F/D to "ISOLATE," GREEN light is ON, RED light is OFF for EFFLUENT ISOLATION VALVE, G31-Z002-AO-31B and INFLUENT ISOLATION VALVE, G31-Z002-AO-32B

Step 6 – On Local Panel G31-Z002-26, PLACE the INFLUENT & EFFLUENT switch to "ISOLATE," and VERIFY that the following valves close:

a. EFFLUENT ISOLATION VALVE, G31-Z002-AO-31B
b. INFLUENT ISOLATION VALVE, G31-Z002-AO-32B

Places INFLUENT & EFFLUENT switch for the off-line F/D to "ISOLATE," G31-Z002-AO-31B and G31-Z002-AO-32B are CLOSED

****CRITICAL STEP**SAT/UNSAT***

PROMPT: GREEN light is ON, RED light is OFF for EFFLUENT STRAINER ISOLATION VALVE, G31-Z002-AO-41B.

Step 7 – CLOSE F/D B EFFLUENT STRAINER ISOLATION VALVE, G31-Z002-AO-41B.

CLOSES off-line F/D B EFFLUENT STRAINER ISOLATION VALVE, G31-Z002-AO-41B.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Notify the examinee as CO that you will THROTTLE RETURN TO VESSEL VLV, G31-F042, to maintain pump flow.

TERMINATING CUE: When RWCU F/D B is bypassed per 0EOP-01-SEP-07 and the Unit SCO is notified, this JPM is complete.

TIME COMPLETED _____

LIST OF REFERENCES

RELATED TASKS:

200655B504

Bypass RWCU Filter Demineralizers per SEP-07.

K/A REFERENCE AND IMPORTANCE RATING:

295025 EA1.08 (3.3/3.7)

Ability to manually operate and/or monitor as they apply to High Reactor Pressure.

REFERENCES:

0EOP-01-SEP-07, BYPASSING RWCU FILTER DEMINERALIZERS

TOOLS AND EQUIPMENT:

RADIO

SAFETY FUNCTION (from NUREG 1123, Rev 2.):

Safety Function 3: Reactor Pressure Control

REASON FOR REVISION:
New for NRC 2004.

Time Required for Completion: 20 Minutes (approximate).

Time Taken: ____

APPLICABLE METHOD OF TESTING

Performance: Simulate ✓ Actual __ Unit: 1

Setting: Control Room ___ Simulator __ (Not applicable to In-Plant JPMs)

Time Critical: Yes ___ No ✓ Time Limit N/A

Alternate Path: Yes ___ No ✓

EVALUATION

Performer:_____ SSN: _____

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Performer Verify Procedure? Yes _____ No _____
(Each Student should verify one JPM per evaluation set)

Comments: _____

_____

_____

_____

_____

Comments reviewed with Student

Evaluator Signature: _____ Date:_____

TASK CONDITIONS:

1. Unit One (1) has experienced a plant transient that resulted in a Group 1 isolation and reactor scram.
2. The Main Condenser is not available as a Heat Sink.
3. Safety Relief Valves (SRVs) have failed.
4. Reactor Vessel Control Procedure (EOP-01-RVCP) and Alternate Emergency Depressurization Procedure (EOP-01-AEDP) are being executed.
5. RWCU pump B, and RWCU Filter Demineralizer B are in service. RWCU pump A, and RWCU Filter Demineralizer A are shutdown.
6. A Control Operator (CO) is standing by ready to assist if any actions need to be performed in the Unit One (1) Control Room.

INITIATING CUE:

You are directed by the Unit SCO to perform the AO actions to Bypass the RWCU Filter Demineralizers per 0EOP-01-SEP-07. Inform the SCO when 0EOP-01-SEP-07 actions are complete.

CP&L

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK NUCLEAR PLANT

PLANT OPERATING MANUAL

VOLUME VI

EMERGENCY OPERATING PROCEDURE

UNIT
0

0EOP-01-SEP-07

BYPASSING RWCU FILTER DEMINERALIZERS

REVISION 4

EFFECTIVE DATE

12/15/98

Sponsor	Signature and Date on File	Date
Approval	Signature and Date on File Manager- Operations	Date

REVISION SUMMARY

This revision incorporates changes required to support implementation of Severe Accident Management Guidelines. Entry conditions have been revised to reflect possible entry from Primary Containment Flooding, 0SAMG-01, and from EOP-01-AEDP.

LIST OF EFFECTIVE PAGES

0EOP-01-SEP-07

Page(s)	Revision
1-6	4

A. TITLE - Bypassing RWCU Filter Demineralizers

B. ENTRY CONDITION

1. As directed by the RC/P section of the "Reactor Vessel Control Procedure" (EOP-01-RVCP), OR

2. As directed by the RC/P section of "Level/Power Control" (EOP-01-LPC), OR

3. As directed by "SAMG Primary Containment Flooding" (0SAMG-01), OR

4. As directed by "Alternate Emergency Depressurization Procedure" (EOP-01-AEDP).

C. OPERATOR ACTIONS

AO: ___ 1. IF two filter/demineralizers are in service, THEN PERFORM Section 1 on page 4 to remove the first F/D from service.

AO: ___ 2. IF one filter/demineralizer is in service, THEN PERFORM Section 2 on page 5 to remove the only on-line F/D from service.

Section 1 - Removing the First F/D from service.

NOTE

Manpower required: 1 Control Operator
1 Auxiliary Operator
Special Equipment: None

NOTE

IF RWCU inlet temperature is less than 300°F, THEN the maximum single pump flow rate is limited to 203 gpm.

CO: ___ 1. IF the RWCU System inlet temperature is greater than 300°F AND two RWCU pumps are running, THEN STOP one RWCU pump.

AO: ___ 2. IF the F/D to remain in service is in automatic flow control, THEN PLACE F/D A(B) FLOW controller G31-Z002-FC-74A(74B) to "MAN".

NOTE

It takes approximately four seconds for holding flow to be established after the hold pump starts.

AO: ___ 3. SLOWLY REDUCE flow on F/D A(B) FLOW controller G31-Z002-FC-74A(74B) until Hold Pump A(B) starts (approximately 50-60 gpm) and maintains flow steady.

AO: ___ 4. WHEN HOLDING PUMP DISCHARGE VALVE, G31-Z002-AO-14A(14B), is fully open, THEN REDUCE filter flow to 0 gpm.

AO: ___ 5. DEPRESS the HOLD START push button for the off-line F/D.

6. On Local Panel G31-Z002-26, PLACE the INFLUENT & EFFLUENT switch for the off-line F/D to "ISOLATE," and VERIFY that the following off-line F/D valves close:

AO: ___ a. EFFLUENT ISOLATION VALVE, G31-Z002-AO-31A(31B)

AO: ___ b. INFLUENT ISOLATION VALVE, G31-Z002-AO-32A(32B)

CO: ___ 7. IF two RWCU pumps are in service, THEN STOP one RWCU pump.

AO: ___ 8. CLOSE the off-line F/D A(B) EFFLUENT STRAINER ISOLATION VALVE, G31-Z002-AO-41A(41B).

AO: ___ 9. PERFORM Section 2 on page 5 of this procedure to remove the only on-line F/D from service.

Section 2 - Removing the only on-line F/D from service.

NOTE

Manpower required: 1 Control Operator
1 Auxiliary Operator
Special Equipment: None

NOTE

Communications should be established between the local panel and the Control Room prior to performing Step 2.

AO: ___ 1. ENSURE F/D A(B) FLOW controller G31-Z002-FC-74A(74B) is in "MAN".

2. PERFORM the following steps simultaneously:

AO: ___ a. THROTTLE CLOSED EFFLUENT FLOW CONTROL VALVE, G31-Z002-FCV-66A(66B), using the manual thumbwheel on F/D A(B) FLOW controller G31-Z002-FC-74A(74B).

CO: ___ b. OPEN FILTER BYPASS VLV, G31-F044.

NOTE

As flow through the filter is reducing, the hold pump will start at approximately 60 gpm.

NOTE

It takes approximately four seconds for holding flow to be established after the hold pump starts.

AO: ___ 3. MAINTAIN flow steady at approximately 60 gpm.

AO: ___ 4. WHEN HOLDING PUMP DISCHARGE VALVE, G31-Z002-AO-14A(14B), is fully open, THEN REDUCE filter flow to 0 gpm.

AO: ___ 5. DEPRESS the HOLD START push button.

6. On Local Panel G31-Z002-26, PLACE the INFLUENT & EFFLUENT switch to "ISOLATE," and VERIFY that the following valves close:

AO: ___ a. EFFLUENT ISOLATION VALVE, G31-Z002-AO-31A(31B)

AO: ___ b. INFLUENT ISOLATION VALVE, G31-Z002-AO-32A(32B)

AO: ___ 7. CLOSE F/D A(B) EFFLUENT STRAINER ISOLATION VALVE, G31-Z002-AO-41A(41B).

NOTE

In order to reduce the number of flow adjustments required, RWCU pump flow is restricted to that allowed for RWCU inlet temperatures less than 300°F.

CO: ___ 8. THROTTLE RETURN TO VESSEL VLV, G31-F042, to maintain pump flow, as read on G31-FI-R609, less than or equal to 203 gpm.

CO: ___ 9. EXIT this procedure and RETURN to the procedure(s) in effect.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SYSTEMS

JPM J

LESSON TITLE: Station Blackout: Cross-Tying 480 V Emergency Buses – Breaker Charging Spring Failure

LESSON NUMBER: AOT-OJT-JP-303-A09

REVISION NO: 01

RECOMMENDED BY: Curt Robert _____
Instructor/Developer DATE

CONCURRENCE BY: _____
Line Superintendent/Supervisor DATE

APPROVED BY: _____
Superintendent/Supervisor Training DATE

SAFETY CONSIDERATIONS:

1. Standard electrical precautions when working around energized electrical equipment.

2. Hard Hat, safety glasses, and ear protection are required in the Diesel Building.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee.

2. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the trainee.

3. Nomex coat over flame resistant or 100% cotton clothing AND low voltage gloves (<1000V red or yellow rubber with leather protectors) AND face shield over safety glasses SHALL be used when racking in or out 480 V breakers. The student will demonstrate the ability to locate this equipment.

Read the following to trainee.

TASK CONDITIONS:

1. A complete Loss of Offsite Power has occurred in both Unit 1 and Unit 2.
2. Diesel Generators 2, 3 and 4 cannot be started.
3. Diesel Generator 1 is running, tied to E1, and has been verified to be operating normally.
4. Emergency buses E3 and E1 have been cross-tied, 480V bus E7 is energized.
5. 480 VAC Buses E5 and E6 have been cross-tied.
6. NUC SERV WATER PMP 2B control power fuses have been removed per Step 3.2.11.14.a.
7. Start this JPM at the ASSD Equipment Cabinet to demonstrate that you can obtain the emergency switchgear bag.
8. All necessary safety equipment may be simulated but you will be required to state the normal location of this equipment.

INITIATING CUE:

You are directed by the Control Operator to perform the Auxiliary Operator actions associated with cross-tying 480V Substation E7 to E8 in accordance with AOP-36.2, Section 3.2.11. Inform the Control Room when the E7 to E8 cross-tie breakers are ready to be closed.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.

Step 1 - Obtain current revision of 0AOP-36.2 Section 3.2.11 and verify copy if applicable.
Current revision of 0AOP-36.2 Section 3.2.11 obtained and verified if applicable.

SAT/UNSAT*

PROMPT:	If requested, indicate Nuclear Service Water Pump 2B is not running as indicated green light lit on front of Compt AL1, or that breaker is open by green mechanical open indicator.
NOTE:	Control power fuses are located in lower right corner of upper cubicle. The control power fuses are the set on the right. The Green light will go out when fuses are removed. Flame resistant or 100% cotton clothing is required per AI-142 for removal of fuses.

Step 2 – Remove control power fuses from Bus E4, Compt AL1, NUC SERV WTR PMP 2B (Row-M1).
Control power fuses removed from Nuc Ser Wtr Pump 2B, Compt AL1 at E4.

SAT/UNSAT*

PROMPT:	If requested, as each breaker is opened, indicate breaker is open as indicated by green mechanical open indicator and/or sound of breaker opening.
NOTE:	A 480 V racking tool is contained in the ASSD Equipment bag. Since 4 KV Buses are cross-tied as an initial condition, this bag would be available in the DG Building.

Step 3 – At 480V Sub E7 TRIP AX9, FEEDER TO MCC 1-1XA-2 (Row-B2).
AX9 OPEN at E7.

SAT/UNSAT*

Step 4 - At 480V Sub E7 TRIP AY0, MCC 2XC (Row-B3).
AYO OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 5 - At 480V Sub E7 TRIP AY2 MCC 2XA (Row-C1).
AY2 OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 6 - At 480V Sub E7 TRIP AY3 MCC 1XJ (Row-C2).
AY3 OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 7 - At 480V Sub E7 TRIP AZ2 MCC 2XG (Row-E3).
AZ2 OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 8 - At 480V Sub E7 TRIP AY8 MCC DGC (Row-A2).
AY8 OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 9 - At 480V Sub E7 TRIP AY4 MCC 2XE (Row-C3).
AY4 OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 10 - At 480V Sub E7 TRIP AY5 MCC 2PA (Row-C4).
AY5 OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 11 - At 480V Sub E7 TRIP AX6 MCC 2XL (Row-D2).
AX6 OPEN at E7.

**** CRITICAL STEP ** SAT/UNSAT***

Step 12 - At 480V Sub E8 TRIP AZ6 MCC 2XH (Row-B3).
AZ6 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 13 - At 480V Sub E8 TRIP AZ7 DISTR PNL E12 (Row-C1).
AZ7 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 14 - At 480V Sub E8 TRIP AZ8 DISTR PNL E11 (Row-C2).
AZ8 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 15 - At 480V Sub E8 TRIP AZ9 FEEDER TO MCC 1XB-2 (Row-C3).
AZ9 OPEN at E8.

SAT/UNSAT*

Step 16 - At 480V Sub E8 TRIP AO2 MCC 2XB (Row-D1).
AO2 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 17 - At 480V Sub E8 TRIP AO3 MCC 1XK (Row-D2).
AO3 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 18 - At 480V Sub E8 TRIP AO4 MCC 2XF (Row-D3).
AO4 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 19 - At 480V Sub E8 TRIP AO5 MCC 2PB (Row-D4).
AO5 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 20 - At 480V Sub E8 TRIP AO8 MCC 2XD (Row-E3).
AO8 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 21 - At 480V Sub E8 TRIP AO1 MCC DGD (Row-F2).
AO1 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 22 - At 480V Sub E8 TRIP AO7 MCC 2XM (Row-E2).
AO7 OPEN at E8.

**** CRITICAL STEP ** SAT/UNSAT***

Step 23 - Verify Tie breaker to E8, Compt AX5 (Row-A1), on Bus E7 is open.
Tie breaker to E8, Compt AX5, on Bus E7 verified open.

SAT/UNSAT*

PROMPT: If asked, inform the examinee that the locking hasp position is as seen.

PROMPT: Inform examinee that use of electrical safety equipment may be simulated, but that the examinee should state the location of this equipment.

NOTE: Breaker racking shutter cannot be lifted unless hasp is depressed.

Step 24 - If necessary, depress the locking hasp on E7 Compt. AX5 to allow opening of the racking shutter.
Locking hasp DEPRESSED or verified to already be depressed on E7 Compt. AX5.

**** CRITICAL STEP ** SAT/UNSAT***

PROMPT: As each breaker is racked in, if requested, indicate breaker fully racked into connect position. As the tie breaker at E7 toggle is turned on, indicate that springs are charged as indicated by yellow mechanical spring indicator.

NOTE: Springs will charge ONLY if spring motor toggle is turned on.

Step 25 - Rotate the racking crank CLOCKWISE at Compt AX5 on Bus E7 until breaker stops in the CONNECT position.

Breaker Compt AX5 on Bus E7 in CONNECT position (racked in).

**** CRITICAL STEP ** SAT/UNSAT***

Step 26 - Place the Compt AX5 on Bus E7 charging power switch to the ON position, and confirm charge is satisfactory by SPRINGS CHARGED indicator.

Charging power switch for E7 Compt AX5 ON and springs charged.

**** CRITICAL STEP ** SAT/UNSAT***

Step 27 - Verify Tie breaker to E7, Compt AI0 (Row-F1), on Bus E8 is open.

Tie breaker to E7, Compt AI0, on Bus E8 verified open.

SAT/UNSAT*

PROMPT: If asked, inform the examinee that the locking hasp position is as seen.

Step 28 - If necessary, depress the locking hasp on E8 Compt. AI0 to allow opening of the racking shutter.

Locking hasp DEPRESSED or verified to already be depressed on E8 Compt. AI0.

**** CRITICAL STEP ** SAT/UNSAT***

Step 29 - Rotate the racking crank CLOCKWISE at Compt AI0 on Bus E8 until breaker stops in the CONNECT position.

Breaker Compt AI0 on Bus E8 in CONNECT position (racked in).

**** CRITICAL STEP ** SAT/UNSAT***

ALTERNATE PATH STARTS HERE.

PROMPT:	As requested, inform the examinee that the closing springs failed to charge as indicated by lack charging noise when toggle switch turned on and/or lack of spring charged indicator at front of breaker.

Step 30 - Place the Compt AI0 on Bus E8 charging power switch to the ON position, and determine springs failed to charge.

Charging power switch for E8 Compt AI0 ON, springs determined not charged.

SAT/UNSAT*

NOTE:	A manual charging handle for the 480 VAC cross-tie breaker springs is located in the Emergency Switchgear Operator ASSD bag and would be available to the examinee. The manual charging lever is located at the bottom middle of the 480 VAC breaker. The breaker compartment door CAN be opened to demonstrate location of the manual charging lever even with the breaker racked out.

Step 31 – Manually charge closing springs as follows:

a. Place charging power toggle switch to OFF.
Charging power toggle switch is OFF.

SAT/UNSAT*

b. Open breaker compartment door and insert manual charging handle.
Manual charging handle is inserted in the breaker.

**** CRITICAL STEP ** SAT/UNSAT***

PROMPT: Springs Charged indicated.

c. Pump manual charging handle until closing springs are charged (clicks into position) and confirm charge is satisfactory by Springs Charged indicator.
Closing springs are fully charged.

**** CRITICAL STEP ** SAT/UNSAT***

d. Remove manual charging handle and close compartment door.
Manual charging handle removed, compartment door closed.

SAT/UNSAT*

e. Place charging power toggle switch to ON.
Charging power toggle switch is ON.

SAT/UNSAT*

PROMPT: When requested as control room to close E7-E8 tie breakers, inform examinee that the breakers are closed.

Step 32 – Inform Control Room that E7-E8 tie breakers are racked in and ready to be closed.
Control Room informed.

SAT/UNSAT*

TERMINATING CUE: Substation E8 is ready to be cross-tied to substation E7 IAW AOP-36.2 Sect. 3.2.11.

*** Comments required for any step evaluated as UNSAT.**

LIST OF REFERENCES

RELATED TASKS:

262605B104
Rack in a 480 V Electrically Operated Breaker per OP-50/AOP-36.2.

K/A REFERENCE AND IMPORTANCE RATING:

262001 AA1.01 3.7/3.8
Ability to Operate and/or Monitor AC Electrical Distribution System as it applies to a Station Blackout

REFERENCES:

0AOP-36.2, Section 3.2.11, Rev. 25

TOOLS AND EQUIPMENT:

1. Plant page (or)
2. Radio
3. Racking tool for 480V Breakers
4. Manual charging handle for 480 V Breaker

SAFETY FUNCTION (from NUREG 1123, Rev 2):

6 (Electrical Distribution)

REASON FOR REVISION:

Changed electrical protection requirements to match the procedure.
Changed CP&L to Progress Energy Carolinas.

Time Required for Completion: 18 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ✓ Actual ___ Unit: ____

Setting: Control Room ___ Simulator____ (Not applicable to In-Plant JPMs)

Time Critical: Yes ___ No ✓ Time Limit N/A

Alternate Path: Yes ✓ No ___

EVALUATION

Trainee:_____ SSN: _____

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure as Authorized Copy?: Yes _____ No _____
(Each Student should verify one JPM per evaluation set.)

Comments: _____

_____

_____

_____

_____

Comments reviewed with Student

Evaluator Signature: _____ Date:_____

TASK CONDITIONS:

1. A complete Loss of Offsite Power has occurred in both Unit 1 and Unit 2.
2. Diesel Generators 2, 3 and 4 cannot be started.
3. Diesel Generator 1 is running, tied to E1, and has been verified to be operating normally.
4. Emergency buses E3 and E1 have been cross-tied, 480V bus E7 is energized.
5. 480 VAC Buses E5 and E6 have been cross-tied.
6. NUC SERV WATER PMP 2B control power fuses have been removed per Step 3.2.11.14.a.
7. Start this JPM at the ASSD Equipment Cabinet to demonstrate that you can obtain the emergency switchgear bag.
8. All necessary safety equipment may be simulated but you will be required to state the normal location of this equipment.

INITIATING CUE:

You are directed by the Control Operator to perform the Auxiliary Operator actions associated with cross-tying 480V Substation E7 to E8 in accordance with AOP-36.2, Section 3.2.11. Inform the Control Room when the E7 to E8 cross-tie breakers are ready to be closed.

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

> **NOTE:** The Station Blackout Coping Analysis Report requires that the Battery Chargers be operating within 1 hour of the start of the Station Blackout.

CR 1. **ENSURE** normal operation of the Diesel Generator to be cross-tied at the local control panel.

CR 2. **CHECK** the deenergized 4160V E Bus for indication of a lockout or phase overcurrent trip as follows:

a. **IF** 4160V Bus E1 is deenergized, **THEN CHECK** the following:

N/A - Lockout Relay 86DP on Compt AE9, *EMERG DIESEL GEN 1 BKR* (Row D1)

- Lockout Relay 86DB on Compt AE8, *SWGR E1 AUX COMPT* (Row C1)

N/A - Time Overcurrent Relays 51A, 51B, and 51C on Compt AE6, *INCM LINE FROM SWGR 1D* (Row A1)

b. **IF** 4160V Bus E3 is deenergized, **THEN CHECK** the following:

CR - Lockout Relay 86DP on Compt AI5, *EMERG DIESEL GEN 3* (Row D1)

CR - Lockout Relay 86DB on Compt AI4, *SWGR E3 AUX COMPT* (Row C1)

CR - Time Overcurrent Relays 51A, 51B, and 51C on Compt AI2, *INCM LINE FROM SWGR 2D* (Row A1)

N/A 3. **IF** indication of a lockout or phase overcurrent exists **AND** AC power can **NOT** be restored to the Blacked Out unit, **THEN GO TO** Section 3.2.19 (page 113) to load strip the Blacked Out unit's batteries.

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

R33 CR 4. **ENSURE** all RBCCW pump control switches on the Blacked Out unit are in *OFF*.

5. **IF** Unit 1 is Blacked Out, **AND** 4160V Bus E1 is to be reenergized, **THEN ENSURE** that the following breakers are open, **AND REMOVE** their control power fuses:

a. On 4160V Bus E1:

N/A - Compt AF0, *RHR PUMP 1C* (Row-E1)

- Compt AF1, *RHR SERV WTR PMP 1C* (Row-F1)

- Compt AF2, *CORE SPRAY PMP 1A* (Row-G1)

- Compt AF3, *CRD PUMP 1A* (Row-H1)

- Compt AF4, *RHR SERV WTR PMP 2C* (Row-I1)

- Compt AF5, *RHR PUMP 2C* (Row-J1)

- Compt AF6, *CONV SERV WTR PMP 2C* (Row-K1)

- Compt AF7, *CONV SERV WTR PMP 1B* (Row-L1)

N/A - Compt AF9, *NUC SERV WTR PMP 1A* (Row-N1)

b. On 4160V Bus E3:

N/A - Compt AI6, *CORE SPRAY PMP 2A* (Row-E1)

N/A - Compt AI8, *RHR PUMP 1A* (Row-G1)

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

6. **IF** Unit 2 is Blacked Out, **AND** 4160V Bus E3 is to be reenergized, **THEN ENSURE** that the following breakers are open, **AND REMOVE** their control power fuses:

   a. On 4160V Bus E3:

CR - Compt AI6, *CORE SPRAY PMP 2A* (Row-E1)

CR - Compt AI7, *RHR SERV WTR PMP 2A* (Row-F1)

CR - Compt AI8, *RHR PUMP 1A* (Row-G1)

CR - Compt AI9, *RHR SERV WTR PMP 1A* (Row-H1)

CR - Compt AJ1, *RHR PUMP 2A* (Row-J1)

CR - Compt AJ2, *CRD PUMP 2A* (Row-K1)

CR - Compt AJ3, *NUC SERV WTR PMP 2A* (Row-L1)

CR - Compt AJ4, *CONV SERV WTR PMP 2A* (Row-M1)

   b. On 4160V Bus E1:

CR - Compt AF2, *CORE SPRAY PMP 1A* (Row-G1)

CR - Compt AF5, *RHR PUMP 2C* (Row-J1)

CR - Compt AF6, *CONV SERV WTR PMP 2C* (Row-K1)

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

NOTE: Two E Bus Cross-Tie Breaker keys (TEM30), from the ASSD Emergency Switchgear bag, will be needed to allow closing the breakers in this section.

7. **PLACE** the Control Selector Switch, SS-B, in the *SBO* position using E Bus Cross-Tie Breaker keys (TEM30) for the following cross-tie breakers:

CR a. Bus E1, Compt AGO, *TIE BREAKER TO EMERG SWGR E3* (Row-O1)

CR b. Bus E3, Compt AJ5, *TIE BREAKER TO EMERG SWGR E1* (Row-N1)

NOTE: A LOCA signal will **NOT** trip the 4160V Bus cross-tie breakers when the cross-tie breaker Control Selector Switch, SS-B, is in the *SBO* position.

NOTE: The E Bus cross-tie breakers must be closed in order from the energized emergency bus toward the de-energized emergency bus due to the bus undervoltage circuit configuration.

NOTE: The appropriate annunciator *BUS E3 UNDERVOLTAGE* (UA-17 2-1) or *BUS E1 UNDERVOLTAGE* (UA-15 2-1) should clear upon restoration of power to Bus E3(E1).

8. **IF** Emergency Bus E1 is energized, **THEN CROSS-TIE** Bus E1 to Bus E3 as follows:

CR a. On 4160V Bus E1, **CLOSE** Compt AGO, *TIE BREAKER TO EMERG SWGR E3* (Row-O1), by placing the Local Breaker Control Switch, CS-1, in the *CLOSE* position.

CR b. On 4160V Bus E3, **CLOSE** Compt AJ5, *TIE BREAKER TO EMERG SWGR E1* (Row-N1), by placing the Local Breaker Control Switch, CS-1, in the *CLOSE* position.

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

9. **IF** Emergency Bus E3 is energized, **THEN CROSS-TIE** Bus E3 to Bus E1 as follows:

N/A a. On 4160V Bus E3, **CLOSE** Compt AJ5, *TIE BREAKER TO EMERG SWGR E1* (Row-N1), by placing the Local Breaker Control Switch, CS-1, in the *CLOSE* position.

N/A b. On 4160V Bus E1, **CLOSE** Compt AGO, *TIE BREAKER TO EMERG SWGR E3* (Row-O1), by placing the Local Breaker Control Switch, CS-1, in the *CLOSE* position.

N/A 10. **IF** the deenergized Emergency Bus can **NOT** be reenergized by the cross-tie, **AND** AC power can **NOT** be restored to the Blacked Out unit, **THEN GO TO** Section 3.2.19 (page 113) to load strip the Blacked Out unit's batteries.

11. **IF** a Control Room A/C and Supply Fan are **NOT** already in operation, **THEN START** one of the following Control Room A/C and Supply Fan units:

N/A a. *CTL ROOM A/C & SUPPLY FAN, 1D-CU-CB* and *1D-SF-CB* (Bus E1/Sub E5/MCC 1CA).

N/A b. *CTL ROOM A/C & SUPPLY FAN, 2D-CU-CB* and *2D-SF-CB* (Bus E3/Sub E7/MCC 2CA).

N/A c. *CTL ROOM A/C SPARE SUPPLY FAN, 2E-SF-CB* (Bus E4/Sub E8/MCC 2CB).

> **NOTE:** **IF** a Control Room A/C and Supply Fan can **NOT** be restarted, **THEN** the Control Room panel doors must be open within 30 minutes of the start of the Station Blackout in accordance with the Station Blackout Coping Analysis Report.

N/A 12. **IF** a Control Room A/C and Supply Fan can **NOT** be restarted, **THEN OPEN** all Control Room panel doors within 30 minutes of the start of the Station Blackout.

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

13. **IF** Bus E2 is deenergized **AND** no Diesel Generators are available to reenergize it, **THEN CROSS-TIE** 480V Sub E5 to E6 as follows:

CA a. **REMOVE** control power fuses from Bus E2, Compt AH6, *NUC SERV WTR PMP 1B* (Row-M1).

b. **TRIP** the following breakers at Sub E5:

CA - Compt AT7, *MCC 1OG* (Row-B1)

CA - Compt AT8, *FEEDER TO MCC 2XA-2* (Row-B2)

CA - Compt AT9, *MCC 1XC* (Row-B3)

CA - Compt AU4, *FEEDER BREAKER MCC 1XA* (Row-C1)

CA - Compt AU1, *MCC 2XJ* (Row-C2)

CA - Compt AV0, *MCC 1XG* (Row-E3)

c. **IF** DG No. 1 is **NOT** available, **THEN TRIP** the following additional breakers at Sub E5:

N/A - Compt AU6, *FEEDER TO MCC DGA* (Row-A2)

N/A - Compt AU2, *MCC 1XE* (Row-C3)

N/A - Compt AU3, *MCC 1PA* (Row-C4)

N/A - Compt AU5, *MCC 1XL* (Row-D2)

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

d. **TRIP** the following breakers at Sub E6:

N/A - Compt AV5, *MCC 1XH* (Row-B3)

- Compt AV6, *DISTR PNL E10* (Row-C1)
- Compt AV7, *DISTR PNL E9* (Row-C2)
- Compt AV8, *FEEDER TO MCC 2XB-2* (Row-C3)
- Compt AV9, *MCC DGB* (Row-C4)
- Compt AW0, *FEEDER TO MCC 1XB* (Row-D1)
- Compt AW1, *MCC 2XK* (Row-D2)
- Compt AW2, *MCC 1XF* (Row-D3)
- Compt AW3, *MCC 1PB* (Row-D4)
- Compt AW4, *MCC 2OG* (Row-E1)

N/A - Compt AW6, *MCC 1XD* (Row-F2)

e. **IF** DG No. 1 is **NOT** available, **THEN TRIP** the following additional breaker at Sub E6:

N/A - Compt AW5, *MCC 1XM* (Row-E2)

CA f. **RACK IN** Sub E5, Compt AT4, *TIE BREAKER TO E6* (Row-A1) in accordance with Steps 3.2.11.13.g through 3.2.11.13.k, **AND THEN CONTINUE** at Step 3.2.11.13.l.

CA g. **CONFIRM** locally breaker is open.

CA h. **IF** necessary, **THEN DEPRESS** locking hasp to allow opening of racking shutter.

CA i. **ROTATE** racking crank in the clockwise direction until breaker stops in *CONNECT*.

CA j. **PLACE** charging power toggle switch to *ON*, **AND CONFIRM** charge is satisfactory by *SPRINGS CHARGED* indicator.

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

CAUTION

IF closing springs fail to charge **AND** require charging manually **THEN** caution should be used to not overcharge closing springs to prevent binding of the breaker.

R6

k. **IF** closing springs fail to charge, **THEN PERFORM** the following:

CR - **PLACE** charging power toggle switch to *OFF*.

CR - **OPEN** breaker compartment door **AND INSERT** Manual Charging Handle.

CR - **PUMP** Manual Charging Handle until closing springs are charged (clicks into position) **AND CONFIRM** charge is satisfactory by *SPRINGS CHARGED* indicator.

CR - **REMOVE** Manual Charging Handle **AND CLOSE** breaker compartment door.

CR - **PLACE** charging power toggle switch to *ON*.

CR l. **REPEAT** Steps 3.2.11.13.g through 3.2.11.13.k to rack in Sub E6, Compt AX1, *TIE BREAKER TO E5* (Row-F1), **AND CONTINUE** at Step 3.2.11.13.m.

m. **PLACE** Unit 1(2) RTGB control switch for the following Sub E6 feeder breakers to *TRIP* **AND CONFIRM** breakers open:

CR - *SUB E6 480V MAIN BREAKER, BREAKER AV4.*

CR - *BUS E2 TO SUB E6, BREAKER AH1.*

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

R6

n. **IF** *SUB E6 480V MAIN BREAKER, BREAKER AV4* fails to open from RTGB, **THEN PERFORM** the following locally at Sub E6:

N/A - **DEPRESS** *TRIP* pushbutton on *SUB E6 480V MAIN BREAKER, COMPT. AV4* to manually trip breaker.

N/A - **CONFIRM** open *SUB E6 480V MAIN BREAKER, COMPT. AV4.*

> **NOTE:** Annunciators *SUB E5 TIE SUB E6 480V BKR TRIP* (UA-15 6-2) and *SUB E6 TIE SUB E5 480V BKR TRIP* (UA-16 5-4) should clear upon restoration of power to 480V Bus E5 or E6.

CA o. **PLACE AND HOLD** Unit 1(2) RTGB control switch for *BUS E5 TIE TO BUS E6* cross-tie beakers in *CLOSE* until both *BREAKER* AT4 (MSTR) **AND** *BREAKER* AX1 (SLAVE) indicate closed.

R6

p. **IF** *BUS E6 TIE TO BUS E5, BREAKER AX1* (SLAVE) fails to close from RTGB, **THEN PERFORM** the following locally at Sub E6:

N/A - **LIFT** Manual Close Lever on *TIE BREAKER TO E5, AX1* to manually close breaker.

N/A - **CONFIRM** closed *TIE BREAKER TO E5, AX1.*

R6

q. **IF** *BUS E5 TIE TO BUS E6, BREAKER AT4* (MSTR) fails to close from RTGB, **THEN PERFORM** the following locally at Sub E5:

N/A - **LIFT** Manual Close Lever on *TIE BREAKER TO E6, AT4* to manually close breaker.

N/A - **CONFIRM** closed *TIE BREAKER TO E6, AT4.*

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

NOTE: Battery Charger operation can be confirmed by proper voltage indication at the RTGB.

r. **ENSURE** that the following Battery Chargers have energized **AND** are supplying DC Loads:

CR - *BATTERY CHARGER 1A-1* (Sub E5/MCC 1CA)

CR - *BATTERY CHARGER 1A-2* (Sub E5/MCC 1CA)

CR - *BATTERY CHARGER 1B-1* (Sub E6/MCC 1CB)

CR - *BATTERY CHARGER 1B-2* (Sub E6/MCC 1CB)

s. **START** the following Battery Room Vent Fans:

CR - *BATTERY ROOM 1A VENT FANS, 1C-SF-CB* and *1C-EF-CB* (Sub E5/MCC 1CA)

CR - *BATTERY ROOM 1B VENT FANS, 1B-SF-CB* and *1B-EF-CB* (Sub E6/MCC 1CB)

t. **IF** DG No. 1 is operating and loaded, **THEN ENSURE** that the supply fans for the following applicable Drywell Coolers have started:

CR - *DRYWELL COOLER 1A* (Sub E5/MCC 1XL)

CR - *DRYWELL COOLER 1B* (Sub E6/MCC 1XM)

14. **IF** Bus E4 is deenergized **AND** no Diesel Generators are available to reenergize it, **THEN CROSS-TIE** 480V Sub E7 to E8 as follows:

CR a. **REMOVE** the control power fuses from Bus E4, Compt AL1, *NUC SERV WTR PMP 2B* (Row-M1).

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

b. **TRIP** the following breakers at Sub E7:

___ - Compt AX9, *FEEDER TO MCC 1-1XA-2* (Row-B2)

___ - Compt AY0, *MCC 2XC* (Row-B3)

___ - Compt AY2, *MCC 2XA* (Row-C1)

___ - Compt AY3, *MCC 1XJ* (Row-C2)

___ - Compt AZ2, *MCC 2XG* (Row-E3)

c. **IF** DG No. 3 is **NOT** available, **THEN TRIP** the following additional breakers at Sub E7:

___ - Compt AY8, *MCC DGC* (Row-A2)

___ - Compt AY4, *MCC 2XE* (Row-C3)

___ - Compt AY5, *MCC 2PA* (Row-C4)

___ - Compt AX6, *MCC 2XL* (Row-D2)

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

d. **TRIP** the following breakers at Sub E8:

___ - Compt AZ6, *MCC 2XH* (Row-B3)

___ - Compt AZ7, *DISTR PNL E12* (Row-C1)

___ - Compt AZ8, *DISTR PNL E11* (Row-C2)

___ - Compt AZ9, *FEEDER TO MCC 1XB-2* (Row-C3)

___ - Compt AO2, *MCC 2XB* (Row-D1)

___ - Compt AO3, *MCC 1XK* (Row-D2)

___ - Compt AO4, *MCC 2XF* (Row-D3)

___ - Compt AO5, *MCC 2PB* (Row-D4)

___ - Compt AO8, *MCC 2XD* (Row-E3)

___ - Compt AO1, *MCC DGD* (Row-F2)

e. **IF** DG No. 3 is **NOT** available, **THEN TRIP** the following additional breaker at Sub E8:

___ - Compt AO7, *MCC 2XM* (Row-E2)

___ f. **RACK IN** Sub E7, Compt AX5, *TIE BREAKER TO E8* (Row-A1) in accordance with Steps 3.2.11.14.g through 3.2.11.14.k, **AND THEN CONTINUE** at Step 3.2.11.14.l.

___ g. **CONFIRM** locally breaker is open.

___ h. **IF** necessary, **THEN DEPRESS** locking hasp to allow opening of racking shutter.

___ i. **ROTATE** racking crank in the clockwise direction until the breaker stops in *CONNECT*.

___ j. **PLACE** charging power toggle switch to *ON*, **AND CONFIRM** charge is satisfactory by *SPRINGS CHARGED* indicator.

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

CAUTION

IF closing springs fail to charge **AND** require charging manually **THEN** caution should be used to not overcharge closing springs to prevent binding of the breaker.

R6

k. **IF** closing springs fail to charge, **THEN PERFORM** the following:

___ - **PLACE** charging power toggle switch to *OFF*.

___ - **OPEN** breaker compartment door **AND INSERT** Manual Charging Handle.

___ - **PUMP** Manual Charging Handle until closing springs are charged (clicks into position) **AND CONFIRM** charge is satisfactory by *SPRINGS CHARGED* indicator.

___ - **REMOVE** Manual Charging Handle **AND CLOSE** breaker compartment door.

___ - **PLACE** charging power toggle switch to *ON*.

___ l. **REPEAT** Steps 3.2.11.14.g through 3.2.11.14.k to rack in Sub E8, Compt A10, *TIE BREAKER TO E7* (Row-F1), **AND CONTINUE** at Step 3.2.11.14.m.

m. **PLACE** Unit 1(2) RTGB control switch for the following Sub E8 feeder breakers to *TRIP* **AND CONFIRM** breakers open:

___ - *SUB E8 480V MAIN BREAKER, BREAKER AZ5.*

___ - *BUS E4 TO SUB E8, BREAKER AK7.*

R6

n. **IF** *SUB E8 480V MAIN BREAKER, BREAKER AZ5* fails to open from RTGB, **THEN PERFORM** the following locally at Sub E8:

___ - **DEPRESS** *TRIP* pushbutton on *SUB E8 480V MAIN BREAKER, COMPT. AZ5* to manually trip breaker.

___ - **CONFIRM** open *SUB E8 480V MAIN BREAKER, COMPT. AZ5.*

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

> **NOTE:** Annunciators *SUB E7 TIE SUB E8 480V BKR TRIP* (UA-17 5-4) and *SUB E8 TIE SUB E7 480V BKR TRIP* (UA-18 5-4) should clear upon restoration of power to 480V Bus E7 or E8.

___ o. **PLACE AND HOLD** Unit 1(2) RTGB control switch for *BUS E7 TIE TO BUS E8* cross-tie breakers in *CLOSE* until both *BREAKER AX5* (MSTR) **AND** *BREAKER A10* (SLAVE) indicate closed.

R6 p. **IF** *BUS E8 TIE TO BUS E7, BREAKER A10* (SLAVE) fails to close from RTGB, **THEN PERFORM** the following locally at Sub E8:

___ - **LIFT** Manual Close Lever on *TIE BREAKER TO E7, A10* to manually close breaker.

___ - **CONFIRM** closed *TIE BREAKER TO E7, A10.*

R6 q. **IF** *BUS E7 TIE TO BUS E8, BREAKER AX5* (MSTR) fails to close from RTGB, **THEN PERFORM** the following locally at Sub E7:

___ - **LIFT** Manual Close Lever on *TIE BREAKER TO E8, AX5* to manually close breaker.

___ - **CONFIRM** closed *TIE BREAKER TO E8, AX5.*

> **NOTE:** Battery Charger operation can be verified by proper voltage indication at the RTGB.

r. **ENSURE** that the following Battery Chargers have energized **AND** are supplying DC loads:

___ - *BATTERY CHARGER 2A-1* (Sub E7/MCC 2CA)

___ - *BATTERY CHARGER 2A-2* (Sub E7/MCC 2CA)

___ - *BATTERY CHARGER 2B-1* (Sub E8/MCC 2CB)

___ - *BATTERY CHARGER 2B-2* (Sub E8/MCC 2CB)

3.2.11 Cross-Tieing 4160V Bus E1(E3) to E3(E1)

s. **START** the following Battery Room Vent Fans:

___ - *BATTERY ROOM 2A VENT FANS, 2C-SF-CB* and *2C-EF-CB* (Sub E7/MCC 2CA)

___ - *BATTERY ROOM 2B VENT FANS, 2B-SF-CB* and *2B-EF-CB* (Sub E8/MCC 2CB)

t. **IF** DG No. 3 is operating and loaded, **THEN ENSURE** that the supply fans for the following applicable Drywell Coolers have started:

___ - *DRYWELL COOLER 2A* (Sub E7/MCC 2XL)

___ - *DRYWELL COOLER 2B* (Sub E8/MCC 2XM)

END OF SECTION

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SYSTEMS

JPM K

LESSON TITLE: Control Room Evacuation IAW AOP-32, Placing the RHR System in SP Cooling

LESSON NUMBER: LOT-OJT-JP-302-E03

REVISION NO: 07

RECOMMENDED BY: Curt Robert
Instructor/Developer DATE

CONCURRENCE BY: _____
Line Superintendent/Supervisor DATE

APPROVED BY: _____
Superintendent/Supervisor Training DATE

SAFETY CONSIDERATIONS:

1. Operating equipment and energized electrical equipment hazards.
2. Hearing protection is required in this area when equipment is operating.
3. Safety Glasses, Hard Hat, and approved footwear must be worn while in the area of this JPM.

EVALUATOR NOTES: (Do not read to performer)

1. The applicable procedure section **WILL** be provided to the performer, once it is demonstrated he/she knows the correct procedure.
2. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.

Read the following to the JPM performer.

TASK CONDITIONS:

1. The Shift Superintendent has determined that Control Room evacuation is required.
2. All immediate actions associated with AOP-32, PLANT SHUTDOWN FROM OUTSIDE CONTROL ROOM, are complete.
3. Remote shutdown equipment has been distributed and communication between the Remote Shutdown Stations is established.
4. NORMAL/LOCAL switches listed in Table 1 and 2 have been placed in LOCAL IAW AOP-32.
5. The 'B' RHR loop has been filled and vented.
6. The RHRSW System has been placed in service.
7. Service Water has been supplied to the vital header.
8. The Station 4 Operator is available in the Diesel Building for starting and stopping loads required by this procedure.
9. This JPM will be performed on Unit _____.

INITIATING CUE:

You are directed by the Unit SCO to perform ALL Station 2 (Reactor Building Operator) actions, including Remote Shutdown Panel actions, associated with placing the 'B' Loop RHR System in Suppression Pool Cooling from outside the Control Room per 0AOP-32, Step 3.2.11.3. Notify the Unit SCO when Suppression Pool Cooling has been established.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.

Step 1 – Obtain current revision of AOP-32.

Obtains current revision of AOP-32.

SAT/UNSAT*

TIME START _____

PROMPT: Prompts are for as found indication. Provide MCC valve light indications commensurate with Performer actions.

PROMPT: Green light is on, red light is off.

Step 2 – Start the 'B' RHR room cooler fan at MCC 1(2)XB, Comp. 1-DP5(2-BV9). Position indication is located on DP7, Row A2.

'B' RHR room cooler is started.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Green light is off, red light is on.

Step 3 – CLOSE RHR Heat Exchanger B Inlet Valve, E11-F047B, at MCC 1(2)XB, Comp. DM7, Row N2.

E11-F047B is closed.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Green light is off, red light is on.

Step 4 – CLOSE RHR Heat Exchanger B Bypass Valve, E11-F048B, at MCC 1(2)XB, Comp. DM8, Row N3.

E11-F048B is closed.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Green light is off, red light is on.

Step 5 – Verify OPEN RHR Heat Exchanger B Outlet Valve, E11-F003B, at MCC 1(2)XB, Comp. DK8, Row N1.

E11-F003B is verified open.

SAT/UNSAT*

PROMPT: Green light is on, red light is off.

Step 6 – OPEN RHR Suppression Pool Discharge Isolation Valve, E11-F028B, at MCC 1(2)XB-2, Comp. DM5, Row B4.

E11-F028B is opened.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Respond as the Station 4 (Diesel Generator) Operator in the following step. After one minute report that B or D RHR pump has been started.

NOTE: RHR System flow must be raised to >500 gpm in one minute to prevent pump overheating.

Step 7 – Contact the Station 4 (Diesel Generator) Operator and direct starting the B or D RHR pump by placing the local START/STOP switch to START.

B or D RHR pump is started by Station 4.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Green light is on, red light is off.

Step 8 – OPEN RHR Heat Exchanger B Bypass Valve, E11-F048B, at MCC 1(2)XB, Comp. DM8, Row N3.

E11-F048B is opened.

****CRITICAL STEP**SAT/UNSAT***

NOTE: The Evaluator may act as a second Operator stationed at the RSDP to provide RHR flow indication. Ensure the Performer can accurately read gauge increments if this option is used.

PROMPT: Green light is on, red light is off.

PROMPT: Provide indication of rising flow as E11-F024B is throttled open

Step 9 – THROTTLE OPEN RHR Suppression Pool Cooling Isolation Valve, E11-F024B, at MCC 1(2)XB-2, Comp. DM2, Row J2 until RHR System flow is >6000 gpm and <7500 as read on the RSDP.

E11-F024B is throttled open until flow is between 6000 and 7500 gpm.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Green light is on, red light is off.

Step 10 – OPEN RHR Heat Exchanger B Inlet Valve, E11-F047B, at MCC 1(2)XB, Comp. DM7, Row N2.

E11-F047B is opened.

****CRITICAL STEP**SAT/UNSAT***

PROMPT: Notify the Performer that no adjustment of E11-F048B is required.

Step 11 – Notify the Unit SCO that Suppression Pool Cooling has been established with the 'B' RHR Loop.

Unit SCO is notified.

SAT/UNSAT*

TERMINATING CUE: When the 'B' Loop of RHR is in Suppression Pool Cooling and the Unit SCO is notified, this JPM is complete.

TIME COMPLETED _____

LIST OF REFERENCES

RELATED TASKS:

200604B504

Perform MCC Operator Actions For Placing Suppression Pool Cooling In Service Per ASSD-002 or AOP-32.

K/A REFERENCE AND IMPORTANCE RATING:

219000 A4.12 (4.1/4.1)

Ability to manually operate and/or monitor in the control room: Suppression pool temperature

REFERENCES:

AOP-32, PLANT SHUTDOWN FROM OUTSIDE CONTROL ROOM

TOOLS AND EQUIPMENT:

Equipment from the Remote Shutdown Equipment Locker.

SAFETY FUNCTION (from NUREG 1123, Rev 2.):

Safety Function 5: Containment Integrity

REASON FOR REVISION:

Update to new revision of AOP-32.

Control Room Evacuation IAW AOP-32, Placing the RHR System in SP Cooling

Time Required for Completion: 15 Minutes (approximate).

Time Taken: ____

APPLICABLE METHOD OF TESTING

Performance: Simulate ✓ Actual ___ Unit: 1/2

Setting: Control Room ___ Simulator ___ (Not applicable to In-Plant JPMs)

Time Critical: Yes ___ No ✓ Time Limit N/A

Alternate Path: Yes ___ No ✓

EVALUATION

Performer:_____ SSN: _____

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Performer Verify Procedure? Yes _____ No _____
(Each Student should verify one JPM per evaluation set)

Comments: _____

_____

_____

_____

_____

Comments reviewed with Student

Evaluator Signature: _____ Date:_____

TASK CONDITIONS:

1. The Shift Superintendent has determined that Control Room evacuation is required.
2. All immediate actions associated with AOP-32, PLANT SHUTDOWN FROM OUTSIDE CONTROL ROOM, are complete.
3. Remote shutdown equipment has been distributed and communication between the Remote Shutdown Stations is established.
4. NORMAL/LOCAL switches listed in Table 1 and 2 have been placed in LOCAL IAW AOP-32.
5. The 'B' RHR loop has been filled and vented.
6. The RHRSW System has been placed in service.
7. Service Water has been supplied to the vital header.
8. The Station 4 Operator is available in the Diesel Building for starting and stopping loads required by this procedure.
9. This JPM will be performed on Unit _____.

INITIATING CUE:

You are directed by the Unit SCO to perform ALL Station 2 (Reactor Building Operator) actions, including Remote Shutdown Panel actions, associated with placing the 'B' Loop RHR System in Suppression Pool Cooling from outside the Control Room per 0AOP-32, Step 3.2.11.3. Notify the Unit SCO when Suppression Pool Cooling has been established.

3.0 OPERATOR ACTIONS

h. Station 2, **OPEN** *NUCLEAR SERVICE WATER TO VITAL HEADER VALVE, SW-V117*, at MCC 1(2)XB Compt DP2, Row G2. ☐

NOTE:	Position indication for *SW-V106* is located on MCC 1(2)XA Compt DE3, Row K3.

i. Station 3, **IF** necessary to increase flow, **THEN THROTTLE** *SERVICE WATER TO RBCCW ISOLATION VALVE, SW-V106*, at MCC 1(2)XA Compt DH9, Row I1. ☐

3. **PERFORM** the following to place the RHR System in operation:

a. Station 2, **START** *B RHR ROOM COOLER FAN* at MCC 1(2)XB Compt 1-DP5(2-BV9), Row D2(C1). ☐

b. Station 2, **CLOSE** *RHR HEAT EXCHANGER B INLET VALVE, E11-F047B*, at MCC 1(2)XB Compt DM7, Row N2. ☐

c. Station 2, **CLOSE** *RHR HEAT EXCHANGER B BYPASS VALVE, E11-F048B*, at MCC 1(2)XB Compt DM8, Row N3. ☐

d. Station 2, **ENSURE** *RHR HEAT EXCHANGER B OUTLET VALVE, E11-F003B*, is open at MCC 1(2)XB Compt DK8, Row N1. ☐

e. Station 2, **OPEN** *RHR SUPPRESSION POOL DISCHARGE ISOLATION VALVE, E11-F028B*, at MCC 1(2)XB-2 Compt DM5, Row B4. ☐

3.0 OPERATOR ACTIONS

NOTE: Close coordination between stations is required when starting an RHR pump in the following steps.

CAUTION

Failure to maintain RHR Loop flow rate at or above 4150 gpm will result in pump overheating. Pump operation in this condition should **NOT** exceed one hour.

CAUTION

R2 An RHR pump should **NOT** be operated with a discharge flow rate of less than 500 gpm for more than one minute with the RHR pumps minimum flow bypass valve closed.

f. Station 4, **START** an RHR Pump:

RHR Pump	Location	
1B	4160 Bus E4, AL0	☐
1D	4160 Bus E2, AH5	☐
2B	4160 Bus E4, AK3	☐
2D	4160 Bus E2, AG9	☐

g. Station 2, **OPEN** *RHR HEAT EXCHANGER B BYPASS VALVE, E11-F048B*, at MCC 1(2)XB Compt DM8, Row N3. ☐

h. Station 2, **THROTTLE OPEN** *RHR SUPPRESSION POOL COOLING ISOLATION VALVE, E11-F024B*, at MCC 1(2)XB Compt DM2, Row J2, to attain between 6000 and 7500 gpm, as indicated on Remote Shutdown Panel indicator, *RHR SYSTEM FLOW, RHR-FI-3338.* ☐

i. Station 2, **OPEN** *RHR HEAT EXCHANGER B INLET VALVE, E11-F047B*, at MCC 1(2)XB Compt DM7, Row N2. ☐

3.0 OPERATOR ACTIONS

j. Station 2, **THROTTLE CLOSE** *RHR HEAT EXCHANGER B BYPASS VALVE, E11-F048B*, at MCC 1(2)XB Compt DM8, Row N3 as required, to cool the suppression pool to less than 90°F. ☐

NOTE:	The Condensate System should be secured prior to 500 psig reactor pressure.

3.2.12 **PERFORM** the following to secure the Condensate System:

1. Station 3, **CLOSE** the following valves using controls on Turbine Building 20' Breezeway Instrument Rack, IR-TB-2, **AND RECORD** on Attachment 5A(B):

   - *RACK ISOLATION VALVE TO COD-PI-32 AND COD-PS-160, COD-PI-32-1* ☐
   - *RACK ISOLATION VALVE TO COD-PI-33 AND COD-PS-161, COD-PI-33-1* ☐
   - *RACK ISOLATION VALVE TO COD-PI-34 AND COD-PS-162, COD-PI-34-1.* ☐

2. Station 3, **OPEN** the following drain valves to trip the Condensate Booster Pumps on low suction pressure **AND RECORD** on Attachment 5A(B):

   - *INSTRUMENT DRAIN VALVE TO COD-PI-32 AND COD-PS-160, COD-PI-32-6* ☐
   - *INSTRUMENT DRAIN VALVE TO COD-PI-33 AND COD-PS-161, COD-PI-33-6* ☐
   - *INSTRUMENT DRAIN VALVE TO COD-PI-34 AND COD-PS-162, COD-PI-34-6.* ☐