

Draft Submittal

BRUNSWICK OCT/NOV 2004

**EXAM 50-325, 324/2004-301
OCTOBER 29, 2004 &
NOVEMBER 2 - 10, 2004**

Draft Simulator JPMs



**PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION**

**JOB PERFORMANCE MEASURE
SYSTEMS**

JPM A

LESSON TITLE: Shutdown HPCI, Aux Oil Pump Does Not Auto Start

LESSON NUMBER: LOT-SIM-JP-019-A12

REVISION NO: 01

RECOMMENDED BY: Curt Robert _____ DATE
Instructor/Developer

CONCURRENCE BY: _____ DATE
Line Superintendent/Supervisor

APPROVED BY: _____ DATE
Superintendent/Supervisor Training

Shutdown HPCI, Aux Oil Pump Does Not Auto Start

SIMULATOR SETUP:

A. Initial Conditions:

1. Recommended Initial Conditions

IC 11 Unit 2
Rx. Pwr. 100% of rated thermal power
Core Age BOC

2. Required Plant Conditions

B. B. Malfunctions

Event	System	Tag	Title	Value (ramp rate)	Activate Time (sec)	Deactivate Time (sec)
			None			

C. Overrides

Event	Panel or System	Tag	Title	Value (ramp rate)	Activate Time (sec)	Deactivate Time (sec)
NA	P601	K1126A	Aux Oil PMP Auto	OFF	00	NA

D. Remote Function

System	Tag	Title	Value (ramp rate)
		None	

Special Instructions

1. Insert a manual scram.
2. Perform Operator immediate actions.
3. Place RCIC or RFPs in service to control reactor level. Reactor level must not drop to the LL2 HPCI initiation setpoint (105 inches) during the performance of this JPM.
4. Place HPCI in pressure control mode at minimum speed in automatic control using the Hard Card.
5. Override HPCI Aux Oil Pump Control Switch "Auto" position to "OFF" (K1126A).
6. If desired, place RHR in Torus Cooling.

SAFETY CONSIDERATIONS:

None

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 2 has scrammed.
2. MSIVs closed following the scram but have been re-opened per 2OP-025, MAIN STEAM SYSTEM OPERATING PROCEDURE.
3. HPCI was placed in pressure control mode but is no longer needed.
4. Another Operator is available to secure the SBT system and perform PT-02.3.1, SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS OPERABILITY TEST.

INITIATING CUE:

You are directed by the Unit SCO to shutdown HPCI using 2OP-19, HIGH PRESSURE COOLANT INJECTION SYSTEM OPERATING PROCEDURE. Inform the Unit SCO when HPCI has been shutdown per the procedure.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain current revision of 2OP-19, Section 7.0 and verify revision if applicable.

Current revision of 2OP-19, Section 7.0 is obtained.

SAT/UNSAT*

TIME START _____

Step 2 – CLOSE E41-F008, BYPASS TO CST VLV.

E41-F008 is closed.

SAT/UNSAT*

Step 3 – CLOSE E41-F011, REDUNDANT ISOL TO CST VLV.

E41-F011 is closed.

SAT/UNSAT*

Step 4 – ENSURE E41-F012, MIN FLOW BYPASS TO TORUS VLV, OPENS.

E41-F012 is verified open.

SAT/UNSAT*

Shutdown HPCI, Aux Oil Pump Does Not Auto Start

Step 5 – CLOSE E41-F001, TURBINE STEAM SUPPLY VLV, AND IMMEDIATELY DEPRESS AND HOLD the TURBINE TRIP push button until E41-F001 is fully CLOSED.

E41-F001 is closed and the Turbine Trip push button is immediately pressed until E41-F001 is fully closed.

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

Step 6 – ENSURE E41-V8, TURBINE STOP VALVE, CLOSES.

E41-V8 is verified closed.

SAT/UNSAT*

NOTE: With the HPCI Aux Oil Pump control switch AUTO position overridden OFF, the pump will not automatically start but can be started by placing the control switch to START.

Event	Panel or System	Tag	Title	Value (ramp rate)	Activate Time (sec)	Deactivate Time (sec)
NA	P601	K1126A	Aux Oil PMP Auto	OFF	00	NA

Step 7 – ENSURE AUXILIARY OIL PUMP auto starts as the turbine speed decreases.

Performer recognizes the failure of the Aux Oil Pump to auto start and manually starts the pump.

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

PROMPT: Respond as necessary as the UNIT SCO to reports of the HPCI Aux Oil Pump failure. Notify the Performer that I&C will investigate.

Shutdown HPCI, Aux Oil Pump Does Not Auto Start

Step 8 – ENSURE E41-F012, MIN FLOW BYPASS TO TORUS VLV, CLOSSES.

E41-F012 is verified closed.

SAT/UNSAT*

NOTE: The Performer may take the controller to MANUAL and then depress the 'PF' push button. This is an acceptable means of returning the controller to 4300 gpm.

Step 9 – ADJUST HPCI FLOW CONTROL setpoint to 4300 gpm.

Flow controller is set to 4300 gpm.

SAT/UNSAT*

PROMPT: Notify the Performer that another Operator will perform PT-02.3.1b, Suppression Pool to Drywell Vacuum Breaker Position Indication Check.

PROMPT: Notify the Performer that 15 minutes has elapsed.

Step 10– 15 minutes after the HPCI Turbine is TRIPPED, the VACUUM PUMP control switch is placed in STOP.

The Vacuum Pump control switch is placed in STOP.

SAT/UNSAT*

Shutdown HPCI, Aux Oil Pump Does Not Auto Start

Step 11– PLACE the VACUUM PUMP control switch in AUTO.

The Vacuum Pump control switch is verified in AUTO.

SAT/UNSAT*

PROMPT: Notify the Performer that bearing differential temperature is 0 degrees Fahrenheit.

Step 12– PLACE the AUXILIARY OIL PUMP control switch in STOP.

The Aux Oil Pump control switch is placed in STOP.

SAT/UNSAT*

Step 13– PLACE the AUXILIARY OIL PUMP control switch in AUTO.

The Aux Oil Pump control switch is verified in AUTO.

SAT/UNSAT*

Step 14– PLACE the BAROMETRIC CNDSR CONDENSATE PUMP control switch in AUTO.

The Barometric Condenser Condensate Pump control switch is verified in AUTO.

SAT/UNSAT*

Step 15– CLOSE E41-F059, COOLING WATER SUPPLY VLV.

E41-F059 is closed.

SAT/UNSAT*

Shutdown HPCI, Aux Oil Pump Does Not Auto Start

PROMPT: Notify the Performer that another Operator will perform steps 21 through 23.
(Secure SBT, Standby lineup checklist, and PT-2.3.1)

Step 16– Notify the Unit SCO that HPCI has been shutdown per 2OP-19.

Unit SCO is notified.

SAT/UNSAT*

TERMINATING CUE: When HPCI is shutdown and the Unit SCO is notified, this JPM is complete.

TIME COMPLETED _____

LIST OF REFERENCES

RELATED TASKS:

206007B101

Shutdown the HPCI System per OP-19.

K/A REFERENCE AND IMPORTANCE RATING:

206000 A4

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

A4.04	Major System Valves	3.7/3.7
A4.10	System Pumps	3.7/3.5
A4.12	Turbine Trip Controls	4.0/3.9

REFERENCES:

20P-019, HIGH PRESSURE COOLANT INJECTION SYSTEM OPERATING
PROCEDURE

TOOLS AND EQUIPMENT:

None

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

Safety Function Group 4, Heat Removal from Reactor Core

REASON FOR REVISION:

Minor format revision.

Shutdown HPCI, Aux Oil Pump Does Not Auto Start

Time Required for Completion: 15 Minutes (approximate).

Time Taken: _____

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

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 2 has scrammed.
2. MSIVs closed following the scram but have been re-opened per 2OP-025, MAIN STEAM SYSTEM OPERATING PROCEDURE.
3. HPCI was placed in pressure control mode but is no longer needed.
4. Another Operator is available to secure the SBGT system and perform PT-02.3.1, SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS OPERABILITY TEST.

INITIATING CUE:

You are directed by the Unit SCO to shutdown HPCI using 2OP-19, HIGH PRESSURE COOLANT INJECTION SYSTEM OPERATING PROCEDURE. Inform the Unit SCO when HPCI has been shutdown per the procedure.

**PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION**

**JOB PERFORMANCE MEASURE
SYSTEMS**

JPM B

**LESSON TITLE: Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I
(CB-XU-63)**

LESSON NUMBER: JPM-B

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.
-

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) is currently operating at maximum power.
2. All power to the trip units in Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63) has been lost and it is desired to reenergize them.
3. Power is available from 125/250 Vdc Switchboard 1A.
4. All applicable prerequisites as listed in Section 4.0 of 1OP-01 are met.
5. This JPM will be performed on Unit One (1).
6. Assume that any required independent verification has been performed.

INITIATING CUE:

You are directed by the Unit SCO to reenergize Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63) and inform when you are complete.

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

PERFORMANCE CHECKLIST

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

Step 1 – Obtain current revision of 1OP-01.

Obtains current revision of 1OP-01.

SAT/UNSAT*

TIME START _____

NOTE: Step 2 and 3 - Toggle switches are located behind guard on the associated power supplies.

PROMPT: OFF

Step 2 – **PLACE** the control switch for *POWER SUPPLY NUMBER 1* on CB-XU-63 in *OFF*.

PLACES POWER SUPPLY NUMBER 1 on CB-XU-63 in OFF.

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

PROMPT: OFF

Step 3 – **PLACE** the control switch for *POWER SUPPLY NUMBER 2* on CB-XU-63 in *OFF*.

PLACES POWER SUPPLY NUMBER 2 on CB-XU-63 in OFF.

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

NOTE: All fuses are located in the upper right hand side of the cabinet.
B21-F5A is in the Top Row fifth fuse in counting from right to left.
B21-F7A is in the Top Row seventh fuse in counting from right to left.
B21-F13A is in the Top Row second fuse in counting from left to right.
B21-F15A is in the Top Row fourth fuse in counting from left to right.

Step 4 – **REMOVE** the following fuses inside Panel CB-XU-63 to prevent the designated master trip units and their associated slave trip units from energizing and tripping:

- a. B21-F5-A (B21-LTM-N031A-1)
- b. B21-F7-A (B21-LTM-N031C-1)
- c. B21-F13-A (B21-LTM-N024A-2)
- d. B21-F15-A (B21-LTM-N025A-2)

Removes four fuses with fuse pullers as follows:

B21-F5A is in the Top Row fifth fuse in counting from right to left.
B21-F7A is in the Top Row seventh fuse in counting from right to left.
B21-F13A is in the Top Row second fuse in counting from left to right.
B21-F15A is in the Top Row fourth fuse in counting from left to right.

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

NOTE: Currently, Circuit 19 on 125 Vdc Distribution Panel 3A is OPEN (to the left).

PROMPT: Circuit 19 on 125 Vdc Distribution Panel 3A remains CLOSED (to the right).

Step 5 – **ENSURE** the breaker for Circuit 19 on 125 Vdc Distribution Panel 3A is closed.

Places Circuit 19 on 125 Vdc Distribution Panel 3A to closed.

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

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

NOTE: Currently, Circuit 1 on 125 Vdc Distribution Panel 11A is OPEN (to the left).

PROMPT: Circuit 1 on 125 Vdc Distribution Panel 11A remains CLOSED (to the right).

Step 6 – **ENSURE** the breaker for Circuit 1 on 125 Vdc Distribution Panel 11A is closed.

Places Circuit 1 on 125 Vdc Distribution Panel 11A to closed.

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

PROMPT: Inverter Number 1 red indicating light on. Inverter Number 2 red indicating light on.

Step 7 – **ENSURE** at least one of the following Inverter red indicating lights is on at Panel CB-XU-63:

- a. Inverter Number 1 red indicating light on.
- b. Inverter Number 2 red indicating light on.

Verifies that Inverter Number 1 and 2 red POWER ON indicating lights are on.

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

NOTE: Step 7 of 10P-01 Section 8.1 is N/A.

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

NOTE: If fuses were not pulled correctly to maintain B21-LTM-N031A-1, B21-LTM-N031C-1, B21-LTM-N024A-2, and B21-LTM-N025A-2 deenergized ATWS/ARI will initiate due to momentary trips on certain trip units if the correct combination of instruments are energized. The trip unit outputs trip before the transmitter can power up and stabilize above the trip setpoint.

PROMPT: When control switch for *POWER SUPPLY NUMBER 1* on CB-XU-63 is placed to *ON POWER SUPPLY NUMBER 1* red AC **AND** DC indicating lights on all instruments indicate in normal band with no trips

Step 8 – **IF** Inverter Number 1 is operating, **THEN PERFORM** the following:

- a. **PLACE** the control switch for *POWER SUPPLY NUMBER 1* on CB-XU-63 in *ON*.
- b. **ENSURE** *POWER SUPPLY NUMBER 1* red AC **AND** DC indicating lights are on.
- c. **ENSURE** the master trip units on Panel CB-XU-63 which did **NOT** have their fuses removed above now have power **AND** are indicating correctly for the current plant conditions.
- d. **RESET** any trips or alarms as applicable.

PLACES the control switch for *POWER SUPPLY NUMBER 1* on CB-XU-63 in *ON*,
Verifies *POWER SUPPLY NUMBER 1* red AC **AND** DC indicating lights are on,
master trip units on Panel CB-XU-63 which did **NOT** have their fuses removed above
now have power **AND** are indicating correctly for the current plant conditions.

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

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

NOTE: If fuses were not pulled correctly to maintain B21-LTM-N031A-1, B21-LTM-N031C-1, B21-LTM-N024A-2, and B21-LTM-N025A-2 deenergized ATWS/ARI will initiate due to momentary trips on certain trip units if the correct combination of instruments are energized. The trip unit outputs trip before the transmitter can power up and stabilize above the trip setpoint.

PROMPT: When control switch for *POWER SUPPLY NUMBER 1* on CB-XU-63 is placed to *ON POWER SUPPLY NUMBER 1* red AC **AND** DC indicating lights on all instruments indicate in normal band with no trips

Step 9 – **IF** Inverter Number 2 is operating, **THEN PERFORM** the following:

- a. **PLACE** the control switch for *POWER SUPPLY NUMBER 2* on CB-XU-63 in *ON*.
- b. **ENSURE** *POWER SUPPLY NUMBER 2* red AC **AND** DC indicating lights are on.
- c. **ENSURE** the master trip units on Panel CB-XU-63 which did **NOT** have their fuses removed above now have power **AND** are indicating correctly for the current plant conditions.
- d. **RESET** any trips or alarms as applicable.

PLACES the control switch for *POWER SUPPLY NUMBER 2* on CB-XU-63 in *ON*,
Verifies *POWER SUPPLY NUMBER 2* red AC **AND** DC indicating lights are on,
master trip units on Panel CB-XU-63 which did **NOT** have their fuses removed above
now have power **AND** are indicating correctly for the current plant conditions.

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

PROMPT: Fuse B21-F5A is inserted as you see it.

Step 10 – **REPLACE** Fuse B21-F5-A, in Panel CB-XU-63, to energize master trip unit B21-LTM-N031A-1 and its associated circuitry.

***REPLACES** Fuse B21-F5-A, in Panel CB-XU-63. B21-F5A is in the Top Row fifth fuse in counting from right to left.*

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

PROMPT: B21-LTM-N031A-1 is indicating properly and RED trip light is ON. When trip reset pushbutton is depressed the RED light extinguishes.

Step 11 – **ENSURE** master trip unit B21-LTM-N031A-1 is indicating properly **AND RESET** any applicable trips or alarms.

*Verifies master trip unit B21-LTM-N031A-1 is indicating properly **AND RESETS** trip by depressing the trip reset pushbutton.*

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

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

PROMPT: Fuse B21-F7A is inserted as you see it.

Step 12 – **REPLACE** Fuse B21-F7-A, in Panel CB-XU-63, to energize master trip unit B21-LTM-N031C-1 and its associated circuitry.

***REPLACES** Fuse B21-F7-A, in Panel CB-XU-63. B21-F7A is in the Top Row seventh fuse in counting from right to left.*

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

PROMPT: B21-LTM-N031C-1 is indicating properly and RED trip light is ON. When trip reset pushbutton is depressed the RED light extinguishes.

Step 13 – **ENSURE** master trip unit B21-LTM-N031C-1 is indicating properly **AND RESET** any applicable trips or alarms.

*Verifies master trip unit B21-LTM-N031C-1 is indicating properly **AND RESETS** trip by depressing the trip reset pushbutton.*

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

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

PROMPT: Fuse B21-F13A is inserted as you see it.

Step 14 – **REPLACE** Fuse B21-F13-A, in Panel CB-XU-63, to energize master trip unit B21-LTM-N024A-2 and its associated circuitry.

REPLACES Fuse B21-F13-A, in Panel CB-XU-63. B21-F13A is in the Top Row second fuse in counting from left to right.

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

PROMPT: B21-LTM-N024A-2 is indicating properly and RED trip light is ON. When trip reset pushbutton is depressed the RED light extinguishes.

Step 15 – **ENSURE** master trip unit B21-LTM-N024A-2 is indicating properly **AND RESET** any applicable trips or alarms.

*Verifies master trip unit B21-LTM-N024A-2 is indicating properly **AND RESETS** trip by depressing the trip reset pushbutton.*

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

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

PROMPT: Fuse B21-F15A is inserted as you see it.

Step 16 – **REPLACE** Fuse B21-F15-A, in Panel CB-XU-63, to energize master trip unit B21-LTM-N025A-2 and its associated circuitry.

REPLACES Fuse B21-F15-A, in Panel CB-XU-63. B21-F15A is in the Top Row fourth fuse in counting from left to right.

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

PROMPT: B21-LTM-N025A-2 is indicating properly and RED trip light is ON. When trip reset pushbutton is depressed the RED light extinguishes.

Step 17 – **ENSURE** master trip unit B21-LTM-N025A-2 is indicating properly **AND RESET** any applicable trips or alarms.

*Verifies master trip unit B21-LTM-N025A-2 is indicating properly **AND RESETS** trip by depressing the trip reset pushbutton.*

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

TERMINATING CUE: When Panel CB-XU-63 is energized and the Unit SCO is notified, this JPM is complete.

TIME COMPLETED _____

LIST OF REFERENCES

RELATED TASKS: 299012B301

K/A REFERENCE AND IMPORTANCE RATING:

216000 A102 2.9/3.1

Ability to predict and/or monitor changes in parameters associated with operating the Nuclear Boiler System controls including returning a sensor to service.

216000 A206 2.9/3.1

Ability to predict the impacts of a loss of DC power on the nuclear boiler instrumentation and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.

REFERENCES:

10P-01, NUCLEAR BOILER SYSTEM

TOOLS AND EQUIPMENT:

Fuse Pullers.

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

Safety Function 7: Instrumentation

REASON FOR REVISION:

New JPM for NRC 2004.

Reenergizing Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63)

Time Required for Completion: 15 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) is currently operating at maximum power.
2. All power to the trip units in Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63) has been lost and it is desired to reenergize them.
3. Power is available from 125/250 Vdc Switchboard 1A.
4. All applicable prerequisites as listed in Section 4.0 of 1OP-01 are met.
5. This JPM will be performed on Unit One (1).
6. Assume that any required independent verification has been performed.

INITIATING CUE:

You are directed by the Unit SCO to reenergize Trip Calibration Cabinet, AQ6, ECCS Division I (CB-XU-63) and inform when you are complete.

SIMULATOR SETUP:

A. Initial Conditions:

1. Recommended Initial Conditions

IC 11
 Rx. Pwr. 100%
 Core Age BOC

B. Required Plant Conditions

A Secondary Containment leak that results in tripping the D12-R609A/B monitors on high radiation, which isolates RB HVAC. RPV water level is below LL2 or DW pressure is >1.7 psig and the Rx Bldg Rad Monitors are tripped.

C. Malfunctions

Event	System	Tag	Title	Value (ramp rate)	Activate Time (sec)	Deactivate Time (sec)
A	RW	RH013F	RWCU Break in Triangle Room	100%/4 mins	00	NA
A	NB	NB006F	MSL D Break before flow restrictor	1%/0 mins	00	NA

D. Overrides

Event	Panel	Tag	Title	Value (ramp rate)	Activate Time (sec)	Deactivate Time (sec)
E1	XU3	ZUA362	Rx Bldg Vent Temp Hi	ON	00	NA

E1: G6B30G3G (RB Vent Flow Indicator on XU-51) >0.25 (of full scale)

E. Special Instructions

1. Place simulator in RUN and activate malfunctions.
2. When drywell pressure rises to cause a reactor scram, carry out the RO immediate actions.

SAFETY CONSIDERATIONS:

NONE.

EVALUATOR NOTES: (Do not read to examinee)

1. The applicable procedure section **WILL NOT** be provided to the examinee.
 2. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the examinee.
-

Read the following to trainee.

TASK CONDITIONS:

1. EOP-03-SCCP has been entered.
2. A high-radiation condition sensed by the RB Vent Radiation Monitors (D12-R609A/B) resulted in the isolation of Reactor Building HVAC.
3. The condition is now cleared and EOP-03-SCCP directs restoring RB HVAC.

INITIATING CUE:

The Unit SCO directs you to restart Reactor Building HVAC per SEP-04 and inform him when your actions are complete.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain current revision of 0EOP-SEP-04.
Current revision of 0EOP-SEP-04 obtained.

SAT/UNSAT*

PROMPT: If requested indicate by pointing peak radiation levels on D12-RR-R605 at 4mr/hr.
If asked inform examinee that UA-03, 6-2 has not alarmed.

Step 2 – Verifies RB vent rad monitors have not been off-scale high as indicated on D12-RR-605 and that Reactor Building Exhaust temperature has not exceeded 135°F
Peak radiation levels determined on D12-RR-R605 to be onscale. Verifies UA-03, 6-2 not in alarm.

SAT/UNSAT*

PROMPT: When requested, install jumpers by modifying Remote Function EP_IAEOPJP6 to ON and inform the examinee that jumpers have been installed to bypass reactor low water level and Drywell high pressure Isolation interlocks.

Step 3 - Request jumpers be installed to bypass the low reactor level and high drywell pressure interlocks.

Jumpers are installed to bypass the interlocks.

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

Step 4 - Place the CAC PURGE VENT ISOL OVRD, CAC-CS-5519 switch to OVERRIDE.
CAC-CS-5519 switch in OVERRIDE.

Step 5 - Reset the Process Reactor Building Vent Exhaust Rad Monitors at Panel H12-P606.
D12-RM-K609A and D12-RM-K609B are reset at Panel H12-P606.

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

Step 6 - Reset the PCIS Group 6 Isolation on RTGB Panel P601.

PCIS Group 6 Isolation reset by depressing pushbuttons S32 and S33 on P601.

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

PROMPT: If asked, inform examinee that instrument air pressure to the Reactor Building ventilation isolation valve latch actuators was never lost, **OR:**

PROMPT: If requested, inform the examinee as Reactor Building Auxiliary Operator that the latches for the Reactor Building Ventilation Isolation Dampers are in the unlatched position.

Step 7 - Open RB Vent Isol Vlvs:

- a. C-BFIV-RB and A-BFIV-RB
C-BFIV-RB, A-BFIV-RB are open.

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

- b. D-BFIV-RB and B-BFIV-RB
D-BFIV-RB, B-BFIV-RB are open.

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

PROMPT: When second set of RB HVAC Supply and Exhaust Fans have been started causing RB Vent Flow to increase >50K scfm, verify Event Trigger E1 to activate to cause annunciator UA-03, 6-2 RX BLDG VENT TEMP HI to alarm.

SEP-04 – Restart RB HVAC with Failure to Isolate

Step 8 - Start as many Reactor Building Exhaust and Supply Fans as possible to provide maximum ventilation.

At least one Reactor Building Supply and Exhaust Fan Running.

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

Step 9 – Recognizes UA-03, 6-2 RX BLDG VENT TEMP HI in alarm.

UA-03 recognized and acknowledged.

SAT/UNSAT*

NOTE: Closing the BFIV-RBs will cause the Reactor Building Vent and Supply fans to automatically trip.

Step 10 – Manually stop the Reactor Building Supply and Exhaust Fans.

All Reactor Building Supply and Exhaust Fans are stopped.

SAT/UNSAT*

Step 11 – Manually close RB Vent Isol Vlvs:

- a. C-BFIV-RB and A-BFIV-RB
C-BFIV-RB, A-BFIV-RB are closed.

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

- b. D-BFIV-RB and B-BFIV-RB
D-BFIV-RB, B-BFIV-RB are closed.

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

SEP-04 – Restart RB HVAC with Failure to Isolate

Step 12 - Ensure initiated SBGT system.

Both SBGT trains are operating.

SAT/UNSAT*

Step 13 – Unit SCO informed that SEP-04, RB HVAC Restart procedure cannot be performed at this time.

Unit SCO informed.

SAT/UNSAT*

TERMINATING CUE: RB HVAC has been isolated and SBGT has been verified running.

* Comments required for any step evaluated as UNSAT.

LIST OF REFERENCES

RELATED TASKS:

288205B501
Restart Reactor Building HVAC per EOP-01-SEP-04

K/A REFERENCE AND IMPORTANCE RATING:

288000 A3.01 3.8, 3.8
Ability to monitor Plant Ventilation System automatic isolation/initiation signals in the control room

REFERENCES:

0EOP-SEP-04 Rev. 11

TOOLS AND EQUIPMENT:

Plant Page

SAFETY FUNCTION (from NUREG 1123, Rev 2):

9 – Radioactivity Release

REASON FOR REVISION:

Minor changes.

Time Required for Completion: 10 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate Actual Unit: 2
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. EOP-03-SCCP has been entered.
2. A high-radiation condition sensed by the RB Vent Radiation Monitors (D12-R609A/B) resulted in the isolation of Reactor Building HVAC.
3. The condition is now cleared and EOP-03-SCCP directs restoring RB HVAC.

INITIATING CUE:

The Unit SCO directs you to restart Reactor Building HVAC per SEP-04 and inform him when your actions are complete.



**PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION**

**JOB PERFORMANCE MEASURE
SYSTEMS**

JPM D

LESSON TITLE: Establish a UAT Backfeed.

LESSON NUMBER: LOT-SIM-JP-050-B03

REVISION NO: 2

RECOMMENDED BY: Curt Robert _____
Instructor/Developer DATE

CONCURRENCE BY: _____
Line Superintendent/Supervisor DATE

APPROVED BY: _____
Superintendent/Supervisor Training DATE

SIMULATOR SETUP

IC-11	BOC
Rx Pwr	100%
Core Age	BOC

Triggers

None

Malfunctions

Active - EE020F (Unit 2 SAT Relay Failure)

Overrides

None

Remote Functions

1. Active - EGZMGDIS (UAT Backfeed Logic & No Load Disconnect), ENABLE
2. RESET – EG_86BAC, Main Generator Backup Lockout Relay

Special Instructions

Ensure Malfunctions and Remote Functions are ACTIVE.

Scram the reactor and perform scram immediate actions

SAFETY CONSIDERATIONS:

None.

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 NUREG 1021, Appendix E, or similar to the trainee.
3. A copy of 2OP-50, Section 8.13, signed off through step 13 should be provided to the examinee.

Read the following to trainee.

TASK CONDITIONS:

1. The Unit 2 Startup Auxiliary Transformer has tripped and locked out, requiring a manual reactor scram and resulting in a Loss Of Off-Site Power.
2. 230 KV Bus 2B is energized. 230 KV Bus 2A is locked out due to the SAT lock out.
3. Diesel Generators 3 and 4 are tied to 4KV Buses E3 and E4.
4. Unit 2 is in process of establishing a UAT backfeed per AOP-36.1 and 2OP-50 to re-energize BOP Buses.
5. 2OP-50 Section 8.13, has been completed through step 13.
6. If independent verification is required assume that it has been completed.

INITIATING CUE:

You are directed by the Unit SCO to complete the steps for UAT backfeed from 230 KV Bus 2B and inform the Unit SCO when all BOP buses are energized.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain latest revision of 2OP-50 Section 8.13.
Current revision of 2OP-50 Section 8.13 obtained.

SAT/UNSAT*

Step 2 - Place the Synchroscope for Generator PCB 29B to the ON position.
Synchroscope switch placed to ON for PCB 29B.

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

Step 3 – Confirm running voltage (230 KV Bus Voltage) is approx. 120 volts.
Running voltage verified to be approx. 120 volts.

SAT/UNSAT*

Step 4 - Close generator PCB 29B.
Generator PCB 29B switch placed to CLOSE.

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

Step 5 – Confirm incoming voltage increases to approximately 120 volts.
Incoming voltage verified at approximately 120 volts.

SAT/UNSAT*

Establish a UAT Backfeed.

Step 6 - Place Synchroscope switch for PCB 29B to OFF.
Synchroscope for 29B is placed to OFF.

SAT/UNSAT*

NOTE: The steps for the remaining PCB are N/A. The sequence of BOP Bus energization is not critical. The generator lockouts are reset due to being an initial condition of the procedure.

PROMPT: If requested, as Unit SCO direct examinee to NA steps for remaining PCB.

Step 7 – Place the CW ISOL VALVES MODE SELECTOR switch to position A.
CW ISOL VALVES MODE SELECTOR switch is in position A.

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

Step 8 – Ensure the mode control switches in MAN for the following:

- a. Condensate Booster Pump 2C
Condensate Booster Pump 2C in MAN.

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

- b. Condensate Booster Pump 2A
Condensate Booster Pump 2B in MAN.

SAT/UNSAT*

- c. Condensate Pump 2B
Condensate Pump 2B in MAN.

SAT/UNSAT*

Establish a UAT Backfeed.

NOTE: Synchroscope will not be at 12 O'clock position since Bus 2C is de-energized.

Step 9 - Place Synchroscope for UAT to Bus 2C to ON.
Synchroscope for UAT to Bus 2C breaker placed to ON.

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

Step 10 - Close the UAT to Bus 2C breaker.
UAT to Bus 2C breaker is closed.

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

Step 11 – Confirm UAT to Bus 2C breaker is closed.
UAT to Bus 2C breaker verified to be closed.

SAT/UNSAT*

Step 12 - Place Synchroscope switch for UAT to 2C breaker to OFF.
Synchroscope switch for UAT to 2C breaker is placed to OFF.

SAT/UNSAT*

NOTE: Examinee should determine steps to energize E4 from 2C are NA.

Establish a UAT Backfeed.

Step 13 – Ensure the mode control switches in MAN for the following:

- a. Condensate Pump 2C
Condensate Pump 2C in MAN.

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

- b. Condensate Pump 2A
Condensate Pump 2A in MAN.

SAT/UNSAT*

- c. Condensate Booster Pump 2B
Condensate Booster Pump 2B in MAN.

SAT/UNSAT*

NOTE: Synchroscope will not be at 12 O'clock position since Bus 2D is de-energized.

Step 14 - Place Synchroscope for UAT to Bus 2D to ON.
Synchroscope for UAT to Bus 2D breaker placed to ON.

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

Step 15 - Close the UAT to Bus 2D breaker.
UAT to Bus 2D breaker is closed.

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

Establish a UAT Backfeed.

Step 16 – Confirm UAT to Bus 2D breaker is closed.
UAT to Bus 2D breaker verified to be closed.

SAT/UNSAT*

Step 17 - Place Synchroscope switch for UAT to 2D breaker to OFF.
Synchroscope switch for UAT to 2D breaker is placed to OFF.

SAT/UNSAT*

NOTE: Examinee should determine steps to energize E3 from 2D are NA.

NOTE: Synchroscope will not be at 12 O'clock position since Bus 2B is de-energized.

Step 18 - Place Synchroscope for UAT to Bus 2B to ON.
Synchroscope for UAT to Bus 2B breaker placed to ON.

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

Step 19 - Close the UAT to Bus 2B breaker.
UAT to Bus 2B breaker is closed.

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

Step 20 – Confirm UAT to Bus 2B breaker is closed.
UAT to Bus 2B breaker verified to be closed.

SAT/UNSAT*

Establish a UAT Backfeed.

Step 21 - Confirm SAT to Bus 2B breaker is open.
SAT to Bus 2B breaker verified to be open.

SAT/UNSAT*

Step 22 - Place Synchroscope switch for UAT to 2B breaker to OFF.
Synchroscope switch for UAT to 2B breaker is placed to OFF.

SAT/UNSAT*

Step 23 – Confirm UA-13 3-6 is clear
UA-13 3-6 verified to be clear.

SAT/UNSAT*

PROMPT: Inform examinee that the SAT will not be deenergized and it is not necessary to transfer E Bus power to the normal feeder at this time. The Generator Isolated Phase Bus system engineer will be notified of UAT Backfeed by another operator.

Step 23 – inform the Unit SCO when all BOP buses are energized.
Unit SCO informed all BOP buses are energized.

SAT/UNSAT*

TERMINATING CUE: All BOP Buses have been energized from the UAT.

* Comments required for any step evaluated as UNSAT.

RELATED TASKS:

245601B101, Place the Auxiliary Transformer in Backfeed Operation per OP-50.

K/A REFERENCE AND IMPORTANCE RATING:

226001 A2.03 3.9/4.3

Use procedures to mitigate consequences of loss of off-site power.

REFERENCES:

AOP-36.1
2OP-50 Rev. 87

TOOLS AND EQUIPMENT:

None.

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

6 - Electrical (AC Electrical Distribution)

REASON FOR REVISION:

Periodic review to ensure current procedure is reflected.

Establish a UAT Backfeed.

Time Required for Completion: 18 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate Actual Unit: 2
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. The Unit 2 Startup Auxiliary Transformer has tripped and locked out, requiring a manual reactor scram and resulting in a Loss Of Off-Site Power.
2. 230 KV Bus 2B is energized. 230 KV Bus 2A is locked out due to the SAT lock out.
3. Diesel Generators 3 and 4 are tied to 4KV Buses E3 and E4.
4. Unit 2 is in process of establishing a UAT backfeed per AOP-36.1 and 2OP-50 to re-energize BOP Buses.
5. 2OP-50 Section 8.13, has been completed through step 13.
6. If independent verification is required assume that it has been completed.

INITIATING CUE:

You are directed by the Unit SCO to complete the steps for UAT backfeed from 230 KV Bus 2B and inform the Unit SCO when all BOP buses are energized.

**PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION**

**JOB PERFORMANCE MEASURE
SYSTEMS**

JPM E

LESSON TITLE: Startup the Second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure.

LESSON NUMBER: LOT-SIM-JP-32-06

REVISION NO: 01

RECOMMENDED BY: Curt Robert _____
Instructor/Developer DATE

CONCURRENCE BY: _____
Line Superintendent/Supervisor DATE

APPROVED BY: _____
Superintendent/Supervisor Training DATE

SIMULATOR SETUP:

A. Initial Conditions:

1. Recommended Initial Conditions

IC	9 (Unit 2)
Rx. Pwr.	52%
Core Age	BOC

2. Required Plant Conditions

B. Malfunctions

RFPT B MAN/DFCS switch to DFCS to trigger 1 (K3202DFC(DFCS)==(equal to) True) Malfunction MCF059F (Multiple ID RFPT B), DFCS Speed Demand Signal Failure to activate (Tied to Trigger 1, placing the DFCS control switch to DFCS) then to automatically delete the malfunction after 5 seconds.

C. Overrides

None

D. Remote Function

None

E. Special Instructions

None.

SAFETY CONSIDERATIONS:

NONE

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. All applicable Prerequisites listed in Section 4.0 of the operating procedure are met.
2. All applicable Initial Conditions listed in Section 5.7.1 of the operating procedure are met.
3. An AO is standing by at the 2B RFP.
4. The 2B Reactor Feed Pump is currently idled per 2OP-32 Section 7.1.2.
5. Radwaste has been notified to place additional demineralizers in service as necessary.

INITIATING CUE:

You are directed to place the second Reactor Feed Pump in service using the operating procedures. Notify the Unit SCO when the second Reactor Feed Pump is in service with the Recirculation Valve in Automatic.

Startup the second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure

PERFORMANCE CHECKLIST

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

Step 1 - Obtain current revision of 2OP-32, Section 5.7 and verify revision if applicable.
Performer starts at step 5.7.2.2.

Current revision of 2OP-32, Section 5.7 obtained, performer goes to step 5.7.2.2.

SAT/UNSAT*

TIME START _____

Step 2 – Ensure RFP B(A) LP SUPPLY VLV RHS-V1(RHS-V2) is OPEN

RHS-V1 is verified OPEN.

SAT/UNSAT*

Step 3 – **SLOWLY RAISE** RFPT B(A) speed by placing RFPT B(A) LOWER /RAISE speed control switch in RAISE until speed is greater than approximately 2550 rpm.

Places LOWER /RAISE speed control switch in RAISE until speed is greater than approximately 2550 rpm as indicated on ACT SPEED indicator 2-RFB-SI-7376

SAT/UNSAT*

Step 4 – **WHEN** RFPT B(A) speed is greater than approximately 2550 rpm, **THEN RAISE** RFPT B(A) SP CTL, C32-SIC-R601B(A), output to match DFCS STPT and SPEED STPT on Panel P603 to within 100 rpm.

RAISES RFPT B(A) SP CTL, C32-SIC-R601B(A), output to match DFCS STPT and SPEED STPT on Panel P603 to within 100 rpm.

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

Startup the second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure

Step 5 – **NOTIFY** Radwaste Operator to monitor and log effluent conductivity for each CDD in service.

Notifies Radwaste Operator.

SAT/UNSAT*

Step 6 – **NOTIFY** Chemistry to sample the effluent of each CDD in service for resin.

Notifies Chemistry.

SAT/UNSAT*

NOTE: When the MAN/DFCS control switch is placed in DFCS this will trigger a loss of DFCS speed demand signal. The DFCS Speed Setpoint will momentarily ramp lower. This malfunction will automatically clear in 2 seconds.

Step 7 – **CONFIRM** the following RFPT B(A) speed signals on Panel P603 agree within approximately 100 rpm:

- a. *DFCS STPT* (speed demand from DFCS)
- b. *SPEED STPT* (speed demand from 5009 control)
- c. *ACT SPD* (actual RFPT speed)

AND PLACE MAN/DFCS control switch in DFCS.

Verifies that RFPT B speed signals agree and places MAN/DFCS in DFCS.

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

Observes that MAN/DFCS control switch is placed in DFCS, DFCS CTRL light is energized, then goes out and the RFP B CONTROL TROUBLE annunciator alarms.

Startup the second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure

Step 8 – Acknowledges RFP B CONTROL TROUBLE annunciator.

Acknowledges RFP B CONTROL TROUBLE annunciator.

SAT/UNSAT*

Step 9 – Reviews APP-UA-13 for window 6-6.

Reviews APP-UA-13 for window 6-6.

SAT/UNSAT*

PROMPT: As the Turbine Building AO report the local annunciator panel has the WOODWARD CONTROL TROUBLE alarm flashing, and that when acknowledged the alarm cleared.
NOTE: Acknowledge and clear the alarm using the remote function for the 5009 control panel.

Step 8 – Directs the Turbine Building AO to investigate the alarm condition at the local 5009 panel in the breezeway.

Directs AO to report the cause of the alarm at the local panel.

SAT/UNSAT*

PROMPT: As the SRO acknowledge the report and state that you have requested I & C to troubleshoot the Woodward Governor.

Step 9 – Notifies SRO of the annunciator. SRO notifies I & C to troubleshoot the Woodward Governor.

SRO notified.

SAT/UNSAT*

Startup the second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure

NOTE: The Performer may reference AOP-23 but entry into the AOP is NOT required.

SIMULATOR OPERATOR: Delete CF059F to simulate repair made by I&C. Inform examiner that malfunction has been deleted.

PROMPT: As the SRO report that I & C has found and repaired a loose connection. Direct the Performer to transfer the RFPT Woodward 5009B to DFCS control per 2OP-32, Section 8.32 and continue placing the RFP in service.

PROMPT: Simulator Operator must acknowledge local alarm panel to clear the common alarm in the Control Room

Step 10 – References Section 8.32 of 2OP-32.

Section 8.32 of 2OP-32 obtained.

SAT/UNSAT*

Step 11 – **PLACE** RFPT B MAN/DFCS selector switch in MAN.

RFPT B MAN/DFCS selector switch in MAN.

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

Step 12 – **DEPRESS** RFPT B CTRL RESET on Panel XU-1.

RFPT B CTRL RESET on Panel XU-1 reset.

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

Startup the second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure

Step 13 – Ensure RFPT B speed indications on the P603 panel agree within 100 rpm.

DFCS STPT within 100 rpm of ACT SPD

SPEED STPT within 100 rpm of ACT SPD

SAT/UNSAT*

Step 14 – Place MAN/DFCS control switch in DFCS.

MAN/DFCS control switch in DFCS, DFCS CTRL light is energized.

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

Step 15 – **SLOWLY RAISE** RFPT B(A) speed by depressing the raise pushbutton on C32-SIC-R601B(A) until RFP discharge pressure is approximately equal to reactor pressure.

RFP B discharge pressure is ~equal to RPV pressure (~1000 psig).

SAT/UNSAT*

Step 16 – Open RFP B DISCH VLV, FW-V4.

RFP B DISCH VLV, FW-V4 is open.

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

Step 17 – **SLOWLY RAISE** RFPT B speed by depressing the raise pushbutton on C32-SIC-R601B until RFP B demand is approximately equal to RFP A demand.

RFP B DEM is approximately equal to RFP A DEM ($\pm 0.5\%$).

SAT/UNSAT*

Startup the second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure

Step 18 – **DEPRESS** the A/M pushbutton on C32-SIC-R601B to place the controller in auto.

C32-SIC-R601B A/M indicator indicates A.

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

Step 19 – **WHEN** RFP B flow is $> 2.5 \times 10^6$ lbm/hr place RFP B RECIRC VLV, FW-FV-V47 in AUTO.

RFP B RECIRC VLV, FW-FV-V47 in AUTO.

SAT/UNSAT*

TERMINATING CUE: When the Feed Pump Recirc Valve is placed in AUTO and the Unit SCO is notified, this JPM is complete.

TIME COMPLETED _____

RELATED TASKS:

259203B101, Start the second Reactor Feed Pump per OP-32
259710B401 Respond to a RFP digital control trouble alarm per APP-UA-13.
259711B101 Transfer RFPT Woodward 5009A(B) to DFCS Control per OP-32.

K/A REFERENCE AND IMPORTANCE RATING:

259001		259002	
A4.02	3.9, 3.7	A1.07	2.6, 2.6
A1.04	2.8, 2.7	A2.06	3.3, 3.4
A3.01	3.3, 3.5	A4.01	3.8, 3.6
A3.08	2.8, 2.7	A4.03	3.8, 3.6
A3.09	3.0, 3.0	A4.07	3.8, 3.6
K5.03	2.8, 2.8		
2.1.1	3.7, 3.8		
2.1.20	4.3, 4.2		
2.1.31	4.2, 3.9		
2.2.2	4.0, 3.5		

REFERENCES:

OP-32 Rev. 123

TOOLS AND EQUIPMENT:

None.

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

2 – Reactor Water Inventory Control

REASON FOR REVISION:

Updated for procedure revision.

Startup the second Reactor Feed Pump per 2OP-32 - DFCS Control Signal Failure

Time Required for Completion: 25 Minutes (approximate).

Time Taken: _____

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

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. All applicable Prerequisites listed in Section 4.0 of the operating procedure are met.
2. All applicable Initial Conditions listed in Section 5.7.1 of the operating procedure are met.
3. An AO is standing by at the 2B RFP.
4. The 2B Reactor Feed Pump is currently idled per 2OP-32 Section 7.1.2.
5. Radwaste has been notified to place additional demineralizers in service as necessary.

INITIATING CUE:

You are directed to place the second Reactor Feed Pump in service using the operating procedures. Notify the Unit SCO when the second Reactor Feed Pump is in service with the Recirculation Valve in Automatic.



**PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION**

**JOB PERFORMANCE MEASURE
SYSTEMS**

JPM F

LESSON TITLE: Actions for a Complete Loss of TBCCW.

LESSON NUMBER: JPM F

REVISION NO: 0

RECOMMENDED BY: Curt Robert
Instructor/Developer DATE

CONCURRENCE BY: _____
Line Superintendent/Supervisor DATE

APPROVED BY: _____
Superintendent/Supervisor Training DATE

SIMULATOR SETUP

IC-13	EOC
Rx Pwr	100%
Core Age	EOC

Triggers

None

Malfunctions

Active – CW014F (TBCCW HX DISCH HDR RUPTURE)

Overrides

None

Remote Functions

None

Special Instructions

Ensure Malfunctions and Remote Functions are ACTIVE.

Scram the reactor and perform scram immediate actions

SAFETY CONSIDERATIONS:

None.

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 NUREG 1021, Appendix E, or similar to the trainee.
3. A copy of 2OP-50, Section 8.13, signed off through step 13 should be provided to the examinee.

Read the following to trainee.

TASK CONDITIONS:

1. The Unit 2 TBCCW Discharge Header has ruptured and AOP-17 has been entered and announced.
2. Unit Two (2) reactor has been scrammed and immediate actions are complete.
3. 2C TBCCW pump is in service supplying **Unit One (1)**.
4. AOs are available to assist with field actions.

INITIATING CUE:

You are directed by the Unit SCO to complete the steps for a total loss of TBCCW per AOP-17 and to inform the SCO when these actions have been completed.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain latest revision of AOP-17 Section 3.2.3.
Current revision of AOP-17 Section 3.2.3 obtained.

*** SAT/UNSAT***

Step 2 - **IF TBCCW HEAD TANK LEVEL HI/LO** (UA-03 1-4) is in alarm **AND** level is low,
THEN UNLOCK AND CLOSE HEAD TANK SUPPLY TO UNIT 1(2), TCC-V1, for the
affected unit.
Direct AO to close 2TCC-V1.

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

Step 3 – **TRIP** both Recirculation Pumps.
Place Recirc MG-Set 2A and 2B control switches in Stop.

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

Step 4 - **TRIP** the Main Turbine.
*Verify Main Turbine Tripped. (Various indications at XU-1- Mechanical Trip light –
TRIPPED, All Valves Closed light lit, Emergency Trip System light lit, 2-UA-23 1-
3 AND 1-4 annunciators sealed in)*

*** SAT/UNSAT***

Actions for a Complete Loss of TBCCW

Step 5 – **TRIP** both Reactor Feed Pumps.

Ensure RFP A and RFP B by verifying RFP A and B HP and LP Stop valves closed and/or annunciators 2-UA-04 1-2 and 1-4.

* SAT/UNSAT*

Step 6 - **TRIP** all Condensate Pumps and Condensate Booster Pumps.

*Condensate Pumps and Condensate Booster Pumps are placed to STOP.
(Should be done so as to prevent an AUTO start)*

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

NOTE: Heater Drain Pumps should be tripped from Unit Trip Load Shed.

Step 7 – **TRIP** all Heater Drain Pumps.

Verify Heater Drain Pumps tripped.

* SAT/UNSAT*

Step 8 – **TRIP** TBCCW Pumps supplying the affected unit.

Place 2A and 2B TBCCW pumps in OFF, Leave 2C TBCCW pump in service on Unit One (1)

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

Actions for a Complete Loss of TBCCW

Step 9 - **ISOLATE** the Service Air System header by placing control switch *SERVICE AIR ISOL VLVS, SA-PV-706-1&2*, to *CLOSE*.

Place SERVICE AIR ISOL VLVS, SA-PV-706-1&2, to CLOSE.

* SAT/UNSAT*

PROMPT: When examinee requests Unit One (1) SCO permission to cross-tie Service Air inform examinee that you will coordinate cross-tie of Service Air.

Step 10 – Cross-tie Unit 1 and Unit 2 Service Air Systems.

Obtain Unit One (1) SCO permission and acknowledge that the Unit One(1) SCO will coordinate cross-tie of Service Air.

** CRITICAL STEP ** SAT/UNSAT*

Step 11 – **TRIP** the affected unit's air compressors.

Place 2A, 2B, 2C, to OFF and 2D air compressor to STOP.

* SAT/UNSAT*

PROMPT: When examinee place D air compressor in STOP inform examinee that another operator will reference and complete AOP-20.

Step 12 - **PLACE** all MSIV switches to **CLOSE**.

Place B21-F022 A-D and B21-F028A-D MSIV control switches in CLOSE..

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

Step 13 – **TRIP** the following:

a. SJAE

At XU-80 depresses OFF/RESET pushbutton for SJAE A and B and verifies that valves reposition.

*** SAT/UNSAT***

b. SPE

At XU-2 places SPE A control switch in STOP.

*** SAT/UNSAT***

c. Mechanical Vacuum Pump(s), if running.

Not running N/A.

*** SAT/UNSAT***

Step 14 - Place **OPEN** condenser vacuum breakers.

Places condenser vacuum breaker control switch to OPEN.

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

Actions for a Complete Loss of TBCCW

Step 23 – Inform the Unit SCO when all the steps for a total loss of TBCCW per AOP-17 are complete.

Unit SCO informed all steps for a total loss of TBCCW per AOP-17 are complete.

*** SAT/UNSAT***

TERMINATING CUE: All steps for a total loss of TBCCW per AOP-17 are complete.

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

RELATED TASKS:

2740001B401, Respond to a Complete Loss of TBCCW per AOP-17.0.

K/A REFERENCE AND IMPORTANCE RATING:

400000 A2.02 2.8/3.0 - Ability to use procedures to mitigate the consequences of abnormally low surge tank level.

295018 AA1.02 3.3/3.4 - Ability to operate system loads as a result of a Complete Loss of Component Cooling Water.

REFERENCES:

AOP-17.0 Rev. 16

TOOLS AND EQUIPMENT:

None.

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

8 – Plant Service Systems

REASON FOR REVISION:

New for NRC 2004 Exam.

Actions for a Complete Loss of TBCCW

Time Required for Completion: 18 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate Actual Unit: 2
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. The Unit 2 TBCCW Discharge Header has ruptured and AOP-17 has been entered and announced.
2. Unit Two (2) reactor has been scrammed and immediate actions are complete.
3. 2C TBCCW pump is in service supplying **Unit One (1)**.
4. AOs are available to assist with field actions.

INITIATING CUE:

You are directed by the Unit SCO to complete the steps for a total loss of TBCCW per AOP-17 and to inform the SCO when these actions have been completed.

**PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION**

**JOB PERFORMANCE MEASURE
SYSTEMS**

JPM G

LESSON TITLE: Recirculation Pump Start – Recirculation Pump Speed Control Failure.

LESSON NUMBER: LOT-SIM-JP-002-A07

REVISION NO: 1

RECOMMENDED BY: Curt Robert
Instructor/Developer DATE

CONCURRENCE BY: _____
Line Superintendent/Supervisor DATE

APPROVED BY: _____
Superintendent/Supervisor Training DATE

SIMULATOR SETUP (Recommended)

IC-11	BOC
Rx Pwr	100%
Core Age	BOC

Triggers

E1 – Auto initiated, Recirc B Runback Reset Push Button (K2716A) = TRUE

Malfunctions

None

Overrides

E1 – Recirc B Flow Control 1.0 over 60 seconds

Remote

None

Special Instructions

Reduce core flow to ENP-24 limit, drive 1st 2 sets of rods on ENP-24.

Secure Recirc Pump B, place seal staging valve (V17) to Manual/Open, and reduce controller output to approx. 15%.

Ensure core flow >30.8 and <45 mlbm/hr, and Recirc A pump flow >24,500 gpm. Ensure scram avoidance region will not be entered when Recirc A pump flow is reduced to 23.500 gpm.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee. Evaluator should provide copy of OP-02, Sections 5.2 and 8.2 completed up to the steps specified in the task conditions.
 2. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
 3. Steps in 2OP-02 to place APRMs to setup are not applicable in the simulator due to simulator configuration with Unit One PRNM.
-

Read the following to trainee.

TASK CONDITIONS:

1. Recirculation Pump 2B has tripped. The cause of the trip has been corrected.
2. Recirculation Pump 2A is in operation.
3. RWCU is in normal operation per 2OP-14.
4. An off-going operator has completed steps in 2OP-02, Section 8.2, up to step 8.2.2.4, and Section 5.2, up to step 5.2.2.22.
5. Another operator is available to make log entries as required.

INITIATING CUE:

You are directed to continue the startup of Recirculation Pump 2B and inform the Unit SCO when 2OP-02 Sections 5.2 and 8.2 are complete.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a current revision of 2OP-02, Sections 5.2 and 8.2.

Current Revision of 2OP-02, Sections 5.2 and 8.2 obtained and verified, if applicable.

SAT/UNSAT*

Step 2 – Ensure temperature differential between the reactor coolant within the dome and bottom head drain is less than 145°F as follows:

- a. Determine reactor pressure, convert to psia by adding 14.7 and use steam tables to convert reactor pressure to temperature.

Reactor temperature in the dome determined by converting psig to psia and using steam tables.

SAT/UNSAT*

PROMPT: If examinee requests another individual to read C12-TR-R018, Channel 153 (Local Indication), direct examinee to use available indication on panel P603.

NOTE: Since bottom head drain temperature indication is available, B32-TR-R650 (H12-P603) or process computer points B055-B058 should not be used.

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

- b. Determine bottom head drain temperature using G31-TI-R607 Point 5 (Panel H12-P603), or C12-TR-R018 Channel 153 (Local).
Bottom head drain temperature using G31-TI-R607 Point 5 is determined.

SAT/UNSAT*

- c. Determine temperature difference and record time.
Temperature differential determined and time recorded in OP-02.

SAT/UNSAT*

PROMPT: If examinee requests another individual to record differential temperature and time in the CO logbook, report log entry is complete.

PROMPT: If examinee asks, inform examinee APRM setup is not desired.

NOTE: Step 23 2OP-02, Section 5.2.2 is not applicable.

Step 3 – Slowly reduce speed of the operating Reactor Recirculation Pump using Recirc Pump 2A Speed Control potentiometer until loop flow is less than or equal to 50% (24,500 gpm) of rated loop flow.

Recirc loop 2A flow is $\leq 24,500$ gpm on B32-FR-R614 or B32-R617.

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

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

Step 4 – Within 30 minutes prior to startup of the second pump, ensure temperature differential between operating loop and idle loop is less than or equal to 50°F and that operating loop flow is less than or equal to 24,500 gpm as follows:

- a. Operating loop temperature (B32-TR-R650) or process computer (B055-B058)
Loop 2A temperature recorded in 2OP-02 using B32-TR-R650 or B055-B056.

SAT/UNSAT*

- b. Idle loop temperature (B32-TR-R650) or process computer (B055-B058)
Loop 2B temperature recorded in 2OP-02 using B32-TR-R650 or B057-B058.

SAT/UNSAT*

- c. Determine differential temperature, record results and time in 2OP-02
Differential temperature determined and recorded, along with time in 2OP-02.

SAT/UNSAT*

PROMPT: If examinee requests another individual to record differential temperature and time in the CO logbook, report log entry is complete.

NOTE: B32-FR-R614 (flow recorder) is available and should be used for the following step.

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

- d. Operating loop flow rate on B32-FR-R614, if available, or flow indicator B32-R613 is less than or equal to 24,500 gpm (50% of rated loop flow) and time recorded in 2OP-02

Loop 2A flow rate from B32-FR-R614 and time recoded in 2OP-02.

SAT/UNSAT*

PROMPT: If examinee requests another individual to record Loop 2A flow rate and time in the CO logbook, report log entry is complete.

NOTE: Step 26 of 2OP-02, Section 5.2.2 is not applicable.
A recirc runback signal will be received when the discharge valve is closed.

Step 5 – Ensure Pump 2B discharge valve B32-F031B is closed.
CLOSES Pump 2B discharge valve B32-F031B.

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

NOTE: Step 28 of 2OP-02, Section 5.2.2 is not applicable.

Step 6 – Ensure 30 minutes has not elapsed since temperature differentials and flow rate were determined.
30 minutes has not elapsed since temperature differentials and flow rate were determined

SAT/UNSAT*

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

Step 7 – Start MG Set 2B drive motor and ensure the following:

MG Set 2B drive motor is started

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

- a. MG Set B drive motor breaker closes.
Ensures MG Set 2B drive motor closes.

SAT/UNSAT*

- b. MG Set B accelerates to speed.
Ensures MG 2B accelerates to speed.

SAT/UNSAT*

- c. Approximately 6 seconds after the drive motor breaker closes, the generator field breaker closes and starts the Reactor Recirculation Pump.
Ensures MG 2B field breaker closes and Recirculation Pump 2B starts.

SAT/UNSAT*

. NOTE: B32-R613 will indicate very little flow since the discharge valve is closed. Flow is through the discharge bypass valve only.

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

- d. Recirc Pump 2B discharge flow B32-R613 indicates flow.
Ensures Recirc Pump 2B discharge flow B32-R613 indicates flow.

SAT/UNSAT*

PROMPT: If examinee requests another individual to record time the MG Set 2B drive motor breaker was closed in the CO logbook, report log entry is complete.

Step 8 – If in Modes 1 or 2 and the reactor is critical, perform the following:

- a. Using 2 second jogs and 10 second rest times for the first minute, jog open Pump 2B discharge valve B32-F031B.
B32-F031B is opened using 2 second jogs and 10 second rest times for the first minute (5 total jogs).

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

- b. Fully open Pump 2B discharge valve B32-F031B.
B32-F031B is fully opened.

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

NOTE: Steps 33 and 34 of 2OP-02, Section 5.2.2 are not applicable.

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

Step 9 – Place the control switch for Seal Staging Valve B32-V17 to AUTO and ensure the valve remains open.

B32-V17 open with the control switch in AUTO.

SAT/UNSAT*

Step 10 – Reset Recirculation runback in accordance with Section 8.3.

Recognizes runback must be reset and obtains copy of 2OP-02, Section 8.3.

SAT/UNSAT*

Step 11 – Adjust the potentiometer on Recirc Pump 2B Speed Control lowering the speed demand signal until speed signal shows a slight decrease in pump speed.

Recirc B Speed Control is lowered to achieve a slight decrease in pump speed.

SAT/UNSAT*

NOTE: When the Runback Reset push button for Recirc Pump 2B is depressed, the speed demand will begin to increase. Speed demand signal will ramp to 100% over a 60 second period. Pump speed (and reactor power) will increase until the scoop tube is locked. Locking the scoop tube is an immediate operator action of AOP-03.0.

Maximum pump speed mismatch is 20% below 58 mlbm/hr total core flow and 10% above 58 mlbm/hr total core flow.

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

PROMPT: If examinee requests I&C assistance in resetting the runback, as I&C report signals matched and runback can be reset.

Step 12 – Reset the Recirculation runback for Reactor Recirculation Pump 2B as follows:

- a Depress the Recirc Runback Reset push button for Recirculation Pump 2B.
Recirc Runback Reset pushbutton for Pump 2B is depressed.

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

- b Ensure reactor power and flow are stabilized.
Recognize increasing speed on Recirc Pump 2B and lock the scoop tube prior to exceeding maximum pump speed mismatch.

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

NOTE: If desired, record Pump Speeds and Core flow when the scoop tube is locked.

Pump A Speed ____ Pump B Speed ____ Total Core Flow ____

NOTE: This condition requires entry into AOP-03.0. When examinee locks scoop tube and informs SCO of the failure, the JPM is complete since the task cannot be completed. Since the task cannot be completed, it is acceptable for the examiner to inform the examinee that the JPM is complete.

PROMPT: When informed as SCO of the failure, inform examinee that another operator will enter and announce AOP-03.0

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

Step 13 – Inform SCO of speed control failure.
SCO informed of speed control failure.

SAT/UNSAT*

TERMINATING CUE: When the scoop tube is locked for Recirc MG Set 2B, this JPM is complete.

* Comments required for any step evaluated as UNSAT.

RELATED TASKS:

202004B101, Startup A Reactor Recirculation Pump Per OP-02

202015B401, Respond To A Recirc Flow Control Failure Increasing Per AOP-03.0

K/A REFERENCE AND IMPORTANCE RATING:

202001 A4.01 3.7/3.7

Ability to manually operate and/or monitor in the control room: Recirculation pumps

REFERENCES:

2OP-02 Rev 117

TOOLS AND EQUIPMENT:

Steam Tables

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

1 – Reactivity Control (Recirculation System)

REASON FOR REVISION:

Updated for procedure revision.

Recirculation Pump Start – Recirculation Pump Speed Control Failure.

Time Required for Completion: 20 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate Actual Unit: 2
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. Recirculation Pump 2B has tripped. The cause of the trip has been corrected.
2. Recirculation Pump 2A is in operation.
3. RWCU is in normal operation per 2OP-14.
4. An off-going operator has completed steps in 2OP-02, Section 8.2, up to step 8.2.2.4, and Section 5.2, up to step 5.2.2.22.
5. Another operator is available to make log entries as required.

INITIATING CUE:

You are directed to continue the startup of Recirculation Pump 2B and inform the Unit SCO when 2OP-02 Sections 5.2 and 8.2 are complete.
