Draft Submittal
(Pink Paper)

BRUNSWICK 2007-301
July - August

1. ADMINISTRATIVE TOPICS OUTLINE (ES-301-1)

2. CONTROL ROOM SYSTEMS & FACILITY WALK-THROUGH TEST OUTLINE (ES-301-2)

3. ADMINISTRATIVE JPMS

4. IN-PLANT JPMS

5. CONTROL ROOM JPMS (SIMULATOR JPMS)

BRUNSWICK JULY-AUG EXAM - 325, 324/2007-301
DRAFT JPMs

05/04/07

Facility: Brunswick		Date of Examination:	2007
Examination Level (circle one):	**RO** / SRO	Operating Test Number:	NRC 2007

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D	Hand Calculation Of APRM GAFs Per PT-01.8C
Conduct of Operations	N	Perform a portion of Control Operator Daily Surveillance Report 2OI-03.2 and identify 4 OOS readings.
Equipment Control	N	Generate a Clearance for maintenance activities on Caswell Beach lube water pump.
Radiation Control	N	Determine Stay Time and Radiological requirements for performing work in a High Radiation Area.
Emergency Plan	N/A	

NOTE:	All items (5 total are required for SROs). RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.
*Type Codes & Criteria:	(C)ontrol room (D)irect from bank (≤ 3 for ROs; ≤ for SROs & RO retakes) (N)ew or (M)odified from bank (> 1) (P)revious 2 exams (≤ 1; randomly selected) (S)imulator

2007 NRC Examination
Summary Description of Admin Tasks

A.1.a This is a bank JPM. The candidate will manually calculate APRM GAFs.

A.1.b This is a new JPM. The candidate will perform a portion of Control Operator Daily Surveillance Report 2OI-03.2 and identify 4 OOS readings.

A.2 This is a new JPM. The candidate will generate a clearance for maintenance activities on the Caswell Beach lube water pump.

A.3 This is a new JPM. The candidate will be required to determine stay time and radiological requirements for performing work in a High Radiation Area

Facility: Brunswick		Date of Examination:	2007
Examination Level (circle one): RO / **SRO**		Operating Test Number:	NRC 2007

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D	Evaluate off-site power source operability per the CO DSR.
Conduct of Operations	N	Perform a portion of Control Operator Daily Surveillance Report 2OI-03.2 and identify 4 OOS readings and appropriate TS entries.
Equipment Control	N	Generate a Clearance for maintenance activities on the Caswell Beach Lube Water Pump.
Radiation Control	D	Determine Off-Site Release Per PEP-03.4.7 and Complete Notification Form.
Emergency Plan	N	Evaluate plant conditions (includes security event) and classify the event. Make PAR determination as required.

NOTE:	All items (5 total are required for SROs). RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.
*Type Codes & Criteria:	(C)ontrol room (D)irect from bank (≤ 3 for ROs; 4 ≤ for SROs & RO retakes) (N)ew or (M)odified from bank (> 1) (P)revious 2 exams (≤ 1; randomly selected) (S)imulator

2007 NRC Examination
Summary Description of Admin Tasks

A.1.a The candidate will determine if electrical loading is within the limits established in the CO Daily Surveillance Report and report the required actions for Unit 1. This is a bank JPM.

A.1.b The candidate will review a portion of the Control Operator Daily Surveillance Report 2OI-03.2 and identify 4 OOS readings and appropriate TS entries. This is a new JPM.

A.2 The candidate will generate a clearance for maintenance activities on the Caswelll Beach lube water pump. This is a new JPM.

A.3 The candidate will determine the offsite release rate and fill out appropriate forms. This is a bank JPM.

A.4 The candidate will evaluate degraded plant conditions which include a security event and make an event classification and PAR as required. This is a new JPM.

05/04/10

Facility:	Brunswick	Date of Examination:	JULY / 2007
Exam Level (circle one):	RO / **SRO (U)**	Operating Test No.:	NRC 2007

Control Room Systems@ (8 for RO; 2 or 3 for SRO-U, including 1 ESF)

	System / JPM Title	Type Code*	Safety Function
S-1	Uncoupled Control Rod During Startup	N, A, L, S	1
S-2	RCIC Failure to Isolate	N, A, S	5
S-3	Core Spray Pump Surveillance Min Flow Valve Failure	N, A, S	2
S-4	Restore Shutdown Cooling following a spurious isolation IAW AOP-15	N, S	4
S-5	Primary Containment Venting During Personnel Entry.	D, L, S	9
S-6	Manual Transfer of 4160 Emergency Bus Supply from the DG to the Normal Feeder IAW 0OP-50.1	N, S	6
S-7	Transfer RPS Bus B to Alternate - Failure to Scram	D, A, S	7
S-8 (RO)	Re-open MSIV's IAW OP-25	D, S	3

In-Plant Systems@ (3 for RO; 3 or 2 for SRO-U)

	System / JPM Title	Type Code*	Safety Function
P-1	Station Blackout: Crosstie of 4KV E-Buses	D, E	6
P-2	Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation.	D, R	8
P-3	Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)	D, R	5

@	All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

2007 NRC Examination
Summary Description of JPMs

S-1 This is a new alternate path JPM in the Reactivity Control safety function area. The candidate will be pulling control rods for startup when a rod becomes uncoupled. Actions will be required to insert/re-couple the control rod.

S-2 This is a new alternate path JPM in the Containment Integrity safety function area. The candidate will be placing RCIC in service when an exhaust diaphragm rupture occurs and RCIC will fail to isolate. Actions will be required to manually isolate RCIC .

S-3 This is a new alternate path JPM in the Reactor Water Inventory Control safety function area. The candidate will be performing the Core Spray Operability Surveillance and the minimum flow valve will fail to function properly. This will require actions to prevent equipment damage.

S-4 This a new JPM in the Heat Removal From Reactor Core Safety Function area. The candidate will be required to restore Shutdown Cooling following a spurious isolation signal IAW abnormal procedures.

S-5 This a bank JPM in the Radioactivity release safety function area. The candidate will be required to startup Primary Containment Ventilation during personnel entry, per 2OP-24 using both purge exhaust fans.

S-6 This a new JPM in the Electrical safety function area. The candidate will be required to manually transfer the 4160 Emergency Bus Supply from the DG to the Normal Feeder.

S-7 This a bank alternate path JPM in the Instrumentation safety function area. The candidate will transfer the RPS power supply to alternate and a condition will occur which should have caused a reactor scram. Immediate actions will be required to complete the automatic action which failed to occur.

S-8 This a bank JPM in the Reactor pressure Control safety function area. The candidate will be required to re-open all MSIV's following a Group 1 isolation.

P-1 This is a bank JPM in the Electrical safety function area. The candidate will be required to locally cross-tie the 4KV emergency buses following a station blackout.

P-2 This is a bank JPM in the Plant Service System safety function area. The candidate will be required to place RHRSW in service following a control room evacuation.

P-3 This is a bank JPM in the Containment Integrity safety function area. The candidate will be required to initiate the LPCI mode of RHR from suppression pool cooling.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

ADMIN

RO

NRC JPM A-1-A

TITLE: Hand Calculation Of APRM GAFs Per PT-01.8C.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. Unit Two is performing a startup following refueling. GP-03 is being performed.
2. Plant conditions:

   Reactor pressure 929 psig

   Mode Switch Start/Hot Stby

   Reactor power (as read on APRMs at H12-P608)

APRM 1	9.6%
APRM 2	7.9%
APRM 3	8.9%
APRM 4	7.6%

3. GP-03 directs verification of APRM GAFs prior to transfer of the Mode Switch to Run.
4. Heat Balance on the process computer is unavailable due to low feedwater flow.
5. The Reactor Engineer has calculated core thermal power to be 277.6 MWt per 0PT-01.8D

INITIATING CUE:

You are directed to perform 0PT-01.8C to calculate APRM GAFs. Determine if GAFs are acceptable for transferring the Mode Switch to Run, or state any action(s) required prior to transferring the Mode Switch.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a current revision of 0PT-01.8C.

Current Revision of 0PT-01.8C obtained and verified, if applicable.

SAT/UNSAT*

START TIME: ____

Step 2 – Record the date, time and Unit on Form 1.

Date, Time and Unit recorded on Form 1.

SAT/UNSAT*

NOTE: Thermal power of 277.6 MWt from 0PT-01.8D is given as an initial condition.

Step 3 – Record the results of 0PT-01.8D, Core Thermal Power Calculation, obtained from the Reactor Engineer on form 1.

277.6 MWt Recorded.

SAT/UNSAT*

Step 4 – Calculate percent rated CTP (desired reading) by dividing 277.6 by 2923, and multiplying times 100%, and record results on Form 1

Determines percent rated CTP is approximately 9.5% (±0.3%).

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

NOTE: APRM readings given as an initial condition.

Step 5 – Record APRM Readings from Panel P608 on Form 1

APRM readings are recorded on Form 1

SAT/UNSAT*

Step 6 – Calculate the AGAF for each APRM Channel by dividing % rated CTP by APRM reading, and record results on Form 1.

APRM AGAFs determined to be ≤1.00 for APRM Channels 1

APRM AGAFs determined to be >1.00 for APRM Channels 2, 3, and 4

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

PROMPT: If examinee requests independent verification for the AGAF calculations, inform examinee the independent verification is complete.

Step 7 – Determine GP-03 requires three APRM to be Operable (GAF ≤1.00). Determine GP-03 allows conservative GAF adjustments if required and that adjustment of APRMs 2, 3, & 4 would be conservative. Determine the Reactor engineer should be contacted for GAF adjustments prior to turbine roll.

Determine APRMs 2, 3, & 4 (at least 2 of 3) must be adjusted to achieve a GAF of ≤1.0 prior to transferring the Mode switch to Run.

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

COMPLETION TIME: ___

TERMINATING CUE:	When AGAFs have been calculated, and the examinee determines acceptance criteria and required actions of 0GP-03, this JPM is complete.

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

RELATED TASKS:

212201B101, Transfer The Reactor Mode Switch To Run Per GP-03

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.33 3.4/4.0

REFERENCES:

0PT-01.8C

0GP-03

TOOLS AND EQUIPMENT:

Calculator.

SAFETY FUNCTION (from NUREG 1123):

Administrative – Conduct Of Operations

Validation Time: 15 Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate ___ Actual ✓ Unit: 2

Setting: Control Room ___ Simulator___ (N/A for Admin or In-Plant JPMs)

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

Alternate Path: Yes ___ No ✓

EVALUATION

Trainee:______________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure as Authorized Copy?: Yes _____ No _____

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Unit Two is performing a startup following refueling. GP-03 is being performed.
2. Plant conditions:

   Reactor pressure 929 psig

   Mode Switch Start/Hot Stby

   Reactor power (as read on APRMs at H12-P608)

APRM 1	9.6%
APRM 2	7.9%
APRM 3	8.9%
APRM 4	7.6%

3. GP-03 directs verification of APRM GAFs prior to transfer of the Mode Switch to Run.
4. Heat Balance on the process computer is unavailable due to low feedwater flow.
5. The Reactor Engineer has calculated core thermal power to be 277.6 MWt per 0PT-01.8D

INITIATING CUE:

You are directed to perform 0PT-01.8C to calculate APRM GAFs. Determine if GAFs are acceptable for transferring the Mode Switch to Run, or state any action(s) required prior to transferring the Mode Switch.

KEY

FORM 1
Page 1 of 1
AGAF Calculation Sheet

A. Date XX Time 12:35 Unit 2

B. Core Thermal Power (CTP) 277.6 MWt

C. Percent of Rated Core Thermal Power (desired reading):

% Rated CTP = (CTP ÷ Rated MWt) x 100% = 9.5 % Pwr

APRM Channel	APRM Reading % Pwr(D)	AGAFi (C/D)
1	9.6	.99
2	7.9	1.2
3	8.9	1.07
4	7.6	1.25
	AGAFi= % of rated CTP / APRM reading in % power = C / D	

Independently verify the AGAF calculations are correct.

1st verification X Date ______
Signature

2nd verification X Date ______
Signature

KEY

DATE COMPLETED ______________________
UNIT __________ % PWR______GMWE__________
SUPERVISOR______________________________
REASON FOR TEST (check one or more):
____ Routine surveillance
____ WR/WO # ___________________________
____ Other (explain)_______________________
____
____
____

FREQUENCY:

A. As required by 1/2PT-01.11 with the process computer not available.

B. As deemed necessary by the Reactor Engineer.

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
0

0PT-01.8C

HAND CALCULATIONS OF AGAFs

REVISION 13

1.0 PURPOSE

The purpose of this procedure is to establish a hand method for calculating the APRM gain adjustment factors (AGAFs) to support the requirements of 1/2PT-01.11 with the process computer not available.

2.0 ACCEPTANCE CRITERIA

This procedure is acceptable when the data has been collected, the calculations have been performed, and the mathematics have been independently verified as correct.

3.0 SPECIAL TOOLS AND EQUIPMENT

Electronic calculator

4.0 DEFINITIONS

The APRM gain adjustment factor (AGAF) for the iAPRM channel is defined as:

$$AGAFi = \frac{\text{Desired reading for iAPRM}}{\text{Actual reading for iAPRM}}$$

Where the desired reading is found by dividing the actual core thermal power by the rated core thermal power and then multiplying by 100%.

The actual reading of the iAPRM is from the iAPRM in percent power.

5.0 PRECAUTIONS AND LIMITATIONS

5.1 The AGAFs are not valid if the APRM reading changes significantly from the value used to obtain the AGAFs prior to calibration.

5.2 Independent verification is required in this procedure.

6.0 PREREQUISITES

6.1 The plant should be brought to a steady state operating condition and held until the calculations are completed.

6.2 Normally the AGAFs are obtained from the process computer. This procedure is used when the process computer is out of service.

7.0 ANNUNCIATIONS EXPECTED

None

8.0 PROCEDURE

Initials

8.1 **RECORD** the date, time, and unit on Form 1. _____

8.2 **PEFORM** 0PT-01.8D, Core Thermal Power Calculation, **AND RECORD** results on Form 1. _____

8.3 **CALCULATE** the percent of rated CTP (desired reading) as follows **AND RECORD** results on Form 1. _____

$$\% \text{ Rated CTP} = (\text{CTP} \div \text{Rated MWt}) \times 100\%$$

8.4 **RECORD** the APRM readings from Panel 608 on Form 1. _____

8.5 **CALCULATE** the AGAF for each APRM channel as follows **AND RECORD** results on Form 1. _____

$$\text{AGAFi} = \frac{\% \text{ of rated CTP}}{\text{iAPRM reading in \% power}}$$

8.6 **INDEPENDENTLY VERIFY** the AGAF calculation for each APRM is correct **AND SIGN** on Form 1. _____

9.0 DATA ANALYSIS

N/A

10.0 GENERAL COMMENTS

____

____

____

____

____

	Initials	Name (Print)
PT was performed by	______	________________
	______	________________

PT has been satisfactorily completed

Responsible Engineering Manager ________________________________
(Signature)

PT has NOT been satisfactorily completed

Responsible Engineering Manager ________________________________
(Signature)

Reviewed By: __________________________
(Signature)

Corrective Action Required

a. ( ) None
b. ( ) WR/WO No. __________
c. ( ) Other (Explain)

AGAF Calculation Sheet

A. Date_____ Time_____ Unit _______________

B. Core Thermal Power (CTP)_________________________ MWt

C. Percent of Rated Core Thermal Power (desired reading):

% Rated CTP = (CTP ÷ Rated MWt) x 100% = _____________ % Pwr

APRM Channel	APRM Reading % Pwr(D)	AGAFi (C/D)
1		
2		
3		
4		

$$\text{AGAFi} = \frac{\text{\% of rated CTP}}{\text{APRM reading in \% power}} = \frac{C}{D}$$

Independently verify the AGAF calculations are correct.

1st verification_______________________________________ Date __________
Signature

2nd verification_______________________________________ Date __________
Signature

REVISION SUMMARY

Revision 13 is an editorial change that incorporates the Progress Energy logo. Ref. PRR 167209.

Revision 12 – Revision removes reference to 2558 MWt as rated Unit 2 thermal power. Revision supports implementation of EC 47907, Implement the Unit 2 Power Uprate Modification . Both Units are licensed to 2923 MWT.

Revision 11 - Procedure revision incorporated EC 46861, Implement Extended Power Uprate for Unit 1 only. This revision increased the rated power for Unit 1 from 2558 to 2923 Mwt.

Revision 10 - Procedure revision incorporates ESR 00-00442, implementation of the power range neutron monitoring system for Unit 1. The number of APRMs has been reduced from 6 to 4 on Unit 1. The Unit 1 APRM channel ID's changed from A-F to 1-4. Changed 0PT-01.11 to 1/2PT-01.11.which now are unit specific procedures.

Revision 9 - Procedure revision converts this document to the proper Microsoft Word 7.0 and the AP-005 format. This revision also incorporates the new Unit 2 rated power value to 2558 mwth due to implementation of Power Uprate.

PLANT OPERATING MANUAL

VOLUME IV

GENERAL PLANT OPERATING PROCEDURE

UNIT
0

0GP-03

UNIT STARTUP AND SYNCHRONIZATION

REVISION 67

TABLE OF CONTENTS

SECTION		PAGE
1.0	PURPOSE	3
2.0	REFERENCES	3
3.0	PRECAUTIONS AND LIMITATIONS	4
4.0	PREREQUISITES	5
5.0	PROCEDURAL STEPS	6
5.1	Transferring The Reactor Mode Switch To RUN	6
5.2	Placing the Feedwater Heaters in Operation	10
5.3	Turbine Generator Startup and Synchronization	14
5.4	Preparation of Heater Drain System for Forward Pumping	16
5.5	Transferring Auxiliary Power From The SAT to the UAT	17

ATTACHMENTS

1	Verification of Reactor Power Level Using Alternate Indications	19

1.0 PURPOSE

This procedure provides the precautions, limitations and instructional guidance for increasing power from rated pressure to synchronization and loading of the turbine generator.

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR

2.3 0AI-81, Water Chemistry Guidelines

2.4 0E&RC-0040, High Radiation Area Key Control

2.5 0GP-02, Approach to Criticality and Pressurization of the Reactor

2.6 0GP-10, Rod Sequence Checkoff Sheets

2.7 1(2)OP-01, Nuclear Boiler System

2.8 1(2)OP-07, Reactor Manual Control System Operating Procedure

2.9 1(2)OP-09, Neutron Monitoring System Operating Procedure

2.10 1(2)OP-26, Turbine System Operating Procedure

2.11 1(2)OP-27, Generator and Exciter System Operating Procedure

2.12 1(2)OP-29, Circulating Water System

2.13 1(2)OP-30, Condenser Air Removal and Off Gas Recombiner System Operating Procedure

2.14 1(2)OP-32, Condensate and Feedwater System Operating Procedure

2.15 1(2)OP-34, Extraction Steam System Operating Procedure

2.16 1(2)OP-35, Heater Drains, Vents, and Level Control Operating Procedure

2.17 1(2)OP-36, Moisture Separator Reheater and Moisture Separator Reheater Drains System Operating Procedure

2.18 0OP-46, Instrument and Service Air System Operating Procedure

2.19 0PT-01.8D, Core Thermal Power Calculation

2.20 1(2)PT-01.11, Core Performance Parameter Check

2.21 0PT-13.1, Reactor Recirculation Jet Pump Operability

2.22 0PT-40.2.6, Turbine Overspeed Trip Test

R23 2.23 Response to Generic Letter 84-09, Hydrogen Control in Primary Containment 10CFR50.44(c)(3)(ii).

2.24 Shearon Harris Nuclear Power Plant LER 89-023-00

R25 2.25 INPO SOER 90-03, Nuclear Instrument Miscalibration

2.26 GE SIL 614, Backup Pressure Regulator

3.0 PRECAUTIONS AND LIMITATIONS

3.1 This procedure is to be used in accordance with the procedure compliance guidelines of 0GP-01, Section 5.0.

3.2 The loading limits of the generator should be maintained within the limits of 1(2)OP-27, Figure 1.

3.3 **WHEN** increasing reactor power, **THEN** APRM GAFs should be periodically monitored to ensure GAFs are less than or equal to 1.00.

4.0 PREREQUISITES

Unit ___ Date/Time Started ____________

Initials

4.1 Reactor pressure is between 925 and 930 psig with one turbine bypass valve open at least 20%. _____

4.2 Reactor mode switch is in *STARTUP/HOT STBY*. _____

4.3 0GP-02 is complete **AND** reviewed by the Unit SCO. _____

5.0 PROCEDURAL STEPS

5.1 Transferring The Reactor Mode Switch To RUN

5.1.1 **ENSURE** A and B bus main generator output breaker generator side **AND** bus side manual disconnects are closed. _____

5.1.2 **IF** this startup is following reactor vessel disassembly, **THEN CONFIRM** drywell head shield plug 1 - 4 installation has been completed. _____

5.1.3 **CONFIRM** the following Low Steam Line Pressure Relays are energized by observing they are pulled in from their stop screws:

1. Relay *A71-K4A* on Panel H12-P609. _____
2. Relay *A71-K4C* on Panel H12-P609. _____
3. Relay *A71-K4B* on Panel H12-P611. _____
4. Relay *A71-K4D* on Panel H12-P611. _____

5.1.4 **CONFIRM** the following MSIV Limit Switch Relays are energized by observing they are pulled in from their stop screws:

1. Relay *C71(72)-K3A* on Panel H12-P609. _____
2. Relay *C71(72)-K3C* on Panel H12-P609. _____
3. Relay *C71(72)-K3E* on Panel H12-P609. _____
4. Relay *C71(72)-K3G* on Panel H12-P609. _____
5. Relay *C71(72)-K3B* on Panel H12-P611 _____
6. Relay *C71(72)-K3D* on Panel H12-P611. _____
7. Relay *C71(72)-K3F* on Panel H12-P611. _____
8. Relay *C71(72)-K3H* on Panel H12-P611. _____

CAUTION

Mechanical vacuum pumps should **NOT** be operated above 5% reactor power; otherwise, a hydrogen explosion may occur.

5.1.5 **INCREASE** reactor power to 6-10% by withdrawing control rods, following the 0GP-10 designated sequence, in accordance with 1(2)OP-07. _____

NOTE: During Low Power operations, one Feedwater Flow instrument may indicate flow before the other Feedwater Flow instrument due to pipe flow characteristics. The Process computer requires both Feedwater Line flows to perform a valid Heat Balance calculation.

NOTE: **IF** the APRM GAFs require adjustment in the following step, **AND** the process computer is **NOT** available or the process computer can not perform a Heat Balance calculation, **THEN** 0PT-01.8C, 0PT-01.8D, or 1(2)OP-09, should be used as necessary.

CAUTION

APRM indicated power levels should **NOT** be reduced by gain adjustments below 20% reactor power; otherwise, non-conservative APRM readings (GAF greater than 1.00) may result from adjustment as power is increased. Reactor Engineering shall be contacted for any GAF adjustments made prior to turbine synchronization.

CAUTION

Three APRMs are required to be ~~operable.~~ Each APRM channel provides input to both RPS Trip Systems.

R25 5.1.6 **ENSURE** APRM GAFs are less than or equal to 1.00 for all operable APRMs. _____

5.1 Transferring The Reactor Mode Switch To RUN (Continued)

5.1.7 **CONFIRM** overlap by observing all operable APRMs indicate between 3.4% and 10% on the APRM/RBM recorders. _____

5.1.8 **CONFIRM** all operable APRM downscale lights are off. _____

5.1.9 **CONFIRM** no operable IRMs are upscale. _____

5.1.10 **EVALUATE** reactor water chemistry parameters in accordance with 0AI-81. _____

5.1.11 **IF** any reactor water chemistry parameter exceeds the limit, **THEN REFERENCE** 0AI-81 for the appropriate action level requirement. _____

5.1.12 **ENSURE** all items in the AO **AND** CO Daily Surveillance Report (DSR) which are applicable in Mode 1 have been checked **AND** are within the specified surveillance interval. _____

5.1.13 **CONFIRM** all Temporary Modifications in the Unit SCO Active TPM Book permit entry into Mode 1. _____

5.1.14 **NOTIFY** Radiation Control the Reactor Mode Switch is being transferred to *RUN* and to implement 0E&RC-0040 as required. _____

5.1.15 **REVIEW** all LCOs (active, tracking, and on-hold) to ensure outstanding LCOs are in compliance with Technical Specification 3.0.4 for entry into Mode 1. _____

NOTE:	The Hardened Wet-Well vent path is required to be available to comply with the NRC Safety Evaluation for Tech Spec amendments 233 and 260, Increased Flexibility in Mode Restraints.

5.1.16 **ENSURE** the Hardened Wet-Well vent path is available. _____

5.1.17 **OBTAIN** concurrence Section 4.0 and Steps 5.1.1 through 5.1.16 are complete **AND** Entry into Mode 1 is authorized. ____

Unit SCO	Date	Time
SS	Date	Time

5.1.18 **PLACE** the reactor mode switch to *RUN*. ____

5.1.19 **ENSURE** APRM/RBM recorders are in a mode to display all APRMs/RBMs. ____

5.1.20 **FULLY WITHDRAW** all operable IRM detectors **AND THEN PLACE** all IRM range switches to Position *3*. ____

CAUTION

APRM indicated power levels should **NOT** be reduced by gain adjustments below 20% reactor power; otherwise, non-conservative APRM readings (GAF greater than 1.00) may result from adjustment as power is increased. Reactor Engineer shall be contacted for any GAF adjustments made prior to turbine synchronization.

R25 5.1.21 **WHEN** reactor power is approximately 15%, as indicated by performing a HEAT BALANCE using the Plant Process Computer or 0PT-01.8D, **THEN PERFORM** the following: ____

1. **CONFIRM** reactor power levels using Attachment 1 from 15% power to placing the turbine on-line. ____

2. **PERFORM** conservative APRM GAF adjustments, as required, in accordance with 1(2)OP-09. ____

5.1 Transferring The Reactor Mode Switch To RUN (Continued)

5.1.22 **ENSURE** backfill flow for each reference leg condensing pot is adjusted in accordance with 1(2)OP-01: _____

Cond. Pot.	Flow Ind.	
D004A	*B21-FI-6061*	_____
D004B	*B21-FI-6066*	_____
D004C	*B21-FI-6060*	_____
D004D	*B21-FI-6064*	_____
D002	*B21-FI-6062*	_____
CDU-001	*B21-FI-6063*	_____
CDU-002	*B21-FI-6065*	_____

5.2 Placing the Feedwater Heaters in Operation

5.2.1 **OPEN** the following MVD startup vent valves:

1. *DRAIN COOLER 1A SU VENT, MVD-V37.* _____
2. *FW HTR 1A AND 2A SU VENT, MVD-V33* and *MVD-V34.* _____
3. *FW HTR 3A SU VENT, MVD-V92.* _____
4. *FW HTR 4A AND 5A SU VENT, MVD-V95* and *MVD-V97.* _____
5. *DRAIN COOLER 1B SU VENT, MVD-V38.* _____
6. *FW HTR 1B AND 2B SU VENT, MVD-V35 and MVD-V36.* _____
7. *FW HTR 3B SU VENT, MVD-V94.* _____
8. *FW HTR 4B AND 5B SU VENT, MVD-V96* and *MVD-V98.* _____

5.2 Placing the Feedwater Heaters in Operation (Continued)

5.2.2 **MONITOR** condenser vacuum closely while placing the feedwater heaters in operation. ____

5.2.3 **SET** the following heater level controllers for the respective normal drain level control valves as follows:

1. *FW HEATER 2A LEVEL CONTROLLER, HD-LC-61*, located on Instrument Rack IR-TB-5, black striped indicator to 0 **AND** in *AUTO*. ____

2. *FW HEATER 2B LEVEL CONTROLLER, HD-LC-64*, located on Instrument Rack IR-TB-5, black striped indicator to 0 **AND** in *AUTO*. ____

3. *FW HEATER 4A LEVEL CONTROLLER, HD-LC-75*, located on Instrument Rack IR-TB-4, black striped indicator to +1 for Unit 1 or to 0 for Unit 2 **AND** in *AUTO*. ____

4. *FW HEATER 5A LEVEL CONTROLLER, HD-LC-83*, located on Instrument Rack IR-TB-4, black striped indicator to +1 on Unit 1 or to 0 on Unit 2 **AND** in *AUTO*. ____

5. *FW HEATER 4B LEVEL CONTROLLER, HD-LC-79*, located on Instrument Rack IR-TB-3, black striped indicator to 0 on Unit 1 or to +1 on Unit 2 **AND** in *AUTO*. ____

6. *FW HEATER 5B LEVEL CONTROLLER, HD-LC-87*, located on Instrument Rack IR-TB-3, black striped indicator to +1 on Unit 1 or to 0 on Unit 2 **AND** in *AUTO*. ____

5.2.4 **SLOWLY OPEN** *DEAERATOR FILL & DRAIN VLV, HD-V57*, while observing condenser vacuum and off-gas flow until valve indicates full open or condenser vacuum starts to decrease. ____

5.2 **Placing the Feedwater Heaters in Operation** (Continued)

5.2.5 **IF** any of the following alarm conditions exist, **THEN CLOSE** *DEAERATOR FILL & DRAIN VLV, HD-V57,* to isolate cleanup of feedwater heater piping: ____

- *RFP A TURB DRAINS LEVEL HI*, UA-04 1-5.
- *RFP B TURB DRAINS LEVEL HI*, UA-04 2-5.
- High deaerator level (57 inches).
- Low deaerator level (43 inches).

5.2.6 **ENSURE** the following valves are open:

1. *FW HTR 5A OUTLET VLV, FW-V6.* ____
2. *FW HTR 5B OUTLET VLV, FW-V8.* ____

CAUTION

The feedwater heater inlet valves should be slowly throttled open; otherwise, reactor water level may increase too rapidly and cause a reactor power excursion.

5.2.7 **CONFIRM** *SULCV, FW-LV-3269* is full open, **AND SLOWLY THROTTLE OPEN** the following valves: ____

1. *FW HTR 4B INLET VLV, FW-V119.* ____
2. *FW HTR 4A INLET VLV, FW-V118.* ____

5.2.8 **WHEN** *FW-V118* and *FW-V119* are full open, **THEN CONFIRM** *SULCV FW-LIC-3269*, Control Station, is in *M* (manual) **AND DECREASE** the *VALVE DEM* signal to 0 %. ____

5.2.9 **THROTTLE CLOSED** *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, as RFPT A(B) load increases, maintaining greater than 20% output demand signal on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600.* ____

5.2 Placing the Feedwater Heaters in Operation (Continued)

5.2.10 **WHEN** *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, is closed, **THEN CLOSE** *FW-FV-177 ISOL VLV, FW-V10*. ____

CAUTION

Primary containment oxygen concentration is required to be less than 4% by volume within 24 hours after reactor power exceeds 15%. Additionally, drywell pneumatics are required to be supplied by PNS when the drywell is required to be inerted.

5.2.11 **CONFIRM** the Backup Nitrogen System is in service in accordance with 0OP-46 prior to exceeding 15% reactor power. ____

5.2.12 **IF** available, **THEN PLACE** the drywell pneumatic loads on nitrogen in accordance with 0OP-46, prior to exceeding 15% reactor power. ____

R23 1. **IF** drywell pneumatic loads can **NOT** be placed on nitrogen, **THEN ENSURE** drywell pneumatic loads are on nitrogen during all periods that drywell oxygen concentration is required to be less than 4% in accordance with Technical Specification 3.6.3.1. ____

5.2.13 **RECORD** the time reactor power exceeds 15% in the Reactor Operator's log **AND INFORM** Unit SCO. ____

5.2.14 **INITIATE** tracking LCOs on the following items when reactor power exceeds 15%, if necessary:

- CAD. (T.S. 3.6.3.2) ____
- Containment oxygen concentration. (T.S. 3.6.3.1) ____

5.2.15 **PERFORM** 0PT-13.1 prior to exceeding 25% reactor power. ____

5.2.16 **RAISE** reactor power to 20-22% by withdrawing control rods in accordance with 1(2)OP-07 in the sequence designated by 0GP-10. ____

5.2.17 **ENSURE** the surveillance requirement for stroking the Recirculation Pump Discharge Valves, SR 3.5.1.5, is current prior to exceeding 25% power. ____

5.3 Turbine Generator Startup and Synchronization

5.3.1 **VERIFY** the applicable Power-Flow Map based on current equipment conditions is selected. ___/___ Ind.Ver.

> **NOTE:** To minimize the time spent at rated speed prior to synchronizing the generator, preliminary steps in the 1(2)OP-27 generator startup section may be performed concurrent with the 1(2)OP-26 section on rolling the turbine to rated speed.

5.3.2 **ROLL** the main turbine to rated speed in accordance with 1(2)OP-26. _____

5.3.3 **SYNCHRONIZE** the main generator to system grid in accordance with 1(2)OP-27. _____

> **CAUTION**
>
> APRM indicated power levels should **NOT** be reduced by gain adjustments below 20% reactor power; otherwise, non-conservative APRM readings (GAF greater than 1.00) may result from adjustment as power is increased. Reactor Engineering shall be contacted for any GAF adjustments made prior to turbine synchronization.

5.3.4 **PERFORM** APRM GAF adjustments, as required, in accordance with 1(2)OP-09. _____

> **NOTE:** The turbine will normally be the limiting factor on load changes since the generator loading is **NOT** as critical as the turbine.

5.3.5 **WHEN** greater than 100 MWe is reached, **THEN PERFORM** the following actions:

1. **CLOSE** *MAIN SV & CV ABOVE SEAT DRN, MVD-CV.* _____
2. **CLOSE** *STM TO EAST MSR DRAIN VLV, MS-V43.* _____
3. **CLOSE** *STM TO WEST MSR DRAIN VLV, MS-V44.* _____
4. **CLOSE** *DRN VLV, MS-V45.* _____

5. **ENSURE** *EAST (WEST) RH STM DRAIN, EBPV-1* is closed. _____

6. **ENSURE** *WEST (EAST) RH STM DRAIN, EBPV-2* is closed. _____

7. **CONFIRM** Unit 1(2) *EAST MSR DRAIN VLV, 1-MSDCV-C-1(2-MSDCV-C-2)*, closes and returns drain tank to automatic level control. _____

8. **CONFIRM** Unit 1(2) *WEST MSR DRAIN VLV, 1-MSDCV-C-2(2-MSDCV-C-1)*, closes and returns drain tank to automatic level control. _____

9. **CONFIRM** Unit 1(2) *EAST 1ST STAGE DRN VLV, 1-1SRDCV-C-1(2-1SRDCV-C-2)*, closes and returns drain tank to automatic level control. _____

10. **CONFIRM** Unit 1(2) *WEST 1ST STAGE DRN VLV, 1-1SRDCV-C-2(2-1SRDCV-C-1)*, closes and returns drain tank to automatic level control. _____

11. **CONFIRM** *E REHEATER FIRST STAGE LEVEL HI-LOW* (UA-23 4-4) annunciator is clear. _____

12. **CONFIRM** *W REHEATER FIRST STAGE LEVEL HI-LOW* (UA-23 4-5) annunciator is clear. _____

13. **CONFIRM** *E MOIST SEP LEVEL-LOW* (UA-23 3-4) annunciator is clear. _____

14. **CONFIRM** *W MOIST SEP LEVEL-LOW* (UA-23 3-5) annunciator is clear. _____

15. **CONFIRM** cross around pipe temperatures are tracking as appropriate on Recorder *TSI-TXR-638*, Points 10, 11, 12, and 13. _____

5.3 Turbine Generator Startup and Synchronization (Continued)

5.3.6 **CLOSE** the following MVD startup vent valves:

1. *DRAIN COOLER 1A SU VENT, MVD-V37.* _____
2. *FW HTR 1A AND 2A SU VENT, MVD-V33* and *MVD-V34.* _____
3. *FW HTR 3A SU VENT, MVD-V92.* _____
4. *FW HTR 4A AND 5A SU VENT, MVD-V95* and *MVD-V97.* _____
5. *DRAIN COOLER 1B SU VENT, MVD-V38.* _____
6. *FW HTR 1B AND 2B SU VENT, MVD-V35* and *MVD-V36.* _____
7. *FW HTR 3B SU VENT, MVD-V94.* _____
8. *FW HTR 4B AND 5B SU VENT, MVD-V96* and *MVD-V98.* _____

NOTE: The frequency for 0PT-40.2.6 is: At least once per operating cycle.

NOTE: The PT PMID numbers are: Unit 1 - 00008883-02 (Unit 2- 00009747-02).

5.3.7 **IF** due, **THEN PERFORM** 0PT-40.2.6. _____

5.4 Preparation of Heater Drain System for Forward Pumping

5.4.1 **PERFORM** applicable section of 1(2)OP-35 for recirculating the heater drains in preparation for pumping forward prior to 25% turbine load. _____

5.5 Transferring Auxiliary Power From The SAT to the UAT

5.5.1 **ENSURE** all synchronizing switches on the RTGB are in *OFF*. ____

NOTE:	Unit 2 components are in parenthesis.
NOTE:	**WHEN** the feeder breaker from the UAT is closed, **THEN** the feeder breaker from the SAT automatically opens.

5.5.2 **PLACE** *UAT TO BUS 1(2)D SYNCHRONIZING SWITCH* in *ON*. ____

5.5.3 **CONFIRM** synchroscope is at "12 o'clock" position, **AND CLOSE** *UAT TO BUS 1(2)D BREAKER, AD7(AD6)*. ____

5.5.4 **CONFIRM** *UAT TO BUS 1(2)D BREAKER, AD7(AD6)*, has closed using the breaker indicating lights. ____

5.5.5 **CONFIRM** *SAT TO BUS 1(2)D BREAKER, AD5(AD4)*, has opened using the breaker indicating lights. ____

5.5.6 **PLACE** *UAT TO BUS 1(2)D SYNCHRONIZING SWITCH* in *OFF*. ____

5.5.7 **PLACE** *UAT TO BUS 1(2)C SYNCHRONIZING SWITCH* in *ON*. ____

5.5.8 **CONFIRM** synchroscope is at "12 o'clock" position, **AND CLOSE** *UAT TO BUS 1(2)C BREAKER, AC5(AC4)*. ____

5.5.9 **CONFIRM** *UAT TO BUS 1(2)C BREAKER, AC5(AC4)*, has closed using the breaker indicating lights. ____

5.5.10 **CONFIRM** *SAT TO BUS 1(2)C BREAKER, AC7(AC6)*, has opened using the breaker indicating lights. ____

5.5 Transferring Auxiliary Power From The SAT to the UAT (Continued)

5.5.11 **PLACE** *UAT TO BUS 1(2)C SYNCHRONIZING SWITCH* in *OFF*. _____

Date/Time Completed ____________

Performed By (Print)	Initials
____________	_____
____________	_____
____________	_____
____________	_____

Reviewed By: ____________

COMMENTS:

R25

Verification Of Reactor Power Level Using Alternate Indications

Unit ____ Date: ____________

TABLE 1

TIME	APPROX. RX PWR	BYPASS VALVE % PWR	STEAM FLOW % PWR	LPRM % PWR	HEAT BALANCE % PWR	APRM GAFs ≤ 1.00	INIT.
	15%						
	20%						
N/A	TURBINE ON LINE	N/A	N/A	N/A	N/A	N/A	N/A

1. **USE** this attachment to validate the heat balance between 15% reactor power and placing the turbine on line, by performing the following:

   a. **OBTAIN** valid Heat Balance (Display 820 or 0PT-01.8D) **AND RECORD** heat balance % power in Table 1.

   b. **OBTAIN** LPRM % PWR (Display 861, Filtered LPRM Readings Edit) **AND RECORD** in Table 1.

   c. **OBTAIN** Total Steam Flow (Mlb/hr).

Steam Line	(A)	(B)	(C)	(D)
(ERFIS)	C32FA014	C32FA015	C32FA016	C32FA017
(P603)	C32-R603A	C32-R603B	C32-R603C	C32-R603D

Total Steam Flow = (A) + (B) + (C) + (D) = ________

OR

USE Computer Point B041

Verification Of Reactor Power Level Using Alternate Indications

Unit ____ Date:____________

d. **OBTAIN** total bypass valve position (% open):

ERFIS computer point EHCXA002: __________%

OR

RTGB Panel XU1: (record the position (% open) of each)

<u>Unit 1</u>:

MS-BPV-1	MS-BPV-2	MS-BPV-3	MS-BPV-4
________%	________%	________%	________%

Total BPV % open = (The sum of adding BPV-1 through BPV-4) / 4 = __________%

<u>Unit 2</u>:

MS-BPV-1	MS-BPV-2	MS-BPV-3	MS-BPV-4	MS-BPV-5
________%	________%	________%	________%	_______%
MS-BPV-6	**MS-BPV-7**	**MS-BPV-8**	**MS-BPV-9**	**MS-BPV-10**
________%	________%	________%	________%	_______%

Total BPV % open = (The sum of adding BPV-1 through BPV-10) / 10 = __________%

NOTE:	Typing MAN runs an interactive program called MAN_ALTDSP that performs alternate power calculations based upon user supplied plant inputs. Remember to enter decimal points for all values. Use the equivalent % power output from this program for the comparison in the next step.

e. **LOG** on to the ERFIS terminal on the SRO's desk:

1) **TYPE**: SET HOST EC01B (EC02B)

OR

SET HOST EC01A (EC02A)

2) **TYPE**: GEPACUSER, at USERNAME prompt

3) **TYPE**: GEPAC, at PASSWORD prompt

4) **TYPE:** MAN (for manual input)

Verification Of Reactor Power Level Using Alternate Indications

Unit _____ Date:____________

NOTE:	The equivalent % power output from this program is to be used for the comparison in the next step.

f. **RECORD** BYPASS valve, and STEAM FLOW % power alternate indications on Table 1 of this attachment using the values obtained from MAN_ALTDSP in Step e.

g. **COMPARE** the Heat Balance (%) with the other alternate indications (%) recorded on Table 1.

Power Ascension may continue **IF**:

1) The heat balance is greater than all alternate indications (conservative as is).

OR

2) One or more alternate indications are within ± 5% of the heat balance (normal acceptance).

OR

3) There are no alternate indications within ± 5% of the heat balance provided the APRMs are adjusted greater than or equal to the next highest alternate indication above the heat balance (conservative action) in accordance with 1(2)OP-09.

OTHERWISE, STOP power ascension **AND CONTACT** Reactor Engineering to account for the differences in agreement.

h. **REPEAT** the above steps at 20% reactor power and in 10% increments until the turbine is placed on line.

2. Definitions for Table 1:

HEAT BALANCE % POWER - A calculation of core thermal power obtained by solving an energy balance on the reactor vessel. Valid heat balance calculations may be obtained from Display 820 edits or manually by performing 0PT-01.8D. Caution must be taken to ensure any failed sensors have valid substituted values.

Verification Of Reactor Power Level Using Alternate Indications

Unit ____ Date:____________

LPRM % POWER - An alternate indication of reactor power calculated only on the process computer which is obtained by averaging calibrated LPRM readings. This uses points U1NSSALTP and U2NSSALTP.

STEAM FLOW % POWER - An alternate indication of reactor power obtained by correlating the total steam flow to a valid heat balance. Total steam flow can be obtained from Plant Process Computer Point B041, the summation of ERFIS points C32FA014, C32FA015, C32FA016, C32FA017 (main steam lines A, B, C, D), or the summation of RTGB indications C32-R603A, B, C, D, on P603.

BYPASS VALVE % POWER - An alternate indication of reactor power obtained by correlating the total bypass valve position (percent open) to a valid heat balance. Total bypass valve position can be obtained from ERFIS point EHCXA002, or RTGB Panel XU1.

REVISION SUMMARY

Revision 67 clarifies information regarding Feedwater Line flow indication and what is required for APRM GAF adjustments when the Process Computer is not calculating a Heat Balance.

Revision 66 incorporates NCR 156480 to ensure the correct Power-Flow Map is selected prior to rolling the Turbine.

Revision 65 deletes Precaution and Limitation for guidance associated with pressure regulator inoperability.

Revision 64 incorporates Tech Spec amendments 233 and 260, Increased Flexibility in Mode Restraints, which affects mode changes with respect to LCO 3.0.4; revises step to ensure drywell pneumatics are on nitrogen during all periods the drywell is required to be inerted iaw the FSAR.

Revision 63 reflects Unit 2 pressure set change to 928 psi iaw EC 50554.

Revision 62 adds step to ensure SR 3.5.1.5 is satisfied prior to exceeding 25% power.

Revision 61 places Unit 1 4A FWH level controller to +1 iaw FWH replacement in EC 50045; changes prerequisite values for reactor pressure on Unit 1 due to change in initial pressure set iaw EC 50552.

Revision 60 incorporated changes for the following: 1) EC 47907, Implement Extended Power Uprate for Unit 2 Operation, 2) EC 46737, Phase 2 Obsolete Recorder Replacement for PRNM, 3) EC 47750, Feedwater Heater 4B Replacement, and 4) EC 46730, Replace Unit 2 Power Range Neutron Monitoring System.

Revision 59 added initial PRA analysis recommendations to Step 3.4 on operation with an inoperable pressure regulator. (AR 75598 Unit 1 EHC Pressure Regulator Action Plan)

Revision 58 added a Section 5.1 step to confirm the drywell head shield plugs 1-4 have been installed prior to placing the mode switch in Run.

Revision 57 incorporated changes to the Unit 1, 5 A/B heater level controller setup in Step 5.2.3 to set the level controller at +1". This agrees with the setup in 1OP-35 per vendor recommendations in accordance with the final test data of ESR 01-00021, which replaced the heaters.

Revision 56 incorporated power changes for EC 46861, Extended Power Uprate Implementation, for Unit 1.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

ADMIN

RO/SRO

NRC ADMIN JPM A-1-B

TITLE: Control Operator Daily Surveillance Report

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. Unit Two is operating at approximately 75% power in support of scheduled activities. A downpower was performed on the previous shift from 100%.

2. Plant conditions:

Reactor power	75%
Mode Switch	Run

All equipment is Operable

INITIATING CUE:

You have just assumed the watch as the Unit 2 Reactor Operator and have been directed to perform a portion of the Unit 2 Control Operator Daily Surveillance Report to support shift activities. Complete pages 34, 35, and 45 of 2OI-03.2 for Sunday, Dayshift

PERFORMANCE CHECKLIST

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

NOTE: The current copy is utilized due to the procedure being used for a seven day period.

START TIME: _

Step 1 - Obtain a current copy of 2OI-03.2

Current copy obtained.

SAT/UNSAT

E: **When the candidate has located the correct procedure, the examiner Will provide the applicable pages of 2OI-03.2 to the candidate.**

Step 2 Complete items on pages 34, 35, and 45 of 2OI-03.2 for Sunday, Dayshift.

Items on pages 34, 35, and 45 of 2OI-03.2 for Sunday, Dayshift Completed.

SAT/UNSAT

Step 3 Identify the following items as needing evaluation for exceeding acceptance criteria:

Item 30 Suppression Pool Level	-43" (downscale)
Item 32 Division II Backup Nitrogen	1710 psig
Item 76 Feedwater Line A temperature	405.9°
Item 77 Feedwater Line B temperature	405.9°

Items identified for evaluation:

Item 30 **SAT/UNSAT**

Item 32 **SAT/UNSAT**

Item 76 **SAT/UNSAT**

Item 77 **SAT/UNSAT**

Step 4 Compare Item 30 reading to the Operating Limit and determine acceptance criteria is not met.

Determination made that Operating Limit is not met. ****CRITICAL STEP****

SAT/UNSAT

NOTE: The operating limit in Step 32 is not met due to a greater than 50 psig drop in pressure in the previous day.

Step 5 Compare Item 32 reading to the Operating Limit and determine acceptance criteria is not met.

Determination made that Operating Limit is not met. ****CRITICAL STEP****

SAT/UNSAT

NOTE: **Items 76 and 77 acceptance criteria are determined by referencing 2OP-32, Attachment 4.**

Step 6 Compare Item 76 reading to the Operating Limit and determine acceptance criteria is met. (Must refer to 2OP-32 Att.4 due to power change from previous day)

Determination made that Operating Limit is met.

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

Step 7 Compare Item 77 reading to the Operating Limit and determine acceptance criteria is met. (Must refer to 2OP-32 Att.4 due to power change from previous day)

Determination made that Operating Limit is met.

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

Step 8 Inform SCO that Items 30 and 32 readings do not meet acceptance criteria.

SCO informed of items not meeting acceptance criteria.

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

TERMINATING CUE (RO): **SCO has been notified that Items 30 and 32 of**

SRO CONTINUES **the Control Operator Daily Surveillance Report**

do not meet acceptance criteria.

Step 9 SCO determines Item 30 Level Instrument is inoperable and Suppression Pool Level must be determined by other means to maintain ECCs Systems and Suppression Pool Operability.

Determination made that other level indication must be used to ensure ECCS/Suppression Chamber Operability

****CRITICAL STEP****

SAT/UNSAT

Step 10 SCO determines Item 32 does not meet operating limits but does not result in an Inoperability.

Determination made that Item 32 parameter does not result in an inoperability.

****CRITICAL STEP****

SAT/UNSAT

TERMINATING CUE (SCO): **SCO has determined Item 30 requires compensatory Action to satisfy surveillance requirement, and Item 32 parameter is an operating limit but does not result in an Inoperability.**

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.18 2.9/3.0

REFERENCES:

0OI-03.2

2OP-32, Attachment 4

Technical Specifications

TOOLS AND EQUIPMENT:

None

SAFETY FUNCTION (from NUREG 1123):

Administrative – Conduct Of Operations

APPLICABLE METHOD OF TESTING

Performance:	Simulate	___	Actual	X	Unit:	2
Setting:	Control Room	___	Simulator	___ (N/A for Admin or In-Plant JPMs)		
ne Critical:	Yes	___	No	X	Time Limit	N/A
Alternate Path:	Yes	___	No	X✓		

EVALUATION

JPM: Pass _____ Fail

Comments:

TASK CONDITIONS:

Unit Two is operating at approximately 75% power in support of scheduled activities. A downpower was performed on the previous shift from 100%.

Plant conditions:

Reactor power	75%
Mode Switch	Run

All equipment is Operable

INITIATING CUE:

You have just assumed the watch as the Unit 2 Reactor Operator and have been directed to perform the Unit 2 Control Operator Daily Surveillance Report to support shift activities.

KEY

ITEM NO.	SHIFT CHECKLIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMITS	SAT	SUN	MON	TUE	WED	THU	FRI
16	**RECORD** *REACTOR PRESSURE C32-R609* (narrow range recorder), Technical Specification SR 3.4.10.1		1, 2	b	07-13	≤ 1045 psig	1030	995					
					13-19		1030						
17	**RECORD** plant status (Oper. Mode Technical Specification Table 1.1-1)		6	a	07-13		1	1					
18	**RECORD** gross megawatts		1	a	07-13	2OP-27 Figure 1	970	740					
19	**RECORD** *CO-CR-24-1* A-N Condenser Hotwell Outlet Conductivity TRM-TR 3.5.1		1,2	c	07-13	≤ 2 µmho/cm	.09	.09					
20	**RECORD** *CO-CR-24-2* A-S Condenser Hotwell Outlet Conductivity TRM-TR 3,5.1		1,2	c	07-13	≤ 2 µmho/cm	.09	.09					
21	**RECORD** *CO-CR-24-3* B-N Condenser Hotwell Outlet Conductivity TRM-TR 3.5.1		1,2	c	07-13	≤ 2 µmho/cm	.09	.09					
22	**RECORD** *CO-CR-24-4* B-S Condenser Hotwell Outlet Conductivity TRM-TR 3.5.1		1,2	c	07-13	≤ 2 µmho/cm	.09	.09					
23	**RECORD** *INTAKE CANAL LEVEL, SCW-LR-285/CW-LR-761* Technical Specification SR 3.7.2.1, TRM 3.10 & 3.20	JJ	6	c	07-13	-5' to < 15'MSL / 4'	0.19	1.29					
24	**RECORD** *DISCHARGE CANAL LEVEL SCW-LR-285/CW-LR-761* 0E&RC-3250		6	a	07-13	3.5' to 6.5'	4.63	4.04					
25	**RECORD** suppression pool avg. bulk water temperature from recorders *CAC-TR-4426-1A* (Div I) and *4426-2A* (Div II) SR 3.6.2.1.1 — Div I	O	1,2,3	c	07-13	≤ 95°F	89	89					
	Div II						89	89					
26	**COMPARE** Div I and Div II in Item 25; should be within 10°F of each other. Technical Specification Table 3.3.3.1-1 Function 4, SR 3.3.3.1.1	J	1,2	c	07-13	within 10°F	Y	Y					

SHIFT Dayshift **CODSR** WEEK BEGINNING ____________

ITEM NO.	SHIFT CHECKLIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMITS	SAT	SUN	MON	TUE	WED	THU	FRI
27	**RECORD** *CAD TANK LEVEL* 2699-2 *CAC-LI-2699* and *2700* Technical Specification SR 3.6.3.2.1		6	c	07-13	≥ 4350 gals	4800	4800					
	2700-2						4800	4800					
28	**CONFIRM** CAD tank level indicator readings in item 27 are within 400 gals.		6	c	07-13	Within 400 gals	✓	✓					
29	**RECORD** *CAD TANK PRESSURE* 2703-2		6	c	07-13	> 80	86	86					
	CAC-PI-2703 (2704) 2704-2					psig	86	86					
30	**RECORD** *SUPP POOL LEVEL* *CAC-LI-4177* (if inoperable, use local level sight glass *CAC-LG-4336*) SR 3.5.2.1/3.6.2.2.1/3.5.2.2a		6	b	07-13	-27" to -31"	-29	X -43					
					13-19		-29						
31	**CHECK** *SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS* *CAC-X18A* through *CAC-X18J* indicate closed. Technical Specification SR 3.6.1.6.1		1,2,3	d	07-13		NR	NR	NR	NR	NR	NR	
32	**RECORD** N_2 *BACKUP* pressure *2-RNA-PI-5269* (Div. I) 5269 *2-RNA-PI-5267* (Div. II) Technical Specification	HH	1,2,3	c	07-13	≥ 1130 psig and ≤ 50 psig decrease/day	1700	1675					
	SR 3.6.1.5.1 5267						1800	X 1710					
33	**RECORD** Intake Canal Water Temperature from Process Computer Point U2CW-L056 SR 3.7.2.2		6	c	17	≤ 90.5°F	75	75					
34	**RECORD** *CST LEVEL (CO-LI-1160A).* SR 3.5.2.2.b	DD	4,5	b	07-13	≥ 16'	28	28					
					13-19		28						

R4

SHIFT Dayshift **CODSR** WEEK BEGINNING ____________

ITEM NO.	SHIFT CHECKLIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMITS	SAT	SUN	MON	TUE	WED	THU	FRI
76	**RECORD** Feedwater line A temperature (PPC Display 825 or 820), **AND CONFIRM** temperature is **NOT** more than 10° below nominal FW temp from 2OP-32 Att. 4. Core Operating Limits Report.	MM	1, ≥30% RTP*	b	07-13	≤10° F below nominal FW temp	429.2	405.9					
					13-19		429.2						
77	**RECORD** Feedwater line B temperature (PPC Display 825 or 820), **AND CONFIRM** temperature is **NOT** more than 10° below nominal FW temp from 2OP-32 Att. 4. Core Operating Limits Report.	MM	1, ≥30% RTP*	b	07-13	≤10° F below nominal FW temp	429.2	405.9					
					13-19		429.2						
78	**RECORD** 2A RHR HX pressure *E11-PI-606A*	OO	1, 2, 3 RHR in STBY	b	07-13	≤200 psig	40	40					
					13-19		40						
79	**RECORD** 2B RHR HX pressure *E11-PI-606B*	OO	1, 2, 3 RHR in STBY	b	07-13	≤200 psig	30	30					
					13-19		30						
80	**FORWARD** previous weeks completed 2OI-03.2 to the SRO.		6	d	07-19		NR	NR	NR		NR	NR	NR

* These checks are not required if operating in FFWTR in accordance with 0GP-13

SHIFT Dayshift **CODSR** WEEK BEGINNING ____________

ITEM NO.	SHIFT CHECKLIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMITS	SAT	SUN	MON	TUE	WED	THU	FRI
16	**RECORD** *REACTOR PRESSURE C32-R609* (narrow range recorder), Technical Specification SR 3.4.10.1		1, 2	b	07-13	≤ 1045 psig	1030						
					13-19		1030						
17	**RECORD** plant status (Oper. Mode Technical Specification Table 1.1-1)		6	a	07-13		1						
18	**RECORD** gross megawatts		1	a	07-13	2OP-27 Figure 1	970						
19	**RECORD** *CO-CR-24-1* A-N Condenser Hotwell Outlet Conductivity TRM-TR 3.5.1		1,2	c	07-13	≤ 2 µmho/cm	.09						
20	**RECORD** *CO-CR-24-2* A-S Condenser Hotwell Outlet Conductivity TRM-TR 3.5.1		1,2	c	07-13	≤ 2 µmho/cm	.09						
21	**RECORD** *CO-CR-24-3* B-N Condenser Hotwell Outlet Conductivity TRM-TR 3.5.1		1,2	c	07-13	≤ 2 µmho/cm	.09						
22	**RECORD** *CO-CR-24-4* B-S Condenser Hotwell Outlet Conductivity TRM-TR 3.5.1		1,2	c	07-13	≤ 2 µmho/cm	.09						
23	**RECORD** *INTAKE CANAL LEVEL, SCW-LR-285/CW-LR-761* Technical Specification SR 3.7.2.1, TRM 3.10 & 3.20	JJ	6	c	07-13	-5' to < 15'MSL / 4'	0.19						
24	**RECORD** *DISCHARGE CANAL LEVEL SCW-LR-285/CW-LR-761* 0E&RC-3250		6	a	07-13	3.5' to 6.5'	4.63						
25	**RECORD** suppression pool avg. bulk water temperature from recorders *CAC-TR-4426-1A* (Div I) and *4426-2A* (Div II) SR 3.6.2.1.1 — Div I	O	1,2,3	c	07-13	≤ 95°F	89						
	Div II						89						
26	**COMPARE** Div I and Div II in Item 25; should be within 10°F of each other. Technical Specification Table 3.3.3.1-1 Function 4, SR 3.3.3.1.1	J	1,2	c	07-13	within 10°F	Y						

ITEM NO.	SHIFT CHECKLIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMITS	SAT	SUN	MON	TUE	WED	THU	FRI
27	**RECORD** *CAD TANK LEVEL* 2699-2 *CAC-LI-2699* and *2700* Technical Specification SR 3.6.3.2.1 2700-2		6	c	07-13	≥ 4350 gals	4800 4800						
28	**CONFIRM** CAD tank level indicator readings in item 27 are within 400 gals.		6	c	07-13	Within 400 gals	✓						
29	**RECORD** *CAD TANK PRESSURE* 2703-2 *CAC-PI-2703 (2704)* 2704-2		6	c	07-13	> 80 psig	86 86						
R4 30	**RECORD** *SUPP POOL LEVEL* *CAC-LI-4177* (if inoperable, use local level sight glass *CAC-LG-4336*) SR 3.5.2.1/3.6.2.2.1/3.5.2.2a		6	b	07-13 13-19	-27" to -31"	-29 -29						
31	**CHECK** *SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS* *CAC-X18A* through *CAC-X18J* indicate closed. Technical Specification SR 3.6.1.6.1		1,2,3	d	07-13		NR	NR	NR	NR	NR	NR	
32	**RECORD** *N_2 BACKUP* pressure *2-RNA-PI-5269* (Div. I) 5269 *2-RNA-PI-5267* (Div. II) Technical Specification SR 3.6.1.5.1 5267	HH	1,2,3	c	07-13	≥ 1130 psig and ≤ 50 psig decrease/day	1700 1800						
33	**RECORD** Intake Canal Water Temperature from Process Computer Point U2CW-L056 SR 3.7.2.2		6	c	17	≤ 90.5°F	75						
34	**RECORD** *CST LEVEL (CO-LI-1160A)*. SR 3.5.2.2.b	DD	4,5	b	07-13 13-19	≥ 16'	28 28						

SHIFT Dayshift **CODSR** WEEK BEGINNING ____________

ITEM NO.	SHIFT CHECKLIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMITS	SAT	SUN	MON	TUE	WED	THU	FRI
76	**RECORD** Feedwater line A temperature (PPC Display 825 or 820), **AND CONFIRM** temperature is **NOT** more than 10° below nominal FW temp from 2OP-32 Att. 4. Core Operating Limits Report.	MM	1, ≥30% RTP*	b	07-13	≤10° F below nominal FW temp	429.2						
					13-19		429.2						
77	**RECORD** Feedwater line B temperature (PPC Display 825 or 820), **AND CONFIRM** temperature is **NOT** more than 10° below nominal FW temp from 2OP-32 Att. 4. Core Operating Limits Report.	MM	1, ≥30% RTP*	b	07-13	≤10° F below nominal FW temp	429.2						
					13-19		429.2						
78	**RECORD** 2A RHR HX pressure *E11-PI-606A*	OO	1, 2, 3 RHR in STBY	b	07-13	≤200 psig	40						
					13-19		40						
79	**RECORD** 2B RHR HX pressure *E11-PI-606B*	OO	1, 2, 3 RHR in STBY	b	07-13	≤200 psig	30						
					13-19		30						
80	**FORWARD** previous weeks completed 2OI-03.2 to the SRO.		6	d	07-19		NR	NR	NR		NR	NR	NR

* These checks are not required if operating in FFWTR in accordance with 0GP-13

R53

Final Feedwater Temperature Vs Power

NOTE: The reactor thermal power/temperature data in this table is **NOT** intended for determining reactor power levels. This information was calculated using empirical data for the feedwater heaters and does **NOT** incorporate degraded heater performance. The 110.3°F Reduced FFWT column is biased 10°F in the conservative direction to provide margin to the limit.

RX PWR	Nominal FW Temp	Nominal FW Temp Reduced 10°F	110.3°F Reduced FW Temp	RX PWR	Nominal FW Temp	Nominal FW Temp Reduced 10°F	110.3°F Reduced FW Temp
100	429.0	419.0	328.7	62	387.8	379.0	301.3
99	427.6	417.6	327.7	61	386.4	377.7	300.4
98	426.5	416.6	327.0	60	385.0	376.3	299.4
97	425.5	415.6	326.3	59	383.6	374.9	298.5
96	424.4	414.6	325.7	58	382.1	373.5	297.5
95	423.4	413.6	325.0	57	380.6	372.1	296.5
94	422.4	412.6	324.3	56	379.1	370.6	295.5
93	421.4	411.7	323.7	55	377.5	369.1	294.5
92	420.4	410.7	323.0	54	375.9	367.5	293.4
91	419.5	409.8	322.4	53	374.2	365.9	292.3
90	418.5	408.8	321.7	52	372.6	364.3	291.2
89	417.5	407.9	321.1	51	370.9	362.6	290.0
88	416.5	406.9	320.4	50	369.1	360.9	288.9
87	415.6	406.0	319.8	49	367.3	359.2	287.7
86	414.6	405.0	319.1	48	365.5	357.4	286.5
85	413.6	404.1	318.5	47	363.6	355.6	285.2
84	412.6	403.1	317.8	46	361.7	353.8	284.0
83	411.7	402.2	317.2	45	359.8	351.9	282.7
82	410.7	401.2	316.5	44	357.8	349.9	281.3
81	409.7	400.3	315.8	43	355.7	347.9	280.0
80	408.7	399.3	315.2	42	353.6	345.9	278.6
79	407.6	398.3	314.5	41	351.5	343.9	277.2
78	406.6	397.3	313.8	40	349.3	341.8	275.7
77	405.6	396.3	313.1	39	347.1	339.6	274.3
76	404.5	395.3	312.4	38	344.9	337.4	272.8
75	403.5	394.2	311.7	37	342.5	335.2	271.2
74	402.4	393.2	311.0	36	340.2	332.9	269.7
73	401.3	392.1	310.3	35	337.8	330.5	268.0
72	400.2	391.0	309.5	34	335.3	328.2	266.4
71	399.0	389.9	308.8	33	332.8	325.7	264.7
70	397.9	388.8	308.0	32	330.2	323.2	263.0
69	396.7	387.7	307.2	31	327.6	320.7	261.3
68	395.5	386.5	306.4	30	325.0	318.1	259.5
67	394.3	385.3	305.6	29	322.2	315.5	257.7
66	393.0	384.1	304.8	28	319.5	312.8	255.9
65	391.8	382.9	303.9	27	316.6	310.1	254.0
64	390.5	381.6	303.1	26	316.5	307.3	252.1
63	389.1	380.4	302.2				

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action C.2 and associated Completion Time not met.	D.1	Initiate action to restore secondary containment to OPERABLE status.	Immediately
	AND		
	D.2	Initiate action to restore one standby gas treatment subsystem to OPERABLE status.	Immediately
	AND		
	D.3	Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ -31 inches.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.2	Verify, for each required core spray (CS) subsystem, the: a. Suppression pool water level is ≥ -31 inches; or b. ------------------------NOTE------------------------ Only one required CS subsystem may take credit for this option during OPDRVs. --- Condensate storage tank water volume is ≥ 228,200 gallons.	12 hours
SR 3.5.2.3	Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days
SR 3.5.2.4	----------------------------NOTE---------------------------- One LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. --- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.5.1	Verify nitrogen bottle supply pressure of each nitrogen backup subsystem is ≥ 1130 psig.	24 hours
SR 3.6.1.5.2	-----NOTES----- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. ---------- Verify each vacuum breaker is closed.	14 days
SR 3.6.1.5.3	Perform a functional test of each vacuum breaker.	92 days
SR 3.6.1.5.4	Verify the full open setpoint of each vacuum breaker is ≤ 0.5 psid.	24 months
SR 3.6.1.5.5	Verify leakage rate of each nitrogen backup subsystem is ≤ 0.65 scfm when tested at an initial nitrogen bottle supply pressure of ≥ 1130 psig.	24 months
SR 3.6.1.5.6	Verify the Nitrogen Backup System supplies nitrogen to the vacuum breakers on an actual or simulated actuation signal.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be ≥ -31 inches and ≤ -27 inches.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Suppression pool water level not within limits.	A.1 Restore suppression pool water level to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	24 hours

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

ADMIN

RO/SRO

NRC JPM A-2

TITLE: Generate a Clearance for maintenance activities on the 2C TBCCW pump.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. The 2C TBCCW has been removed from service for maintenance activities to repack the shaft on the pump.
2. The pump must be vented and drained.
3. The manual suction discharge valves for the 2C TBCCW pump are leaking by and can not be used as isolation for the pump
4. Passport is not available and there are no historical clearances for the 2C TBCCW Pump available.

INITIATING CUE:

You are directed to propose a clearance boundary for the 2C TBCCW pump by completing Attachment 4 of OPS-NGGC-1301. Columns for Equipment/ Component, Position, and Sequence are to be completed.

NOTE: The examinee may reference prints D-2033, Sht.1, LL-92018 and LL-09218 to determine clearance points. Procedure OPS-NGGC-1301

Step 1 – Obtains references and determines the following blocking points:

ATTACHMENT 4
Sheet 1 of 1
OPERATIONS CLEARANCE Checklist

Clearance No.
PAGE 1 of 1

INT NAME (PRINT) INT NAME (PRINT)

___ __________ ___ __________
___ __________ ___ __________
___ __________ ___ __________

* Independent Verification Required? Yes/No If No, N/A the Blocks

Seq	Action	Type	Tag Id	Position	Equipment/Component	Completed By	IV By
1				OFF/ LOCKED	MCC 2TH COMPT D17 2C TBCCW PP MTR BKR		
2				OFF/ LOCKED	MCC 1TH COMPT D16 2C TBCCW PP MTR BKR (Alternate Feed)		
3				OFF/ LOCKED	MCC 2TH COMPT D20 2-TCC-V3 MTR BKR		
4				OFF/ LOCKED	MCC 2TH COMPT D21 2-TCC-V14 MTR BKR		
5				OFF/ LOCKED	MCC 1TH COMPT D20 1-TCC-V4 MTR BKR		
6				OFF/ LOCKED	MCC 1TH COMP D21 1-TCC-V15 MTR BKR		
7				CLOSED	2-TCC-V3 HANDWHEEL		
8				CLOSED	2-TCC-V14 HANDWHEEL		
9				CLOSED	1-TCC-V4 HANDWHEEL		
10				CLOSED	1-TCC-V15 HANDWHEEL		
11				OPEN	2-TCC-V249 HANDWHEEL		
12				OPEN	2-TCC-V252 HANDWHEEL		

EXAMINER NOTE: All blocking points are **CRITICAL STEPS**

SAT/UNSAT

Step – 2 Determines clearance sequence as noted in table above and described further below

1. Tags 1 & 2 can be applied in any order but they must be the first blocking points tagged.
2. Tags 3 through 6 can be applied in any order but must be the next group of blocking points tagged.
3. Tags 7 though 10 can be applied in any order but must be the next group of blocking points tagged.
4. Tags 11 & 12 must be applied next in any order.

Examinee determines the sequence described above

****CRITICAL TASK****

SAT/UNSAT

TERMINATING CUE: When the blocking points and sequence have been determined the JPM is complete

COMMENTS:

K/A REFERENCE AND IMPORTANCE RATING:

2.2.13 3.6/3.8

Knowledge of tagging and clearance procedures

REFERENCES:

OPS-NGGC-1301, Revision 17

Prints: D-2033, Sht.1, LL-92018 and LL-09218

TOOLS AND EQUIPMENT:

NONE

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

A.2 - Equipment Control

Time Required for Completion: 30 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate _	Actual	X	Unit:	2
Setting:	Control Room ___	Simulator	X		
Time Critical:	Yes ___	No	X	Time Limit	N/A
Alternate Path:	Yes ___	No	X		

EVALUATION

JPM: Pass Fail

TASK CONDITIONS:

1. The 2C TBCCW has been removed from service for maintenance activities to repack the shaft on the pump.
2. The pump must be vented and drained.
3. The manual suction discharge valves for the 2C TBCCW pump are leaking by and can not be used as isolation for the pump
5. Passport is not available and there are no historical clearances for the 2C TBCCW Pump available.

INITIATING CUE:

You are directed to propose a clearance boundary for the 2C TBCCW pump by completing Attachment 4 of OPS-NGGC-1301. Columns for Equipment/ Component, Position, and Sequence are to be completed.

Develop a clearance boundary – TBCCW Pump 2C

ANSWER KEY

ATTACHMENT 4
Sheet 1 of 1
Operations Clearance Checklist

Clearance No.________________

Page ____ of ____

Checklist Type: Hang; Lift; Boundary Change (Circle one)

INT NAME (PRINT) INT NAME (PRINT)

____ __________________ ____ __________________
____ __________________ ____ __________________
____ __________________ ____ __________________

* Independent Verification Required? YES/NO If NO, N/A the Blocks

Seq	Action	Type	Tag Id	Position	Equipment/Component	Completed. By	Verified By *
1		ANY ORDER		OFF/ LOCKED	MCC 2TH COMPT D17 2C TBCCW PUMP MOTOR BREAKER		
2				OFF/ LOCKED	MCC 1TH COMPT D16 2C TBCCW PUMP MOTOR BREAKER (ALTERNATE FEED)		
3				OFF/ LOCKED	MCC 2TH COMPT D20 2-TCC-V3 MOTOR BREAKER		
4		ANY ORDER		OFF/ LOCKED	MCC 2TH COMPT D21 2-TCC-V14 MOTOR BREAKER		
5				OFF/ LOCKED	MCC 1TH COMPT D20 1-TCC-V4 MOTOR BREAKER		
6				OFF/ LOCKED	MCC 1TH COMP D21 1-TCC-V15 MOTOR BREAKER		
7 T				CLOSED	2-TCC-V3 HANDWHEEL		

Continued Y / N

Sequence must have breakers OFF/LOCKED prior to placing tags on associated valve handwheels.

QA RECORD

Develop a clearance boundary – TBCCW Pump 2C

Seq	Action	Type	Tag Id	Position	Equipment/Component	Completed. By	Verified By *
8				CLOSED	2-TCC-V14 HANDWHEEL		
9		ANY	ORDER	CLOSED	1-TCC-V4 HANDWHEEL		
10				CLOSED	1-TCC-V15 HANDWHEEL		
11	NEXT			OPEN	2-TCC-V249 HANDWHEEL		
12	NEXT			OPEN	2-TCC-V252 HANDWHEEL		

QA RECORD

9.3.1.1 **Administrative** (Cont.)

11. The Personal Clearance Preparer shall identify any significant loss of function incurred by clearance activities and document the loss of function in the clearance Special Instructions. Some potential examples of significant loss of function may include disabled annunciators, defeated protective relays, defeated trip functions, disabled indicators, disabled meters or gauges, masked annunciators, or loss of monitoring capabilities.

12. For systems where a pump or fan is affected by a clearance, the clearance should be installed and removed in the sequence listed in the table below to prevent damage to equipment. Deviations from the sequence and specific instructions below are allowed for safety, ALARA, or if the deviation would not impact personnel or equipment safety.

Clearance Installation	Clearance Removal
Secure pump/fan and hang a tag on its control switch.	Remove tags from handwheels of valves and reposition manual valves as required. For pumps, open the suction valve before opening the discharge valve.
Remove the power source for the pump/fan prime mover (open breaker, remove fuse, shut steam supply valve and so forth) and place tag on the power source.	Remove tags on power sources to valves and restore the power supply as required.
Reposition valves from control switches, as required by the clearance, and place tags on the control switches. Include tags for switches in alternate locations if applicable.	Remove tags from valve control switches and reposition valves as required.
Remove power source (electrical, air, hydraulic, and so forth) from valves, if applicable, and tag the power source removed.	Remove the tag from the power source for the pump/fan prime mover. Restore the power source as directed by restoration lineup.
FOR MANUAL VALVES * Reposition manual valves as required by the clearance and place tag on handwheels of the valves covered by the clearance. For pumps, shut the discharge valve before shutting the suction valve.	Remove the tag on pump/fan control switch and reposition the switch as required.

Boundary Device Tagging Guidelines

Boundary Device	Restrictions	Tagout Method
Motor Operated Valve	- Some Limitorque operated valves are prone to drift if in manual - If primary use of valve is flow control, monitor for seat leakage - If manual torquing is required, untorque valve prior to stroking electrically	- Position valve from control switch - Place a CIT or clearance tag on control switch as required - Place tag on power supply - Place tag on valve handwheel that indicates valve position (handwheel should only be manually engaged if leak by is present - If torqued, refer to site procedures for additional requirements
Hydraulic Operated Valve (Fails Closed)	- Evaluate on a case by case basis to determine if valve can perform adequately as a boundary device	- Position valve from control switch - Place a CIT or clearance tag on control switch as required - Place tag on power supply to hydraulic pump - If the operator has a handwheel or other manual positioning device that could open the valve, it should also be tagged - If the operator does not have a handwheel or other manual positioning device, tag the operator to prevent inadvertent violation of the boundary
R 2.2.1 Hydraulic Operated Valve (Fails Open)	- Normally not used as a boundary device - Either a manual positioning device or a mechanical gag is required (SOER 85-5) - Evaluate on a case by case basis to determine if valve can perform adequately as a boundary device	- Position valve from control switch - Place a CIT or clearance tag on control switch as required - Place tag on power supply to hydraulic pump - If the operator has a handwheel or other manual positioning device it should be tagged - If a mechanical gag is installed, it should be tagged - If the operator does not have a handwheel or other manual positioning device, tag the operator to prevent inadvertent violation of the boundary

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

ADMIN

RO

NRC JPM A-3

TITLE: Determine Stay Time limitations for performing work in a High Radiation Area.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

Two workers will be performing a lube check and coupling alignment on the Unit Two (2) RWCU Pump.

Worker #1 has accumulated 1625 mr this year.

Worker #2 has accumulated 1675 mr this year.

The following times for each worker have been estimated for performance of the job.

1. Traversing South West stairwell 20' – 50' Rx Bldg	12 minutes
2. Staging time in access area outside the RWCU room	6 minutes
3. Staging time in area directly inside room access door	12 minutes
4. Work time at the "B" RWCU pump	2 hours

It has been estimated that a total of 30 mr per person will be accumulated once the job is completed for de-staging and return to the maintenance shop.

INITIATING CUE:

Using the information above and the provided radiological survey:

1. Determine the total dose accumulated in performance of the job on the Unit 2 "B" RWCU pump for both workers. (assume the same task times for both workers)
2. Determine if any Brunswick dose limitations will be exceeded.

PERFORMANCE CHECKLIST

NOTE: Provide the examinee the attached survey map.

Step 1 - Determines dose for each worker as follows:

1. Traversing SW stairwell 20' – 50' Rx Bldg

   (12 min) .2 Hr X 5 mr/hr = **1 mr**

2. Staging time in access area outside the RWCU room

   (6 min) .1 Hr X 10 mr/hr = **1 mr**

3. Staging time in area directly inside room access door

   (12 min) .2 Hr X 75 mr/hr = **15 mr**

4. Work time at the "B" RWCU pump

   2 Hrs X 150 mr/hr = **300 mr**

An additional **30** mr will be accumulated once the job is done.

Total = 1 + 1 + 15 + 300 + 30 = **347 mr**

**** CRITICAL STEP****

SAT/UNSAT

Step 2 – Determines that Worker #2 would exceed the Brunswick administrative limit of **2R** per calendar year if the estimated dose were accumulated.

Worker #1	1625 mr + 347 mr	= 1972 mr (< 2R limit)
Worker #2	1675 mr + 347 mr	= 2022 mr **(> 2R limit)**

** CRITICAL STEP**

SAT/UNSAT

TERMINATING CUE: When the total dose for each worker has been determined and the administrative limits addressed, the JPM is complete.

Comments

K/A REFERENCE AND IMPORTANCE RATING:

2.3.10 2.9

2.3.1 2.6

REFERENCES:

TOOLS AND EQUIPMENT:

Calculator.

SAFETY FUNCTION (from NUREG 1123):

Validation Time: 15 Minutes

APPLICABLE METHOD OF TESTING

Performance:	Simulate ___	Actual	X	Unit:	2
Setting:	Control Room ___	Simulator___ (N/A for Admin or In-Plant JPMs)			
Time Critical:	Yes ___	No	X	Time Limit	N/A
Alternate Path:	Yes ___	No	X		

EVALUATION

JPM: Pass _____ Fail _____

____

____

____

TASK CONDITIONS:

Two workers will be performing a lube check and coupling alignment on the Unit Two (2) RWCU Pump.

Worker #1 has accumulated 1625 mr this year.

Worker #2 has accumulated 1675 mr this year.

The following times for each worker have been estimated for performance of the job.

1.	Traversing South West stairwell 20' – 50' Rx Bldg	12 minutes
2.	Staging time in access area outside the RWCU room	6 minutes
3.	Staging time in area directly inside room access door	12 minutes
4.	Work time at the "B" RWCU pump	2 hours

It has been estimated that a total of 30 mr per person will be accumulated once the job is completed for de-staging and return to the maintenance shop.

INITIATING CUE:

Using the information above and the provided radiological survey:

1. Determine the total dose accumulated in performance of the job on the Unit 2 "B" RWCU pump for both workers. (assume the same task times for both workers)

5.0 PREREQUISITES

N/A

6.0 PRECAUTIONS AND LIMITATIONS

N/A

7.0 SPECIAL TOOLS AND EQUIPMENT

N/A

8.0 ACCEPTANCE CRITERIA

N/A

9.0 INSTRUCTIONS

R2.1 9.1 Adult Occupational Dose Limits

9.1.1 Whole Body - The more limiting of a total effective dose equivalent equal to 5 rem or the sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye equal to 50 rem.

9.1.2 Skin - A shallow dose equivalent equal to 50 rem.

9.1.3 Lens of Eye - A lens dose equivalent equal to 15 rem.

9.1.4 Extremities - A shallow dose equivalent equal to 50 rem.

9.2 Occupational Dose to Minors

Minors shall not be employed to work in radiation control areas, although they may enter as visitors.

9.3 Progress Energy Annual Administrative Dose Limits

9.3.1 0.5 rem Progress Energy dose if non-Progress Energy dose for the current year has not been determined. No dose extension is permitted.

9.3.2 2 rem Progress Energy dose not to exceed 4 rem total dose if non-Progress Energy dose for the current year has been determined.

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL SURVEY

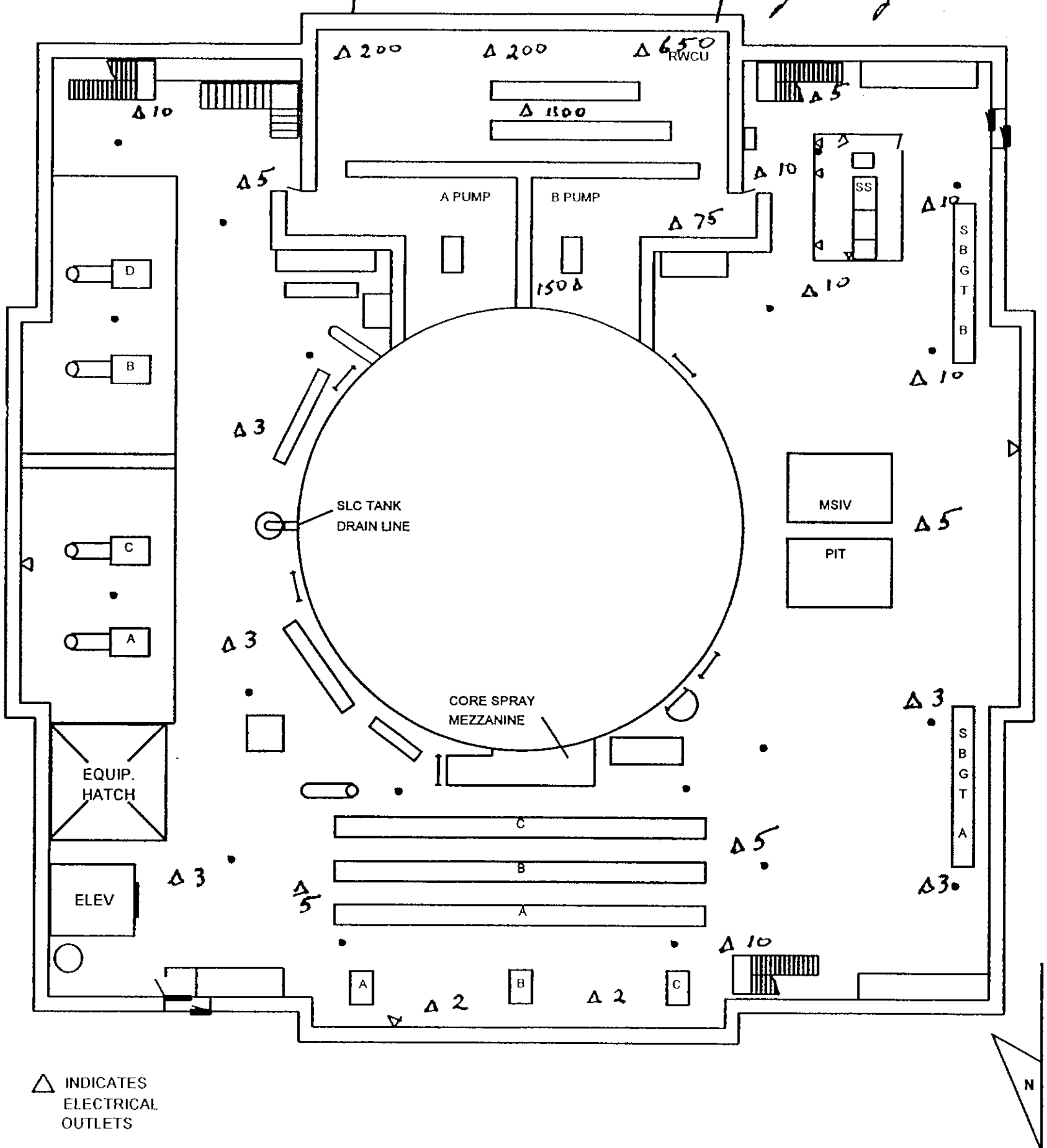
SURVEY NO. -

DATE: Today TIME:	**DOSE RATE**	**CONTAMINATION**
SURVEYOR	INST. TYPE Teletector	β ☐ α ☐ β ☐ α ☐
SIGNATURE	SERIAL NO. T117B	INST/SN
	β FACTOR	EFF.
	RX POWER 100	
REVIEWED	H2 SCFM 38	BKGD. CPM CPM

UNIT 2 BLDG RB EL 50' AREA RWCU Pump "B" Room RWP NO.

COMPONENT OR TAG NO. 2B RWCU Pump WR/JO

WORK PERFORMED Pump lube check/coupling alignment



Δ INDICATES ELECTRICAL OUTLETS

SMEAR RESULTS
IN DPM/100 CM^2
B=BETA IN mRAD/HR/100CM ^{2}
M=CPM/MASLIN

NO.	RESULTS

RA -RADIATION AREA
HRA -HIGH RADIATION AREA
LHRA -LOCKED HIGH RADIATION AREA
RCA -RADIATION CONTROL AREA

CA -CONTAMINATION AREA
HCA -HIGH CONTAMINATION AREA
AA -AIRBORNE AREA
—x—x—x— ROPE BOUNDARY

DOSE RATES IN mR/HR
n° -NEUTRON (mRem/Hr)

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

SRO

NRC ADMIN JPM A-1-A

TITLE: Evaluate Unit 2 Offsite Power Source Operability

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedures (2OI-03.1, Unit 2 Tech Specs), WILL NOT be provided to the trainee, but should be available.
2. A calculator will need to be provided.

TASK CONDITIONS:

1. You are a Unit One (2) SCO.
2. The load dispatcher has informed the Control Room that system reserve is low.
3. The fourth Circulating Water Intake Pump has been started on Unit Two (2) per guidance of 2OP-29.0.
4. Buses Common A and B are being supplied by their respective Unit power.
5. B Loop of Suppression Pool Cooling is in service to support upcoming RCIC testing.
6. The process computer is unavailable.
7. Unit 2 is in Mode 1, at 100% power.

INITIATING CUE:

Following the start of a Circulating Water Intake Pump, you are directed to determine if electrical loading is within the limits established in the CO Daily Surveillance Report (DSR), and report the required actions for Unit 2.

Step 1 - Obtain current revision of 2OI-03.1.

Current revision of 2OI-03.01 obtained

SAT/UNSAT

Step 2 - Determine Attachment 1 items 45 & 46 and notes S & T apply.

Determines Attachment 1 items 45 & 46 and notes S & T apply.

. SAT/UNSAT

PROMPT: IF asked, only control room indication may be used to determine amperage. The process computer is unavailable

Step 3 - Determine amps on Bus 2C.

Bus 2C amps of ≈ 1800 amps using XU-2 ammeter

SAT/UNSAT

Step 4 - Determine amps on Bus 2D.

Bus 2D amps of ≈ 1750 amps using XU-2 ammeter

SAT/UNSAT

Step 5 – Determines per Item 45 of 2OI-03.2 that total amps for 2C and 2D is 3550 and exceeds the limit specified.

Determines 2C &2D total amps is > limit of 3225

****CRITICAL STEP****

SAT/UNSAT

Step 6 - Determine amps on Common B.

Determines Common B amps of ≈ 100 amps using XU-2 ammeter

SAT/UNSAT

Step 7 – Determines per Item 46 of 2OI-03.2 that total amps for 2C, 2D and Common B is 3650 and exceeds the limit specified.

Determines 2C, 2D, Common B total amps is > limit of 3550

****CRITICAL STEP****

SAT/UNSAT

Step 8 – Determines that Note T applies for items 45 & 46. Enter appropriate TS.

1. TS 3.8.1. Conditions C.1, 2, 3 & E.1 & 2

****CRITICAL STEP****

SAT/UNSAT

TERMINATING CUE: When TS determination has been made, the JPM is complete

Comments:

K/A REFERENCE AND IMPORTANCE RATING:

262001 3.1/3.9

REFERENCES:

2OI-03.1 Rev. 95
Unit 2Technical Specifications

TOOLS AND EQUIPMENT:

Calculator

SAFETY FUNCTION (from NUREG 1123, Rev 1.):

Safety Function 6, Electrical (A.C. Electrical Distribution)

Time Required for Completion: 12 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate Actual X Unit: 2

Setting: Control Room _ Simulator X

Time Critical: Yes No X

Time Limit N/A

Alternate Path: Yes ___ No X

EVALUATION

JPM: Pass Fail

PLANT OPERATING MANUAL

VOLUME VII

OPERATING INSTRUCTION

UNIT
2

2OI-03.2

CONTROL OPERATOR DAILY SURVEILLANCE REPORT

REVISION 95

1.0 PURPOSE

The Control Operator Daily Surveillance Report (CODSR) provides the Control Operator (CO) with guidelines for the timely collection of plant performance data required by Technical Specifications surveillance requirements.

The CODSR contains those Technical Specifications surveillance requirements the CO may perform without a formal procedure, such as instrument checks. It also directs the CO to additional procedures required to complete Technical Specifications surveillance requirements and provides a means of documenting the completion of those procedures.

2.0 REFERENCES

2.1 Technical Specifications

2.2 Technical Requirements Manual (TRM)

2.3 Offsite Dose Calculation Manual (ODCM)

R4 2.4 ACR 92-455

2.5 0E&RC-3250, Groundwater Monitoring Program

2.6 FSAR 2.4.8.3.3

2.7 0OI-01.08, Control of Equipment and System Status

2.8 CAP-NGGC-0200, Corrective Action Program

2.9 Reply to Notice of Violation BSEP 98-0043, CR 98-00016

3.0 RESPONSIBILITIES

3.1 The Operations Data Management Assistant is responsible for obtaining the latest revision of the CODSR; ensuring all temporary changes and supplemental information are attached as required; and distributing the CODSR to the Control Room by 1300 each Friday.

3.2 The Control Operators are responsible for maintaining the CODSR; completing each item on the CODSR during the specified time interval (or, additionally, as directed by shift checklist instructions or notes) to ensure surveillance requirements are met; and immediately notifying the Unit SCO when values are outside required limits.

3.3 The Unit SCO is responsible for reviewing the CODSR after shift completion and ensuring appropriate actions are taken if discrepancies are found.

3.0 RESPONSIBILITIES

3.4 The SRO is responsible for ensuring the completed weeks DSR is transmitted to the Operations DMA for record retention.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 **ENSURE** numerical values are recorded where called for by the CODSR.

4.2 **WHEN** specific instruments are required to be checked, **THEN** they are specified by the CODSR.

4.3 **WHEN** a specific procedure (other than instrument checks) is required, **THEN** the CODSR specifies the procedure to be used.

4.4 **WHEN** a check is **NOT** required because the required condition is not established, **THEN** NR is the acceptable entry. No other entry (except checks or values) are acceptable unless a note is entered on the applicable CODSR Notes page. A note designation (N-1, 2, etc.) must be used in the checkoff block when notes are made. Each different note designation must have a corresponding CODSR item number. Notes must be in accordance with "example of how to make CODSR notes."

4.5 **WHEN** an * appears in a shift block, **THEN** the check is to be performed on that shift/day.

4.6 **WHEN** an additional surveillance is required by a Tech Spec, TRM, or ODCM LCO, **THEN** it is added to the CODSR by the Unit SCO, who will indicate the operating mode under which the surveillance is required, the frequency required and any limits imposed. A blank CODSR form is maintained in the current CODSR for this purpose.

5.0 DEFINITIONS

NOTE:	For instruments that do not have independent instrument channels measuring the same parameters, the qualitative assessment, by observation, of channel behavior during operation must consist of current instrument indication being appropriate for plant conditions (e.g. power or HWC changes will impact many plant radiation monitor readings). If an instrument feeds a downstream device (e.g. indicator feeds a recorder through an action pak) then a comparison between the indicator and the recorder is not an appropriate channel check. If the recorder is working properly, it could be used to determine the appropriateness of the indication for current plant conditions.

5.1 CHANNEL CHECK: A channel check shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameters.

5.2 DAYSHIFT is the period from 0700 to 1900 on the day specified (i.e., Saturday dayshift is Saturday 0700 to Saturday 1900).

5.3 NIGHTSHIFT is the period from 1900 on the day specified to 0700 on the next day (i.e., Saturday nightshift is Saturday 1900 to Sunday 0700).

6.0 PROCEDURAL STEPS

6.1 The Operations Data Management Assistant:

6.1.1 **OBTAINS** a copy of the latest revision of the CODSR from Document Control.

6.1.2 **MARKS** the CODSR with the appropriate dates.

6.1.3 **ENSURES** all applicable temporary changes are attached to the CODSR.

6.1.4 **PROVIDES** Supplemental Tech Spec, TRM, or ODCM Surveillances to Attachment 1 of the CODSR as directed.

6.1.5 **DELIVERS** the CODSR to the Control Room by 1300 hours each Friday.

6.0 PROCEDURAL STEPS

6.2 The Control Operator:

6.2.1 **MAINTAINS** the CODSR **AND INITIALS** the Documentation and Review Sheet following the performance of any checks.

6.2.2 **ENSURES** anyone performing checks at his direction also initials the Documentation and Review Sheet.

6.2.3 **COMPLETES** each item on the CODSR during the specified time interval (or, additionally, as directed by shift checklist instructions or notes) to ensure surveillance requirements are met.

6.2.4 **RECORDS** values **OR PLACES** check marks in those blocks which do **NOT** require a recorded value.

6.2.5 **ENSURES** Attachments 2, 3, and 4 are included with the CODSR when the unit is in Mode 5.

6.2.6 **CIRCLES**, in red, all values which are **NOT** within required limits.

6.2.7 **IMMEDIATELY NOTIFIES** the Unit SCO when recorded values are **NOT** within required limits.

6.3 The Unit SCO:

6.3.1 **REVIEWS** the CODSR **AND INITIALS** the Documentation and Review Sheet at the end of each shift.

6.3.2 **ENSURES** all required entries have been made **OR** a note is on the applicable Notes page which adequately explains why the surveillance was not done.

6.3.3 **ENSURES** all recorded values are within required limits.

6.3.4 **ENSURES** appropriate action is taken in accordance with 0OI-01.08 Section 5.1, LCO Evaluation and Follow-Up, **OR** CAP-NGGC-0200, Corrective Action Program, if discrepancies are found during review.

UNIT 2

CONTROL OPERATOR
DAILY SURVEILLANCE REPORT
(CODSR)

TECHNICAL SPECIFICATION, TECHNICAL REQUIREMENTS MANUAL,
AND ODCM ITEMS

NOTIFY UNIT SCO IMMEDIATELY OF
EXCEEDED LIMITS OF TECHNICAL SPECIFICATION, TECHNICAL
REQUIREMENTS MANUAL, OR ODCM ITEMS

WEEK BEGINNING________________

DOCUMENTATION AND REVIEW SHEET

UNIT 2 CODSR

Day	Shift	*Performed By (Initials): Duty Control Operator	*Performed By (Initials): Others	*Reviewed By (Initials): Unit SCO
	07-19			
SAT	19-07			
	07-19			
SUN	19-07			
	07-19			
MON	19-07			
	07-19			
TUES	19-07			
	07-19			
WED	19-07			
	07-19			
THURS	19-07			
	07-19			
FRI	19-07			

**"Initials" Reference List

Shift	Name (Print)	Initials

*Person performing or reviewing CODSR need only initial in appropriate column.
**To be completed by each person initialing the CODSR for this week (need only be completed once/week by each person).

WEEK BEGINNING ____________________

EXAMPLE OF HOW TO MAKE CODSR NOTES:

Front of CODSR:

ITEM NO.	SHIFT CHECK LIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMIT	SAT
3	Suppression pool level CAC-LI-4177 Technical Specification SR 3.5.2.1, 3.6.2.1.1, 3.5.2.2.a	C	6	b	07-13	-27" to -31"	-28"
					13-19		N-1

CODSR Note Page:

NOTE NO.	DATE	TIME	ITEM No.	PAGE No.	INITIALS	REMARKS	WR/WO
1	01-04-86	1500	3	25	(Initials)	CAC-LI-4177 failed downscale	123456

For subsequent references to the same item number, indicate by the proper note designation.

1. Entries on the Notes sheet shall contain the date, time, CODSR item and page number to which the remarks apply, initials, and necessary remarks. Indicate whether a Work Request is required. (Work Request or Work Order number, if available ["Y" if Work Request or Work Order number is not available], or "NR").

NOTES

A. Personnel should **NOT** transit between upper and lower levels of the refuel platform when irradiated components are latched.

B. Not used

C. **RECORD** numerical value.

D. Only required to be met during core alterations. One SRM may be used to satisfy more than one of the three requirements. Neutronic bridge must be maintained between SRM detectors.

E. **IF** inoperable, **THEN SAMPLE** reactor coolant for conductivity.

F. This surveillance can be satisfied by ensuring the RWM is operable with no associated alarms.

G. Transfer additional testing requirements from previous week's DSR in accordance with 0OI-01.08.

H. With spent fuel pool gates removed and SFP level greater than or equal to 37 feet 1 inch (21 feet 10 inches above RPV flange), only one RHR S/D cooling subsystem is required to be operable. **IF** SFP level is less than 37 feet 1 inch, **THEN** two RHR subsystems are required to be operable.

I. Use Daily Fuel Cell Status Sheet to confirm all control rod drives removed from the core are listed in Attachment 4 CODSR and to confirm all other control rods in core cells containing one or more fuel assemblies are fully inserted.

J. **RECORD** maximum differential reading.

K. **IF** inoperative, **THEN ESTIMATE AND RECORD** sample flow in accordance with appropriate section of 2OP-11.

L. **IF** inoperable, **THEN ESTIMATE AND RECORD** effluent flow in accordance with appropriate section of 0PEP-03.6.1. Notify E&RC that the flow integrator is **NOT** available for effluent calculations. **IF** estimated stack flow exceeds 86,000 cfm, **THEN REDUCE** the flow to less than or equal to 86,000 cfm.

M. **IF** hydrogen analyzers and recombiner outlet temperature indicators are found inoperative, **THEN RECORD** recombiner bed temperature as indicated on *2-OG-TR-4280* or *2-OG-TR-4320*, located on Panel XU-80.

N. **IF** readings are **NOT** indicative of current plant conditions, **THEN CONTACT** Nuclear Engineer for further evaluation.

O. **IF** recorder *CAC-TR-4426-1A(2A)* is inoperable, **THEN** readings may be obtained from computer point G050(G051). **OBTAIN** readings from TY-4426-1(2) digital display for greatest accuracy.

P. Average the bulk average output of *TY-4426-1* and *TY-4426-2* to obtain the drywell average air temperature for comparison to the Technical Specification limit. **IF** one or more SPTMS air RTDs fail in one division, **THEN** the other division temperature may be used to ensure compliance with the Technical Specification. **IF** one or more SPTMS air RTDs fail in both divisions, **THEN USE** 0PT-16.2 to calculate the average air temperature. Divisions were defined by EER 93-0578 and are delineated in the Technical Specification equipment list under Post Accident Monitoring Instrumentation Table 3.3.3.1-1.

Q. **IF** the instrument indication is below the specified limits, **THEN DECLARE** the instrument inoperable. **IF** the instrument indication is above the specified limits, **THEN CONTACT** the System Engineer.

R. **ENSURE** the background is greater than or equal to the minimum allowable background posted on the monitor drawer.

S. Points U2ED_E008 and E013 are to be used for checking Buses C & D. Point U2ED_C468 (combined points U2ED_E008, E013, and E037) is to be used for checking Buses C, D, & Common A/B. **IF** points are inoperable, **THEN USE** ammeter on XU-2 **OR** take local reading.

T. Loads should be confirmed to be less than the applicable amperage limit before/after evolutions that could add substantial load to any one of the buses (approximate current increases listed in table). **IF** the limit is exceeded **THEN DECLARE** both off site power sources inoperable. Ref. Calc BNP-E-7.002 R4C.

Load/Pump	Heater Drain	Condensate	Cond booster	Circ Water	T B Chiller	D Air Comp
Approx Amps	127	130	157	346	206	37
Load/Pump	RHR	RHR SW	Core Spray	CRD	NSW / CSW	Fire pump
Approx Amps	129	102	160	33	41	33

V. **PERFORM** 2PT-01.11:

a. Once/24 hours when operating ≥ 23% rated thermal power.

b. Within 12 hours after thermal power is ≥ 23% of rated thermal power.

W. **PERFORM** 0PT-13.1 **OR** 0PT-13.4:

a. Prior to exceeding 25% rated thermal power.

b. Once per 24 hours in Mode 1 with rated thermal power exceeding 25%.

c. Within 4 hrs after associated recirculation loop is in operation, if not performed within the previous 24 hours

Y. The following formulas may be used to determine the effluent flow rate (scfm). Additionally, the calculated flow rate may be compared with that of the associated flow recorder; this comparison is **NOT** required to demonstrate operability.

Main Stack *2-VA-FIQ-5902-2 or 5902-1 (2-VA-FR-3359)*

$$\text{Flow (scfm)} = \frac{\text{Counts}}{\text{Minute}} \times \frac{\text{1000 scf}}{\text{Count}}$$

Reactor Building *2-VA-FIQ-3356 (2-VA-FR-3356)*

$$\text{Flow (scfm)} = \frac{\text{Counts}}{\text{Minute}} \times \frac{\text{1000 scf}}{\text{Count}}$$

Turbine Building *2-VA-FIQ-3358 (2-VA-FR-3358)*

$$\text{Flow (scfm)} = \frac{\text{Counts}}{\text{Minute}} \times \frac{\text{100 scf}}{\text{Count}}$$

Z. **IF** a SPTMS Water Temperature RTD indicates greater than 10°F difference as compared to the Bulk Average Suppression Pool Water Temperature, **THEN CONTACT** Engineering and evaluate the operability limit of suppression chamber water temperature instrumentation in accordance with TRM 3.8.

AA. After initially inerting the drywell, following a period when the drywell has been purged for personnel access, continuously monitor oxygen content for a period of 7 days using *CAC-AT-4409* and *4410*. Following this initial observation period, the monitors and recorders should be placed and maintained in standby in accordance with 2OP-24 except when biweekly readings are required. Prior to obtaining the twice-a-week readings, the monitors and recorders should be operated in accordance with 2OP-24 for at least 15 minutes. **IF** one of the monitors is inoperable, **THEN** the other monitor may be used to obtain the bi-weekly readings. **IF** oxygen concentration is greater than 2.5%, **REDUCE** oxygen concentration in accordance with 2OP-24 or one monitor is to be left running continuously.

BB. The greater than or equal to 3 cps check, SR 3.3.1.2.4, is **NOT** required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant (reference Note QQ) **OR** during spiral offload. Two SRM channels are required operable in Modes 3, 4, and 5. Three channels are required operable in Mode 2.

CC. **ENTER** the LPRM out of operate using Z A(B,C,D) XX-YY notation. **ENTER** the date removed from service. Each shift check the listed LPRM is **NOT** in operate until returned to service by the Unit SCO or the Reactor Engineer. **ENTER** the date the LPRM is returned to service for operability and the name of the individual returning the LPRM to service.

DD. Only required if Core Spray System is required to be operable per TS and the Suppression Pool is inoperable. Only one Core Spray subsystem will be considered operable based on CST level ≥ 228,200 gallons during OPDRVs and only one Core Spray Subsystem is allowed to be aligned to the CST.

EE. **IF** SJAE off gas radiation monitor readings are greater than 1,000 mr/hr, 0OI-01.08, Section 5.8 should be referenced.

FF **WHEN** reactor cavity/vessel level is greater than 210" as determined by Shutdown Range level instruments, *B21-LTM-N017A-D1* and *B21-LTM-N031A-D1* should read upscale. This condition satisfies channel check criteria for *B21-LTM-N017A-D1* and *B21-LTM-N031A-D1*. On loss of power, these instruments will fail downscale.

GG. **NOT** required in Modes 2 and 3 with all turbine stop valves closed.

HH. **IF** there is an unexplained pressure drop (> 50 psig) over a one-day period, **THEN** **CONTACT** System Engineer.

JJ. Intake canal level and instrumentation requirements:

IF intake canal level reaches 4.0 feet, **THEN SECURE** chlorination of the Service Water System.

IF intake canal reaches -5 feet, **THEN REFER** to 2OP-29 precautions for required action associated with the Circulating Water System.

Intake canal level/SW pump suction bay meets the Tech Spec minimum level if:

SCW-LR-285/CW-LR-761 indicate ≥ -5.1 feet with **NO** valid SW screen annunciator (UA-01 1-6, 2-6, 3-6, or 4-6)

OR

Performance of local service water bay level measurement in accordance with 2OP-43 is greater than -6 feet.

IF intake canal level reaches ≥ 15 feet, reference TRM 3.20.

IF intake canal level instrumentation is inoperable reference TRM 3.10.

KK. **IF** in single recirculation loop operation, **THEN USE** 0GP-14, Extended Single Recirculation Loop Operation to satisfy the channel checks for these items.

LL. **WHEN** determining a factor of 3 increase from the stack noble gas monitor the determination is made from the indicated data as is. Do **NOT** attempt to separate the effect of dilution from other sources of stack effluent.

MM. **IF** FW temperature is more than 10°F below nominal and reactor power is greater than or equal to 30% RTP **THEN:**

Reactor Operation must be in accordance with the applicable FWTR Power to Flow Map **AND,**

IF Main Turbine Bypass System is inoperable **THEN ENSURE** the reactor engineer has established reduced MCPR limits as required by the COLR within 4 hours.

NN. Following an Outage the Date/time entered should be the Date/time the unit entered Operating Mode 2.

OO. **IF** RHR HX pressure is ≥ 200 psig, then vent the affected RHR loop in accordance with 2OP-17 **AND IF** RHR HX pressure is ≥ 220 psig, **THEN DECLARE** the affected RHR loop inoperable for Suppression Pool Cooling.

PP. Questions concerning instrument operability should be resolved using a source check compared to previous source check readings. In accordance with ODCM Appendix E, CAC-AQH-1264-3 is the required instrument, ensure the indicator is used for the source check.

QQ. A core quadrant is defined as one quarter of the core as divided along the North/ East/ South/ West axes, and centered on control rod 26-27.

OPER MODES		FREQ	
1.	Pwr. Operation	a.	Once/Shift
2.	Startup	b.	Twice/Shift
3.	Hot Shutdown	c.	Once/24 Hours
4.	Cold Shutdown	d.	Once/7 Days
5.	Refuel	e.	Twice/7 Days
6.	All Modes	f.	As required by plant conditions and/or technical specifications.
7.	When bridge is being used.		
		g.	Every 30 minutes
		h.	Three times/shift

ITEM NO.	SHIFT CHECKLIST	NOTES	OPER MODE	FREQ	TIME	TS/OPER LIMITS	SAT	SUN	MON	TUE	WED	THU	FRI
45	**CHECK** total amperes from Buses C,&D less than or equal to 3225 amps, **IF** operating within 200 amps of the limit, **THEN MAKE** an operator log entry containing the requirements of Note T.	S, T	Main Generator on line	a	07-19	≤3225 amps C-1800 D-1750 T=3550							
46	**CHECK** total amperes from Buses C,&D & common A/B (if fed from Unit 2) less than or equal to 3550 amps, **IF** operating within 200 amps of the limit **THEN MAKE** an operator log entry containing the requirements of Note T.	S, T	Main Generator on line	a	07-19	≤ 3550 amps Common B = 180 TOTAL = 3650							
47	**CHECK** total amperes from Buses C,&D less than or equal to 2370 amps, **IF** operating within 200 amps of the limit, **THEN MAKE** an operator log entry containing the requirements of Note T.	S, T	Main Gen. off line with **UAT backfeed** normal load shed	a	07-19	≤2370 amps							
48	**CHECK** total amperes from Buses C,&D & common A/B (if fed from Unit 2) less than or equal to 3370 amps, **IF** operating within 200 amps of the limit **THEN MAKE** an operator log entry containing the requirements of Note T.	S, T	Main Gen. off line, **SAT in service,** normal load shed	a	07-19	≤3370 amps							
49	**CHECK** total amperes from Buses C,&D less than or equal to 2050 amps, **IF** operating within 200 amps of the limit, **THEN MAKE** an operator log entry containing the requirements of Note T.	S, T	Main Gen off line with **UAT backfeed** part time load shed	a	07-19	≤2050 amps							
50	**CHECK** total amperes from Buses C,&D & common A/B (if fed from Unit 2) less than or equal to 3080 amps, **IF** operating within 200 amps of the limit **THEN MAKE** an operator log entry containing the requirements of Note T.	S, T	Main Gen. off line, **SAT in service,** part time load shed	a	07-19	≤3080 amps							

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources—Operating

LCO 3.8.1 The following AC electrical power sources shall be OPERABLE:

a. Two Unit 2 qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System;

b. Four diesel generators (DGs); and

c. Two Unit 1 qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----------------------------------NOTE-----------------------------------
LCO 3.0.4.b is not applicable to DGs.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ------------NOTE------------ Only applicable when Unit 1 is in MODE 4 or 5. ------------------------------ One Unit 1 offsite circuit inoperable.	A.1	Restore Unit 1 offsite circuit to OPERABLE status.	45 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ------------NOTES------------ 1. Only applicable when Unit 1 is in MODE 4 or 5. 2. Condition B shall not be entered in conjunction with Condition A. --------------------------------- Two Unit 1 offsite circuits inoperable due to one Unit 1 balance of plant circuit path to the downstream 4.16 kV emergency bus inoperable for planned maintenance. <u>AND</u> DG associated with the affected downstream 4.16 kV emergency bus inoperable for planned maintenance.	B.1	Declare required feature(s) with no power available inoperable when the redundant required feature(s) are inoperable.	Immediately from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	<u>AND</u> B.2	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	2 hours <u>AND</u> Once per 12 hours thereafter
	<u>AND</u> B.3	Restore both Unit 1 offsite circuits and DG to OPERABLE status.	7 days <u>AND</u> 10 days from discovery of failure to meet LCO 3.8.1.a or b

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One offsite circuit inoperable for reasons other than Condition A or B.	C.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	2 hours AND Once per 12 hours thereafter
	AND		
	C.2	Declare required feature(s) with no offsite power available inoperable when the redundant required feature(s) are inoperable.	24 hours from discovery of no offsite power to one 4.16 kV emergency bus concurrent with inoperability of redundant required feature(s)
	AND		
	C.3	Restore offsite circuit to OPERABLE status.	72 hours AND 10 days from discovery of failure to meet LCO 3.8.1.a or b

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One DG inoperable for reasons other than Condition B.	D.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	2 hours AND Once per 12 hours thereafter
	AND		
	D.2	Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable.	4 hours from discovery of Condition D concurrent with inoperability of redundant required feature(s)
	AND		
	D.3.1	Determine OPERABLE DG(s) are not inoperable due to common cause failure.	24 hours
	OR		
	D.3.2	Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours
	AND		
	D.4	Restore DG to OPERABLE status.	7 days AND 10 days from discovery of failure to meet LCO 3.8.1.a or b

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Two or more offsite circuits inoperable for reasons other than Condition B.	E.1	Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition E concurrent with inoperability of redundant required feature(s)
	AND		
	E.2	Restore all but one offsite circuit to OPERABLE status.	24 hours
F. One offsite circuit inoperable for reasons other than Condition B. AND One DG inoperable for reasons other than Condition B.	-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition F is entered with no AC power source to any 4.16 kV emergency bus. ----------		
	F.1	Restore offsite circuit to OPERABLE status.	12 hours
	OR		
	F.2	Restore DG to OPERABLE status.	12 hours
G. Two or more DGs inoperable.	G.1	Restore all but one DG to OPERABLE status.	2 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
H. Required Action and associated Completion Time of Condition A, B, C, D, E, F or G not met.	H.1	Be in MODE 3.	12 hours
	AND		
	H.2	Be in MODE 4.	36 hours
I. One or more offsite circuits and two or more DGs inoperable. OR Two or more offsite circuits and one DG inoperable for reasons other than Condition B.	I.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	7 days

(continued)

PROGRESS ENERGY - CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SIMULATOR

SRO
NRC ADMIN JPM A-3

TITLE: Determine Off-Site Release Per PEP-03.4.7 And Complete Notification Form.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL NOT** be provided to the trainee.
2. This JPM may be performed in any location with a computer loaded with the Rascal 3.0.4 program.
3. Transfer data from attachment 2 of this JPM handwritten onto an actual attachment from PEP-03.4.7. Prepare Notification Form per PEP-02.6.21 with lines 1-11, 14-15 complete.
4. The release at the site boundary should be approximately 1.14 E+02 mrem TEDE and 3.30 E+02 mrem CDE. Slight variances may be expected due to time data is entered in relation to Reactor shutdown. (Dose requires declaration of Site Area Emergency)

TASK CONDITIONS:

1. The site is in a General Emergency due to a failure of 3 out of 3 fission product barriers on Unit 2. Fuel failure exists with an unisolable steam line break in the Turbine Building.

2. The Unit 2 reactor was successfully scrammed at _______ (15 minutes ago, evaluator to provide the time based on real current time).

3. Attachment 5 of PEP-3.4.7 has been filled out for data entry. (Give examinee Attachment 5. Fill out current time and current date with time of shutdown as 15 minutes ago)

4. A follow-up Emergency Notification has been completed with the exception of lines 15 and 16 for the Shift Superintendent (SEC) approval.

INITIATING CUE:

You are directed by the Shift Superintendent (SEC) to perform an initial dose calculation per PEP 03.4.7, Automation of Off-site dose projection procedure.

You are to transfer the projected dose data to lines 15 and 16 of the attached follow-up notification form in accordance with PEP-02.6.21.

Once lines 15 & 16 are completed, you are to give the Emergency Notification form to the Shift Superintendent (SEC) for approval.

ATTACHMENT 5

Data Sheet for Dose Projection Inputs

CHARACTERISTIC	TIME			
Main Stack	Release Rate (μCi/cc)	4.2E5		
	Flow Rate (CFM)	42000		
Turbine Building	#1 Release Rate (μCi/cc)	2.2E6		
	#1 Flow Rate (CFM)	15000		
	#2 Release Rate (μCi/cc)	2.2E6		
	#2 Flow Rate (CFM)	15000		
Reactor Building	Release Rate (μCi/cc)	3.5E2		
	Flow Rate (CFM)	0		
Torus Vent	Release Rate (μCi/cc)	0		
Core Uncovered	Time (1) lost/ (2) Returned	10 Minutes		
Effective Filtration	Yes / No	Yes		
Release Height	Ground	Yes		
	Elevated	Yes		
Release Duration	Anticipated Length of Time	1 Hours		
Shutdown	Date			
	Time			
Met Data Wind Speed	Upper	15 MPH		
	Lower	13 MPH		
Met Data Direction	Upper	68 DEG		
	Lower	67 DEG		
Stability	Class	E		
Seabreeze	Yes / No	No		

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a current revision of PEP-03.4.7.
Current Revision ofPEP-03.4.7 obtained.

SAT/UNSAT*

Step 2 - Access Rascal 3.0.4 program.
Rascal Program accessed.

SAT/UNSAT*

Step 3 – Select Source Term to Dose Model (STD).
STD selected.

SAT/UNSAT*

Step 4 – Click on the Event Type button.
Event Type selected.

SAT/UNSAT*

Step 5 – Select Nuclear Power Plant and then OK.
NPP and OK selected.

SAT/UNSAT*

Step 6 – Select Event Location.
Event Location selected.

SAT/UNSAT*

Step 7 – Using the drop down box under sites select Brunswick Unit 2.
Brunswick Unit 2 selected.

SAT/UNSAT*

Step 8 – Click on the Source Term button.
Source Term selected.

SAT/UNSAT*

Step 9 – Select Monitored Releases – Mixtures and then select OK.
Monitored Releases - Mixtures selected.

SAT/UNSAT*

Step 10 – Select Reactor Shutdown YES and enter today as the date and 15 minutes ago as the time.
YES selected and date and time entered.

SAT/UNSAT*

Step 11 – Enters Sample ID as current date and time in the format of mmddyyhhmm.
Sample ID is entered.

SAT/UNSAT*

Step 12 – Enters Sample time as current date and the time the sample was taken.

Sample time is entered.

SAT/UNSAT*

NOTE:	Examine needs to make sure that the correct units are selected. May have to select something different than the default. Concentration is in µCi/cc which is the same as µCi/cm^3. Flow rate is in CFM which is ft^3/min.

Step 13 – Enters effluent gross concentration as 2.2E6 µCi/cc.
2.2E6 µCi/cm^3 entered.

SAT/UNSAT*

Step 14 – Enters effluent flow rate as 15000 cfm.
15000 ft^3/min entered.

SAT/UNSAT*

Step 15 – Selects Noble gases to 99% and Halogens to 1% and then clicks on OK.
Percentages are entered.

SAT/UNSAT*

Step 16 – Clicks on the release path button.
Release path panel pops up.

SAT/UNSAT*

Step 17 – Selects not an isolated path with a release height of 0 meters and considers building wake effects as YES.

Not an Isolated path selected, release height entered as 0, and YES selected for building wake effects.

SAT/UNSAT*

Step 18 – Enters the start of release as the sample time.

Enters the sample time as the start of the release.

SAT/UNSAT*

Step 19 – Selects release duration as 1 hour and then selects OK.

Selects release duration and enters 1 hour.

SAT/UNSAT*

Step 20 – Clicks on Meteorology button.

Meteorology screen pops up.

SAT/UNSAT*

Step 21 – From data set type, selects actual observations and forecasts and then enter new data.

Enter new data selected.

SAT/UNSAT*

Step 22 – Selects enter new data.

Enter new data selected.

SAT/UNSAT*

Step 23 – Enters the following data; type = obs, date = today, time = sample time, degrees of ground level, wind speed at ground level, stability class = E. After data is entered select OK.

Data entered and OK selected.

SAT/UNSAT*

Step 24 – Select Save and Process data button.

Save and Process data screen pops up.

SAT/UNSAT*

Step 25 – Enter new name as date and time (mmddyyhhmm), then click on OK.

Enters file name and selects OK.

SAT/UNSAT*

Step 26 – Close screens and select calculate doses.

Calculate doses selected.

SAT/UNSAT*

Step 27 – Select distance of calculation as close in, default value for end of calculations as 6 hours, and enter a case description of BNP and the hour (i.e. BNP1230). Then selects OK.

Close in selected, 6 hours selected, and BNPhhhh entered.

SAT/UNSAT*

NOTE:	Instructions for completion of Lines 15 & 16 of the Notification Form are contained in PEP-02.6.21, Attachment 2.

Step 28 – Complete line 15 of the Emergency Notification form.

Projection period is 6 hours.
Estimated release duration is 1 hour.
Enters time and date.

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

NOTE:	Values from the Rascal program are in Rem and the form requires mrem.
NOTE:	TEDE values are: Site Boundary (0.5 miles) is 6.2E7 mrem. 2 miles is 1.4E7 mrem. 5 miles is 4.4E6 10 miles is 1.4E6 Adult Thyroid CDE (mrem) values are: Site Boundary (0.5 miles) is 7.1E8 mrem. 2 miles is 1.2E8 mrem. 5 miles is 2.9E7 10 miles is 8.7E6

Step 29 – Complete line 16 of the Emergency Notification form.

TEDE and CDE data transferred from dose projection to Notification Form for Site Boundary, 2 Miles, 5 Miles and 10 Miles.

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

NOTE: Some variation is expected due to time of data entry based on shutdown time. Answers based on data entry of exactly 15 minutes shutdown.

Step 30 - Notifies Shift Superintendent of results.

Shift Superintendent notified of off-site dose projection results and given the Emergency Notification form for approval.

SAT/UNSAT*

TERMINATING CUE: When the offsite dose projection has been performed and lines 15 & 16 of the Emergency Notification form are filled in, this JPM is complete.

COMMENTS:

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.3.10 2.9/3.3
Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure

REFERENCES:

0PEP-03.4.7
0PEP-02.1

TOOLS AND EQUIPMENT:

Computer loaded with Rascal 3.0.4.

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

Administrative - Radiation Control

Time Required for Completion: 15 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate ___	Actual	X	Unit:	2
Setting:	Control Room ___	Simulator___	(Not applicable to In-Plant JPMs)		
Time Critical:	Yes ___	No	X	Time Limit	N/A
Alternate Path:	Yes ___	No	X✓		

JPM: Pass _____ Fail _____

TASK CONDITIONS:

1. The site is in a General Emergency due to a failure of 3 out of 3 fission product barriers on Unit 2. Fuel failure exists with an unisolable steam line break in the Turbine Building.

2. The Unit 2 reactor was successfully scrammed at _______ (15 minutes ago, evaluator to provide the time based on real current time).

3. Attachment 5 of PEP-3.4.7 has been filled out for data entry. (Give examinee Attachment 5. Fill out current time and current date with time of shutdown as 15 minutes ago)

4. A follow-up Emergency Notification has been completed with the exception of lines 15 and 16 for the Shift Superintendent (SEC) approval.

INITIATING CUE:

You are directed by the Shift Superintendent (SEC) to perform an initial dose calculation per PEP 03.4.7, Automation of Off-site dose projection procedure.

You are to transfer the projected dose data to lines 15 and 16 of the attached follow-up notification form in accordance with PEP-02.6.21.

Once lines 15 & 16 are completed, you are to give the Emergency Notification form to the Shift Superintendent (SEC) for approval.

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

1. ■ DRILL B ACTUAL EVENT MESSAGE # 1+

2. ■ INITIAL B FOLLOW-UP NOTIFICATION: TIME______ DATE __/__/__ AUTHENTICATION # ______

3. SITE: Brunswick Confirmation Phone # (___)________

4. **EMERGENCY CLASSIFICATION:** A UNUSUAL EVENT B ALERT C SITE AREA EMERGENCY ■ GENERAL EMERGENCY

BASED ON EAL # 12.04.01 EAL DESCRIPTION: Loss of any two-out-of-three fission product barriers with a potential loss of the third barrier

5. **PROTECTIVE ACTION RECOMMENDATIONS:** A NONE

■ EVACUATE A, B, C, D, E

■ SHELTER F, G, H, K

D CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.

E OTHER______

6. **EMERGENCY RELEASE:** A None ■ Is Occurring C Has Occurred

7. RELEASE SIGNIFICANCE: A Not applicable B Within normal operating limits ■ Above normal operating limits D Under evaluation

8. EVENT PROGNOSIS: A Improving ■ Stable C Degrading

9. METEOROLOGICAL DATA: Wind Direction* from 68 degrees Wind Speed* 15 mph

(*Not Required for Initial Notifications) Precipitation* None Stability Class* A B C D ■ F G

10. ■ DECLARATION B TERMINATION Time Today Date __/__/__

11. AFFECTED UNIT(S): 1 2

12. UNIT STATUS: (Unaffected Unit(s) Status Not Required for Initial Notifications)

A U1 ___% Power Shutdown at Time ______ Date __/__/__

■ U2 Ø % Power Shutdown at Time ______ Date __/__/__

13. REMARKS: On-site facilities are being activated. Off-Site logistics and technical support will be needed.

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6 A IS SELECTED.

14. RELEASE CHARACTERIZATION: TYPE: ■ Elevated C Ground UNITS: A Ci

MAGNITUDE: Noble Gases: N/A Iodines: N/A Particulates: N/A Other: ______

FORM: ■ Airborne Start Time Today Date __/__/__ Stop Time ______ Date __/__/__

B Liquid Start Time ______ Date __/__/__ Stop Time ______ Date __/__/__

15. PROJECTION PARAMETERS: Projection period: ____ Hours Estimated Release Duration ____ Hours

Projection performed: Time ______ Date __/__/__

16. PROJECTED DOSE:

DISTANCE	TEDE (mrem)	Adult Thyroid CDE (mrem)
Site boundary		
2 Miles		
5 Miles		
10 Miles		

APPROVED BY: ________ Title ________ Time ______ Date __/__/__

NOTIFIED BY: ________ RECEIVED BY: ________ Time ______ Date __/__/__

KEY

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

1. ■ DRILL B ACTUAL EVENT MESSAGE # 1+

2. ■ INITIAL B FOLLOW-UP NOTIFICATION: TIME ______ DATE ___/___/___ AUTHENTICATION # ______

3. SITE: Brunswick Confirmation Phone # (___) ______

4. **EMERGENCY CLASSIFICATION:** A UNUSUAL EVENT B ALERT C SITE AREA EMERGENCY ■ GENERAL EMERGENCY

BASED ON EAL # 12.04.01 EAL DESCRIPTION: Loss of any two-out-of-three fission product barriers with a potential loss of the third barrier.

5. **PROTECTIVE ACTION RECOMMENDATIONS:** A NONE

■ EVACUATE A, B, C, D, E

■ SHELTER F, G, H, K

D CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.

E OTHER ______

6. **EMERGENCY RELEASE:** A None ■ Is Occurring C Has Occurred

7. RELEASE SIGNIFICANCE: A Not applicable B Within normal operating limits ■ Above normal operating limits D Under evaluation

8. EVENT PROGNOSIS: A Improving ■ Stable C Degrading

9. METEOROLOGICAL DATA: Wind Direction* from 68 degrees Wind Speed* 15 mph

(*Not Required for Initial Notifications) Precipitation* None Stability Class* A B C D ■ F G

10. ■ DECLARATION B TERMINATION Time Today Date ___/___/✓

11. AFFECTED UNIT(S): 1 2

12. UNIT STATUS: (Unaffected Unit(s) Status Not Required for Initial Notifications)

A U1 ___% Power Shutdown at Time ______ Date ___/___/___

■ U2 ∅ % Power Shutdown at Time ______ Date ___/___/___

13. REMARKS: On site facilities are being activated. Off-site logistical and technical support will be needed.

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6 A IS SELECTED.

14. RELEASE CHARACTERIZATION: TYPE: ■ Elevated C Ground UNITS: A Ci

MAGNITUDE: Noble Gases: N/A Iodines: N/A Particulates: N/A Other: ______

FORM: ■ Airborne Start Time Today Date ___/___/___ Stop Time ______ Date ___/___/___

B Liquid Start Time ______ Date ___/___/___ Stop Time ______ Date ___/___/___

15. PROJECTION PARAMETERS: Projection period: 6 Hours Estimated Release Duration 1 Hours

Projection performed: Time Today Date ___/___/___

16. PROJECTED DOSE:

DISTANCE	TEDE (mrem)	Adult Thyroid CDE (mrem)
Site boundary	6.2 E+7	7.18 E+8
2 Miles	1.4 E+7	1.2 E+8
5 Miles	4.4 E+6	2.9 E+7
10 Miles	1.4 E+6	8.7 E+6

17. APPROVED BY: ______ Title ______ Time ______ Date ___/___/___

NOTIFIED BY: ______ RECEIVED BY: ______ Time ______ Date ___/___/___

5.0 PRECAUTIONS AND LIMITATIONS

5.1 For releases of radionuclides too small to be adequately evaluated using RASCAL, refer to E&RC procedures.

5.2 Sea Breeze affect is NOT a specific calculation option by RASCAL; however, the meteorological program will model sea breeze if additional meteorological weather stations are used. Failure to consider the effects of a sea breeze on plume projections could result in large errors in both the projected plume location and intensity.

5.3 If met data is not available, Delta T is the preferred method to determine meteorological stability class. IF Delta T data is not available, THEN use Sigma Theta to determine meteorological stability class.

5.4 Due to inherent uncertainties associated with generating dose projections using RASCAL, several different input models should be run when data permits. (e.g., when grab sample release data is available for a stack release, projections may be made using both a release rate model and release concentration model).

5.5 As new data becomes available for plant conditions (source terms), meteorological conditions, and event conditions, RASCAL dose projections should be updated accordingly. Meteorological conditions should be monitored approximately every 15 minutes for changes and RASCAL dose projections updated accordingly.

6.0 SPECIAL TOOLS AND EQUIPMENT

6.1 RASCAL is normally run from designated computers located in the TSC/EOF, Alt. EOF and Control Room. These designated computers are connected to reliable power sources and are provided with the necessary software to run RASCAL.

7.0 INSTRUCTIONS

7.1 Instructions for Control Room SRO

7.2 Start RASCAL Program by turning on the computer that is designated for performing RASCAL dose projections, if not already operating.

7.0 INSTRUCTIONS

7.3 To start the RASCAL software after boot-up and login to the Standard Desktop operating system:

7.3.1 Click on the RASCAL desktop icon OR

7.3.2 Start the RASCAL program from the desktop screen by selecting: Start>Programs>Emergency Preparedness >RASCAL>RASCAL 3.0.4 Shell.

7.4 **IF** computer difficulties are experienced when attempting to run RASCAL, **THEN** contact the NGG Information Technology (IT) HELP desk.

7.5 **WHEN** the RASCAL program starts and displays text showing the version, **THEN** select the "OK" button (lower right) on the screen to initiate projection process.

7.6 Select the model to be used (**STDose)**.

7.7 **Select EVENT** TYPE

7.7.1 Choose one of the four event types. Basis for selection is determined by the origin of the actual or potential release.

7.7.2 IF the actual or potential release is from a plant system, THEN choose NUCLEAR POWER PLANT.

7.7.3 IF the actual or potential release is from the Spent Fuel Pool, THEN choose SPENT FUEL.

7.7.4 FUEL CYCLE / UF6 / CRITICALITY - **NOT APPLICABLE AT BNP**.

7.7.5 OTHER RADIOACTIVE MATERIAL RELEASES. - **NOT APPLICABLE AT BNP**.

7.7.6 Proceed with the case development by selecting "OK" in the lower right corner of the Event Type Selection window. A ✓mark will appear in front of Event Type when this step is complete.

7.0 INSTRUCTIONS

7.8 Select EVENT LOCATION

7.8.1 Select LOAD EXISTING NUCLEAR POWER PLANT SITE from DATABASE.

7.8.2 In the SITE NAMES drop-down menu box, select Brunswick 1 or Brunswick 2 by clicking on the drop-down menu arrow, scrolling down to Brunswick 1 or Brunswick 2, and selecting the appropriate unit, and then clicking on "OK" button (lower right) on the screen.

7.8.3 The default plant parameters for Brunswick Plants are automatically loaded and displayed on the bottom of the screen and should not be altered unless otherwise authorized and directed by the RCM, TAD, SRO, or SEC. Plant default parameters are as follows:

Brunswick Unit 1

1	Average Reactor Power: MW(th)	2923
2	Number of Assemblies in Core	560
3	Coolant Volume	3.379E+04 gal
4	Containment Volume	1.641E+05 ft3
5	Avg. Fuel Burnup: MWD/MTU (in reactor)	32500
6	Avg. Fuel Burnup: MWD/MTU (in spent fuel pool)	15000

Brunswick Unit 2

1	Average Reactor Power: MW(th)	2923
2	Number of Assemblies in Core	560
3	Coolant Volume	3.218E+04 gal
4	Containment Volume	1.641E+05 ft3
5	Avg. Fuel Burnup: MWD/MTU (in reactor)	32500
6	Avg. Fuel Burnup: MWD/MTU (in spent fuel pool)	15000

7.8.4 Proceed with case development by selecting "OK" in the lower right corner of the screen.

7.8.5 A ✓ mark will appear in front of Event Location when this step is complete.

7.9 Select SOURCE TERM

7.9.1 The preferred basis for dose projection is known plant conditions and source term data from a monitored release. The selection process for operations is as follows: **IF** effluent rad monitors are in service at the release point, - **THEN** select Monitored Releases - Mixtures source term and proceed to step 7.9.3. **IF** effluent monitors are out of service, **THEN** select Containment Radiation Monitor source term and proceed to step 7.9.5. **IF** effluent rad monitors and containment rad monitors are out of service, **THEN** select Time Core Uncovered source term and proceed to step 7.9.6:

7.9.2 When gross concentration of release is known, (Effluent Radiation Monitors) but isotopic composition is not known, select **Monitored Releases – Mixtures**. Radioactive Gaseous release input parameter is located on ERFIS screen 795.

7.9.3 **MONITORED RELEASES - MIXTURES** (select and respond "OK")

1. Respond "YES" or "NO" to Reactor shutdown status and enter the date/time the Reactor Shutdown.
2. Input sample data as follows:
    - Sample ID – Enter the current date and time using the following format: - mmddyyhhmm
    - Date/Time of sample – Enter the current date and enter the time the effluent monitor reading was obtained.
3. If the release is through the main stack, obtain the Stack Monitor Reading and Flow from 1/2-D12-RR-4599 **(uCi/cc and Flow in cfm)** and enter into RASCAL. Radioactive Gaseous release input parameter is located on ERFIS screen 795.

7.0 INSTRUCTIONS

4. If the release is through Turbine #1 or Turbine# 2 vent monitors, obtain Turbine #1 or Turbine #2 Vent monitors 1/2 – D12-RR-4548 (***u*Ci/cc and Flow in cfm**) readings and enter into RASCAL. Radioactive Gaseous release input parameter is located on ERFIS screen 795.

5. If the release is through the Reactor #1 Vent Monitor 1 – CAC-AQH-1264-3 or Reactor #2 Vent Monitor 2- CAC-AQR-1264-3 (cpm and Flow in cfm), obtain readings and convert to ***u*Ci/cc** and enter into RASCAL. Radioactive Gaseous release input parameter is located on ERFIS screen 795.

6. If the hardened wetwell vent is initiated, the Operator should go to the releasing plant's panel XU-54 and obtain release radioactivity in ***u*Ci/cc** and enter the information into RASCAL. Obtain the release flow and enter the flow parameter into RASCAL.

7. Input percentage of isotopic mixture for:

   Noble Gases (Krypton /Xenon) – **99%**

   Halogens (Iodines) – **1%**

   All others are not normally included in mixture data input.

   Percentage indicated must equal 100%

7.9.4 Select the "OK" button on the screen to return to the primary screen for building a dose projection. Select Release Path and proceed to step 7.10

7.9.5 **CONTAINMENT RADIATION MONITOR** - (select and respond OK) When the event has provided primary containment monitoring readings outside the normal operating expectations and the effluent monitors are **NOT** in service, select **Containment Radiation Monitor** and proceed as follows:

1. Respond "YES" if the Reactor is shutdown and enter the date/time. If the Reactor is not shutdown, enter the date/time the radioactive release started.

2. Enter the Radiation monitor reading(s) in the table. Include date and time monitor reading was taken. Multiple readings and monitors can be used.

7.0 INSTRUCTIONS

3. Select the "OK" button on the screen to return to the primary screen for building a dose projection. Select Release Path and proceed to step 7.10

7.9.6 **TIME CORE UNCOVERED** (select and respond "OK") IF the effluent monitors and containment radiation monitors are not in service, select Time Core Uncovered. This source term calculation is based on the period of time the reactor core is uncovered. **Select Time Core Uncovered** as proceed as follows:

1. Enter the date/time the reactor was shutdown or the release date/time.

2. Respond "YES" or "NO to the following parameters and enter the date/time:

   - Core uncovered

   - Core recovered

3. Select the "OK" button on the screen to return to the primary screen for building a dose projection. Select Release Path and proceed to step 7.10

7.9.7 **Spent Fuel Source Term -** Spent fuel type events have distinct source term options and must be selected from the Event Type Screen, select the event location – Brunswick 1 or Brunswick 2. Once Spent Fuel Accident event type is selected, the source term will be defined using one of three methods

- Pool Storage - Uncovered Fuel (applicable if fuel exposed)

- Pool Storage - Damaged assembly underwater (applicable if fuel submerged)

- Dry Storage - Cask Release

- Select applicable source term and respond "OK"

7.0 INSTRUCTIONS

7.9.8 **Pool Storage- Uncovered Fuel**. This source term option is distinguished by the amount of spent fuel present in the fuel pool and is applicable if fuel is exposed above the water. The number of fuel assemblies in the pool can be defined in terms of batches. 1 batch is equivalent to 187 fuel assemblies and the maximum number of batches stored in the pool for dose projection purposes is 10.6 or 1983 assemblies. Enter the following Amount of Fuel in the pool irradiated within: 180 days, 180+ days, Not Used:

- If a refueling outage occurred less than 180 days ago **enter 1** under the 180 day selection, **enter 9.6** under 180+ days.
- If a refueling outage occurred greater than 180 days ago, **enter 0** under the 180 day selection; **enter 10.6** under the 180+ days selection.
- Enter the date and time fuel is uncovered
- Respond "YES" or "NO" to Pool Totally Drained and provide the date/time.
- Respond "YES" or "NO" to Fuel Recovered and provide the date/time
- Select the "OK" button on the screen to return to the primary screen for building a dose projection. Select Release Path and proceed to step 7.10

7.9.9 **Pool Storage – Damaged Assembly Underwater**. This source term option is distinguished by the number of damaged fuel assemblies underwater and the last date if irradiation:

- Enter the estimated number of fuel assemblies damaged.
- Enter the estimated Age of damaged fuel assemblies - based on last date of irradiation

OR

- Estimate how long the damaged fuel assemblies have been in storage.
- Provide date and time when damage to fuel occurred

7.0 INSTRUCTIONS

1 Select the "OK" button on the screen to return to the primary screen for building a dose projection. Select Release Path and proceed to step 7.10

7.9.10 **Dry Storage – Cask Release** – This source term is distinguished by the type of cask or number of spent fuel assemblies' damaged:

- For Type of Cask – Enter **Unknown**
- Number of Assemblies – Enter the number of assemblies in the cask – default at BNP is 18 per cask
- How long in Storage – Enter a default value of **5 years** unless the actual age is known.
- Type of Event – Enter Major Damage and estimate the percent of damage to the cask, or Enter Loss of Cooling > 24 hours (thermal limit). All other selections will result in a popup screen indicating no release is projected.
- Select the "OK" button on the screen to return to the primary screen for building a dose projection. Select Release Path and proceed to step 7.10

7.10 RASCAL Release Path Options.

7.10.1 **Select Release Path Options:**

- **Monitored Releases – Mixtures release**: No selection is required for this option. When using Monitored Releases – Mixtures, the software will define the release path screen.
- **Through the wet well**: This option assumes that the release passes by a wet pathway through the suppression pool into the containment wet-well atmosphere. Particulates and aerosols airborne in the containment wet well are reduced by factors to account for their interactions with the suppression pool under subcooled or saturated conditions.
- **Through the dry well**: This option assumes that the release passes by a dry pathway through the primary system into the containment dry-well atmosphere without passing through the suppression pool. Particulates and aerosols airborne in the containment dry well are reduced by factors to account for the actions of sprays or natural processes.

- **Containment Bypass**: This pathway is used if there has been an inter-system or interfacing LOCA allowing a release from the RCS to a point outside the containment. This would be indicated by loss of coolant or rapid decrease in reactor cooling system pressure without any increase in pressure, temperatures or radiation levels in the containment. If the core is uncovered the release rate from the reactor cooling system will be assumed to be the release rate from the fuel. For this dry pathway case, the non-noble gases are reduced by a factor of 5 to account for plate-out on the piping. If the core is covered, the release rate will be the injection rate and no reduction will be assumed for the release pathway from the core to the break. The break may be inside another building. In this case the building may have sprays or filters. Therefore, the user needs to specify the building conditions and release rate

7.10.2 **Monitored Releases – Mixtures Release Option**

1. Release point characterization - Select "Isolated Stack" when the release is through the Main stack. **Isolated stack height is 100 meters. This is an elevated release.**

2. Plume Rise: Enter **NO** if ambient air temperatures are not known. Enter **YES** if the ambient temperatures are known and will be used in the metrological data set.

3. Select **not an isolated** stack when the release is point is through the reactor building, turbine building, or radwaste building. Effective height is entered as 0 meters.

    - Enter **0 meters** for not an isolated stack (ground) release.

    - Building Wake? (Select **"Yes"**)

4. Start of Release to Atmosphere – enter date and time

7.0 INSTRUCTIONS

5. End of release to atmosphere –

   - If the release has ended – select End time and enter the date and time the release ended.

   - If the release is on-going or anticipated – enter the estimated duration

6. Select OK and go to step 7.11.

7.10.3 **Through the Wet Well** on screen input: (Time Core is Uncovered and Containment Rad Monitor source terms only)

1. Pathway description –Select "Through the wet well".

2. Release point characterization - Select "Isolated Stack" when the release is through the Main stack. **Isolated stack height is 100 meters. This is an elevated release.**

3. Plume Rise: Enter **NO** if ambient air temperatures are not known. Enter **YES** if the ambient temperatures are known and will be used in the metrological data set.

4. Select **not an isolated** stack when the release is point is through the reactor building, turbine building, or radwaste building. Effective height is entered as 0 meters.

   - Enter **0 meters** for all not an isolated (ground) release.

   - Building Wake? (Select **"Yes"**)

5. Enter the Date and time for the start of the release to the wet well.

6. Select percent volume and enter the following:

   - enter current date
   - enter time release started
   - event - select wet well
   - even setting – select subcooled or saturated
   - next row – enter current date
   - enter time release started
   - event – select filters
   - event setting – select ON or OFF
   - next row – enter current date
   - enter time release started
   - event – select leak rate
   - event setting – select design, or 100% failure, or define the leak rate and time period.

7. Select OK and go to step 7.11

7.10.4 **Containment Bypass** on screen input:

1. Pathway description – Select “Containment Bypass”.
2. Select **not an isolated** stack when the release is point is through the reactor building, turbine building, or radwaste building. Effective height is entered as 0 meters.
   - Enter **0 meters** for all not an isolated (ground) release
3. Building Wake? (Select **“Yes**”)
4. Select Direct to atmosphere or building failure

5. Enter the current date in the grid box

   - Enter the time the core was uncovered into the grid box
   - Under Event Select RELEASE
   - Under Event Setting select ON

6. Select OK and go to step 7.11

7.10.5 Through the dry well on screen input: (Time Core is Uncovered and Containment Rad Monitor source terms only)

1. Pathway description –Select "Through the dry well".
2. Release point characterization - Select "Isolated Stack" when the release is through the Main stack. **Isolated stack height is 100 meters. This is an elevated release.**
3. Plume Rise: Enter **NO** if an ambient air temperature is not known. Enter **YES** if the ambient temperature is known and will be used in the metrological data set.
4. Select **not an isolated** stack when the release is point is through the reactor building, turbine building, or radwaste building. Effective height is entered as 0 meters.
   - Enter **0 meters** for all not an isolated (ground) release
   - Building Wake? (Select **"Yes"**)
5. Enter the Date and time for the start of the release to the dry well.

7.0 INSTRUCTIONS

6. Select percent volume and enter the following:

   - enter current date
   - enter time release started
   - event - select sprays
   - even setting – select **ON** or **OFF**
   - next row – enter current date
   - enter time release started
   - event – select filters
   - event setting – select **ON** or **OFF**
   - next row – enter current date
   - enter time release started
   - event – select leak rate
   - event setting – select design, or 100% failure, or define the leak rate and time period.

7. Select OK and proceed to step 7.11

7.11 METEOROLOGY

7.11.1 Brunswick Nuclear Power Plant (BNP) Meteorological Data can be obtained from ERFIS or the National Weather Service.

7.11.2 Wilmington National Weather Service data can be obtained by phone. (See EPL-001, Emergency Phone List, for the telephone number).

7.0 INSTRUCTIONS

7.11.3 Determination of Sea Breeze Potential (This task is normally completed once the TSC/EOF are activated.) IF all of the following conditions are present, **THEN** the potential for a Sea Breeze Effect exists:

1. BNP wind direction is between 16° and 269°, **AND**
2. BNP Stability class of A, B, or C
3. Meteorological Data Record time is between 0700 and 1900 hours, **AND**
4. Meteorological Data Record date and date of Sea Breeze onset time are the same.

7.11.4 **IF** a Sea Breeze is present, **THEN** RASCAL projections may underestimate the dose by a factor of 2.5, and the plume behavior may be erratic. Entering additional weather station data will improve the accuracy of modeling a sea breeze condition. This task is normally completed once the TSC/EOF are activated.

NOTE:	IF Sea Breeze conditions exist during the case calculations, conspicuously mark printed reports as such and point this out to the RCD, RCM, and other dose projection coordinators, when the reports are made available to them.

7.11.5 Obtain stability class from the Met. Tower.

7.11.6 If data for stability class determination cannot be obtained from the Met Tower, call the National Weather Service, or use the following guidance and Attachment 3.

1. **Delta T** - (Preferred method of determination) - Temperature difference between the 10m and 100m measuring points on the Met tower (normally a negative number, but could be positive if a temperature inversion exists).
2. **Sigma theta** - (Secondary method of determination) The standard deviation of horizontal wind direction fluctuation.

7.0 INSTRUCTIONS

7.12 Input meteorological data

7.12.1 **Select Metrology from STDose Model**

7.12.2 Obtain Met data from ERFIS as described in Attachment 4 or per Attachment 3, or the National Weather Service, and/or WSI. If a weather agency provides a written weather report, Attachment 2 provides information for weather report symbols. The Minimum Met data required for dose projection model is wind speed and direction.

7.12.3 Select "ACTUAL OBSERVATION AND FORECASTS" for Data Set Type.

7.12.4 Select "CREATE NEW" option.

7.12.5 When Meteorological Data Processor screen opens, select "ENTER DATA."

7.12.6 Select the applicable Met data source:

1. Multiple met data sets may be developed and saved as the case construction progresses.
2. Ensure that the appropriate data source is selected at the top of the window when entering each new set of data. More than one met data source may be loaded simultaneously to model more complex met calculations.

7.12.7 Enter the following meteorological data, as available:

1. Type - (Choose one)

   Select "OBS" for observed data or "FCST" for forecast data

2. Date/Time of met data
3. Direction "From" in degrees
4. Speed in mph
5. Stability class (Using dropdown listing, select determined classification)

7.0 INSTRUCTIONS

6. Precipitation (Using dropdown listing, select condition)

OPTIONAL:

7. Air Temperature in degrees Fahrenheit

8. Air Pressure (mb)

9. Dew Point in degrees Fahrenheit

7.12.8 Select the "SAVE AND PROCESS DATA" button on the screen.

7.12.9 Enter a name for the met data set just entered. Use the current date and time. (Example: 0505042155) This allows for repeated update of new met data saved under different names for future retrieval.

7.12.10 Optional Data Set Description may be added for detail or create automatic may be used.

7.12.11 Select "Return" when completed.

7.12.12 Endure the saved file is highlighted and select OK

7.12.13 OPTIONAL - To view wind graphics select "View Met Data" from the Meteorological Data Viewer screen and select the radius view wanted (10, 25 or 50 miles).

1. Optional "VIEW TOPOGRAPHY" feature in top center of screen provides shoreline imaging on display. Select this feature by clicking on the box

2. "RETURN" button backs out to the Meteorological Data Viewer screen.

3. "EXIT" button from the Meteorological Data Viewer screen returns view to the Meteorological Data Processor screen.

4. "EXPORT DATA SET" - allows for directing a saved file of the met data set just created.

5. Select "RETURN" to exit.

7.12.14 "CANCEL" or use the "X" windows exit feature to return to the primary screen for building a dose projection.

7.0 INSTRUCTIONS

7.13 CALCULATE DOSES

7.13.1 Select "Calculate Doses" and specify the options and descriptions for this set of calculations:

1. Distance for calculation – "Close in" is the preferred distance at the early stages of a release. "Close in" selection reduces the calculation time.

2. Define the number of hours from start of release; the default is 6 hours and is sufficient during the early phases on a release.

3. User specified time – Normally used in EOF/TSC as additional information becomes available.

4. **Case Description (Required)** for identification of variations of case input data. Normal description is BNP and the current time: Example BNP1800.

5. Select "OK" button to begin calculations.

7.13.2 Steps 7.13.3 through 7.13.7 are **optional steps** during the early phase of a release. These steps allow the user to review detailed graphics and individual dose components.

7.13.3 From the primary screen for building a dose projection, select "DETAILED RESULTS."

7.13.4 Select the desired options on Detailed Results of Dose Calculation screen.

7.13.5 Select "DISPLAY SELECTED RESULTS" button, and the graphic display of plume footprint of calculated case is presented on screen. Position cursor over cell to view specific bearing, distance, and dose.

7.13.6 Selecting "OK" allows you to back out of the Detailed Results of Dose Calculation screen.

7.13.7 Selecting "EXIT" from the Detailed Results of Dose Calculation screen allows you to back out to the primary screen for building a dose projection.

7.0 INSTRUCTIONS

7.14 Printable Reports for distribution as follows:

7.14.1 CASE SUMMARY report should be printed, and then obtain a peer check of the results

7.14.2 If the TSC/EOF is NOT activated, print the MAX DOSE VALUE summary report and SOURCE TERM summary report and distribute to the SEC.

7.14.3 If the TSC is activated, and the EOF is NOT activated, print the MAX.DOSE VALUE summary report and SOURCE TERM summary report and distribute to the RCD for review and approval.

7.14.4 If the TSC and EOF are activated, print and distribute the MAX.DOSE VALUE summary report and SOURC TERM summary report and distribute to the RCM for review and approval.

7.14.5 All summary and graphic displays may be printed individually by using the “Print” button on the associated screen.

7.14.6 To expedite identification for the Maximum Dose Value select the detailed results button. Under the Display Format – select the NUMERIC TABLE radar button. Under the RESULT TYPE area select TEDE radar button or CDE radar button. Selecting the TEDE radar button will display dose in TEDE. Selecting the CDE radar button will display dose in CDE (Thyroid). Select the Display Selected Results. The results will highlight a column, the highest dose will be located in this column, TEDE or CDE. Print and distribute plume footprint graphics display printout as requested.

7.15 Discontinue use of this procedure when the Plant Emergency has been terminated; or Recovery actions have begun, and the ERM or SEC has suspended the use of PEP’s.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

SRO

NRC ADMIN JPM A-4

TITLE: Event Classification/PAR

TASK CONDITIONS:

The following conditions exist in Unit 2 which had been operating at 100% power.

TIME 1200

A Tornado has hit the site causing a Station Blackout.

The Emergency Diesels tripped immediately after starting and can not be re-started.

A scram occurred and no control rods inserted.

Drywell Pressure is 1.1 psig and slowly rising.

Reactor Level is normal

INITIATING CUE:

Based on the above conditions, you are to determine the event classifications required. Complete paperwork associated per 0PEP-02.1, Initial Emergency Actions, if any PAR determination is required.

This is a time critical JPM.

Step 1 – Reviews the given conditions and determines that a Site Area Emergency declaration is required per 0PEP-02.1,

Within 15 minutes *Declares SAE per Att.1 step 05.03.01*

****CRITICAL TASK****

SAT/UNSAT

PROMPT: Once the initial declaration is determined, provide the applicant with the following information and have them re-evaluate the event:

The Time is 1225:

1. One Emergency Diesel Generator has been restored
2. Reactor Level is normal
3. Drywell Pressure is 1.1 psig and stable.
4. Two armed security guards have entered the control room and stated that they are taking control of the plant.

Step 1 – Reviews the given conditions and determines that a General Emergency declaration is required per 0PEP-02.1,

Within 15 minutes *Declares GE per Att.1 step 11.04.01*

****CRITICAL TASK****

SAT/UNSAT

NOTE: If the applicant refers to Att.4 of 0PEP-02.1 for Hostile events, state that another operator is addressing those actions.

Step 1 – Completes PAR within 15 minutes of GE declaration

Within 15 minutes *of GE declaration, completes PAR (Nuclear Power Plant Emergency Notification Form)*

****CRITICAL TASK****

SAT/UNSAT

PROMPT: If asked, provide Wind Speed of 6 MPH from 45 degrees. (for notification form)

NOTE: The Applicant should provide you the completed notification form within the specified time frame. (see sample provided)

Terminating CUE: The JPM is complete once the declarations are made and the *Nuclear Power Plant Emergency Notification Form* is provided.

COMMENTS:

K/A REFERENCE AND IMPORTANCE RATING:
GEN 2.4.29 2.6/4.0

REFERENCES:
0PEP-02.1, Rev 10

TOOLS AND EQUIPMENT:
None.

SAFETY FUNCTION (from NUREG 1123, Rev 2.):
A.4 - Emergency Procedures/Plan

APPLICABLE METHOD OF TESTING

Performance: Simulate **X** Actual Unit:

Setting: Control Room Simulator **X**

Time Critical: **Yes** No Time Limit 15 minutes for each declaration

Alternate Path: Yes **No**

TASK CONDITIONS:

The following conditions exist in Unit 2 which had been operating at 100% power.

TIME 1200

A Tornado has hit the site causing a Station Blackout.

The Emergency Diesels tripped immediately after starting and can not be re-started.

A scram occurred and no control rods inserted.

Drywell Pressure is 1.1 psig and slowly rising.

Reactor Level is normal

INITIATING CUE:

Based on the above conditions, you are to determine the event classifications required. Complete paperwork associated per 0PEP-02.1, Initial Emergency Actions, if any PAR determination is required.

This is a time critical JPM.

KEY

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

1. [A] DRILL [B] ACTUAL EVENT   MESSAGE # ______

2. [A] INITIAL [B] FOLLOW-UP   NOTIFICATION: TIME ______ DATE ___/___/___   AUTHENTICATION # ______

3. SITE: Brunswick   Confirmation Phone # (____)________

4. **EMERGENCY CLASSIFICATION:** [A] UNUSUAL EVENT [B] ALERT [C] SITE AREA EMERGENCY [D] GENERAL EMERGENCY

BASED ON EAL # 11.04.01   EAL DESCRIPTION: A HOSTILE FORCE HAS TAKEN CONTROL OF PLANT EQUIPMENT SUCH THAT PLANT PERSONNEL ARE UNABLE TO OPERATE EQUIPMENT REQUIRED TO MAINTAIN SAFETY FUNCTIONS

5. **PROTECTIVE ACTION RECOMMENDATIONS:** [A] NONE

[B] EVACUATE A, B, C, D

[C] SHELTER E, F, H, G, K

[D] CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.

[E] OTHER ______

6. **EMERGENCY RELEASE:** [A] None [B] Is Occurring [C] Has Occurred

7. RELEASE SIGNIFICANCE: [A] Not applicable [B] Within normal operating limits [C] Above normal operating limits [D] Under evaluation

8. EVENT PROGNOSIS: [A] Improving [B] Stable [C] Degrading

9. METEOROLOGICAL DATA: Wind Direction* from 45 degrees   Wind Speed* 6 mph

(*Not Required for Initial Notifications) Precipitation* ______   Stability Class* [A] [B] [C] [D] [E] [F] [G]

10. [A] DECLARATION [B] TERMINATION   Time ______ Date ___/___/___

11. AFFECTED UNIT(S): [1] [2]

12. UNIT STATUS: (Unaffected Unit(s) Status Not Required for Initial Notifications)

[A] U1 0 % Power Shutdown at Time 1200 Date ___/___/___

[B] U2 0 % Power Shutdown at Time 1200 Date ___/___/___

13. REMARKS: ACTIVATING EMERGENCY FACILITIES (EOF/TSC) AND EMERGENCY OPERATING PROCEDURES

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6 A IS SELECTED.

14. RELEASE CHARACTERIZATION: TYPE: [A] Elevated [C] Ground   UNITS: [A] Ci

MAGNITUDE: Noble Gases: N/A Iodines: N/A Particulates: N/A Other: ______

FORM: [A] Airborne Start Time ______ Date ___/___/___ Stop Time ______ Date ___/___/___

[B] Liquid Start Time ______ Date ___/___/___ Stop Time ______ Date ___/___/___

15. PROJECTION PARAMETERS: Projection period: ______ Hours   Estimated Release Duration ______ Hours

Projection performed: Time ______ Date ___/___/___

16. PROJECTED DOSE:

DISTANCE	TEDE (mrem)	Adult Thyroid CDE (mrem)
Site boundary		
2 Miles		
5 Miles		
10 Miles		

APPROVED BY: X ______ Title ______ Time ______ Date ___/___/___

NOTIFIED BY: ______ RECEIVED BY: ______ Time ______ Date ___/___/___

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC PLANT JPM P-1

TITLE: **Station Blackout: Crosstie of 4KV E-Buses (E2 - E4)**

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. For the applicable procedure section **WILL** be provided to the trainee.

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 1, 3 and 4 cannot be started.
3. Diesel Generator 2 is running, tied to Bus E2, and has been locally verified to be operating properly.
4. The Electric Fire pump is under clearance and the Diesel Fire pump is running.
5. Fire Pmp Mot Fdr Bkr on E2 and E4 are tagged out.
6. All RBCCW pump control switches on Unit 2 are OFF.

INITIATING CUE:

You are directed by the Control Operator to perform the Auxiliary Operator actions associated with cross-tying 4.16 KV Emergency Switchgear E2 to E4 in accordance with AOP-36.2, Section 3.2.12. You are to inform the Control Room when the crosstie breakers between E2 and E4 are closed.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain current revision of 0AOP-36.2 Section 3.2.12 and verify copy if applicable.
Current revision of 0AOP-36.2 Section 3.2.12 obtained and verified if applicable.

NA / SAT / UNSAT

NOTE: The examinee must state the location of the ASSD equipment bag which is located outside of the U2 cable spread room across from the elevator in the ASSD cabinet.

Step 2 - Obtain ASSD Switchgear Operator bag.
ASSD Switchgear Operators' bag obtained.

SAT/UNSAT*

PROMPT: If requested, indicate to examinee that the overcurrent relays on the E4 slave breaker are reset and the DG lockout relays (86DP & 86DB) are reset. (Recommend inform examinee devices as currently seen)

Step 3 – Verify Lockout Relay 86DP is reset on Bus E4 Compt AK2, Row D1 for indication of fault.
Lockout Relay 86DP is reset at E4, Compt AK2, Row D1.

SAT/UNSAT*

Step 4 – Verify Lockout Relay 86DB is reset on Bus E4 Compt AK1, Row C1 for indication of fault.
Lockout Relay 86DB is reset at E4, Compt AK1, Row C1.

SAT/UNSAT*

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

5. **TRIP** the following breakers:

___ a. Bus E2, Compt AH7, *FIRE PMP MOT FDR BKR* (Row-N1)

___ b. Bus E4, Compt AL3, *FIRE PMP ALT FDR BKR* (Row-O1)

R33 ___ 6. **ENSURE** all RBCCW pump control switches on the Blacked Out unit are in *OFF*.

7. **IF** Unit 1 is Blacked Out, **AND** Bus E2 is to be reenergized, **THEN ENSURE** that the following breakers are open**, AND REMOVE** their control power fuses:

NOTE:	Components marked with an "*" have normal and alternate control power fuses. Both fuses are required to be pulled.

a. On Bus E2:

___ - Compt AG8, *RHR SERV WTR PMP 2D* (Row-E1)

___ - *Compt AG9, *RHR PUMP 2D* (Row-F1)

___ - Compt AH0, *CORE SPRAY PMP 1B* (Row-G1)

___ - *Compt AH2, *CONV SERV WTR PMP 1C* (Row-I1)

___ - Compt AH3, *CRD PUMP 1B* (Row-J1)

___ - Compt AH4, *RHR SERV WTR PMP 1D* (Row-K1)

___ - *Compt AH5, *RHR PUMP 1D* (Row-L1)

___ - *Compt AH6, *NUC SERV WTR PMP 1B* (Row-M1)

___ - Compt AH7, *FIRE PMP MOT FDR BKR* (Row-N1)

b. On Bus E4:

___ - Compt AK5, *CORE SPRAY PMP 2B* (Row-G1)

___ - Compt AK6, *CONV SERV WTR PMP 1A* (Row-H1)

___ - *Compt AL0, *RHR PUMP 1B* (Row-L1)

Step 5 – Verify Timed Overcurrent Relays 51A, 51B, and 51C on incoming line from SWGR 2C are reset on Bus E4 Compt AJ9, Row A1 for indication of fault.

Timed Overcurrent Relays are reset at E4, Compt AJ9, Row A1.

SAT/UNSAT*

PROMPT: If requested, as each breaker is opened, indicate breaker is open as indicated by green mechanical open indicator.

Step 6 – At E4 verify open breaker and remove control power fuses for the following breakers:

Row	Compt	Component	Bkr Open	Norm C/P Fuses	Alt C/P Fuses
E1	AK3	RHR PUMP 2B			
F1	AK4	RHR SERV WTR PMP 2B			
G1	AK5	CORE SPRAY PMP 2B			
H1	AK6	CONV SERV WTR PMP 1A			
J1	AK8	CRD PUMP 2B			
K1	AK9	RHR SERV WTR PMP 1B			
L1	AL0	RHR PUMP 1B			
M1	AL1	NUC SERV WTR PMP 2B			
N1	AL2	CONV SERV WTR PMP 2B			

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

PROMPT: Inform examinee that FIRE PMP ALT FDR BKR. (Compt AL3, Row O1) is under clearance, i.e. breaker is racked out and fuses are on the shelf.

Step 7 – At E4 verify open breaker and remove control power fuses for FIRE PMP ALT FDR BKR. (Compt AL3, Row O1)

Breaker is racked out and fuses are tagged out on the shelf.

SAT/UNSAT*

Step 8 – At E2 verify open breaker and remove control power fuses for the following breakers:

Row	Compt	Component	Bkr Open	Norm C/P Fuses	Alt C/P Fuses
F1	AG9	RHR PUMP 2D			
G1	AH0	CORE SPRAY PUMP 1B			

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

> **NOTE:** TEM30 keys from the ASSD equipment bag will be used for the SS-B switches. The keys cannot be removed while the switch is in SBO.

Step 9 –At E2 place Control Selector Switch SS-B in the SBO position for the Tie Breaker to Emerg Swgr E4 (Compt AH9, Row P1).

Selector switch SS-B in SBO position.

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

Step 10 – At E4 place Control Selector Switch SS-B in the SBO position for the Tie Breaker to Emerg Swgr E2 (Compt AL5, Row Q1).

Selector switch SS-B in SBO position.

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

> **NOTE:** The breaker at E2 must be closed first or the breaker at E4 will trip on undervoltage.

Step 11 – At E2 close Tie Breaker to Emerg Swgr E4 (Compt AH9, Row P1) by placing Local Breaker Control Switch, CS-1, in the CLOSE position.

Cross-tie breaker AH9 is closed.

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

Step 12 – At E4 close Tie Breaker to Emerg Swgr E2 (Compt AL5, Row Q1) by placing Local Breaker Control Switch, CS-1, in the CLOSE position.
Cross-tie breaker AL5 is closed.

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

Step 13 – Inform Control Room that E2-E4 crosstie breakers are closed.
Control Room informed.

SAT/UNSAT*

PROMPT:	If requested, indicate that cross-tie breakers AL5 and AH9 are closed as indicated by red light lit at respective compartments, and E4 voltage is approximately 4160 V as indicated by voltmeter at PT compartment.

TERMINATING CUE:	When breakers AH9 and AL5 have been closed to energize Bus E4, this JPM is complete.

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

LIST OF REFERENCES

RELATED TASKS:

200055B504
Perform the actions associated with a Loss of Off-Site Power and On-Site Power (Station Blackout) per AOP-36.2.

K/A REFERENCE AND IMPORTANCE RATING:

262001 A4.04 3.6/3.7

REFERENCES:

0AOP-36.2, Section 3.2.12, Rev. 31

TOOLS AND EQUIPMENT:

1. Plant page (or)
2. Radio
3. Racking tool and PPE for 480V Breakers

SAFETY FUNCTION (from NUREG 1123, Rev 2):

N/A (Emergency and Abnormal Plant Evolutions Section)

Station Blackout: Crosstie of 4KV E-Buses (E2 - E4)

Time Required for Completion: 20 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? 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 1, 3 and 4 cannot be started.
3. Diesel Generator 2 is running, tied to Bus E2, and has been locally verified to be operating properly.
4. The Electric Fire pump is under clearance and the Diesel Fire pump is running.
5. Fire Pmp Mot Fdr Bkr on E2 and E4 are tagged out.
6. All RBCCW pump control switches on Unit 2 are OFF.
7. You are expected to state the location of the ASSD equipment bag.

INITIATING CUE:

You are directed by the Control Operator to perform the Auxiliary Operator actions associated with cross-tying 4.16 KV Emergency Switchgear E2 to E4 in accordance with AOP-36.2, Section 3.2.12. You are to inform the Control Room when the crosstie breakers between E2 and E4 are closed.

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

NOTE:	The operator dispatched to stop the electric fire pump should **NOT** be the same operator dispatched for cross-tie operations. This is to allow cross-tie operations to be started immediately to ensure the one hour requirement for starting the battery chargers is met.

___ 1. **STOP** the Electric Fire Pump **AND ENSURE** that the Diesel Fire Pump automatically starts.

NOTE:	The Station Blackout Coping Analysis Report requires that the battery chargers be operating within 1 hour of the start of the Station Blackout.

___ 2. **ENSURE** normal operation of the diesel generator to be cross-tied at the local control panel.

___ 3. **CHECK** the deenergized E Bus for indication of a lockout or phase overcurrent trip as follows:

a. **IF** Bus E2 is deenergized, **THEN CHECK** the following:

___ - Lockout Relay 86DP on Compt AG7, *EMERG DIESEL GEN 2 BKR* (Row D1)

___ - Lockout Relay 86DB on Compt AG6, *SWGR E2 AUX COMPT* (Row C1)

___ - Time Overcurrent Relays 51A, 51B, and 51C on Compt AG4, *INCM LINE FROM SWGR 1C* (Row A1)

b. **IF** Bus E4 is deenergized, **THEN CHECK** the following:

___ - Lockout Relay 86DP on Compt AK2, *DIESEL GEN 4 BKR* (Row D1)

___ - Lockout Relay 86DB on Compt AK1, *SWGR E4 AUX COMPT* (Row C1)

___ - Time Overcurrent Relays 51A, 51B, and 51C on Compt AJ9, *INCM LINE FROM SWGR 2C* (Row A1)

___ 4. **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.

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

8. **IF** Unit 2 is Blacked Out **AND** Bus E4 is to be reenergized, **THEN** **ENSURE** the following breakers are open, **AND REMOVE** their control power fuses:

NOTE:	Components marked with an "*" have normal and alternate control power fuses. Both fuses are required to be pulled.

a. On Bus E4:

___ - *Compt AK3, *RHR PUMP 2B* (Row-E1)

___ - Compt AK4, *RHR SERV WTR PMP 2B* (Row-F1)

___ - Compt AK5, *CORE SPRAY PMP 2B* (Row-G1)

___ - Compt AK6, *CONV SERV WTR PMP 1A* (Row-H1)

___ - Compt AK8, *CRD PUMP 2B* (Row-J1)

___ - Compt AK9, *RHR SERV WTR PMP 1B* (Row-K1)

___ - *Compt AL0, *RHR PUMP 1B* (Row-L1)

___ - *Compt AL1, *NUC SERV WTR PMP 2B* (Row-M1)

___ - Compt AL2, *CONV SERV WTR PMP 2B* (Row-N1)

___ - Compt AL3, *FIRE PMP ALT FDR BKR* (Row-O1)

b. On Bus E2:

___ - *Compt AG9, *RHR PUMP 2D* (Row-F1)

___ - Compt AH0, *CORE SPRAY PMP 1B* (Row-G1)

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.

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

___ a. Bus E2, Compt AH9, *TIE BREAKER TO EMERG SWGR E4* (Row-P1)

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

___ b. Bus E4, Compt AL5, *TIE BREAKER TO EMERG SWGR E2* (Row-Q1)

NOTE:	A LOCA signal will **NOT** trip E Bus cross-tie breakers when the cross-tie breaker Control Selector Switch, *SS-B*, is in *SBO*.
NOTE:	The E Bus cross-tie breakers must be closed in order from the energized E Bus toward the de-energized E Bus due to the bus undervoltage circuit configuration.
NOTE:	The appropriate annunciator *BUS E4 UNDERVOLTAGE* (UA-18 2-1) or *BUS E2 UNDERVOLTAGE* (UA-16 2-1) should clear upon restoration of power to Bus E4(E2).

10. **IF** Bus E2 is energized, **THEN CROSS-TIE** Bus E2 to Bus E4 as follows:

___ a. On Bus E2, **CLOSE** Compt AH9, *TIE BREAKER TO EMERG SWGR E4* (Row-P1), by placing the Local Breaker Control Switch, *CS-1*, in *CLOSE*.

___ b. On Bus E4, **CLOSE** Compt AL5, *TIE BREAKER TO EMERG SWGR E2* (Row-Q1), by placing the Local Breaker Control Switch, *CS-1*, in *CLOSE*.

11. **IF** Bus E4 is energized, **THEN CROSS-TIE** Bus E4 to Bus E2 as follows:

___ a. On Bus E4, **CLOSE** Compt AL5, *TIE BREAKER TO EMERG SWGR E2* (Row-Q1), by placing the Local Breaker Control Switch, *CS-1*, in *CLOSE*.

___ b. On Bus E2, **CLOSE** Compt AH9, *TIE BREAKER TO EMERG SWGR E4* (Row-P1), by placing the Local Breaker Control Switch, *CS-1*, in *CLOSE*.

___ 12. **IF** the deenergized E 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.

13. **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:

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

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

___ 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.

___ 14. **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.

15. **IF** Bus E1 is deenergized **AND** no diesel generators are available to reenergize it, **THEN CROSS-TIE** Sub E5 to E6 as follows:

___ a. **REMOVE** the normal and alternate control power fuses from Bus E1, Compt AF9, *NUC SERV WTR PMP 1A* (Row-N1).

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

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

___ - Compt AU6, *FEEDER TO MCC DGA* (Row-A2)

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

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

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

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

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

___ - Compt AU2, *MCC 1XE* (Row-C3)

___ - Compt AU3, *MCC 1PA* (Row-C4)

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

c. **IF** DG 2 is **NOT** available, **THEN TRIP** the following additional breaker at Sub E5:

___ - Compt AU5, *MCC 1XL* (Row-D2)

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

___ - 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 AW0, *FEEDER TO MCC 1XB* (Row-D1)

___ - Compt AW1, *MCC 2XK* (Row-D2)

___ - Compt AW4, *MCC 2OG* (Row-E1)

___ - Compt AW6, *MCC 1XD* (Row-F2)

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

e. **IF** DG 2 is **NOT** available, **THEN TRIP** the following additional breakers at Sub E6:

___ - Compt AV9, *MCC DGB* (Row-C4)

___ - Compt AW2, *MCC 1XF* (Row-D3)

___ - Compt AW3, *MCC 1PB* (Row-D4)

___ - Compt AW5, *MCC 1XM* (Row-E2)

___ f. **RACK IN** Sub E5, Compt AT4, *TIE BREAKER TO E6* (Row-A1) in accordance with Steps 3.2.12.15.g through 3.2.12.15.k, **AND THEN CONTINUE** at Step 3.2.12.15.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 breaker stops in *CONNECT*.

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

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 3.2.12.15.g through 3.2.12.15.k to rack in Sub E6, Compt AX1, *TIE BREAKER TO E5* (Row-F1), **AND CONTINUE** at Step 3.2.12.15.m.

m. **PLACE** Unit 1(2) RTGB control switch for the following Sub E5 feeder breakers to *TRIP* **AND CONFIRM** the breakers open:

___ - *SUB E5 480V MAIN BREAKER*, *BREAKER AU9*

___ - *BUS E1 TO SUB E5*, *BREAKER AF8*

R6

n. **IF** *SUB E5 480V MAIN BREAKER, BREAKER AU9* fails to open from RTGB, **THEN PERFORM** the following locally at Sub E5:

___ - **DEPRESS** *TRIP* pushbutton on *SUB E5 480V MAIN BREAKER, COMPT. AU9* to manually trip breaker.

___ - **CONFIRM** open *SUB E5 480V MAIN BREAKER, COMPT. AU9*.

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

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 Sub E5 or E6.

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

R6 p. **IF** *BUS E5 TIE TO BUS E6, BREAKER AT4* (MSTR) fails to close from RTGB, **THEN PERFORM** the following locally at Sub E5:

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

___ - **CONFIRM** closed *TIE BREAKER TO E6, AT4.*

R6 q. **IF** *BUS E6 TIE TO BUS E5, BREAKER AX1* (SLAVE) fails to close from RTGB, **THEN PERFORM** the following locally at Sub E6:

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

___ - **CONFIRM** closed *TIE BREAKER TO E5, AX1.*

NOTE:	Battery charger operation can be verified by proper voltage indication at the RTGB.

r. **ENSURE** the following battery chargers have energized **AND** are supplying DC loads:

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

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

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

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

s. **START** the following battery room vent fans:

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

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

t. **IF** DG 2 is operating and loaded, **THEN ENSURE** the supply fans for the following applicable drywell coolers have started:

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

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

16. **IF** Bus E3 is deenergized **AND** no diesel generators are available to reenergize it, **THEN CROSS-TIE** Sub E7 to E8 as follows:

___ a. **REMOVE** the control power fuses from Bus E3, Compt AJ3, *NUC SERV WTR PMP 2A* (Row-L1).

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

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

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

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

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

c. **IF** DG 4 is **NOT** available, **THEN TRIP** the following additional breaker at Sub E7:

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

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

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

e. **IF** DG 4 is **NOT** available, **THEN TRIP** the following additional breakers at Sub E8:

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

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

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

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

___ f. **RACK IN** Sub E7, Compt AX5, *TIE BREAKER TO E8* (Row-A1) in accordance with Steps 3.2.12.16.g through 3.2.12.16.k, **AND THEN CONTINUE** at Step 3.2.12.16.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.

3.2.12 **Cross-Tying 4160V Bus E2(E4) to E4(E2)**

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 3.2.12.16.g through 3.2.12.16.k to rack in Sub E8, Compt A10, *TIE BREAKER TO E7* (Row-F1), **AND CONTINUE** at Step 3.2.12.16.m.

m. **PLACE** Unit 1(2) RTGB control switch for the following Sub E7 feeder breakers to *TRIP* **AND CONFIRM** breakers open:

___ - *SUB E7 480V MAIN BREAKER, BREAKER AZ1*

___ - *BUS E3 TO SUB E7, BREAKER AJ0*

R6

n. **IF** *SUB E7 480V MAIN BREAKER, BREAKER AZ1* fails to open from RTGB, **THEN PERFORM** the following locally at E7:

___ - **DEPRESS** *TRIP* pushbutton on *SUB E7 480V MAIN BREAKER, COMPT. AZ1* to manually trip breaker.

___ - **CONFIRM** open *SUB E7 480V MAIN BREAKER, COMPT. AZ1.*

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

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 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 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.*

R6 q. **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.*

NOTE:	Battery charger operation can be verified by proper voltage indication at the RTGB.

r. **ENSURE** 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)

3.2.12 Cross-Tying 4160V Bus E2(E4) to E4(E2)

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 4 is operating and loaded, **THEN ENSURE** that 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

NRC PLANT JPM P-2

TITLE: Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

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.

Read the following to the JPM performer.

TASK CONDITIONS:

1. The Shift Superintendent has made the determination 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 RHRSW System is accessible and in standby IAW OP-43.
6. The Station 4 Operator is available in the Diesel Building for starting and stopping loads required by this procedure.
7. This JPM will be performed on Unit ______.

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

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 RHRSW System in operation from outside the Control Room per 0AOP-32, Step 3.2.11.2. Inform the Unit SCO when all required actions have been completed.

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

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: Provide MCC Valve light indications commensurate with Performer actions.

PROMPT: Green light is on, red light is off (as shown).

Step 2 – OPEN SW-V105, NUCLEAR SERVICE WATER SUPPLY VALVE, at MCC 1(2) XB Compartment DM1, Row H3.
SW-V105 is opened.

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

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

Step 3 – CLOSE SW-V141, WELL WATER SUPPLY VALVE, at the Remote Shutdown Panel.
SW-V141 is verified closed.

SAT/UNSAT*

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

PROMPT: Red light is on, green light is off.

Step 4 – CLOSE SW-V143, WELL WATER SUPPLY VALVE, at the Remote Shutdown Panel.
SW-V143 is closed.

SAT/UNSAT*

PROMPT: Red light is on, green light is off (as shown).

Step 5 – OPEN or VERIFY OPEN E11-F002B, RHR HEAT EXCHANGER 'B' SERVICE WATER DISCHARGE VALVE, at MCC 1(2) XB Compartment DN9, Row G4.
E11-F002B is verified opened.

SAT/UNSAT*

PROMPT: Respond as the Station 4 (Diesel Generator) Operator in the following step. After one minute report that both unit NSW Pumps have been started.

Step 6 – Contact the Station 4 (Diesel Generator) Operator and direct starting both affected unit NSW pumps by placing their local START/STOP switches to START.
Both affected unit NSW pumps are started.

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

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

PROMPT: Respond as the Station 4 (Diesel Generator) Operator in the following step. After one minute report that the RHR Service Water Booster Pump has been started.

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

The RHR SW Booster Pump is started.

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

PROMPT: If directed, respond as the Station 4 Operator that you are monitoring RHR Service Water Booster Pump amperage.

PROMPT: The next step will require the Performer to throttle open E11-F068B until amperage on the running Service Water Booster Pump reaches 80 amps. As the Station 4 Operator, provide cues of rising pump current as the valve is throttled open. The Performer should secure throttling the valve when pump amperage reaches 80 amps.

PROMPT: Green light is on, red light is off (as shown).

Step 8 – THROTTLE OPEN E11-F068B, RHR HEAT EXCHANGER 'B' SERVICE WATER DISCHARGE VALVE, at MCC 1(2) XB Compartment DN1, Row K4, until amperage on the running RHR Service Water Booster Pump reaches 80 amps.

E11-F068B is throttled open until pump amperage reaches 80 amps.

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

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

PROMPT: Green light is on, red light is off (as shown).

Step 9 – OPEN SW-V117, NUCLEAR SERVICE WATER TO VITAL HEADER VALVE, at MCC 1(2) XB Compartment DP2, Row G2.

SW-V117 is opened.

SAT/UNSAT*

PROMPT: If contacted, report as the Station 3 Operator that the supply of Service Water to running equipment is adequate.

Step 10 –Notify the Unit SCO that the RHR Service Water System is in operation.

The Unit SCO is notified.

SAT/UNSAT*

TERMINATING CUE: When the RHR Service Water System is in operation and the Unit SCO is notified, this JPM is complete.

TIME COMPLETED ____________

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

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

Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

Time Required for Completion: 20 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:________________________________

JPM: Pass _____ Fail _____

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 made the determination that Control Room evacuation is required.
2. All immediate actions associated with AOP-32 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 RHRSW System is accessible and in standby IAW OP-43.
6. The Station 4 Operator is available in the Diesel Building for starting and stopping loads required by this procedure.
7. 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 RHRSW System in operation from outside the Control Room using 0AOP-32, Step 3.2.11.2. Inform the Unit SCO when all required actions have been completed.

3.0 OPERATOR ACTIONS

3.2.11 **PERFORM** the following to place RHR loop B in Suppression Pool Cooling:

1. **PERFORM** the following to fill and vent RHR Loop B:

   a. Station 2, **ENSURE** *RHR PUMP B AND D SUPPRESSION POOL SUCTION VALVE, E11-F020B,* is open at MCC 1(2)XB. Compt DN6, Row G1. ☐

   b. Station 2, **ENSURE** *RHR PUMP B SUPPRESSION POOL SUCTION VALVE, E11-F004B*, is open at MCC 1(2)XB Compt DK9, Row M1. ☐

   c. Station 2, **ENSURE** *RHR PUMP D SUPPRESSION POOL SUCTION VALVE, E11-F004D*, is open at MCC 1(2)XB Compt DL0, Row M3. ☐

   d. Station 3, **ENSURE** RHR loop B keep fill station is in service (located 50 foot El.West). ☐

   e. Station 3, **OPEN** *REACTOR VESSEL HEAD SPRAY VENT VALVE, E11-V85* (located at vessel head spray station 66' El., West), until a solid stream of water is observed flowing from the vent line, **THEN CLOSE** the vent valve. ☐

   f. Station 3, **OPEN** *LOOP B RHR SYSTEM HIGH POINT VENT VALVES, E11-V79* and *E11-V80* (located RHR Hx B room El. 20', South), until a solid stream of water is flowing from the vent line, **THEN CLOSE** the vent valves. ☐

2. **PERFORM** the following to place the RHR Service Water System in operation:

   a. Station 2, **OPEN** *NUCLEAR SERVICE WATER SUPPLY VALVE, SW-V105*, at MCC 1(2)XB Compt DM1, Row H3. ☐

b. Station 1, **CLOSE** the following valves:

- *RHR VITAL SERVICE WATER HEADER WELL WATER SUPPLY VALVE, SW-V141* ☐
- *SERVICE WATER HEADER WELL WATER SUPPLY VALVE, SW-V143.* ☐

c. Station 2, **ENSURE** *RHR HEAT EXCHANGER B SERVICE WATER DISCHARGE VALVE, E11-F002B*, is open at MCC 1(2)XB Compt DN9, Row G4. ☐

d. Station 4, **ENSURE** both Nuclear Service Water Pumps to the affected unit are operating:

NSW Pump	Location	
1A	4160 Bus E1, AF9	☐
1B	4160 Bus E2, AH6	☐
2A	4160 Bus E3, AJ3	☐
2B	4160 Bus E4, AL1	☐

e. Station 4, **START** *RHR SERVICE WATER BOOSTER PUMP B* or *D:*

RHR SW Pump	Location	
1B	4160 Bus E4, AK9	☐
1D	4160 Bus E2, AH4	☐
2B	4160 Bus E4, AK4	☐
2D	4160 Bus E2, AG8	☐

f. Station 4, **MONITOR** the amperage on the Service Water Booster Pump that was started. ☐

g. Station 2, **THROTTLE OPEN** *RHR HEAT EXCHANGER B SERVICE WATER DISCHARGE VALVE, E11-F068B*, at MCC 1(2)XB Compt DN1, Row K4, until the amperage on the running RHR service water pump reaches 80 amps. ☐

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. ☐

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC PLANT JPM P-3

TITLE: Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

SAFETY CONSIDERATIONS:

1. Operating equipment and energized electrical equipment hazards.
2. This area is subject to radiological hazards. Check the appropriate RWP and the Radiation Protection desk prior to conducting the JPM.
3. Practice ALARA at all times while simulating actions.

EVALUATOR NOTES: (Do not read to performer)

1. Provide 0ASSD -02, Section B to the performer.
2. A floor map of the locations for this JPM is included at the end of the JPM.
3. **START LOCATION:** MCC 2XB

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

Read the following to the JPM performer.

TASK CONDITIONS:

1. A Control Room fire has resulted in Control Room Evacuation.
2. 0ASSD-02 has been entered and is being performed.
3. You are the Unit 2 Reactor Building MCC Operator
4. You are required to simulate the use of sound powered phones and demonstrate proper communications during the conduct of this JPM.
5. ASSD equipment has been distributed.
6. Section B.1 and B.2 of ASSD-02 has been completed, Service Water flow has been established through RHR HX 2B.
7. Suppression Pool Cooling is in service using the 2B RHR Pump, operating at 9,500 gpm. No other RHR operations are occurring.

INITIATING CUE:

You are directed by the Unit 2 SCO to perform 0ASSD-02 Section B9 Reactor Building MCC Operator actions, steps 1.1.3 through 1.1.7, to remove Suppression Pool Cooling from service, then align and start RHR in LPCI mode and inform the Unit 2 SCO when RHR is available for LPCI injection.

SECTION B9
UNIT 2 RX BLDG MCC OPERATOR ACTIONS
LPCI Injection

1.0 OPERATOR ACTIONS

1.1 **IF** directed to initiate LPCI injection, **THEN PERFORM** the following:

1.1.1 **IF** backup nitrogen supply for SRVs has **NOT** already been aligned, **THEN PERFORM** the following on the Reactor Building 50' elevation:

1. **PLACE** keylock switch *2-RNA-CS-001* in *LOCAL* for valve *2-RNA-SV-5482*. ☐

2. **PLACE** keylock switch *2-RNA-CS-002* in *LOCAL* for valve *2-RNA-SV-5253*. ☐

3. **INFORM** the Unit 2 SCO that backup nitrogen supply has been made available for SRV operation. ☐

1.1.2 **WHEN** MCCs 2XB and 2XB-2 are energized, **THEN COMPLETE** any **remaining steps** for the MCC switch lineups in the initial actions of Section B1. ☐

1.1.3 **IF** in suppression pool cooling, **THEN STOP** suppression pool cooling in accordance with Section B5, page 47. ☐

1.1.4 **IF** in shutdown cooling, **THEN STOP** shutdown cooling in accordance with Section B7, page 52. ☐

1.1.5 **IF** adding water to the reactor vessel in accordance with Section B8, **THEN PERFORM** the following:

1. **CONTINUE** with steps in Section B8 until RHR Pump 2B is running and injecting. ☐

   a. **IF** RHR Pump 2B will **NOT** start, **THEN START** RHR Pump 2D. ☐

2. **GO TO** Step 1.1.7.2 of this section. ☐

1.1.6 **ESTABLISH** ASSD sound-powered phone communication with Unit 2 SCO. ☐

SECTION B9
UNIT 2 RX BLDG MCC OPERATOR ACTIONS
LPCI Injection

1.1.7 **IF** water is **NOT** being added to the reactor vessel, **THEN PERFORM** the following:

1. **DIRECT** Emergency Switchgear Operator to start RHR Pump 2B. ☐

   a. F RHR Pump 2B will **NOT** start, **THEN START** RHR Pump 2D. ☐

2. **WHEN** informed RHR Pump 2B(2D) is running, **THEN SLOWLY OPEN** *RHR HX 2B BYP VLV, E11-F048B,* at MCC 2XB Compt DM8 (**Row N3**). ☐

3. **INFORM** Unit 2 SCO that LPCI is available. ☐

4. **WHEN** informed that reactor pressure is less than 390 psig, **THEN OPEN** *RHR OUTBOARD INJ VLV, E11-F017B,* at MCC 2XB-2 Compt DL9 (**Row C2**). ☐

5. **THROTTLE** *RHR OUTBOARD INJ VLV, E11-F017B*, at MCC 2XB-2 Compt DL9 (**Row C2**), as directed. ☐

6. **WHEN** directed, **THEN CLOSE** *RHR OUTBOARD INJ VLV, E11-F017B,* at MCC 2XB-2 Compt DL9 (**Row C2**). ☐

7. **WHEN** directed, **THEN CLOSE** *RHR HX 2B BYP VLV, E11-F048B,* at MCC 2XB Compt DM8 (**Row N3**). ☐

1.2 **WHEN** directed, **THEN START** shutdown cooling in accordance with Section B6. ☐

SECTION B5
UNIT 2 RX BLDG MCC OPERATOR ACTIONS
Removing Suppression Pool Cooling From Service

1.0 OPERATOR ACTIONS

1.1 **WHEN** directed to stop suppression pool cooling, **THEN PERFORM** the following:

1.1.1	**OPEN** *RHR PUMP 2B MIN FLO BYP VLV, E11-F007B*, at MCC 2XB Compt DL3 (**Row M2**).	☐
1.1.2	**CLOSE** *RHR SUPP POOL CLG ISOL VLV, E11-F024B*, at MCC 2XB Compt DM2 (**Row J2**).	☐
1.1.3	**DIRECT** the Emergency Switchgear Operator to stop RHR Pump 2B.	☐
1.1.4	**WHEN** informed RHR Pump 2B is stopped, **THEN CLOSE** *RHR SUPP POOL DISCH ISOL VLV, E11-F028B*, at MCC 2XB-2 Compt DM5 (**Row B4**).	☐
1.1.5	**CLOSE** *RHR HX 2B INL VLV, E11-F047B*, at MCC 2XB Compt DM7 (**Row N2)**.	☐
1.1.6	**CLOSE** *RHR HX 2B BYP VLV, E11-F048B*, at MCC 2XB Compt DM8 (**Row N3**).	☐
1.1.7	**INFORM** the Unit 2 SCO suppression pool cooling is removed from service.	☐

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the step.

Comments required for any step evaluated as UNSAT.

Step 1 – **LOCATE** step 1.1.3 in Section B9 of 0ASSD-02, then go to section B5 to secure suppression pool cooling.

Section B5 of 0ASSD-02 located.

SAT/UNSAT*

TIME START ____________

PROMPT: After the control switch is placed in OPEN state that there is dual indication then wait 20 seconds and state GREEN LIGHT OFF, **RED LIGHT ON**.

Step 2 - **OPEN** RHR PUMP 2B MIN FLOW BPV, E11-F007B, at MCC 2XB Compt DL3 (Row M2).

Rotated control switch for RHR PUMP 2B MIN FLOW BPV, E11-F007B to OPEN.

SAT/UNSAT*

PROMPT: After the control switch is rotated to CLOSE state that there is dual indication then wait 25 seconds and state GREEN LIGHT ON, **RED LIGHT OFF**.

Step 3 **CLOSE** RHR SUPP POOL CLG ISOL VLV, E11-F024B, at MCC 2XB Compt DM2 (Row J2) is CLOSED.

Rotated control switch for RHR SUPP POOL CLG ISOL VLV, E11-F024B, Compt DM2 (Row J2) to CLOSE.

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

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

PROMPT: Role play as Emergency Switchgear Operator DG Building using correct communications. Report **RHR 2B stopped**.

Step 4 - **DIRECT** the Emergency Switchgear Operator DG Building to **STOP** RHR Pump 2B.

RHR Pump 2 B stopped

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

PROMPT: After the control switch is rotated to CLOSE state that there is dual indication then wait 70 seconds and state GREEN LIGHT ON, **RED LIGHT OFF**.

Step 5. **CLOSE** RHR SUPP POOL DISCH ISOL VLV, E11-F028B, at MCC 2XB-2 Compt DM5 (Row B4).

Rotated control switch for RHR SUPP POOL DISCH ISOL VLV, E11-F028B, to CLOSE.

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

PROMPT: After the control switch is placed in CLOSE state that there is dual indication then wait 70 seconds and state GREEN LIGHT ON, **RED LIGHT OFF**.

Step 6 - **CLOSE** RHR HX 2B INL VLV, E11-F047B, at MCC 2XB Compt DM7 (Row N2).

Rotated control switch for RHR HX 2B INL VLV, E11-F047B to OPEN.

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

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

PROMPT:	(E11-F048B is already closed because the RHR system was in Suppression Pool Cooling.) Report GREEN LIGHT ON, **RED LIGHT OFF**.

Step 7 - **ENSURE** RHR HX 2B BPV, E11-F048B, at MCC 2XB Compt DM8 (Row N3) is CLOSED.

RHR HX 2B BPV, E11-F048B is CLOSED.

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

PROMPT:	Role play SCO using correct communications

Step 8 – **INFORM** Unit 2 SCO that Suppression Pool Cooling is removed from service.

Unit 2 SCO informed Suppression Pool Cooling is removed from service.

SAT/UNSAT*

Step 9 – **GO to** step 1.1.6 in Section B9 of 0ASSD-02.

Step 1.1.6 of Section B9 of 0ASSD-02 located.

SAT/UNSAT*

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

PROMPT:	Role play as SCO and Emergency Switchgear Operator using correct communications. Acknowledge communications.

Step 10 - **ESTABLISH** Communication with the Unit 2 SCO and the Emergency Switchgear Operator DG Building using *ASSD UNIT 2 TRAIN B SOUND-POWERED PHONE CKT* at MCC 2XB Compt D3Z (Row C2). In the event the ASSD sound-powered phone system is inoperable, hand-held portable radios or the plant Gai-tronics system may be used.

Communications established using ASSD UNIT 2 TRAIN B SOUND-POWERED PHONE CKT at MCC 2XB Compt D3Z (Row C2) or hand-held portable radios or the plant Gai-tronics system.

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

PROMPT:	Role play as Emergency Switchgear Operator DG Building using correct communications. Report **RHR 2B started**.

Step 11 - **DIRECT** the Emergency Switchgear Operator DG Building to **START** RHR Pump 2B.

RHR Pump 2 B started

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

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

PROMPT:	Respond as the control switch is momentarily opened that **BOTH the GREEN and RED LIGHTS ON.** After the switch has been held in OPEN for ~100 seconds state GREEN LIGHT OFF, **RED LIGHT ON**.

Step 12 - **SLOWLY OPEN** RHR HX 2B BPV, E11-F048B, at MCC 2XB Compt DM8 (Row N3), until valve is full OPEN.

Momentarily rotate RHR HX 2B BPV, E11-F048B control switch to OPEN until Valve is fully OPEN.

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

PROMPT:	Role play SCO using correct communications. When informed, that LPCI is available, state that Reactor pressure has lowered to 395 psig.

Step 13 – **INFORM** Unit 2 SCO that LPCI is available.

Unit 2 SCO informed LPCI is available.

SAT/UNSAT*

PROMPT:	After the control switch is placed in OPEN state that there is dual indication then wait 20 seconds and state GREEN LIGHT OFF, **RED LIGHT ON.**

Step 14 - **OPEN** RHR OUTBOARD INJ VLV, E11-F017B, at MCC 2XB-2 Compt DL9 (Row C2).

Rotated control switch for RHR OUTBOARD INJ VLV, E11-F017B to OPEN.

SAT/UNSAT*

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

PROMPT: Role play SCO using correct communications. DIRECT the U2 MCC Operator to **THROTTLE** RHR OUTBOARD INJ VLV, E11-F017B CLOSED for 10 seconds.

Step 15 – **CONFIRM** Unit 2 SCO directions to THROTTLE RHR OUTBOARD INJ VLV, E11-F017B CLOSED for 10 seconds.

Using correct communications Unit 2 SCO directions confirmed.

SAT/UNSAT*

PROMPT: After the control switch is placed in CLOSE state that there is dual indication then wait 10 seconds and state **BOTH GREEN and RED LIGHTS ON**.

Step 16 - **THROTTLE CLOSED** RHR OUTBOARD INJ VLV, E11-F017B, at MCC 2XB-2 Compt DL9 (Row C2) for 10 seconds.

Rotated control switch for RHR OUTBOARD INJ VLV, E11-F017B to CLOSE for 10 seconds.

SAT/UNSAT*

PROMPT: Role play SCO using correct communications. DIRECT the U2 MCC Operator to standby for further directions. **THIS JPM IS COMPLETE**.

TERMINATING CUE: U2 MCC Operator to standby for further directions with RHR Pump 2B is LPCI.

STOP TIME ____________

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

LIST OF REFERENCES

0ASSD-02

RELATED TASKS:

200668B504, Perform Emergency Switchgear Operator Actions To Remove Suppression Pool Cooling From Service Per ASSD-002 or AOP-32

K/A REFERENCE AND IMPORTANCE RATING:

295016 AA1.04 3.1/3.2, Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT: AC Electrical Distribution.

REFERENCES:

0ASSD-02, Rev. 34

TOOLS AND EQUIPMENT:

N/A

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

5 - RHR/LPCI: Suppression Pool Cooling mode
2 – RHR/LPCI: Injection Mode

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

Time Required for Completion:____ Minutes.

Time Taken: ____

APPLICABLE METHOD OF TESTING

Performance: Simulate X Actual __ Unit: 2

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

Time Critical: Yes ____ No X Time Limit ____

Alternate Path: Yes ___ No X

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

____

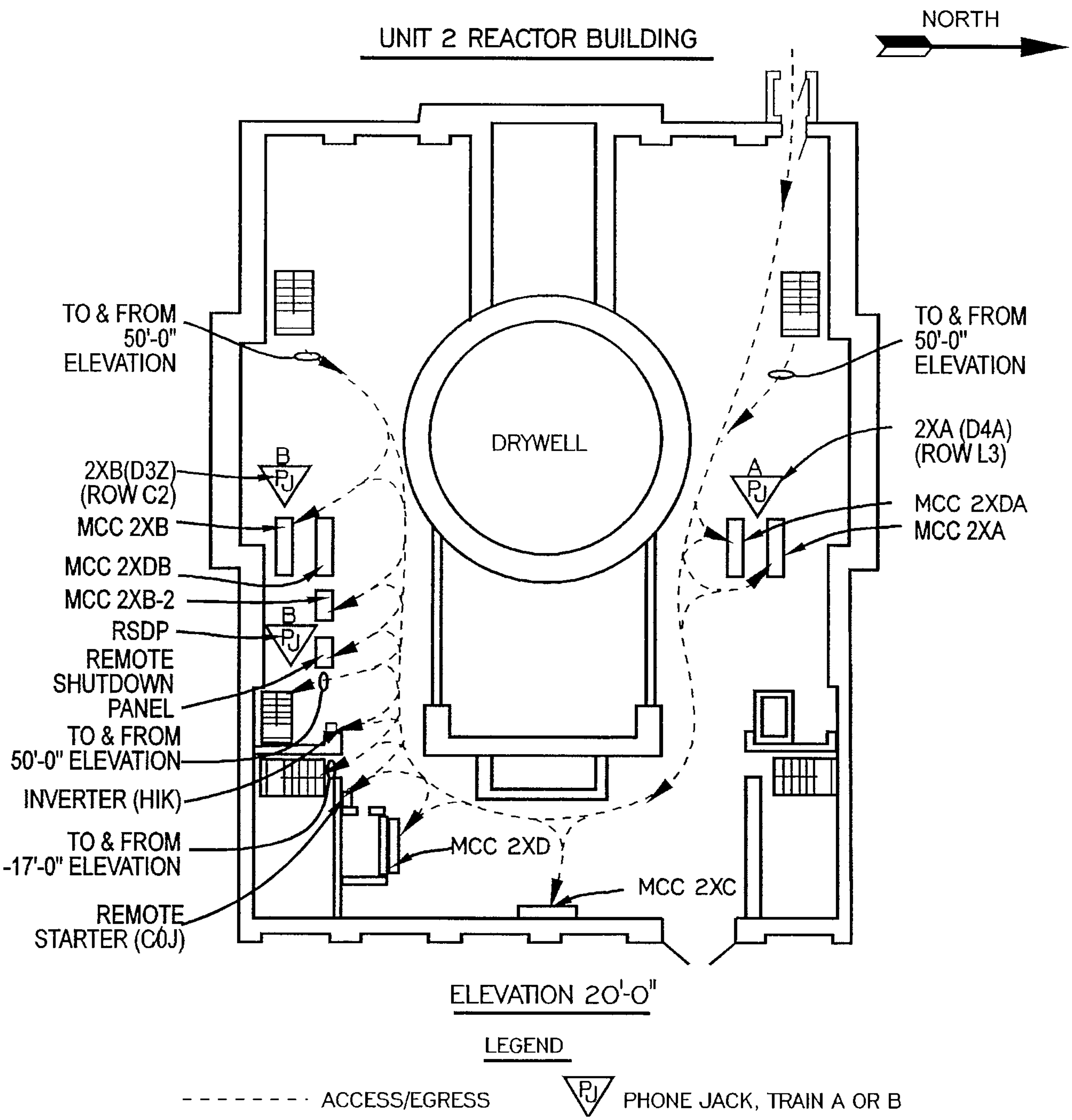
NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)

Evaluator Signature: ______________________________ Date:__________

NRC PLANT JPM P-3

Initiate LPCI Injection from Suppression Pool Cooling per ASSD-02 (U2 RB MCC Operator)



TASK CONDITIONS:

1. A Control Room fire has resulted in Control Room Evacuation.
2. 0ASSD-02 has been entered and is being performed.
3. You are the Unit 2 Reactor Building MCC Operator
4. You are required to simulate the use of sound powered phones and demonstrate proper communications during the conduct of this JPM.
5. ASSD equipment has been distributed.
6. Section B.1 and B.2 of ASSD-02 has been completed, Service Water flow has been established through RHR HX 2B.
7. Suppression Pool Cooling is in service using the 2B RHR Pump, operating at 9,500 gpm. No other RHR operations are occurring.

INITIATING CUE:

You are directed by the Unit 2 SCO to perform 0ASSD-02 Section B9 Reactor Building MCC Operator actions, steps 1.1.3 through 1.1.7, to remove Suppression Pool Cooling from service, then align and start RHR in LPCI mode and inform the Unit 2 SCO when RHR is available for LPCI injection.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-1

TITLE: UNCOUPLED CONTROL ROD

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. Unit Two is operating at 100% power.
2. PT-14.1, Control Rod Operability Check is due to be performed. This is the first performance of the PT this month.
3. Partially withdrawn control testing is not required.
4. The Reactor Engineer has determined no power reductions are required for rod movement, and inadvertent control rod double notch will not result in a Technical Specification thermal limit violation.
5. A second licensed operator is available to monitor control rod movement.

INITIATING CUE:

You are directed by the Unit SCO to perform PT-14.1 beginning at step 7.3.2 and inform him when the test is complete.

NOTE: Sequence is assumed unless denoted in the Comments.

Step 1 - Obtain control rod position edit from process computer or manually determine using RPIS

Control rod position edit obtained from process computer or rod positions manually determined using RPIS.

SAT/UNSAT

PROMPT: If asked, Failed Fuel Management is not in effect

Step 2 – If failed fuel management is in effect...

Fuel Management is not in effect

SAT/UNSAT

Step 3 - Ensure CRD Drive water pressure is 260 to 275 psid.

Drive water pressure is 260-275 psid.

SAT/UNSAT

Step 4 - IF reactor power is greater than the LPSP of RWM, THEN PERFORM the following steps for each control rod at position 48:

Determines reactor power is >LPSP of RWM (given in initial conditions)

SAT/UNSAT

Step 5– Select desired control rod and verify selection by documenting on Attachment 2

Selects 02-19 and documents on Att. 2

SAT/UNSAT

NOTE: The following 3 steps may be first performed and then documented on Att.2

Step 6 – Insert the withdrawn control rod one notch and document indicated control rod position changes on Attachment 2

Rod 02-19 is inserted from position 48 to 46 using Rod Movement Control Switch. and recorded on Att. 2

** **CRITICAL STEP** **

SAT/UNSAT

Step 7 – Using either single notch or continuous withdraw, Reposition control rod 02-19 to position 48 and document on Attachment 2.

Control rod 02-19 positioned back to position 48 using either notch or continuous withdraw and documented on Att. 2

** **CRITICAL STEP** **

SAT/UNSAT

Step 8 - MAINTAIN the continuous withdraw signal for approximately 3 to 5 seconds (if applied in Step 7.3.5.3) OR APPLY a separate notch or continuous withdraw signal, AND PERFORM the following:

A. CONFIRM annunciator ROD OVER TRAVEL (A-05 4-2) does NOT alarm AND DOCUMENT on Attachment 2.

Confirms annunciator does NOT alarm AND documents on Attachment 2.

SAT/UNSAT

B. CONFIRM rod position indication on four-rod display is NOT lost AND DOCUMENT on Attachment 2.

Confirms rod position indication on four-rod display is NOT lost AND documents on Attachment 2.

SAT/UNSAT

Step 9 - IF required, THEN RECORD stall flow indicated on FLOW INDICATOR, C11(C12)-FT-R604, on Attachment 2.

Records stall flow on Att. 2

SAT/UNSAT

Step 10 - CONFIRM FULL OUT indication on full-core display is illuminated AND DOCUMENT on Attachment 2.

Full out indication of full core display recorded on Attachment 2.

SAT/UNSAT

NOTE: The following step will be N/A

Step 11 - IF double-clutching or drive water differential pressure greater than 325 psid was required to move control rod, THEN DOCUMENT on Attachment 2 in Comments column.

Determines that no comments are required

SAT/UNSAT

NOTE: The following step is addressed in the initial conditions. The applicant should continue with the next control rod (02-23)

Step 12 - IF testing of partially withdrawn control rods is NOT approved by the Reactor Engineer OR the Unit SCO has determined testing of these control rods at the 7-day frequency is NOT desired, THEN GO TO Step 7.3.

Determines per initial conditions that testing of partial withdrawn control rods is not required

SAT/UNSAT

Step 13 – Select desired control rod and verify selection by documenting on Attachment 2

Selects 02-23 and documents on Att. 2

SAT/UNSAT

NOTE: The following 3 steps may be first performed and then documented on Att.2

Step 14 – Insert the withdrawn control rod one notch and document indicated control rod position changes on Attachment 2

Rod 02-23 is inserted from position 48 to 46 using Rod Movement Control Switch. and recorded on Att. 2

** **CRITICAL STEP** **

SAT/UNSAT

Step 15 – Using either single notch or continuous withdraw, Reposition control rod 02-19 to position 48 and document on Attachment 2.

Control rod 02-23 positioned back to position 48 using either notch or continuous withdraw and documented on Att. 2

** **CRITICAL STEP** **

SAT/UNSAT

Step 16 - MAINTAIN the continuous withdraw signal for approximately 3 to 5 seconds (if applied in Step 7.3.5.3) OR APPLY a separate notch or continuous withdraw signal, AND PERFORM the following:

A. CONFIRM annunciator ROD OVER TRAVEL (A-05 4-2) does NOT alarm AND DOCUMENT on Attachment 2.

Confirms annunciator does NOT alarm AND documents on Attachment 2.

SAT/UNSAT

B. CONFIRM rod position indication on four-rod display is NOT lost AND DOCUMENT on Attachment 2.

Confirms rod position indication on four-rod display is NOT lost AND documents on Attachment 2.

SAT/UNSAT

Step 17 - IF required, THEN RECORD stall flow indicated on FLOW INDICATOR, C11(C12)-FT-R604, on Attachment 2.

Records stall flow on Att. 2

SAT/UNSAT

Step 18 - CONFIRM FULL OUT indication on full-core display is illuminated AND DOCUMENT on Attachment 2.

Full out indication of full core display recorded on Attachment 2.

SAT/UNSAT

NOTE: The following step will be N/A

Step 19 - IF double-clutching or drive water differential pressure greater than 325 psid was required to move control rod, THEN DOCUMENT on Attachment 2 in Comments column.

Determines that no comments are required

SAT/UNSAT

NOTE: The following step is addressed in the initial conditions. The applicant should continue with the next control rod (02-23)

Step 20 - IF testing of partially withdrawn control rods is NOT approved by the Reactor Engineer OR the Unit SCO has determined testing of these control rods at the 7-day frequency is NOT desired, THEN GO TO Step 7.3.

Determines per initial conditions that testing of partial withdrawn control rods is not required

SAT/UNSAT

Step 21 – Select desired control rod and verify selection by documenting on Attachment 2

Selects 02-27 and documents on Att. 2

SAT/UNSAT

NOTE: The following 3 steps may be first performed and then documented on Att.2

Step 22 – Insert the withdrawn control rod one notch and document indicated control rod position changes on Attachment 2

Rod 02-27 is inserted from position 48 to 46 using Rod Movement Control Switch. and recorded on Att. 2

** **CRITICAL STEP** **

SAT/UNSAT

Step 23 – Using either single notch or continuous withdraw, Reposition control rod 02-19 to position 48 and document on Attachment 2.

Control rod 02-27 positioned back to position 48 using either notch or continuous withdraw and documented on Att. 2

** **CRITICAL STEP** **

SAT/UNSAT

Step 24 - MAINTAIN the continuous withdraw signal for approximately 3 to 5 seconds (if applied in Step 7.3.5.3) OR APPLY a separate notch or continuous withdraw signal, AND PERFORM the following:

A. CONFIRM annunciator ROD OVER TRAVEL (A-05 4-2) does NOT alarm AND DOCUMENT on Attachment 2.

Rod overtravel reported to SCO. APP A-05 4-2 referenced.

** **CRITICAL STEP** **

SAT/UNSAT

Step 25 - Attempt to recouple control rod by inserting a single notch, followed by a full withdrawal.

Rod 02-27 is inserted to position 46, then withdrawn to position 48.

**** CRITICAL STEP ****

SAT/UNSAT

Step 26 - Determine rod 02-27 coupling attempt unsuccessful and inform Unit SCO.

Determined coupling attempt unsuccessful.

**** CRITICAL STEP ****

SAT/UNSAT

PROMPT: As Unit SCO, inform examinee that further control rod testing is suspended until the Nuclear Engineer is notified.

TERMINATING CUE: When control rod 02-27 is determined to be uncoupled, this JPM is complete.

RELATED TASKS:

201002B201, Conduct Control Rod Operability Check Per PT-14.1

K/A REFERENCE AND IMPORTANCE RATING:

201003 A2.02 3.7/3.8
Ability to predict impacts of and use procedures to mitigate consequences of an uncoupled rod.

REFERENCES:

0PT-14.1, Revision 48
2APP-A-05, Revision 40

TOOLS AND EQUIPMENT:

None.

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

1 - Reactivity Control

APPLICABLE METHOD OF TESTING

Performance:	Simulate	___	Actual	X	Unit:	2
Setting:	Control Room	___	Simulator	X	In-Plant:	
Time Critical:	Yes	___	No	X	Time Limit	
Alternate Path:	Yes	X	No			

EVALUATION

Performer:

JPM: Pass _____ Fail

Comments:

TASK CONDITIONS:

1. Unit Two is operating at 100% power.
2. PT-14.1, Control Rod Operability Check is due to be performed. This is the first performance of the PT this month.
3. Partially withdrawn control testing is not required.
4. The Reactor Engineer has determined no power reductions are required for rod movement, and inadvertent control rod double notch will not result in a Technical Specification thermal limit violation.
5. A second licensed operator is available to monitor control rod movement.

INITIATING CUE:

You are directed by the Unit SCO to perform PT-14.1 and inform him when the test is complete.

Progress Energy

BRUNSWICK NUCLEAR PLANT

C
Continuous Use

DATE COMPLETED ____________________
UNIT ______ % PWR__________ GMWE__________
SUPERVISOR____________________
REASON FOR TEST (check one or more)
_____ Routine Surveillance
_____ WO # ____________________
_____ Other (explain)____________________

FREQUENCY:

A. Once per 7 days for withdrawn control rods when reactor power is greater than LPSP for RWM.

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
0

0PT-14.1

CONTROL ROD OPERABILITY CHECK

REVISION 60

1.0 PURPOSE

1.1 This test is performed to determine operability of the CRD System in conformance with requirements specified in Technical Specifications SR 3.1.3.2, SR 3.1.3.3, and SR 3.1.3.5.

1.2 This test provides instructions for exercising control rods that are fully inserted.

1.3 This test provides instructions for obtaining control rod drive stall flows on fully withdrawn control rods for trending information.

2.0 REFERENCES

2.1 Technical Specifications

2.2 UFSAR, Section 3.9.4

2.3 1(2)OP-07, Reactor Manual Control System Operating Procedure

2.4 1(2)OP-08, CRD Hydraulic System Operating Procedure

2.5 SD-07, Reactor Manual Control System

2.6 SD-08, CRD Hydraulic System

2.7 General Electric Service Information Letter No. 52

2.8 0AI-59, Jumpering Wire Removal and Designated Jumper

2.9 OPS-NGGC-1306, Reactivity Management Program

2.10 0ENP-24.0, Reactor Engineering Guidelines

2.11 NCR 173772, Unit 2 Control Rod Misposition

3.0 PRECAUTIONS AND LIMITATIONS

3.1 A control rod should be returned to the required position before exercising the next control rod.

3.2 During performance of this procedure, the guidance in 1(2)OP-07 applies for increasing CRD drive water differential pressure to move control rods.

3.3 Control rod selection shall be concurrently verified and documented prior to rod movement.

3.0 PRECAUTIONS AND LIMITATIONS

3.4 Management involvement is required for pre-job briefings for control rod movement for the purpose of power suppression testing.

3.5 Stall flows for fully withdrawn control rods are obtained in accordance with the following schedule:

- First performance of month, CRDs on pages 1 and 2 of Attachment 2
- Second performance of month, CRDs on pages 3 and 4 of Attachment 2
- Third performance of month, CRDs on pages 5 and 6 of Attachment 2
- Fourth performance of month, CRDs on pages 7 and 8 of Attachment 2

4.0 PREREQUISITES

4.1 No other testing or maintenance in progress that will adversely affect the performance of this test.

4.2 Rod Position Information System (RPIS) and Reactor Manual Control System (RMCS) in operation in accordance with 1(2)OP-07.

4.3 CRD Hydraulic System in operation in accordance with 1(2)OP-08.

4.4 Reactor Engineer has provided information for control rods requiring reduced reactor power for movement.

4.5 Reactor Engineer has identified any control rods used for suppressing fuel leaks.

4.6 Reactor Engineer has determined inadvertent control rod double notch on withdrawal will not result in a technical specification thermal limit violation.

4.7 A second licensed operator or other qualified member of technical staff is required for performance of this test in accordance with OPS-NGGC-1306.

5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 ACCEPTANCE CRITERIA

NOTE:	**IF** any control rod can **NOT** be moved with drive water pressure, **THEN** it must be considered inoperable.
NOTE:	**IF** unable to observe control rod position changes due to rod position indication failures, **THEN** the affected control rod must be considered inoperable **AND** the actions of TS 3.1.3.C implemented.

6.1 This test may be considered satisfactory when the following criteria are met:

6.1.1 For each fully withdrawn control rod, control rod drives can be inserted at least one notch with drive water pressure (SR 3.1.3.2).

NOTE:	Partially withdrawn control rods are only required to be tested once per 31 days. (SR 3.1.3.3)

6.1.2 For each partially withdrawn control rod, control rod drives can be inserted at least one notch with drive water pressure (SR 3.1.3.3).

NOTE:	Coupling integrity is confirmed by observing annunciator *ROD OVER TRAVEL* (A-05 4-2) does **NOT** alarm **AND** rod position indication on the four-rod display is **NOT** lost when a fully withdrawn control rod is given a withdraw signal.

6.1.3 For each fully withdrawn control rod, coupling integrity is verified by observing the drives do not go to the withdrawn overtravel position when the control rod is withdrawn to *FULL OUT* (SR 3.1.3.5).

6.1.4 For each control rod fully inserted which was tested, control rod drives can be withdrawn at least one notch with drive water pressure.

6.1.5 The control rod drive stall flows are less than 5 gpm or a WR is prepared.

6.1.6 The control rod position changes during the movement of the control rod drive.

6.1.7 Control rod reed switch position *48* corresponds to control rod position indicated by *FULL OUT* on the select matrix or a WR is prepared.

6.1.8 The control rod drive water differential pressures required to move control rods are less than or equal to 325 psid or a WR is prepared.

7.0 PROCEDURAL STEPS

Initials

7.1 **OBTAIN** permission from the Unit SCO to perform this test. _____

7.2 **CONFIRM** all prerequisites listed in Section 4.0 are met. _____

NOTE:	It is **NOT** necessary to exercise control rods in the sequence listed on Attachment 2.
NOTE:	Control rods with restrictions for movement may be highlighted in yellow on Attachment 2.

7.3 CRD Exercise

7.3.1 **IDENTIFY** all control rods with restrictions **AND** the applicable restrictions, for operability testing in the Comments block on Attachment 2. ___/___ Ind.Ver.

7.3.2 **OBTAIN** a control rod position edit from the PPC **OR** **MANUALLY DETERMINE** current control rod positions using RPIS. ___/___ Ind.Ver.

7.3.3 **IF** failed fuel management is in effect, **THEN** reactor power level is in accordance with 0ENP-24.0 limits for testing **OR** is less than the maximum power level for testing recommended by the Reactor Engineer. _____

7.3.4 **ENSURE** CRD drive water pressure is at 260 to 275 psid. _____

7.0 PROCEDURAL STEPS

Initials

> **NOTE:** Steps in this procedure for which no Initial line is provided are steps performed multiple times and are documented separately on Attachment 2.

> **CAUTION**
>
> Each withdrawn control rod should be inserted one notch **AND** repositioned to the initial position prior to selection of another control rod for exercising.

7.3.5 **IF** reactor power is greater than the LPSP of RWM, **THEN PERFORM** the following steps for each control rod at position 48:

> **NOTE:** CRD drive water differential pressure increases may be necessary to move control rods.
>
> **NOTE:** CRD stall flow check may be performed at rated conditions coincident with Steps 7.3.5.1 through 7.3.5.5.
>
> **NOTE:** Control rod selection shall be concurrently verified and documented prior to rod movement.

1. **SELECT** desired control rod **AND VERIFY** selection by documenting on Attachment 2.

> **NOTE:** Steps 7.3.5.2 through 7.3.5.4 may first be performed and then documented on Attachment 2.

2. **INSERT** the withdrawn control rod one notch **AND DOCUMENT** indicated control rod position changes on Attachment 2.

> **NOTE:** **WHEN** withdrawing control rod to *FULL OUT*, a continuous withdraw signal may be applied and held until approximately 3 to 5 seconds after control rod has reached position 48 in order to check for rod overtravel. The control rod drive may also be held for 60 seconds in the continuous withdraw mode to purge any air from the drive.

3. **USING** either single notch or continuous withdraw, **REPOSITION** the inserted control rod to position 48 **AND DOCUMENT** the indicated control rod position changes on Attachment 2.

7.0 PROCEDURAL STEPS

Initials

4. **MAINTAIN** the continuous withdraw signal for approximately 3 to 5 seconds (if applied in Step 7.3.5.3) **OR APPLY** a separate notch or continuous withdraw signal, **AND PERFORM** the following:

   a. **CONFIRM** annunciator *ROD OVER TRAVEL* (A-05 4-2) does **NOT** alarm **AND DOCUMENT** on Attachment 2.

   b. **CONFIRM** rod position indication on four-rod display is **NOT** lost **AND DOCUMENT** on Attachment 2.

NOTE:	**IF** a control rod drive stall flow is greater than or equal to 5 gpm, **THEN** 1(2)OP-07, Section 8, may be used for flushing collet piston annulus seals. **IF** flushing does **NOT** reduce stall flow below 5 gpm, **THEN** a WR is required.
NOTE:	Stall flows should be obtained with drive water differential pressure approximately 260 psid.

5. **IF** required, **THEN RECORD** stall flow indicated on *FLOW INDICATOR, C11(C12)-FT-R604,* on Attachment 2.

6. **CONFIRM** *FULL OUT* indication on full-core display is illuminated **AND DOCUMENT** on Attachment 2.

7. **IF** double-clutching or drive water differential pressure greater than 325 psid was required to move control rod, **THEN DOCUMENT** on Attachment 2 in Comments column.

NOTE:	Partially withdrawn control rods are only required to be tested once per 31 days. (SR 3.1.3.3)

7.3.6 **IF** testing of partially withdrawn control rods is **NOT** approved by the Reactor Engineer **OR** the Unit SCO has determined testing of these control rods at the 7-day frequency is **NOT** desired, **THEN GO TO** Step 7.3.8. _____

7.0 PROCEDURAL STEPS

Initials

NOTE:	A power reduction may be required to perform Step 7.3.7.

7.3.7 **IF** approved by the Reactor Engineer, **THEN PERFORM** the following steps for each withdrawn control rod that is **NOT** at position 48:

NOTE:	CRD drive water differential pressure increases may be necessary to move control rods.
NOTE:	**IF** a control rod double notches during withdrawal, **THEN** the rod should be **IMMEDIATELY REINSERTED** to the required position and a WR written using tag number 1/2-B11-CR(xx-yy).
NOTE:	Control rod selection shall be concurrently verified and documented prior to rod movement.

1. **SELECT** desired control rod **AND VERIFY** selection by documenting on Attachment 2.

NOTE:	Steps 7.3.7.2 and 7.3.7.3 may first be performed and then documented on Attachment 2.

2. **INSERT** the withdrawn control rod one notch **AND DOCUMENT** indicated control rod position changes on Attachment 2.

3. **CONFIRM** the control rod moved in Step 7.3.7.2 is at the position required by the Reactor Engineer **OR REPOSITION** control rod in accordance with the Reactor Engineer **AND DOCUMENT** control rod position changes on Attachment 2.

4. **IF** double clutching or drive water differential pressure greater than 325 psid was required to move control rod, **THEN DOCUMENT** on Attachment 2 in Comments column.

7.0 PROCEDURAL STEPS

Initials

CAUTION

Control rods inserted to suppress power around leaking fuel are **NOT** to be notch tested.

7.3.8 **IF** approved by the Reactor Engineer, **THEN PERFORM** the following steps for each fully inserted control rod: _____

NOTE: **IF** a control rod double notches during withdrawal, **THEN** the rod should be **IMMEDIATELY REINSERTED** to the required position and a WR written using tag number 1/2-B11-CR(xx-yy).

NOTE: CRD drive water differential pressure increases may be necessary to move control rods.

NOTE: Control rod selection shall be concurrently verified and documented prior to rod movement.

1. **SELECT** desired control rod **AND VERIFY** selection by documenting on Attachment 2.

NOTE: Steps 7.3.8.2 and 7.3.8.3 may first be performed and then documented on Attachment 2.

2. **WITHDRAW** control rod one notch **AND DOCUMENT** indicated control rod position changes on Attachment 2.

3. **REPOSITION** control rod to *FULL IN* **OR** to the position required by the Reactor Engineer **AND DOCUMENT** indicated control rod position changes on Attachment 2.

4. **IF** double clutching or drive water differential pressure greater than 325 psid was required to move control rod, **THEN DOCUMENT** on Attachment 2 in Comments column.

7.0 PROCEDURAL STEPS

Initials

7.4 **IF** stall flow for a fully withdrawn control rod is greater than or equal to 5 gpm, **THEN PERFORM** CRD Collet Piston Annulus Flush in accordance with 1(2)OP-07. _____

7.5 **IF** stall flow for a fully withdrawn control rod remains greater than or equal to 5 gpm, **AND** the control rod does **NOT** have an outstanding WO or WR identifying this condition, **THEN PERFORM** Stop Piston Worn Seals Test in accordance with 1(2)OP-07. _____

7.6 **OBTAIN** Control Rod Position Edit (810 Display) **OR MANUALLY DETERMINE** current control rod positions using RPIS. _____

7.7 **VERIFY** each control rod is repositioned to the position required by the Reactor Engineer. ___/___ Ind.Ver.

7.8 **IF** stall flow for a fully withdrawn control rod can **NOT** be reduced below 5 gpm, **THEN INITIATE** a WR against the control rod **AND RECORD** WR number on Attachment 2. _____

7.9 **IF** drive water differential pressure greater than 325 psid was required for any control rod movement, **THEN INITIATE** a WR **AND RECORD** the number on Attachment 2. _____

7.10 **ENSURE** required information has been recorded on the cover page. _____

7.11 **NOTIFY** the Unit SCO when this test is complete or found to be unsatisfactory. _____

Certification and Review Form

General Comments and Recommendations ____________________________

____

____

	Initials	Name (Print)
Performed by:	________	____________________
	________	____________________
	________	____________________
	________	____________________
	________	____________________

Exceptions to satisfactory performance ____________________________

____

____

Corrective action required ____________________________________

____

____

Test procedure has been satisfactorily completed.

Unit SCO: ____________________________ ____________
Signature Date

Test procedure has **NOT** been satisfactorily completed.

Unit SCO: ____________________________ ____________
Signature Date

Test has been reviewed by:

Shift Superintendent: ____________________________ ____________
Signature Date

ATTACHMENT 2
Page 1 of 8
Control Rod Operability Check
Frequency: Weekly (Daily When Required)

ROD NO.	*CORRECT ROD SELECTED AND VERIFIED 7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	ROD MOVEMENT 7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	REPOSITION ROD 7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM 7.3.5.4.a (Initial)	4-ROD DISPLAY POSITION INDICATION NOT LOST 7.3.5.4.b (Initial)	STALL FLOW 7.3.5.5 (Flow)	FULL OUT LIGHT 7.3.5.6 (Initial)	VERIFIED CORRECT ROD MOVED AND REPOSITIONED (Initial)	WR or WO Number	Comments
02-19	XX / XX	XX	XX	XX	XX	XX	XX	XX		N/A
02-23	XX / XX	XX	XX	XX	XX	XX	XX	XX		N/A
02-27	XX / XX	XX	XX							
02-31	/									
02-35	/									
06-11	/			WILL ALARM →	REFERS TO ANNUNCIATOR RESPONSE					A-5 4-2
06-15	/									
06-19	/									
06-23	/									
06-27	/									
06-31	/									
06-35	/									
06-39	/									
06-43	/									
10-07	/									
10-11	/									
10-15	/									

*Concurrent Verification of rod selection required prior to rod movement.

Control Rod Operability Check

Frequency: Weekly (Daily When Required)

	*CORRECT ROD SELECTED AND VERIFIED	ROD MOVEMENT	REPOSITION ROD	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM	4-ROD DISPLAY POSITION INDICATION NOT LOST	STALL FLOW	FULL OUT LIGHT	VERIFIED CORRECT ROD MOVED AND REPOSITIONED		
ROD NO.	7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	7.3.5.4.a (Initial)	7.3.5.4.b (Initial)	7.3.5.5 (Flow)	7.3.5.6 (Initial)	(Initial)	WR or WO Number	Comments
10-19	/									
10-23	/									
10-27	/									
10-31	/									
10-35	/									
10-39	/									
10-43	/									
10-47	/									
14-07	/									
14-11	/									
14-15	/									
14-19	/									
14-23	/									
14-27	/									
14-31	/									
14-35	/									
14-39	/									
14-43	/									

* Concurrent Verification of rod selection required prior to rod movement.

Control Rod Operability Check

Frequency: Weekly (Daily When Required)

	*CORRECT ROD SELECTED AND VERIFIED	ROD MOVEMENT	REPOSITION ROD	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM	4-ROD DISPLAY POSITION INDICATION NOT LOST	STALL FLOW	FULL OUT LIGHT	VERIFIED CORRECT ROD MOVED AND REPOSITIONED		
ROD NO.	7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	7.3.5.4.a (Initial)	7.3.5.4.b (Initial)	7.3.5.5 (Flow)	7.3.5.6 (Initial)	(Initial)	WR or WO Number	Comments
14-47	/									
18-03	/									
18-07	/									
18-11	/									
18-15	/									
18-19	/									
18-23	/									
18-27	/									
18-31	/									
18-35	/									
18-39	/									
18-43	/									
18-47	/									
18-51	/									
22-03	/									
22-07	/									
22-11	/									

* Concurrent Verification of rod selection required prior to rod movement.

Control Rod Operability Check

Frequency: Weekly (Daily When Required)

	*CORRECT ROD SELECTED AND VERIFIED	ROD MOVEMENT	REPOSITION ROD	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM	4-ROD DISPLAY POSITION INDICATION NOT LOST	STALL FLOW	FULL OUT LIGHT	VERIFIED CORRECT ROD MOVED AND REPOSITIONED		
ROD NO.	7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	7.3.5.4.a (Initial)	7.3.5.4.b (Initial)	7.3.5.5 (Flow)	7.3.5.6 (Initial)	(Initial)	WR or WO Number	Comments
22-15	/									
22-19	/									
22-23	/									
22-27	/									
22-31	/									
22-35	/									
22-39	/									
22-43	/									
22-47	/									
22-51	/									
26-03	/									
26-07	/									
26-11	/									
26-15	/									
26-19	/									
26-23	/									
26-27	/									

* Concurrent Verification of rod selection required prior to rod movement.

Control Rod Operability Check

Frequency: Weekly (Daily When Required)

	*CORRECT ROD SELECTED AND VERIFIED	ROD MOVEMENT	REPOSITION ROD	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM	4-ROD DISPLAY POSITION INDICATION NOT LOST	STALL FLOW	FULL OUT LIGHT	VERIFIED CORRECT ROD MOVED AND REPOSITIONED		
ROD NO.	7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	7.3.5.4.a (Initial)	7.3.5.4.b (Initial)	7.3.5.5 (Flow)	7.3.5.6 (Initial)	(Initial)	WR or WO Number	Comments
26-31	/									
26-35	/									
26-39	/									
26-43	/									
26-47	/									
26-51	/									
30-03	/									
30-07	/									
30-11	/									
30-15	/									
30-19	/									
30-23	/									
30-27	/									
30-31	/									
30-35	/									
30-39	/									

* Concurrent Verification of rod selection required prior to rod movement.

Control Rod Operability Check

Frequency: Weekly (Daily When Required)

	*CORRECT ROD SELECTED AND VERIFIED	ROD MOVEMENT	REPOSITION ROD	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM	4-ROD DISPLAY POSITION INDICATION NOT LOST	STALL FLOW	FULL OUT LIGHT	VERIFIED CORRECT ROD MOVED AND REPOSITIONED		
ROD NO.	7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	7.3.5.4.a (Initial)	7.3.5.4.b (Initial)	7.3.5.5 (Flow)	7.3.5.6 (Initial)	(Initial)	WR or WO Number	Comments
30-43	/									
30-47	/									
30-51	/									
34-03	/									
34-07	/									
34-11	/									
34-15	/									
34-19	/									
34-23	/									
34-27	/									
34-31	/									
34-35	/									
34-39	/									
34-43	/									
34-47	/									
34-51	/									
38-07	/									
38-11	/									

* Concurrent Verification of rod selection required prior to rod movement.

Control Rod Operability Check
Frequency: Weekly (Daily When Required)

	*CORRECT ROD SELECTED AND VERIFIED	ROD MOVEMENT	REPOSITION ROD	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM	4-ROD DISPLAY POSITION INDICATION NOT LOST	STALL FLOW	FULL OUT LIGHT	VERIFIED CORRECT ROD MOVED AND REPOSITIONED		
ROD NO.	7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	7.3.5.4.a (Initial)	7.3.5.4.b (Initial)	7.3.5.5 (Flow)	7.3.5.6 (Initial)	(Initial)	WR or WO Number	Comments
38-15	/									
38-19	/									
38-23	/									
38-27	/									
38-31	/									
38-35	/									
38-39	/									
38-43	/									
38-47	/									
42-07	/									
42-11	/									
42-15	/									
42-19	/									
42-23	/									
42-27	/									
42-31	/									
42-35	/									

* Concurrent Verification of rod selection required prior to rod movement.

Control Rod Operability Check

Frequency: Weekly (Daily When Required)

ROD NO.	*CORRECT ROD SELECTED AND VERIFIED 7.3.5.1 or 7.3.7.1 or 7.3.8.1 (Initial)	ROD MOVEMENT 7.3.5.2 or 7.3.7.2 or 7.3.8.2 (Initial)	REPOSITION ROD 7.3.5.3 or 7.3.7.3 or 7.3.8.3 (Initial)	OVERTRAVEL ANNUNCIATOR DOES NOT ALARM 7.3.5.4.a (Initial)	4-ROD DISPLAY POSITION INDICATION NOT LOST 7.3.5.4.b (Initial)	STALL FLOW 7.3.5.5 (Flow)	FULL OUT LIGHT 7.3.5.6 (Initial)	VERIFIED CORRECT ROD MOVED AND REPOSITIONED (Initial)	WR or WO Number	Comments
42-39	/									
42-43	/									
42-47	/									
46-11	/									
46-15	/									
46-19	/									
46-23	/									
46-27	/									
46-31	/									
46-35	/									
46-39	/									
46-43	/									
50-19	/									
50-23	/									
50-27	/									
50-31	/									
50-35	/									

* Concurrent Verification of rod selection required prior to rod movement.

REVISION SUMMARY

Revision 60 incorporates PRR 217342 to structure procedure more efficiently and improve the ability to use the procedure in accordance with expectations for Continuous Use procedures. PRR 215244 was also incorporated to address a minor procedure use issue during a Job Performance Measure (JPM) administered during recent Licensed Operator Requalification (LOR) exams.

Revision 59 is an Editorial Correction to clarify Step 7.4.6.

Revision 58 removes CAPR designation incorporated in Revision 56.

Revision 57 is an Editorial Correction to add a new Precaution and Limitation regarding management involvement in pre-job briefings for control rod movement for the purpose of power suppression testing in accordance with AR 173722.

Revision 56 incorporates CAPR NCR 173772 adding steps for rod selection verification and documentation prior to rod movement.

Revision 55 incorporates recommended corrective action in accordance with NCR 154776 to add criteria for determining control rod coupling integrity. A note has been added stating that steps that do not have a sign off line are steps performed multiple times and documented on the attachment.

Revision 54 adds a new sign-off step for confirmation that power level is in accordance with 0ENP-24.0, Reactor Engineering Guidelines or is less than the maximum power level for testing recommended by the Reactor Engineer. Procedure has also been converted to Word 2002.

Revision 53 is an Editorial Correction to delete reference to 0AP-038 and replace it with reference to OPS-NGGC-1306, Reactivity Management Program.

Revision 52 removes the special testing requirements for Unit 1 control rod 26-47 which existed for Cycle 13. This revision also incorporates PassPort Work Management terminology.

Revision 51 is an Administrative correction for a typographical error which inadvertently changed control rod 50-31 to non-existent control rod 40-31 on Attachment 2.

Revision 50 changes the method of satisfying Tech Spec SR 3.1.3.3 for Unit 1 Control Rod 26-47 only.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-2

TITLE: RCIC SYSTEM OPERATION

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. The plant is in Mode 1.
2. 0PT-10.1.1, RCIC System Operability Test, is in progress.
3. Personnel are in the field in support of the RCIC surveillance.
4. All pre-job and ALARA briefs have been completed.
5. The HP Window has been notified of the anticipated rad level changes when steam is admitted to the RCIC turbine.
6. Brunswick Security personnel have been notified of restricted access to the Unit 2 -17 foot elevation during the RCIC operation.
7. 0PT-10.1.1 has been completed up to, and including, 7.9.4.

INITIATING CUE:

You are directed by the Unit SCO to continue with the performance of 0PT-10.1.1 beginning with Step 7.10.1. The 2-E51-F022, RCIC Bypass to the CST Valve, is to be throttled open by holding the valve control switch in the Open position for approximately 3 seconds.

Step 1 – OPEN COND PUMP DISCH INBD DRAIN VALVE, E51-F004.

2-E51-F004 is Opened. SAT/UNSAT

Step 2 – CONFIRM RCIC SYSTEM PRESS LOW (A-02, 2-6) annunciator is clear.

SYSTEM PRESS LOW (A-02, 2-6) annunciator is clear. SAT/UNSAT

PROMPT: When oil level is requested, report that it is normal

Step 3 – ENSURE the RCIC lubricant oil level is normal.

RCIC lubricant oil level is normal. SAT/UNSAT

PROMPT: When local suction pressure indication is requested, inform the candidate that suction pressure is 52 psig.

Step 4 – RECORD RCIC pump suction pressure (stopped) indicated on E51-R002 (local) on Attachment 2.

RCIC pump suction pressure (52 psig) recorded on Attachment 2.

SAT/UNSAT

Step 5 – IF RCIC pump suction ppressure is greater than or equal to 29 psig, THEN RECORD RCIC CONDENSATE CHECK VALVE TO PUMP, E51-F011 and RCIC CONDENSATE PUMP DISCHARGE LINE CHECK VALVE, E51-F047 are closed on Attachment 3.

E51-F011 recorded on Attachment 3. SAT/UNSAT

E51-F047 recorded on Attachment 3. SAT/UNSAT

Step 6 – Step 7.10.5 determined to be not applicable.

Step 7.10.5 determined to be not applicable. SAT/UNSAT

PROMPT: WHEN requested, inform the candidate that suppression chamber to drywell vacuum breaker monitoring has been established and that all of the vacuum breakers indicate CLOSED.

Step 7 – IF desired, THEN ESTABLISH MONITORING of the suppression chamber to drywell vacuum breakers.

Suppression chamber to drywell vacuum breaker monitoring established.

SAT/UNSAT

Step 8 – CLOSE COND PUMP DISCH INBD DRAIN VLV, E51-F004.

E51-F004 CLOSED. SAT/UNSAT

Step 9 – OPEN REDUNDANT ISOL TO CST VLV, E41-F011.

E41-F011 OPENED. SAT/UNSAT

Step 10 – START BAROMETRIC CNDSR VACUUM PUMP.

Barometric Condsr Vacuum Pump started. SAT/UNSAT

Step 11 – OPEN COOLING WATER SUPPLY VLV, E51-F046.

E51-F046 Opened. SAT/UNSAT

Step 12 – THROTTLE OPEN BYPASS TO CST VLV, E51-F022, 2 to 4 seconds, unless otherwise directed by the Unit SCO.

E51-F022 throttled open approximately 3 seconds. SAT/UNSAT

Step 13 – DISPATCH an auxiliary operator to observe the system discharge piping for excessive motion and water hammer during startup of the RCIC System.

Auxiliary operator dispatched. SAT/UNSAT

Step 14 – EVACUATE all personnel below the Reactor Building 20' Elevation east half.

Announces that personnel evacuate from Reactor Building below the 20' Elevation east half.

SAT/UNSAT

PROMPT: WHEN requested, inform the candidate that suppression pool monitoring has been established.

Step 15 – MONITOR suppression pool temperature at intervals less than or equal to 5 minutes to ensure the average suppression pool temperature is less than 104°F.

Suppression Pool temperature monitoring is established.

SAT/UNSAT

Step 16 – Open the RCIC Turbine Steam Supply Valve, 2-E51-F045.

2-E51-F045 is opened. SAT/UNSAT

NOTE: The recognition of a failure of the E51-F007 and E51-F008 to close and the candidate's actions to close them may be performed in either order.

Step 17 - Recognize RCIC Isolation Signal "A" light is lit and the 2-E51-F007 not closing.

2-E51-F007 failure to isolate is recognized. ****CRITICAL STEP****

SAT/UNSAT

Step 18 – 2-E51-F007 CLOSED by taking the control switch to the CLOSE position.

2-E51-F007 closed using the control switch. ****CRITICAL STEP****

SAT/UNSAT

Step 19 - Recognize RCIC Isolation Signal "B" light is lit and the 2-E51-F008 not closing.

2-E51-F008 failure to isolate is recognized. ****CRITICAL STEP****

SAT/UNSAT

Step 20 – 2-E51-F008 CLOSED by taking the control switch to the CLOSE position.

2-E51-F008 closed using the control switch. ****CRITICAL STEP****

SAT/UNSAT

Step 21 – Recognize RCIC TURBINE TRIP failed to actuate.

RCIC TURBINE TRIP failure recognized. SAT/UNSAT

Step 22 – RCIC Turbine tripped using the trip pushbutton on the RTGB.

RCIC turbine tripped using the manual pushbutton. SAT/UNSAT

Step 23 – Notify the SCO that RCIC had failed to isolate automatically on a valid signal and that RCIC has been isolated and tripped by operator action.

SCO notified of RCIC status. SAT/UNSAT

TERMINATING CUE: When the 2-E51-F007 and 2-E51-F008 are CLOSED and the SCO is informed of the status, this JPM is complete.

TIME COMPLETED __________

RCIC EXHAUST DIAPHRAGM FAILURE WITH A RCIC FAILURE TO ISOLATE

RELATED TASKS:

217000 K1.07 3.1/3.2 Knowledge of the physical connections and /or cause-effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and Leak Detection.

217000 A2.14 3.3/3.4 Ability to (a) predict the impact of a rupture disc failure: Exhaust-Diaphragm on the Reactor Core Isolation System (RCIC); and (b) based on those predictions, mitigate the consequences of the abnormal condition.

REFERENCES:
0PT-10.1.1, Rev. 89
TOOLS AND EQUIPMENT:
None.
SAFETY FUNCTION (from NUREG 1123, Rev 2.):
5 – Containment Integrity

Time Required for Completion: 15 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate	**Actual**		Unit: 2
Setting:	Control Room	**Simulator**		
Time Critical:	Yes **No**	Time Limit	N/A	
Alternate Path:	**Yes** No			

EVALUATION
Trainee:
JPM: Pass Fail

Remedial

Comments:

TASK CONDITIONS:

1. The plant is in Mode 1.
2. 0PT-10.1.1, RCIC System Operability Test, is in progress.
3. Personnel are in the field in support of the RCIC surveillance.
4. All pre-job and ALARA briefs have been completed.
5. The HP Window has been notified of the anticipated rad level changes when steam is admitted to the RCIC turbine.
6. Brunswick Security personnel have been notified of restricted access to the Unit 2 -17 foot elevation during the RCIC operation.
7. 0PT-10.1.1 has been completed up to, and including, 7.9.4.

INITIATING CUE:

You are directed by the Unit SCO to continue with the performance of 0PT-10.1.1 beginning with Step 7.10.1. The 2-E51-F022, RCIC Bypass to the CST Valve, is to be throttled open by holding the valve control switch in the Open position for approximately 3 seconds.

KEY

Progress Energy | BRUNSWICK NUCLEAR PLANT | **C** **Continuous Use**

DATE COMPLETED ______________________
UNIT ______ % PWR__________GMWE__________
SUPERVISOR______________________________
REASON FOR TEST (check one or more):
____ Routine surveillance
____ WO # ______________________________
____ Other (explain)_____________________

FREQUENCY:

A. Once every 92 days in Modes 1, 2, and 3.
B. Leakage Walkdown – at least once per 24 months.

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT 0

0PT-10.1.1

RCIC SYSTEM OPERABILITY TEST

REVISION 89

1.0 PURPOSE

1.1 This test is performed to determine the operability of the RCIC System in conformance with the requirements specified in the ASME Boiler and Pressure Vessel Code, Section XI, ASME/ANSI-OM-CODE, and Technical Specifications 5.5.6, TRM 3.14 and SR 3.5.3.3, SR 3.6.1.6.1, and SR 3.6.1.6.2. It also satisfies Technical Specification SR 3.6.2.1.1 to monitor suppression pool temperature at least every five minutes while adding heat and Technical Specification 5.5.2 for leak tightness inspection every 24 months.

1.2 The following test quantities shall be measured, observed, or calculated as applicable:

1.2.1 Valve stem travel or disk movement

1.2.2 Pump discharge pressure

1.2.3 Pump flow rate

1.2.4 Reactor pressure

1.2.5 Turbine speed (rpm)

1.2.6 Pump suction pressure (stopped and running)

1.2.7 Pump vibration velocity

1.2.8 Pump lubricant level/pressure

1.2.9 Pump differential pressure (calculated)

2.0 REFERENCES

R1 2.1 Technical Specifications 3.5.3.3, 3.6.1.6.1, 3.6.1.6.2, 3.6.2.1.1, 5.5.2a & b, 5.5.6, TRM 3.14

2.2 FSAR, Section 7.4.1

2.3 1(2)OP-10, Standby Gas Treatment System Operating Procedure

2.4 1(2)OP-16, Reactor Core Isolation Cooling System Operating Procedure

2.0 REFERENCES

2.5 1(2)OP-17, Residual Heat Removal System Operating Procedure

2.6 1(2)OP-51, DC Electrical System Operating Procedure

2.7 1(2)OP-59, Hydrogen Water Chemistry System Operating Procedure

2.8 0OI-65, Operation of IRD Model 890 Data Collector

2.9 SD-16, Reactor Core Isolation Cooling System Description

2.10 ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition

2.11 ANSI/ASME, OM-1987, "Operation and Maintenance of Nuclear Power Plants," w/OMa-1988 Addenda

2.12 0PT-02.3.1, Suppression Chamber To Drywell Vacuum Breakers Operability Test

2.13 0PT-02.3.1b, Suppression Pool to Drywell Vacuum Breaker Position Indication Check

2.14 0ENP-16.1, IST Pump and Valve Data

2.15 0ENP-17, Pump and Valve Inservice Testing (IST)

2.16 NUREG-0737, Item III.D.1.1, Integrity of Systems Outside Containment Likely to Contain Radioactive Material for Pressurized Water Reactors and Boiling Water Reactors

R17 2.17 CP&L Response to NRC Bulletin 88-04, Potential Safety-Related Pump Loss

R18 2.18 GE SIL No. 106 Rev. 2, Suppression Pool Temperature Monitoring and Control

R19 2.19 SOER 89-1, Testing of Steam Turbine/Pump Overspeed Trip Devices

2.20 GE SIL 623, RCIC Pump Discharge Pressure

2.21 EGR-NGGC-0010, System & Component Trending Program and System Libraries

2.22 0ENP-23, Predictive Maintenance Program

2.0 REFERENCES

2.23 Piping Diagram, D-02529, SH.1, Reactor Core Isolation Cooling System, Unit 2

2.24 Piping Diagram, D-02529, SH.2, Reactor Core Isolation Cooling System, Unit 2

2.25 Piping Diagram, D-25029, SH.1, Reactor Core Isolation Cooling System, Unit 1

2.26 Piping Diagram, D-25029, SH.2, Reactor Core Isolation Cooling System, Unit 1

2.27 NUREG 1482, Guidelines For Inservice Testing at Nuclear Power Plants

2.28 0FPP-005, Fire Watch Program

R29 2.29 SOER 01-01, Unplanned Radiation Exposure, Recommendation 6d

3.0 PRECAUTIONS AND LIMITATIONS

3.1 The following annunciators may alarm during the performance of this test:

3.1.1 *RCIC TURBINE TRIPPED* (A-03 5-3)

3.1.2 *RCIC VACUUM TANK PRESS HI* (A-03 6-4)

3.1.3 *RCIC TURB OIL PRESS LO* (A-03 5-4)

3.1.4 *RCIC PUMP DISCH FLOW LO* (A-03 3-4)

3.2 Test Information Attachments 2 and 3 shall be reviewed by the IST group.

3.3 Suppression pool water shall not be injected into the reactor vessel during the performance of this test.

3.0 PRECAUTIONS AND LIMITATIONS

R1 3.4 Confirm suppression pool average temperature less than 105°F every 5 minutes when adding heat to the suppression pool as required by SR 3.6.2.1.1.

3.4.1 When suppression pool average water temperature is greater than 95°F, then suppression pool temperature shall be logged at 30 minute intervals.

R18 3.5 When the RCIC System is discharging steam into the suppression pool, then suppression pool cooling should be in service to insure proper mixing for the best possible indication of average water temperature.

3.6 Suppression pool cooling should be placed in service prior to starting RCIC turbine operation. Both RHR Loops may be required for suppression pool cooling if average cooling water inlet temperature is greater than 80°F.

3.7 Suppression pool average water temperature may be monitored using Process Computer points G050 and G051 for operator convenience. However, Technical Specifications function must be verified using the SPTMS temperature recorders *CAC-TR-4426-1A(2A)* and *CAC-TR-4426-1B(2B)*.

R1 3.8 If average suppression pool temperature reaches 104°F, then RCIC System should be shut down. The maximum allowable suppression pool temperature during testing which adds heat to the suppression pool is 105°F (LCO 3.6.2.1 Action C).

R1 3.9 If average suppression pool temperature exceeds 110°F, then the reactor must be scrammed in accordance with Tech Spec 3.6.2.1.

3.10 When evolutions are in progress that have the potential to change suppression pool level, then a second operator is necessary to monitor suppression pool level.

R17 3.11 Operation of the RCIC System under minimum flow conditions with *MIN FLOW BYPASS TO TORUS VLV, E51-F019*, open should be minimized to reduce suppression pool level increases.

3.12 The steam line to the turbine must be completely drained prior to any turbine operation.

3.13 To ensure adequate oil pressure and to prevent exhaust valve chattering, operation of the RCIC turbine below 2000 rpm should be kept to a minimum.

3.0 PRECAUTIONS AND LIMITATIONS

3.14 DC Limitorque valves are limited to a duty cycle of 3 starts in 5 minutes followed by a 50-minute cooldown period except:

3.14.1 Valves *1(2)E51-F013, 1(2)E51-F019, 1(2)E51-F045,* and *1(2)E51-V8* have a duty cycle of 6 starts and,

3.14.2 *1(2)E51-F022* is allowed 9 actuations with an average duration of 3 seconds (or less) with at least 15 seconds between actuations in accordance with guidelines established by ESR 94-00802.

Any valve actuation, whether in the form of a throttle action, a continuous stroke, or any auto-actuated movement, is considered a motor start. Adherence to the duty cycle requirements will minimize DC valve motor failures.

3.15 The RCIC turbine has the potential for failures that could cause personnel injuries. The potential is most significant when the system is initially started after control system maintenance or after an extended period of being idle. Announcing turbine starts and clearing of all personnel below the Reactor Building 20' elevation east half are required during this period of risk. Permission to access this area during initial RCIC turbine roll requires the approval of the Unit SCO.

R1 3.16 Failure to ensure each suppression chamber to drywell vacuum breaker is closed (0PT-02.3.1b for SR 3.6.1.6.1) and functional (0PT-02.3.1 or observing valve position for SR 3.6.1.6.2) will violate Technical Specifications.

3.17 The vibration velocity readings shall be taken at the test positions specified on the Data Sheet. Ensure the probe is located on the correct bearing in accordance with Attachment 6 and in the correct direction as specified on Attachment 2.

3.18 When taking vibration readings, then the accelerometer probe shall be used with the magnetic holder for each test position and the probe must be in firm contact with the bearing housing.

3.19 When taking pressure readings to be recorded on Attachment 2, the indicator/pointer fluctuation should be reduced to a minimum. A valve upstream of the gauge may be throttled to reduce fluctuation. Care should be taken to ensure proper communication between gauge and main flow path.

3.0 PRECAUTIONS AND LIMITATIONS

3.20 The HPCI System should be operable prior to and during the performance of this test, for Mode 1, 2, and 3 testing.

R29

3.21 During RCIC turbine operation using reactor steam, caution should be used when entering the south RHR area and the mini-steam tunnel. A portable radiation monitor should be carried to check for high radiation levels and to prevent inadvertent exposure to personnel.

3.22 Hydrogen injection rate should be minimized, in accordance with 1(2)OP-59 and Chemistry concurrence, during performance of this test to reduce personnel radiation exposure.

3.23 If RCIC System automatic initiation should occur while the RCIC *FLOW CONTROL, E51-FIC-R600*, is in manual (*M*), then the controller shall be immediately returned to automatic (*A*) to allow proper operation of the system. Depressing the *PF* pushbutton on the controller will immediately place the controller in automatic (*A*) at 400 gpm.

3.24 The RCIC System will be inoperable while the mechanical overspeed device is in the tripped position. Therefore, all efforts to quickly reset the device should be made.

3.25 When using temporary test gauges, then the full scale range of each instrument shall be three times the reference value or less, with adequate low range to prevent damage during use.

3.26 If an overspeed event occurs and pump discharge pressure of greater than 1500 psig is noted, then a routine walk down of the SRHR room for leakage should be performed. Engineering should be contacted for estimation of maximum discharge pressure above 1500 psig, in accordance with ESR 99-00507. If no significant joint leakage is noted and the estimated pressure is less than 2000 psig, an Operations Log entry should be made documenting the overpressure event and walkdown. For discharge pressures estimated greater than 2000 psig, Engineering will provide analysis of the piping equipment prior to declaring the system operable following the event.

3.27 During system venting, air is not expected in the system. If air is found, then a W/O should be initiated and the system engineer notified of the condition. The presence of air in the system does not mean the system is inoperable but can imply component degradation that must be addressed at some point. The test may be continued provided the air in the system is removed by the normal venting process.

3.0 PRECAUTIONS AND LIMITATIONS

3.28 The local lube oil sight glass has a scale that indicates a normal level range. The oil level should be in the normal range when the turbine lube oil system has been shutdown for a while (up to 24 hours may be needed for the level to stabilize after a turbine run). When the turbine lube oil system is in operation, oil level will normally drop and take time to return to the "standstill" normal level in the sight glass, this is not a problem as long as there is visible oil in the sight glass.

4.0 PREREQUISITES

4.1 No other testing or maintenance is in progress that will adversely affect the performance of this test.

4.2 The SBGT System is in standby in accordance with 1(2)OP-10.

4.3 RCIC System is in standby in accordance with 1(2)OP-16.

4.4 The station battery chargers are in operation in accordance with 1(2)OP-51.

R1 4.5 The suppression pool level is between -27 inches and -31 inches.

4.6 Ensure maintenance is available to take oil samples when the run is complete.

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Confirm no active corrective maintenance WO exists on the following installed instruments. **IF** any active WO exists, **THEN** operability of the instrument must be resolved and recorded in the General Comments and Recommendations section before the instrument may be used.

	Instrument	WO	WO #
5.1.1	*E51-FT-N003*	yes/no	
5.1.2	*E51-FIC-R600*	yes/no	
5.1.3	*E51-PT-N004*	yes/no	
5.1.4	*E51-PI-R601*	yes/no	
5.1.5	*E51-PI-R001*	yes/no	
5.1.6	*E51-PI-R004*	yes/no	
5.1.7	*E51-PT-N007*	yes/no	
5.1.8	*E51-PI-R602*	yes/no	
5.1.9	*E51-PT-N008*	yes/no	
5.1.10	*E51-PI-R603*	yes/no	
5.1.11	*E51-PI-3005*	yes/no	
5.1.12	*C32-PT-N008*	yes/no	
5.1.13	*C32-PR-R609*	yes/no	
5.1.14	*E51-PI-R002*	yes/no	
5.1.15	*E51-PI-R003*	yes/no	
5.1.16	*C32-PT-N005A*	yes/no	
5.1.17	*C32-PT-N005B*	yes/no	
5.1.18	*C32-LPR-R608*	yes/no	
5.1.19	*E51-C002-2*	yes/no	
5.1.20	*E51-C002-EGM*	yes/no	
5.1.21	*E51-C002-MAG-PU*	yes/no	

5.0 SPECIAL TOOLS AND EQUIPMENT

5.2 Suitable test gauges may be used to obtain data in place of any installed instrument. If used, then record the following information:

ID No. ______ N/A ______
Range of instrument ____________
Cal date ____________
Cal due date ____________
Parameter being measured ______ N/A ______

ID No. ______ N/A ______
Range of instrument ____________
Cal date ____________
Cal due date ____________
Parameter being measured ______ N/A ______

5.3 Tubing, valves, and fittings to install test gauges (as required).

5.4 Predictive Maintenance personnel will provide the vibration monitoring equipment they will use to collect vibration data. Record the required data below:

Data Collector ID No. ____________
Transducer ID No. ____________
Data Collector/transducer cal date ____________
Data Collector/transducer cal due date ____________

5.5 Portable speed indicator. If used, then record the following information:

ID No. ____________
Cal date ____________
Cal due date ____________

5.6 Vent and drain rig.

6.0 ACCEPTANCE CRITERIA

This procedure may be considered satisfactory when the following criteria are met:

6.1 Pump Tests

R1

6.1.1 The RCIC System develops a flow rate of greater than or equal to 400 gpm with a pump discharge pressure of greater than or equal to 1125 psig when the steam supply pressure is between 945 psig and 1045 psig.

6.1.2 The pump test data shall be compared to the allowable ranges identified on Test Information Attachment 2.

6.1.3 If deviations fall within the ALERT RANGE of Attachment 2, then the frequency of testing shall be doubled until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set of reference values established per OMa-1988, Paragraph 6.1.

6.1.4 If the deviations fall within the REQUIRED ACTION RANGE of Attachment 2, the pump shall be declared inoperable and not returned to service until the condition has been corrected.

6.1.5 If completed test results show deviations outside the allowable ACCEPTANCE VALUE, the instrument(s) involved may be re-calibrated and the test rerun. This shall not preclude declaring the pump inoperable.

6.1.6 Deviations from the standard methods of testing will be specified in the procedure.

6.2 Check Valve Exercising

6.2.1 Valve exercising to the full open position shall be satisfied by demonstrating the ability to pass maximum accident condition flow. Flow rates less than maximum accident flow are considered partial exercise tests.

6.2.2 Valve exercising to the closed position shall be considered satisfactory by demonstrating the ability to establish a differential pressure across the valve seat or by opening an upstream drain connection and confirming the absence of pressurized flow with pressure on the downstream side.

6.0 ACCEPTANCE CRITERIA

6.3 Leak Tightness Examination

6.3.1 Identified leakage is recorded on Attachment 4, Leak Identification Data Sheet, and a Work Request (WR) is initiated for any leakage with the exception of packing and gasket leakage less than 5 drops per minute (dpm). The WR shall state that identified leakage is required to be corrected or minimized as required by TS 5.5.2.

6.3.2 For 'through-wall' or 'through-weld' leakage, a Nuclear Condition Report (NCR) is initiated to assess structural integrity of the affected component.

7.0 PROCEDURAL STEPS

Initials

7.1 **OBTAIN** permission from the Unit SCO to perform this test.

R1 7.2 **CONFIRM** reactor pressure is between 945 psig and 1045 psig.

7.2.1 **IF** reactor pressure is less than 945 psig, **THEN SLOWLY INCREASE** the setpoint of the pressure regulator to attain at least 945 psig. N/A

NOTE:	Fire watch inspections in the 20' ECCS room should be coordinated with Security to ensure they are completed as required while performing this test. 0FPP-005 requires a fire watch inspection in the 20' ECCS Room once every clock hour. Additionally, 30 minutes should elapse between fire watch inspections in an area. Fire watch inspections established for impairments in areas that could be affected by this test should be coordinated also.

7.3 **CONTACT** Security **AND COORDINATE** fire watch inspections.

7.4 **PERFORM** the following notifications:

7.4.1 **NOTIFY** E&RC of the estimated time of RCIC turbine operation.

7.4.2 **WHEN** available, **THEN NOTIFY** I&C and Maintenance Supervisors of RCIC turbine and pump run so they can observe operation, if desired.

7.5 **ENSURE** prerequisites listed in Section 4.0 are met.

7.6 **ENSURE** the required data has been recorded in Section 5.0.

7.7 **ENSURE** RHR is in the suppression pool cooling mode, in accordance with 1(2)OP-17.

7.8 **PERFORM** the following to place the SBGT in service:

7.8.1 **IF** HPCI is **NOT** in standby, **THEN ENSURE** HPCI *VACUUM PUMP DISCHARGE TO SBGT SYSTEM VALVE, E41-V30,* is open. N/A

7.0 PROCEDURAL STEPS

Initials

7.8.2 **START** SBGT in accordance with 1(2)OP-10. Y

7.8.3 **ENSURE** the following valves are open:

1. *POST LOCA VENT, SGT-V8.* Y
2. *POST LOCA VENT, SGT-V9.* Y

7.9 Verification of Filled Discharge Piping

CAUTION

During system venting, air is **NOT** expected in the system. **IF** air is found, then a W/R should be initiated and the system engineer notified of the condition. The presence of air in the system does **NOT** mean the system is inoperable but can imply component degradation that must be addressed at some point. The test may be continued provided the air in the system is removed by the normal venting process.

7.9.1 **IF** required, **THEN CONNECT** a vent and drain rig to *RCIC PUMP DISCHARGE HEADER VENT VALVE, E51-V33.* N/A

7.9.2 **THROTTLE OPEN** *RCIC PUMP DISCHARGE HEADER VENT VALVE, E51-V33.* Y

7.9.3 **WHEN** a solid stream of water issues from the vent, **THEN CLOSE** *RCIC PUMP DISCHARGE HEADER VENT VALVE, E51-V33.* Y

7.9.4 **IF** desired, **THEN REMOVE** the vent and drain rig. N/A

7.0 PROCEDURAL STEPS

Initials

R29

> **CAUTION**
>
> Performance of this section has the potential to significantly increase area dose rates. During RCIC turbine operation using reactor steam, caution should be used when personnel are entering the south RHR area and the mini-steam tunnel. A portable radiation monitor should be carried to check for high radiation levels and to prevent inadvertent exposure to any personnel entering the area.

7.10 Pump Operability Testing

7.10.1 **OPEN** *COND PUMP DISCH INBD DRAIN VLV, E51-F004*. _____

1. **CONFIRM** *RCIC SYSTEM PRESS LOW* (A-02 2-6) annunciator is clear. _____

7.10.2 **ENSURE** the RCIC lubricant oil level is normal. _____

7.10.3 **RECORD** RCIC pump suction pressure (stopped) indicated on *E51-PI-R002* (local) on Attachment 2. _____

> **NOTE:** A suction pressure of greater than or equal to 29 psig confirms RCIC *CONDENSATE CHECK VALVE TO PUMP, E51-F011*, and *RCIC CONDENSATE PUMP DISCHARGE LINE CHECK VALVE, E51-F047*, are closed.

7.10.4 **IF** RCIC pump suction pressure is greater than or equal to 29 psig, **THEN RECORD** RCIC *CONDENSATE CHECK VALVE TO PUMP, E51-F011* and *RCIC CONDENSATE PUMP DISCHARGE LINE CHECK VALVE, E51-F047* are closed on Attachment 3. _____

7.10.5 **IF** RCIC suction pressure is **NOT** greater than or equal to 29 psig, **THEN PERFORM** the following:

1. **RECORD** RCIC suction pressure and CST level in the Comments Section of Attachment 1. _____

2. **SLOWLY THROTTLE OPEN** *RCIC KEEPFILL STATION BYPASS VALVE, E51-V70*, while monitoring RCIC suction pressure. _____

7.0 PROCEDURAL STEPS

Initials

3. **IF** RCIC suction pressure increases to greater than or equal to 29 psig **THEN PERFORM** the following:

   a. **IMMEDIATELY CLOSE** *RCIC KEEPFILL STATION BYPASS VALVE, E51-V70.* _____

   b. **RECORD** RCIC *CONDENSATE CHECK VALVE TO PUMP, E51-F011* and *RCIC CONDENSATE PUMP DISCHARGE LINE CHECK VALVE, E51-F047* are closed on Attachment 3. _____

4. **IF** RCIC suction pressure does **NOT** increase to greater than or equal to 29 psig **AND** flow is evident through the keepfill bypass line, **THEN PERFORM** the following:

   a. **CLOSE** *RCIC KEEPFILL STATION BYPASS VALVE, E51-V70.* _____

   b. **NOTIFY** the Unit SCO that the *E51-F011* and *E51-F047* valve positions could **NOT** be confirmed closed. _____

   c. **NOTIFY** Engineering for determination. _____

NOTE:	Technical Specifications 3.6.1.6.2 (Modes 1, 2, or 3) requires completion of 0PT-02.3.1, Suppression Chamber To Drywell Vacuum Breakers Operability Test, within 12 hours following an operation that causes any of the vacuum breakers to open. The test is **NOT** required if vacuum breakers are monitored and determined to remain closed.

7.10.6 **IF** desired, **THEN ESTABLISH MONITORING** of the suppression chamber to drywell vacuum breakers. _____

7.10.7 **CLOSE** *COND PUMP DISCH INBD DRAIN VLV, E51-F004.* _____

7.10.8 **OPEN** *REDUNDANT ISOL TO CST VLV, E41-F011.* _____

7.10.9 **START** *BAROMETRIC CNDSR VACUUM PUMP.* _____

7.10.10 **OPEN** *COOLING WATER SUPPLY VLV, E51-F046.* _____

7.0 PROCEDURAL STEPS

Initials

NOTE:	The System Engineer may have trend data that will assist in positioning *BYPASS TO CST VLV, E51-F022*, as needed (ESR 99-00507).

7.10.11 **THROTTLE OPEN** *BYPASS TO CST VLV, E51-F022*, 2 to 4 seconds, unless otherwise directed by the Unit SCO. _____

7.10.12 **DISPATCH** an auxiliary operator to observe the system discharge piping for excessive motion and water hammer during startup of the RCIC System. _____

CAUTION

During the initial startup transient, it is possible for the turbine exhaust rupture discs to release steam. Personnel access below the Reactor Building 20' elevation east half during RCIC initial roll is prohibited. Exceptions require Unit SCO permission.

7.10.13 **EVACUATE** all personnel below the Reactor Building 20' elevation east half. _____

7.10.14 **MONITOR** suppression pool temperature at intervals less than or equal to 5 minute to ensure the average suppression pool temperature is less than 104°F. _____

NOTE:	**WHEN** evolutions are in progress with the potential to change suppression pool level, **THEN** a second operator is necessary to monitor suppression pool level.

CAUTION

IF the average suppression pool temperature reaches 104°F, **THEN** testing which adds heat should be terminated.

CAUTION

IF the average suppression pool temperature reaches 110°F, **THEN** the reactor must be manually scrammed to comply with Technical Specifications.

7.10.15 **OPEN** *TURBINE STEAM SUPPLY VLV, E51-F045*. _____

7.0 PROCEDURAL STEPS

Initials

7.10.16 **CONFIRM** RCIC turbine starts and develops a flow of greater than or equal to 400 gpm **AND RECORD** the start time below: _____

____

NOTE:	Depending upon the number of valve motor starts required in the following step, consideration may be given to manually throttling the valve.
NOTE:	The required test flow/pressure condition can usually be obtained by increasing the flow controller setpoint to between 480 and 500 gpm, and then throttling *E51-F022* in 0.5 to 1.0 second increments.

CAUTION

1(2) E51-F022 is allowed nine actuations with an average duration of 3 seconds (or less) with at least 15 seconds between actuations in accordance with guidelines established by ESR 94-00802. Any valve actuation, whether in the form of a throttle action, a continuous stroke, or any auto-actuated movement, is considered a motor start. Adherence to the duty cycle requirements will minimize DC valve motor failures.

7.10.17 **ADJUST** RCIC *FLOW CONTROL, E51-FIC-R600*, and *BYPASS TO CST VLV, E51-F022*, as necessary, to obtain a pump discharge pressure of greater than or equal to 1130 psig with a pump flow rate of greater than or equal to 400 gpm. _____

7.10.18 **RECORD** the following **AND CIRCLE** the indicator used when appropriate:

1. Pump discharge pressure on *E51-PI-R601*. _____

   _______________psig

2. Pump flow rate on *E51-FIC-R600*. _____

   _______________gpm

3. Reactor pressure on *C32-R609* **OR** *C32-R608*. _____

   _______________psig

7.0 PROCEDURAL STEPS

Initials

4. Steam inlet pressure on *E51-PI-R602* **OR** *E51-PI-R003* (local). _____

_______________psig

5. Steam exhaust pressure on *E51-PI-R603* **OR** *E51-PI-R004* (local). _____

_______________psig

> **NOTE:** A turbine steam exhaust pressure of less than or equal to 30 psig on *E51-PI-R603* or *E51-PI-R004* (local), confirms *TURBINE EXHAUST CHECK VALVE, E51-F040,* and *TURBINE EXHAUST STOP CHECK VALVE, E51-F001*, are open.

7.10.19 **CONFIRM** turbine steam exhaust pressure is less than or equal to 30 psig **AND RECORD** *TURBINE EXHAUST CHECK VALVE, E51-F040* and *TURBINE EXHAUST STOP CHECK VALVE, E51-F001* are open on Attachment 3. _____

> **NOTE:** Pump operation should remain as stable as possible during the examination.
>
> **NOTE:** A leakage walkdown is required to be performed every 24 months in accordance with TS 5.5.2.

7.10.20 **IF** required, **THEN PERFORM** a leak tightness examination of components identified on Attachment 7, **AND RECORD** any leakage observed on Attachment 4. _____

7.10.21 **WHEN** leak tightness examination is complete **OR** determined **NOT** needed, **THEN PERFORM** the following:

1. **PLACE** RCIC *FLOW CONTROL, E51-FIC-R600,* in manual (*M*). _____

> **NOTE:** Local speed verification using the portable speed indicator is preferred.

2. **ADJUST** RCIC *FLOW CONTROL, E51-FIC-R600,* as necessary, to obtain approximately 2500 rpm. _____

7.0 PROCEDURAL STEPS

Initials

3. **OPEN** *BYPASS TO CST VLV, E51-F022.* _____

4. **SLOWLY OPEN** *E51-PI-R001 INSTRUMENT ISOLATION VALVE, E51-PI-R001-3.* _____

5. **ADJUST** RCIC *FLOW CONTROL, E51-FIC-R600* **OR** *BYPASS TO CST VLV, E51-F022,* as necessary, to attain the reference values given on Attachment 2 in accordance with the following:

   a. Turbine speed of 2500 rpm on *E51-C002-2* **OR** 2485 to 2515 rpm on portable speed indicator. _____

   b. System flow of 465 gpm for Unit 1 (480 gpm for Unit 2). _____

NOTE:	To minimize the potential for delays, it is allowable to check that the pump dP is in the acceptable range shown on Attachment 2 prior to the 2-minute hold period.
NOTE:	The RCIC System shall operate for at least 2 minutes under conditions as stable as the system permits prior to recording test data.

7.10.22 **RECORD** the following information on Attachment 2 **AND CIRCLE** the indicator used:

1. RCIC suction pressure (running) on *E51-PI-R002* (local). _____

2. RCIC discharge pressure on *E51-PI-R001* (local). _____

3. RCIC turbine speed on *E51-C002-2* **OR** strobe tach (local). _____

4. RCIC system flow on *E51-FIC-R600.* _____

5. RCIC pump vibration velocity (in/sec peak) at the test positions designated on Attachment 2. _____

7.10.23 **CLOSE** *E51-PI-R001 INSTRUMENT ISOLATION VALVE, E51-PI-R001-3.* ___/___ Ind.Ver.

7.0 PROCEDURAL STEPS

Initials

NOTE:	Steps 7.10.24 through 7.10.28 may be performed at any time after RCIC is running and may be performed in any sequence, as appropriate, with concurrence from the Unit SCO.

7.10.24 **ENSURE** the RCIC lubricant oil level is normal **AND RECORD** on Attachment 2. _____

NOTE:	Operability of the keep-fill check valves are performed as a pair.
NOTE:	A pressure indication on *E51-PI-R601* greater than *E51-PI-3005* confirms *RCIC KEEPFILL STATION OUTLET CHECK, E51-V72* and *RCIC KEEPFILL STATION OUTLET CHECK VALVE, E51-V73*, are closed.

7.10.25 **IF** pressure indication on *E51-PI-R601* is greater than *E51-PI-3005*, **THEN RECORD** *RCIC KEEPFILL STATION OUTLET CHECK, E51-V72 and RCIC KEEPFILL STATION OUTLET CHECK VALVE, E51-V73,* are closed on Attachment 3. _____

7.10.26 **IF** pressure indication on *E51-PI-3005* is greater than *E51-PI-R601* or *E51-PI-3005* is off-scale high, **THEN PERFORM** the following:

1. **CONNECT** a drain hose at *E51-PI-3005 INSTRUMENT DRAIN VALVE, E51-PI-3005-6,* **AND ROUTE** to floor drain. _____
2. **CLOSE** *RCIC KEEPFILL STATION INLET ISOLATION VALVE, E51-V66.* _____
3. **OPEN** *E51-PI-3005 INSTRUMENT DRAIN VALVE, E51-PI-3005-6,* and drain for at least 3 minutes. _____

NOTE:	The absence of flow under pressure during the following venting sequence confirms one or both of the keep fill check valve(s) (*RCIC KEEPFILL STATION OUTLET CHECK, E51-V72, RCIC KEEPFILL STATION OUTLET CHECK VALVE, E51-V73*) go to the closed position and satisfies reverse exercise requirements. It is acceptable that some drainage will be present.
NOTE:	**IF** the check valve can **NOT** be determined to be closed, **THEN** a W/R shall be written.

4. **CONFIRM** *KEEPFILL STATION OUTLET CHECK, E51-V72*, and *RCIC KEEPFILL STATION OUTLET CHECK VALVE, E51-V73* are closed, **AND RECORD** on Attachment 3. ____

5. **CLOSE** *E51-PI-3005 INSTRUMENT DRAIN VALVE, E51-PI-3005-6.* ___/___ Ind.Ver.

6. **OPEN** *RCIC KEEPFILL STATION INLET ISOLATION VALVE, E51-V66.* ___/___ Ind.Ver.

NOTE:	RCIC System flow of greater than or equal to 400 gpm confirms *CONDENSATE STORAGE TANK SUCTION CHECK VALVE, E51-F011*, and *PUMP DISCHARGE CHECK VALVE, E51-F014*, are open.

7.10.27 **CONFIRM** RCIC System flow is greater than or equal to 400 gpm **AND RECORD** *CONDENSATE STORAGE TANK SUCTION CHECK VALVE, E51-F011* and *PUMP DISCHARGE CHECK VALVE, E51-F014* are open on Attachment 3. ____

7.10.28 **IF** the Unit SCO deems it appropriate for current plant conditions, **THEN CONTINUE** RCIC system operation **AND ADJUST** parameters, as needed to obtain additional data or confirm proper system operation as required within the following: ____

1. Within vendors rated speed range of approximately 2000 rpm to 4600 rpm.

2. Within the flow and pressure limits of the control room flow and discharge pressure indicators, unless specifically authorized by the Unit SCO.

7.0 PROCEDURAL STEPS

Initials

3. Stable system operation if flow is below 120 gpm.

4. Minimize time with *MIN FLOW BYPASS TO TORUS VLV, E51-F019*, open on low flow.

7.10.29 **WHEN** RCIC run is complete, **THEN PERFORM** the following to trip the RCIC turbine:

1. **ENSURE** RCIC *FLOW CONTROL, E51-FIC-R600* in Manual (*M*). _____

2. **IF** RCIC turbine speed is above 2600 rpm, **THEN ADJUST** RCIC *FLOW CONTROL, E51-FIC-R600*, as necessary, to obtain 2400 to 2600 rpm. _____

3. **DEPRESS** *TURBINE TRIP, E51-S17*, push button to trip the RCIC turbine. _____

7.10.30 **CLOSE** *TURBINE STEAM SUPPLY VLV, E51-F045.* _____

7.10.31 **CLOSE** *TURBINE TRIP & THROTTLE VLV, E51-V8*, motor operator **AND HOLD** the control switch in *CLOSE* for approximately 5 seconds after full closed indication to ensure latch mechanism engagement. _____

7.10.32 **OPEN** *TURBINE TRIP & THROTTLE VLV, E51-V8.* _____

7.10.33 **OPEN** *TORUS SUCTION VLV, E51-F031.* _____

7.10.34 **OPEN** *TORUS SUCTION VLV, E51-F029.* _____

7.10.35 **CONFIRM** *CST SUCTION VLV, E51-F010*, closes. _____

7.10.36 **CONFIRM** *BYPASS TO CST VLV, E51-F022*, closes. _____

7.10.37 **OPEN** *TURBINE STEAM SUPPLY VLV, E51-F045.* _____

7.10.38 **CONFIRM** RCIC turbine starts and accelerates. _____

7.10.39 **ADJUST** RCIC *FLOW CONTROL, E51-FIC-R600*, as necessary, to obtain 2400 to 2600 rpm. _____

7.10.40 **CONFIRM** *MIN FLOW BYPASS TO TORUS VLV, E51-F019*, opens. _____

7.0 PROCEDURAL STEPS

Initials

NOTE: *PUMP SUCTION CHECK VALVE, E51-F030*, and *MINIMUM FLOW CHECK VALVE, E51-F021*, are confirmed to go to the partially open position when RCIC flow changes are heard when stroking *MIN FLOW BYPASS TO TORUS VLV, E51-F019*.

CAUTION
Operation of the RCIC turbine with no flow path should be minimized to prevent pump damage.

7.10.41 **CLOSE** *MIN FLOW BYPASS TO TORUS VLV, E51-F019*. _____

7.10.42 **ENSURE** *MIN FLOW BYPASS TO TORUS VLV, E51-F019*, re-opens. _____

7.10.43 **CONFIRM** *PUMP SUCTION CHECK VALVE, E51-F030* and *MINIMUM FLOW CHECK VALVE, E51-F021* partially open **AND RECORD** on Attachment 3. _____

NOTE: For purposes of this procedure, the tripping of the RCIC turbine will denote "completion of steam discharge to the Suppression Chamber" for purposes of Tech Spec surveillances SR 3.6.1.6.1 (0PT-02.3.1b) and SR 3.6.1.6.2 (0PT-02.3.1).

R19 7.10.44 **DEPRESS** the local mechanical overspeed device trip lever to trip the RCIC turbine **AND RECORD** the time below. _____

____

7.10.45 **CLOSE** *TURBINE STEAM SUPPLY VLV, E51-F045*. _____

7.10.46 **CLOSE** *TURBINE TRIP & THROTTLE VLV, E51-V8*, motor operator **AND HOLD** the control switch in *CLOSE* for approximately 5 seconds after full closed indication to ensure latch mechanism engagement. _____

7.10.47 **RESET** the mechanical trip overspeed device in accordance with 1(2)OP-16. _____

7.0 PROCEDURAL STEPS

Initials

7.10.48 **OPEN** *TURBINE TRIP & THROTTLE VLV, E51-V8.* _____

7.10.49 **IF NOT** needed for HPCI operation, **THEN CLOSE** *REDUNDANT ISOL TO CST VLV, E41-F011.* _____

7.10.50 **PLACE** RCIC *FLOW CONTROL, E51-FIC-R600*, in automatic (*A*). _____

NOTE: Technical Specification 3.6.1.6.1 (Modes 1, 2, or 3) requires completion of 0PT-02.3.1b, Suppression Pool to Drywell Vacuum Breaker Position Check, within 6 hours after any discharge of steam to the suppression chamber from any source.

NOTE: Step 7.10.51 documents compliance with Technical Specifications and may be completed as required during the performance of the procedure.

R1 7.10.51 **IF** in Modes 1, 2, or 3, **THEN ENSURE** 0PT-02.3.1b, Suppression Pool to Drywell Vacuum Breaker Position Check, is completed within 6 hours after any discharge of steam to the suppression chamber from any source. _____

NOTE: Technical Specification 3.6.1.6.2 (Modes 1, 2, or 3) requires the suppression chamber to drywell vacuum breakers to remain closed **OR** completion of 0PT-02.3.1, Suppression Chamber to Drywell Vacuum Breakers Operability Test, within 12 hours following an operation that caused any of the vacuum breakers to open.

NOTE: Step 7.10.52 documents compliance with Technical Specifications and may be completed as required during the performance of the procedure.

R1 7.10.52 **IF** in Modes 1, 2, or 3, **THEN PERFORM** one of the following:

1. **CONFIRM** suppression chamber to drywell vacuum breakers remained closed. _____

OR

2. 0PT-02.3.1, Suppression Chamber to Drywell Vacuum Breakers Operability Test, is completed within 12 hours following an operation that causes any of the vacuum breakers to open. _____

7.0 PROCEDURAL STEPS

Initials

7.10.53 **NOTIFY** Maintenance to sample RCIC turbine oil, as follows, within 2 hours: _____

1. **UNCAP AND OPEN** *RCIC TURBINE OIL SAMPLE VALVE, E51-TOSV-1*, to collect approximately 1 cup of oil to purge the sample line. _____

2. **OBTAIN** oil sample. _____

3. **CLOSE AND CAP** *RCIC TURBINE OIL SAMPLE VALVE, E51-TOSV-1.* ___/___ Ind.Ver.

7.10.54 **CLOSE** *COOLING WATER SUPPLY VLV, E51-F046.* _____

7.10.55 **CLOSE** *TORUS SUCTION VLV, E51-F031.* _____

7.10.56 **CLOSE** *TORUS SUCTION VLV, E51-F029.* _____

7.10.57 **OPEN** *CST SUCTION VLV, E51-F010.* _____

7.10.58 **IF** desired, **THEN SECURE** RHR from the Suppression Pool Cooling mode in accordance with 1(2)OP-17. _____

7.10.59 **WHEN** 15 minutes have elapsed after securing the RCIC Turbine, **THEN PERFORM** the following:

1. **STOP** *BAROMETRIC CNDSR VACUUM PUMP.* _____

2. **PLACE** *BAROMETRIC CNDSR VACUUM PUMP* control switch in *AUTO.* _____

7.10.60 **IF** desired, **THEN RETURN** SBGT to standby in accordance with 1(2)OP-10. _____

7.0 PROCEDURAL STEPS

Initials

NOTE:	ERFIS computer points EHCPA002 and EHCPA003, in Group Point Display # 38, may be accessed to more precisely adjust the pressure regulator setpoint.

7.10.61 **IF** the pressure regulator setpoint was increased to support RCIC testing **AND** surveillance testing requiring a reactor pressure of 945 psig is complete, **THEN SLOWLY DECREASE** the pressure regulator setpoint to 928 psig. _____

7.11 RCIC System Restoration

NOTE:	Completion of this section will return the RCIC System to standby in accordance with 1(2)OP-16.

7.11.1 **STOP** suppression pool temperature monitoring **AND RECORD** the maximum average temperature achieved during this test. _____

___________°F

7.11.2 **ENSURE** proper oil level is maintained at the RCIC turbine (visible in sight glass per Precaution and Limitation 3.29). _____

7.0 PROCEDURAL STEPS

Initials

7.11.3 **ENSURE** the valves listed below are in the position as indicated:

Valve No.	Valve Description	Position	Checked	Verified
E51-V9	Turbine Governor Valve	OPEN		
E51-F019	Min Flow Bypass To Torus Vlv	CLOSED		
E51-F022	Bypass To CST Vlv	CLOSED		
E51-F066	Turbine Exh Vac Bkr Vlv	OPEN		
E51-F062	Turbine Exh Vac Bkr Vlv	OPEN		
E51-F010	CST Suction Vlv	OPEN		
E51-F031	Torus Suction Vlv	CLOSED		
E51-F029	Torus Suction Vlv	CLOSED		
E51-F012	Pump Discharge Vlv	OPEN		
E51-F008	Steam Supply Outboard Isol Vlv	OPEN		
E51-F007	Steam Supply Inboard Isol Vlv	OPEN		
E51-F045	Turbine Steam Supply Vlv	CLOSED		
E51-F013	RCIC Injection Vlv	CLOSED		
E51-F025	Supply Drain Pot Inbd Drain Vlv	OPEN		
E51-F026	Supply Drain Pot Otbd Drain Vlv	OPEN		
E51-F054	Supply Drain Pot Drain Byp Vlv	CLOSED		
E51-F046	Cooling Water Supply Vlv	CLOSED		
E51-F004	Cond Pump Disch Inbd Drain Vlv	CLOSED		
E51-F005	Cond Pump Disch Otbd Drain Vlv	OPEN		
E41-F011	Redundant Isol To CST Vlv	CLOSED		
E51-V33	RCIC Pump Discharge Header Vent Valve	CLOSED		
E51-V70	RCIC Keepfill Station Bypass Valve	CLOSED		

7.0 PROCEDURAL STEPS

Initials

7.11.4 **ENSURE** *TURBINE TRIP AND THROTTLE VLV* (Actuator Position), *E51-V8*, is open. ____/____ Ind.Ver.

7.11.5 **ENSURE** *TURBINE TRIP AND THROTTLE VLV* (Valve Position), *E51-V8*, is open. ____/____ Ind.Ver.

7.11.6 **IF** installed, **THEN REMOVE** the drain hose at *E51-PI-3005 INSTRUMENT DRAIN VALVE, E51-PI-3005-6.* ______

7.11.7 **ENSURE** the following for RCIC *FLOW CONTROL, E51-FIC-R600*:

1. In automatic (*A*) position. ____/____ Ind.Ver.
2. Setpoint set at 400 gpm. ____/____ Ind.Ver.
3. Yellow *ALM* light off. ____/____ Ind.Ver.
4. Red *FAIL* light off. ____/____ Ind.Ver.

7.11.8 **ENSURE** *TURBINE SPEED TEST SELECTOR* switch in *NORMAL.* ____/____ Ind.Ver.

7.11.9 **ENSURE** *TURBINE TEST POWER* switch is *OFF.* ____/____ Ind.Ver.

7.11.10 **ENSURE** *BAROMETRIC CNDSR VACUUM PUMP* is **NOT** running. ____/____ Ind.Ver.

7.11.11 **ENSURE** *BAROMETRIC CNDSR VACUUM PUMP* control switch in *AUTO.* ____/____ Ind.Ver.

7.11.12 **ENSURE** *BAROMETRIC CNDSR CONDENSATE PUMP* is **NOT** running. ____/____ Ind.Ver.

7.11.13 **ENSURE** *BAROMETRIC CNDSR CONDENSATE PUMP* control switch in *AUTO.* ____/____ Ind.Ver.

7.11.14 **IF** ERFIS is available, **THEN REQUEST** STA or other knowledgeable individual to obtain ERFIS data in accordance with Attachment 5. ______

7.0 PROCEDURAL STEPS

Initials

7.11.15 **ENSURE** the required information has been recorded on the cover page. _____

7.11.16 **NOTIFY** IST group when data has been recorded on Test Information Attachments 2 and 3 **AND DOCUMENT** the following information: _____

IST ________________ Date________ Time _______
Name

7.11.17 **NOTIFY** Unit SCO when this test is complete or found to be unsatisfactory. _____

Certification and Review Form

General Comments and Recommendations ______________________________

	Initials	Name (Print)
Test procedure performed by:	Y	L. McGersey

Exceptions to satisfactory performance ______________________________

Corrective action required ______________________________

> **NOTE:** Pump test data shall be analyzed within 96 hours after completion of this PT. Unit SCO review/approval of the PT satisfies this ASME Code requirement.

Test procedure has been satisfactorily completed
Unit SCO: ______________________________ __________
Signature Date

Test procedure has **NOT** been satisfactorily completed
Unit SCO: ______________________________ __________
Signature Date

Test procedure has been reviewed by:
Shift Superintendent: ______________________________ __________
Signature Date

RCIC Pump Data Sheet

UNIT 1

Discharge pressure – suction pressure (running) = delta P (dP)

N/A - N/A = N/A

Lubricant level normal N/A

NOTES: 1. Pump vibration is measured at the test point marked on the pump for the correct bearing number and direction as indicated by the Test Position number as follows:
- the number indicates the bearing number from Attachment 6
- for direction, A = Axial, H = Horizontal, V = Vertical

2. The magnetic holder is to be used with the accelerometer probe for all vibration readings.

TEST PARAMETER	ACTUAL VALUE	REFERENCE VALUE	ACCEPTANCE VALUE	ALERT RANGE		REQUIRED ACTION RANGE	
				LOW	HIGH	LOW	HIGH
Suction Press. (Stopped) psig	N/A	N/A	≥ 8	N/A	N/A	< 8	N/A
Suction Press. (Running) psig		N/A	N/A	N/A	N/A	N/A	N/A
Discharge Press. psig		N/A	N/A	N/A	N/A	N/A	N/A
Pump DP psid		275	247.5 to 302.5	N/A	N/A	< 247.5	> 302.5
Flow Rate gpm		465	N/A	N/A	N/A	N/A	N/A
Pump Speed rpm		2500	2485-2515*	N/A	N/A	N/A	N/A
Vibration-vel (in/sec peak) Position 3 H		0.114	0 to 0.285	N/A	> 0.285 to 0.684	N/A	> 0.684
Vibration-vel (in/sec peak) Position 3 V		0.074	0 to 0.185	N/A	> 0.185 to 0.444	N/A	> 0.444
Vibration-vel (in/sec peak) Position 4 A		0.105	0 to 0.262	N/A	> 0.262 to 0.630	N/A	> 0.630
Vibration-vel (in/sec peak) Position 4 H		0.138	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/sec peak) Position 4 V	N/A	0.089	0 to 0.222	N/A	> 0.222 to 0.534	N/A	> 0.534

*Range given in Acceptance Value only applicable when using a portable speed indicator.

ATTACHMENT 2
Page 2 of 4
RCIC Pump Data Sheet

UNIT 1

Performed by: (Signature) N/A Date: N/A Time: N/A

IST Group: (Signature) N/A Date: N/A Time: N/A

CORRECTIVE ACTION

1. Any required corrective action shall be performed in accordance with Section 6.0, Acceptance Criteria.

RCIC Pump Data Sheet

UNIT 2

Discharge pressure – suction pressure (running) = delta P (dP)

____________ - ____________ = ____________

Lubricant level normal____________

NOTES: 1. Pump vibration is measured at the test point marked on the pump for the correct bearing number and direction as indicated by the Test Position number as follows:
- the number indicates the bearing number from Attachment 6
- or direction, A = Axial, H = Horizontal, V = Vertical

2. The magnetic holder is to be used with the accelerometer probe for all vibration readings.

TEST PARAMETER	ACTUAL VALUE	REFERENCE VALUE	ACCEPTANCE VALUE	ALERT RANGE		REQUIRED ACTION RANGE	
				LOW	HIGH	LOW	HIGH
Suction Press. (Stopped) psig		N/A	≥ 8	N/A	N/A	< 8	N/A
Suction Press. (Running) psig		N/A	N/A	N/A	N/A	N/A	N/A
Discharge Press. psig		N/A	N/A	N/A	N/A	N/A	N/A
Pump DP psid		283	254.7 to 311.3	N/A	N/A	< 254.7	> 311.3
Flow Rate gpm		480	N/A	N/A	N/A	N/A	N/A
Pump Speed rpm		2500	2485-2515*	N/A	N/A	N/A	N/A
Vibration-vel (in/sec peak) Position 3 H		0.083	0 to 0.207	N/A	> 0.207 to 0.498	N/A	> 0.498
Vibration-vel (in/sec peak) Position 3 V		0.070	0 to 0.175	N/A	> 0.175 to 0.420	N/A	> 0.420
Vibration-vel (in/sec peak) Position 4 A		0.063	0 to 0.157	N/A	> 0.157 to 0.378	N/A	> 0.378
Vibration-vel (in/sec peak) Position 4 H		0.091	0 to 0.227	N/A	> 0.227 to 0.546	N/A	> 0.546
Vibration-vel (in/sec peak) Position 4 V		0.104	0 to 0.260	N/A	> 0.260 to 0.624	N/A	> 0.624

*Range given in Acceptance Value only applicable when using a portable speed indicator.

RCIC Pump Data Sheet

UNIT 2

Performed by: ______________________ ________ ________
(Signature) Date Time

IST Group: ______________________ ________ ________
(Signature) Date Time

CORRECTIVE ACTION

1. Any required corrective action shall be performed in accordance with Section 6.0, Acceptance Criteria.

ATTACHMENT 3
Page 1 of 2

Unit 1 RCIC Valve Test Information Sheet

VALVE NUMBER	STROKE DIRECTION	REMOTE POSITION INDICATION (INITIALS)		STROKE TIME TEST (SEC)	STROKE TIME ACCEPTANCE CRITERIA (SECONDS)			REF. STROKE TIME	FAIL-SAFE TEST (INITIALS)	FULL-STROKE EXERCISE (INITIALS)	CHECK VALVE EXERCISE (INITIALS)	VALVE SAT/ UNSAT
					ACCEPTABLE RANGE							
		STEM	IND. LIGHTS		MINIMUM (≥)	MAXIMUM (≤)	LIMITING (≤)					
1-E51-F040	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1-E51-F001	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E51-V72/ V73	CLOSE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E51-F011	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E51-F014	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E51-F030	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E51-F021	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E51-F011	CLOSE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E51-F047	CLOSE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTES: Spaces next to valve number shall be filled in with an appropriate entry, initials, or N/A.

Performed by (Signature) N/A Date N/A

Performed by (Signature) N/A Date N/A

Reviewed, IST group (Signature) N/A Date N/A

Unit 2 RCIC Valve Test Information Sheet

VALVE NUMBER	STROKE DIRECTION	REMOTE POSITION INDICATION (INITIALS)		STROKE TIME TEST (SEC)	STROKE TIME ACCEPTANCE CRITERIA (SECONDS) ACCEPTABLE RANGE			REF. STROKE TIME	FAIL-SAFE TEST (INITIALS)	FULL-STROKE EXERCISE (INITIALS)	CHECK VALVE EXERCISE (INITIALS)	VALVE SAT/ UNSAT
		STEM	IND. LIGHTS		MINIMUM (≥)	MAXIMUM (≤)	LIMITING (≤)					
2-E51-F040	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-F001	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-V72/ V73	CLOSE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-F011	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-F014	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-F030	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-F021	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-F011	CLOSE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E51-F047	CLOSE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

NOTE: Spaces next to valve number shall be filled in with an appropriate entry, initials, or N/A.

Performed by (Signature) ______________________________ Date__________

Performed by (Signature) ______________________________ Date __________

Reviewed, IST group (Signature) ______________________________ Date__________

ATTACHMENT 4
Page 1 of 1

Leak Identification Data Sheet

NOTE:	For packing and gaskets, a WR is required to be initiated and documented if leakage exceeds 5 dpm.
NOTE:	Each WR/WO listed is required to state that identified leakage is to be corrected or minimized as required by TS 5.5.2.

Component	Nature of Leak	Leakage Rate[1]	WR/WO#

[1] Leakage identified from components shown in Attachment 7.

Examination Performed by: ________________/____________________ Date ________
(Signature) (Print Name)

ERFIS Trace Setup and Notes

NOTE: The parameters shown below in the example display are normally saved as SIIT10. **IF** the setup has been lost, **THEN** the parameters should be entered again and saved as SIIT10.

NOTE: The RCIC System Engineer should be contacted if any unexpected trips or other significant problems are noted. Otherwise, the RCIC data should be forwarded to the RCIC System Engineer for trending purposes.

EXAMPLE DISPLAY:

NO.	POINT ID	ORIGIN NUMBER	FILTER 1 (HZ)	FILTER 2 (HZ)	SCALING (A OR M)	UNITS/ Y GRID	OFFSET
1.	E51SA014	1			M	500.000	0.000
2.	E51DD042	2			M	4.000	-1.000
3.	E51PA006	3			M	200.000	0.000
4.	E51FA004	7			M	100.000	0.000
5.	B21LA001	5			M	20.000	140.000
6.	B21PA104	6			M	100.000	600.000
7.							

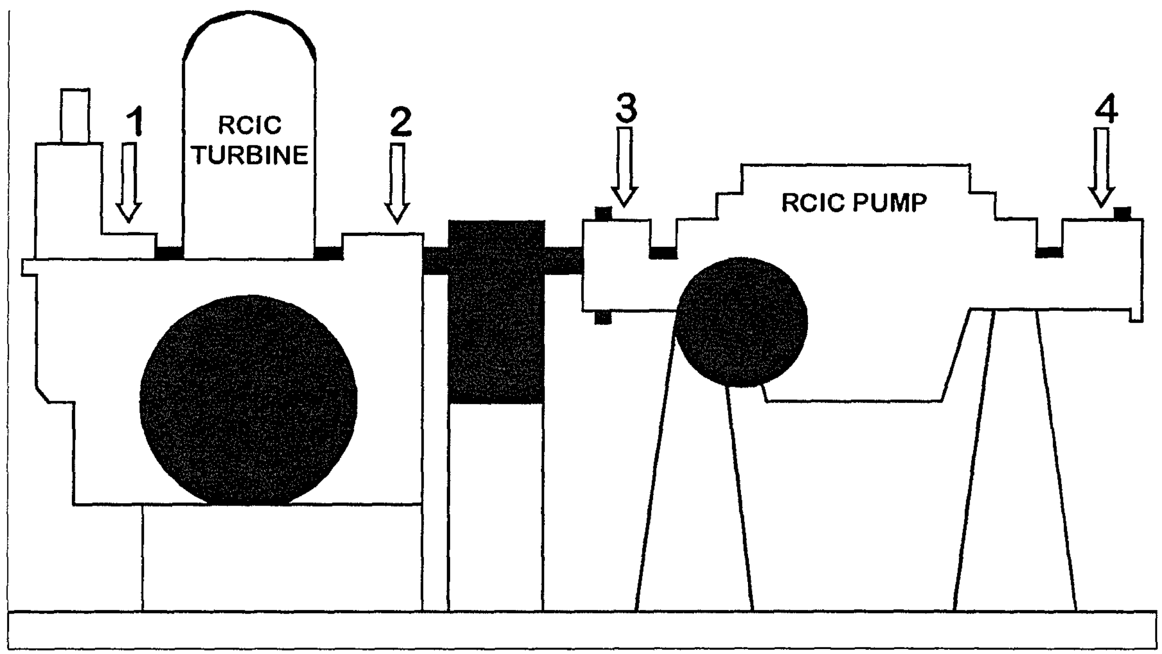
Total number of Y grids: 12

Initials

1. Make a trace of the entire run at 120 seconds per grid and 1.0" grids. ____

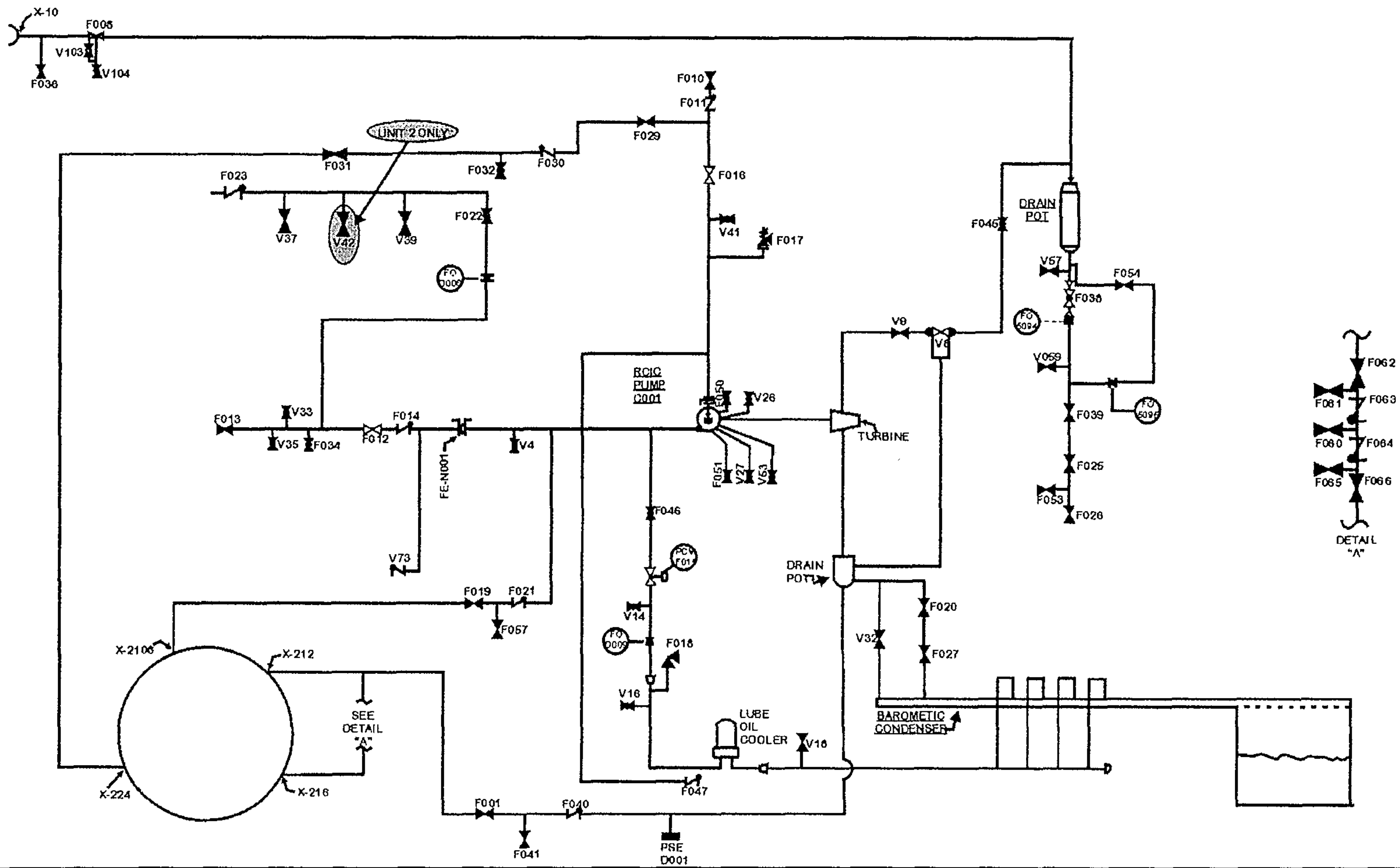
2. Make additional traces at 10 seconds per grid and 1.0" grids to show the first 1 to 2 minutes of each RCIC run. Tab trends at 0.5 second intervals may also be used. ____

ATTACHMENT 6
Page 1 of 1
Pump Vibration Test Position Numbers (Bearing Numbers)



Leakage Inspection Boundary

NOTE:	Because of drawing limitations, instrumentation lines and turbine casing piping are not shown. The leakage inspection boundary for instrumentation lines extend to and include the last instrument root valve before the instrument. Turbine casing piping to the drain pot is included the leakage inspection boundary.
NOTE:	The Suppression Chamber and Barometric Condenser are **NOT** required to be examined. They are shown for clarification only.



Leakage Inspection Guideline

When performing leakage inspections for TS 5.5.2, the following guidance should be followed to the extent practical.

1. The leakage inspection should be conducted by examining the accessible exposed surfaces for evidence of leakage.

2. For insulated components or components whose external surfaces are inaccessible for direct inspection, the leakage inspection should be performed on surrounding areas (i.e. floors or equipment surfaces located under the component) for evidence of leakage or other areas to which leakage may be channeled.

3. For vertical surfaces, the inspection of the lowest elevation where leakage may be detected should be performed.

4. For ALARA, a leakage inspection using remote visual equipment or the use of an installed leakage detection system to identify leakage is acceptable.

REVISION SUMMARY

Revision 89 incorporates program changes to perform a Leakage Walkdown in accordance with TS 5.5.2 (NCR 207575). Acceptance criteria added for pump values in the Alert Range to perform increased testing to conform to other PT s for the same type of testing. Editorial change to remove Desdemona font from place keeping aids.

Revision 88 incorporates Tech Spec Change TSC-2004-04 for suppression chamber to drywell vacuum breakers, Sections 3.16, 7.10, and 7.11.

Revision 87 incorporates EC 50554 which returns Unit 2 pressure set to 928 following testing.

Revision 86 adds step to confirm reactor pressure greater than 945 psig and adjust the pressure regulator as needed to attain 945 psig. Likewise, steps are added to return the pressure regulator setpoint to 928 psig for Unit 1 when testing is complete.

Revision 85 incorporated EC 46907, AST Implementation for Unit 2 Operation, which changed the normal valve position for 2-SGT-V8 & V9 from closed to open.

Revision 84 is an editorial correction, which updated the title page, added SOER 01-01 to the references, and annotated the associated P/L Step 3.29 and Caution prior to Step 7.10 to reflect response to recommendation 6d of the SOER. (AR 49693-26-04)

Revision 83 deleted two precaution and limitation steps stating the RCIC bearing oil temperature limits. These steps were deleted to eliminate confusion since the local temperature indicating switches were previously replaced with just temperature switches (DRs 86-0177 & 86-0124), which actuate high temperature alarms in the main control room.

Revision 82 incorporated TSC-2001-08, which changed Step 7.10.50 to perform 0PT-02.3.1b, Suppression Pool to Drywell Vacuum Breaker Position Indication Check within 6 hours after discharging steam to the suppression, and converted the procedure to Word 2000 software/format.

Revision 81 incorporated EC 47810, AST Implementation for Unit 1 Operation, which changed the normal valve position for 1-SGT-V8 & V9 from closed to open.

Revision 80 added Precaution/Limitations Step 3.30 and 3.31 concerning RCIC pre/post run oil levels venting of air from system, deleted specific references to vibration data collectors and transducers, and updated PassPort Work Management references as well as T/S 5.5.2 reference. (AR 00021660; PAR 00-537).

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-3

TITLE: CORE SPRAY SURVEILLANCE

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. No other testing or maintenance is in progress that will adversely affect the performance of this test.

2. The Core Spray System (Loop A) is in standby per 1(2)OP-18.

3. The station battery chargers are in operation per 1(2)OP-51.

4. 0PT-07.2.4a, Core Spray Operability Test – Loop "A" is in progress.

5. All pre-job briefs have been completed

6. 0PT-07.2.4a has been completed up to, and including, Step 7.7.4.

INITIATING CUE:

You are directed by the unit SCO to continue with the performance of 0PT-07.2.4a beginning with Step 7.8.1 and notify him when the surveillance is completed.

Step 1 **OBSERVE** *CORE SPRAY PUMP A* suction pressure (stopped) as indicated on *E21-PI-R001A* **AND RECORD** on Attachment 2.

Suction pressure recorded on Attachment 2 SAT/UNSAT

Step 2 **ENSURE** one of the following valves is open:

NUC SW TO VITAL HEADER VLV, SW-V117 or
CONV SW TO VITAL HEADER VLV, SW-V111

SW-V117 or SW-V111 verified OPEN SAT/UNSAT

Step 3 **ENSURE** VITAL HEADER XTIE VLV, SW-V118, IS OPEN

SW-V118 verified open. SAT/UNSAT

Step 4 **ENSURE** WELL WATER TO VITAL HEADER VALVE, SW-V141 IS CLOSED.

SW-V141 verified closed. SAT/UNSAT

Step 5 **STATION** an operator to monitor system piping for excessive motion and water hammer when a Core Spray Pump is started.

Operator stationed to monitor for vibration. SAT/UNSAT

PROMPT: CS PUMP A oil level is SAT

Step 6 **ENSURE** proper CORE SPRAY PUMP A lubricant level.

Proper lubricant level verified. SAT/UNSAT

Step 7 **START** CORE SPRAY PUMP A while monitoring Pump discharge pressure on E21-PI-R600A AND CONFIRM pressure increases to greater than or Equal to 300 psig in less than or equal to 5.0 seconds.

Core Spray Pump started and pressure increase verified.

SAT/UNSAT

Step 8 **RECORD** the time that CORE SPRAY PUMP A was started.

Core Spray Pump A start time recorded. SAT/UNSAT

Step 9 **ENSURE** the following:
CORE SPRAY DIVISION 1 ROOM COOLER FAN has Started.

CORE SPRAY DIVISION 1 ROOM COOLER FAN verified Started.

SAT/UNSAT

PROMPT: AS AO, report SW-V128 open

SERVICE WATER OUTLET VALVE, SW-V128, is open.

SW-V128 verified open by contacting the building Auxiliary operator.

SAT/UNSAT

Step 10 **THROTTLE** OPEN Core Spray FULL FLOW TEST BYP VLV, E21-F015A, to obtain greater than or Equal to 4700 gpm as indicated on E21-FI-R601A.

E21-F015A Throttled Open and flow achieved. SAT/UNSAT

Step 11 WHEN flow is greater than 603 gpm, CONFIRM that the Core Spray MIN FLOW BYPASS VLV, E21-F031A, closes.

E21-F031A verified closed. ****CRITICAL STEP****
SAT/UNSAT

Step 12 CONFIRM CORE SPRAY PUMP A discharge pressure is greater than or equal to 260 psig, as indicated on E21-PI-R600A.

Core Spray Pump A discharge pressure confirmed to be > 260 psig

SAT/UNSAT

Step 13 CONFIRM KEEPFILLL STATION CHECK VALVES, E21-F030A and/or E21-F029A, go to the closed Position, and record on Att.3

E21-F030A and/or E21-F029A confirmed to have gone to the closed position and recorded on Attachment 3.

SAT/UNSAT

Step 14 **SLOWLY OPEN** E21-PI-7119A INSTRUMENT ISOLATION VALVE, E21-V5000.

Contacts AO to open E21-V5000

PROMPT: When contacted by the candidate, acknowledge direction to open the E21-V5000 and report that the valve is open.

SAT/UNSAT

Step 15 THROTTLE Core Spray FULL FLOW TEST BYP VLV, E21-F015A, to obtain 4700 gpm as indicated on E21-FI-R601A.

Flow established at 4700 gpm. SAT/UNSAT

Step 16 OBSERVE CORE SPRAY PUMP A suction pressure (running) as indicated on E21-PI-R001A AND RECORD on Attachment 2.

Suction pressure obtained and recorded on Att.2

SAT/UNSAT

Step 17 OBSERVE CORE SPRAY PUMP A discharge pressure as indicated on E21-PI-7119A AND RECORD on Att.2

Core Spray Pump A discharge pressure obtained and recorded on Attachment 2.

SAT/UNSAT

Step 18 OBSERVE CORE SPRAY PUMP A system flow as Indicated on FLOW INDICATOR E21-FI-R601A and record on Att.2

Pump flow obtained and recorded on Attachment 2.

SAT/UNSAT

PROMPT: When requested, as AO, report lubricant level SAT

Step 19 ENSURE proper lubricant level AND RECORD on Att.2

Lubricant level verified by contacting auxiliary operator

In the reactor building. SAT/UNSAT

PROMPT: INFORM the candidate that vibration readings have been

Obtained and will be entered in the surveillance after the

Pump is secured.

Step 20 THROTTLE Core Spray *FULL FLOW TEST BYP VLV*

E21-F015A, to obtain 5000 gpm as indicated on

E21-FI-R601A.

E21-F015A throttled open and 5000 gpm

Flow obtained. SAT/UNSAT

Step 21 **CONFIRM** *CORE SPRAY PUMP A DISCHARGE*

CHECK VALVE, E21-F003A, fully opens **AND**

RECORD on Attachment 3.

E21-F003A confirmed to be fully open and recorded

On Attachment 3. SAT/UNSAT

PROMPT: Inform the candidate that a leakage walkdown is not required For this performance of the surveillance.

Step 22 **CLOSE** *E21-PI-7119A INSTRUMENT ISOLATION VALVE, E21-V5000.*

PROMPT: When contacted by the candidate, acknowledge direction to Close the E21-V5000 and report that the valve is closed.

Step 23 **CLOSE** Core Spray FULL FLOW TEST BYP VLV, E21-F015A.

E21-F015A closed. SAT/UNSAT

EXAMINER NOTE: The next critical step will be a failure of E21-F031A to open automatically, requiring candidate action to immediately open the valve.

Step 24 **WHEN** *CORE SPRAY LOOP A* flow is less than 603 gpm, **ENSURE** that Core Spray *MIN FLOW*

BYPASS VLV, E21-F031A, opens.

Operator recognizes E21-F031A does not open

Automatically and opens the valve by manipulating

The E21-F031A to the Open position. ****CRITICAL STEP****
SAT/UNSAT

Step 25 **STOP** *CORE SPRAY PUMP A* **AND RECORD** the

time.

Core Spray Pump 2A secured and time recorded. SAT/UNSAT

Examiner Note: When the Core Spray Pump 2A has been secured and

The candidate has informed the SCO of the failure of

The E21-F031A, the JPM is complete.

COMMENTS:

RELATED TASKS:

209001 A4.04 2.9/2.9 Ability to manually operate and/or monitor in the control room: minimum flow valve

REFERENCES:
0PT-07.2.4a Rev. 57

TOOLS AND EQUIPMENT:
None

SAFETY FUNCTION (from NUREG 1123, Rev 2.):
2 – Reactor Water Inventory Control

Time Required for Completion: 15 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate	**Actual**	Unit:	2
Setting:	Control Room	**Simulator**		
Time Critical:	Yes **No**	Time Limit	N/A	
Alternate Path:	**Yes** No			

EVALUATION

JPM: Pass Fail

Comments:

TASK CONDITIONS:

1. No other testing or maintenance is in progress that will adversely affect the performance of this test.

2. The Core Spray System (Loop A) is in standby per 1(2)OP-18.

3. The station battery chargers are in operation per 1(2)OP-51.

4. 0PT-07.2.4a, Core Spray Operability Test – Loop "A" is in progress.

5. All pre-job briefs have been completed

6. 0PT-07.2.4a has been completed up to, and including, Step 7.7.4.

INITIATING CUE:

You are directed by the unit SCO to continue with the performance of 0PT-07.2.4a beginning with Step 7.8.1 and notify him when the surveillance is completed.

DATE COMPLETED ____________________
UNIT ______ % PWR__________GMWE__________
SUPERVISOR____________________
REASON FOR TEST (check one or more):
____ Routine surveillance
____ W/O # ____________________
____ Other (explain)____________________

FREQUENCY:
A. Once every 92 days
B. Stem verification - each refueling NOT to exceed two years
C. Leakage walkdown – at least once per 24 months
D. Stroking/timing E21-F015A- each refueling outage

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
0

0PT-07.2.4a

CORE SPRAY SYSTEM OPERABILITY TEST - LOOP A

REVISION 57

1.0 PURPOSE

1.1 This test is performed to determine the operability of the Core Spray System A Loop. The test conforms to the requirements specified in Technical Specifications 5.5.6 to perform testing in accordance with ASME Boiler and Pressure Code, Section XI ASME/ANSI OM-Code. This test satisfies Technical Specification surveillance's SR 3.5.1.6 and 3.5.2.5 (for the Core Spray Pump). Performance of Valve Remote Position indicator Verification satisfies the requirements of SR 3.3.3.1.3. This test satisfies a portion of SRs 3.5.1.12 and 3.5.2.7 related to response time testing for Core Spray Pump A and E21-F005A.

1.2 This test also satisfies Technical Specification 5.5.2 for leak tightness inspection every 24 months.

1.3 The following test quantities shall be measured, calculated, or observed and recorded as applicable:

1.3.1 Valve stem travel or disk movement

1.3.2 Proper operation of the valve remote position indicator (RPI)

1.3.3 Time required for valve stroke

1.3.4 Pump inlet pressure

1.3.5 Pump discharge pressure

1.3.6 Pump vibration velocity

1.3.7 Pump flow rate

1.3.8 Pump lubricant level

1.3.9 Pump differential pressure (calculated)

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR, Section 6.3

2.3 1(2)OP-18, Core Spray System Operating Procedure

2.4 1(2)OP-51, DC Electrical System Operating Procedure

2.5 0OI-01.08, Control of Equipment and System Status

2.6 Technical Requirements Manual (TRM)

2.7 0SD-18, Core Spray System Description

2.8 ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition

2.9 ANSI/ASME, OM-1987, "Operation and Maintenance of Nuclear Power Plant," w/OMa-1988 Addenda, Part 6 and Part 10

2.10 NRC Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs

2.11 0ENP-17, Pump and Valve Inservice Testing (IST)

2.12 0ENP-16.1, IST Pump and Valve Data

R13 2.13 EC 46949, 2-E21-F004A/B and F005A/B Motor Pinion Gear Ratio Change & Compiling Core Spray Surveillance Requirements

2.14 EER 90-0315, Vibration Program for 1A and 2A Core Spray Pumps

R15 2.15 Response to NRC Bulletin 88-04, Potential Safety Related Pump Loss

2.16 D-25024, Sheet 2, Core Spray System, Unit 1

2.17 D-02524, Sheet 2, Core Spray System, Unit 2

2.18 NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

2.0 REFERENCES

2.19 ESR 97-00508, ECCS Response Time Testing Methods

R20 2.20 Second Request for Additional Information, Brunswick Steam Electric Plant, Units 1 and 2 Response to Generic Letter 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power Operated Gate Valves"

2.21 EGR-NGGC-0010, System and Component Trending Program and System Libraries

2.22 0ENP-23, Predictive Maintenance Program

2.23 RFJ-24, Refueling Justification for Stroking E21-F015A/B.

2.24 0AP-54, Plant Leak Management

R25 2.25 Brunswick Steam Electric Plant Units 1 and 2, Issuance of Amendment RE: Alternative Source Term (License Amendments 221 and 246, dated May 30, 2002)

2.26 10 CFR 50.67, Accident Source Term

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Attachments 2 and 3 must be reviewed by the IST group.

3.2 Water from the suppression pool should not be injected into the reactor vessel during the performance of this test.

3.3 The following annunciators may alarm during the performance of this test:

3.3.1 *CORE SPRAY OR RHR PUMPS RUNNING* (A-03 2-1).

3.3.2 *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10).

3.4 The vibration velocity readings shall be taken at the test positions specified on the data sheet. Since there are multiple test points, ensure that the probe is located on the correct bearing (see Attachment 5) and in the correct direction as specified in the test position number.

3.0 PRECAUTIONS AND LIMITATIONS

3.5 For taking vibration readings, the probe shall be securely mounted at each test position. The probe must be in firm contact with the bearing housing when taking data.

3.6 When taking readings to be recorded on Attachment 2, the indicator/pointer fluctuation should be reduced to a minimum. A valve upstream of the gauge may be throttled to reduce fluctuation. Care should be taken to ensure proper communication between the gauge and main flow path.

3.7 Suitable test gauges may be used in place of any installed instrument. If used, the full-scale range of each instrument should be three times the reference value or less, with adequate range to prevent damage during use. Use of alternate test gauges requires recording the test gauge identification number, test gauge calibration date, and test gauge calibration due date.

3.8 Some steps of this test require independent verification.

3.9 An Operator should be stationed to monitor system piping for excessive motion and/or water hammer when a core spray pump is started. The susceptible piping includes core spray discharge piping located in the overhead of the 50' elevation of the Reactor Building.

3.10 When opening system drain/vent valves, proper radiological control procedures shall be observed.

3.11 Core Spray Loop A shall be declared inoperable from the beginning of Valve Testing, Section 7.6, to when valve stroking is complete **AND** the *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10) is cleared.

3.12 During system venting, air is not expected in the system. Should air be found, initiate a W/O and notify the System Engineer. Presence of air in the system does not make the system inoperable but does imply component degradation at some point that must be addressed. The test may continue provided air can be removed from the system via the normal venting process.

4.0 PREREQUISITES

4.1 No other testing or maintenance is in progress that will adversely affect the performance of this test.

4.2 The Core Spray System (Loop A) is in standby per 1(2)OP-18.

4.3 The station battery chargers are in operation per 1(2)OP-51.

4.4 **IF** a leakage walkdown is required, **THEN** 0AP-054 Alternative Source Term (AST) Combined Leakage Log value has been recorded on Attachment 4.

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Confirm that no active corrective maintenance W/O exists on the following installed instruments. If any active W/O exists, operability of the instrument must be resolved and recorded in the General Comments and Recommendations section before the instrument may be used.

	Instrument	W/R-W/O	W/R-W/O #
5.1.1	E21-PT-N001A	yes / no	N/A
5.1.2	E21-FT-N003A	yes / no	
5.1.3	E21-PI-R600A	yes / no	
5.1.4	E21-FI-R601A	yes / no	
5.1.5	E21-PI-2651	yes / no	
5.1.6	E21-PI-7119A	yes / no	
5.1.7	E21-PI-R001A	yes / no	N/A

5.0 SPECIAL TOOLS AND EQUIPMENT

5.2 Suitable test gauges may be used to obtain data in place of any installed instrument. If used, note:

5.2.1	ID number	N/A
5.2.2	Range of instrument	
5.2.3	Calibration date	
5.2.4	Calibration due date	
5.2.5	Parameter measured	N/A

5.3 A stopwatch with the following data recorded below:

5.3.1	Stopwatch identification number.	7 KL0K43
5.3.2	Stopwatch calibration date.	1-1-07
5.3.3	Stopwatch calibration due date.	12-31-07

5.4 Predictive Maintenance personnel will provide the vibration monitoring instrument used for data collection. Record the required data below:

5.4.1	Vibration monitor identification number.	3 CELU7
5.4.2	Transducer identification number.	BR 438
5.4.3	Vibration monitor/transducer calibration date.	2-28-07
5.4.4	Vibration monitor/transducer calibration due date.	2-29-08

5.5 Vent and drain rig

5.6 Tubing, valves, and fittings to install test gauges (as required).

5.7 Ladder for vibration readings

6.0 ACCEPTANCE CRITERIA

This test may be considered satisfactory when the following criteria are met:

6.1 Pump Tests

NOTE:	Acceptance Criteria 6.1.1 includes allowances for a number of items (such as flow diversion through the minimum flow valve, cracks, and the vent hole). Meeting the values shown assure that CS can provide 4100 gpm to the vessel with 113 psid between the Suppression Pool and the vessel as required by Technical Specifications.

R13 6.1.1 *CORE SPRAY PUMP A* operation develops a recirculation flow rate of 4700 gpm or greater against a system head of greater than or equal to 260 psig. (SR 3.5.1.6, SR 3.5.2.5)

6.1.2 *CORE SPRAY PUMP A* discharge pressure increases to greater than or equal to 300 psig within 5 seconds of control switch operation. (SR 3.5.1.12, SR 3.5.2.7)

6.1.3 The pump test data shall be compared to the allowable ranges identified in Test Information Attachment 2.

6.1.4 If deviations fall within the ALERT RANGE of Attachment 2, the frequency of testing shall be doubled until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set of reference values established per OMa-1988, Paragraph 6.1.

6.1.5 If the deviations fall within the REQUIRED ACTION RANGE of Attachment 2, the pump shall be declared inoperable and not returned to service until the condition has been corrected.

6.1.6 When completed test results show deviations greater than the allowable ACCEPTANCE VALUE RANGE, the instruments involved may be recalibrated and the test rerun. However, this shall not preclude declaring the pump inoperable as required.

6.0 ACCEPTANCE CRITERIA

6.2 Valve Tests

NOTE:	Stroke time shall be measured from the time the control switch is repositioned to the time the valve is fully stroked by light indication. Deviations from this standard method of testing will be specified in the procedure.

6.2.1 Valve Stroke Time

1. Measured stroke times shall be within the ACCEPTABLE RANGE as specified by the minimum and maximum stroke times shown on Attachment 3.

2. For tests where the measured stroke time of a valve exceeds the maximum ACCEPTABLE stroke time but **does not** exceed the LIMITING stroke time, the valve shall be immediately retested or declared INOPERABLE.

   a. If a valve is retested, and the measured stroke time is within the ACCEPTABLE RANGE, the valve may be declared OPERABLE. A Condition Report (CR) shall be generated to ensure the OM Code requirement associated with the evaluation is completed by Engineering.

   b. If a valve is retested and the measured stroke time falls outside the ACCEPTABLE RANGE, a Tracking LCO shall be generated to track the time agreed upon by the Shift Superintendent and BESS in accordance with 0OI-01.08. Otherwise, declare the valve INOPERABLE and meet the requirements of all applicable Technical Specifications.

3. For tests where the measured stroke time of the valve is less than the minimum ACCEPTABLE stroke time, exceeds the LIMITING stroke time or the valve disc or stem fail to exhibit the required change of position, the valve shall immediately be declared INOPERABLE.

4. For Core Spray Injection Valves, E21-F004A and E21-F005A, the measured opening stroke time shall be less than or equal to 23.8 seconds to satisfy Core Spray Loop A response time requirements. (SR 3.5.1.12, SR 3.5.2.7).

6.0 ACCEPTANCE CRITERIA

6.2.2 Valve Full-Stroke Exercise

Full-stroke exercise requirements shall be satisfied by completely cycling a valve from the closed position to the open position and back to the closed position or from the open position to the closed position and back to the open position.

6.2.3 Valve Remote Position Indicator (RPI) Verification

At a refueling frequency (not to exceed 2 years), each RPI Verification identified on Attachment 3 shall be observed to verify that the valve position is accurately indicated in both the open and closed positions by the indicating lights on the RTGB when the valve stem or mechanical position indicator has stopped moving. RPI verification satisfies the requirements of SR 3.3.3.1.3.

6.2.4 Check Valve Exercising

1. Check valve exercising to the full open position shall be satisfied by demonstrating the ability to pass maximum accident condition flow.

2. Check valve exercising to the closed position shall be considered satisfactory by demonstrating the ability to establish a differential pressure across the valve seat, or by verifying the absence of flow under pressure while venting the upstream side of the valve seat with pressure on the downstream side.

6.3 Leak Tightness Examination

6.3.1 Identified leakage is recorded on Attachment 4, Leak Identification Data Sheet, and a Work Request (WR) is initiated for any leakage with the exception of packing and gasket leakage less than 5 drops per minute (dpm). The WR shall state that identified leakage is required to be corrected or minimized as required by TS 5.5.2.

6.3.2 For 'through-wall' or 'through-weld' leakage, a Nuclear Condition Report (NCR) is initiated to assess structural integrity of the affected component.

6.0 ACCEPTANCE CRITERIA

R25

6.3.3 The following applicable actions are taken when the combined leakage total (AST Combined Leakage Log value plus leakage from components shown on Attachment 6) is greater than 0 gpm:

1. If the combined leakage is determined to be less than or equal to 1 gallon per minute (gpm), the normal work management process (PRI 3) for correcting leakage is implemented.

2. If the combined leakage is determined to be greater than 1 gpm and less than or equal to 20 gpm, the initiated WR should be identified as PRI 2 to expedite corrective actions to eliminate or reduce identified leakage as soon as plant conditions allow.

3. If the combined leakage is greater than 20 gpm, the initiated WR should be identified as PRI 2 to expedite corrective actions to eliminate or reduce identified leakage as soon as plant conditions allow. A Nuclear Condition Report (NCR) is initiated to have Engineering assess the impact to the AST (10CFR50.67) analysis.

7.0 PROCEDURAL STEPS

Initials

7.1 **OBTAIN** permission from the Unit SCO to perform this test, **AND ENSURE** LCO requirements have been reviewed in accordance with 0OI-01.08. — S Unit SCO

7.2 **ENSURE** all prerequisites listed in Section 4.0 are met. — Y

7.3 **CONFIRM** required data has been recorded in Section 5.0. — Y

7.4 **NOTIFY** Maintenance the pumps are being tested so they can observe the pump run, if desired. — Y

NOTE:	A leakage walkdown is required to be performed each 24 months per TS 5.5.2.b.

7.5 **IF** a leakage walkdown is required of *CORE SPRAY LOOP A* during the performance of this procedure, **THEN PREPARE** to perform a system walkdown to identify system leaks. — N/A

7.6 Valve Testing

NOTE:	Those steps associated with valve remote position indicator (RPI) verification are performed each refueling, not to exceed 2 years, or after maintenance which affects RPI performance. **IF** RPI verification is **NOT** required for this test, **THEN** N/A may be entered in the Initials.
NOTE:	Steps 7.6.1 through 7.6.3.2 are required to be performed only during refueling outages in an effort to prevent voiding Core Spray piping during power operations. **IF** these steps are **NOT** required for this test, **THEN** NA may be entered where appropriate.

R20

CAUTION

Core Spray Loop A shall be declared inoperable from the beginning of Valve Testing to when valve stroking is complete **AND** the *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10) is cleared.

7.6.1 **IF** performing during a refueling outage, **THEN ENSURE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* is closed. — N/A

7.0 PROCEDURAL STEPS Initials

7.6.2 **IF** performing during a refueling outage**, THEN OPEN** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A*. N/A

1. **CONFIRM** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A*, valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.6.3 **IF** performing during a refueling outage**, THEN CLOSE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. N/A

1. **CONFIRM** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A*, valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. N/A

2. **IF** entrance into this procedure was necessary only to perform stroking and timing of *E21-F015A*, **THEN GO TO AND PERFORM** Section 7.7 **AND** applicable steps of Section 7.9. N/A

7.6.4 **ENSURE** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* is open. Y

7.6.5 **CLOSE** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* **AND RECORD** valve stroke time on Attachment 3. Y

1. **CONFIRM** Core Spray *OUTBOARD INJECTION VLV, E21-F004A*, valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.6.6 **ENSURE** Core Spray *INBOARD INJECTION VLV, E21-F005A,* is closed. Y

7.6.7 **OPEN** Core Spray *INBOARD INJECTION VLV, E21-F005A,* **AND RECORD** valve stroke time on Attachment 3. Y

1. **CONFIRM** Core Spray *INBOARD INJECTION VLV, E21-F005A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.0 PROCEDURAL STEPS

Initials

7.6.8 **CLOSE** Core Spray *INBOARD INJECTION VLV, E21-F005A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. Y

1. **CONFIRM** Core Spray *INBOARD INJECTION VLV, E21-F005A,* valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.6.9 **OPEN** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. Y

1. **CONFIRM** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.6.10 **ENSURE** Core Spray *TORUS SUCTION VLV, E21-F001A,* is open. Y

7.6.11 **CLOSE** Core Spray *TORUS SUCTION VLV, E21-F001A,* **AND RECORD** valve stroke time on Attachment 3. Y

1. **CONFIRM** Core Spray *TORUS SUCTION VLV, E21-F001A,* valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.0 PROCEDURAL STEPS

Initials

7.6.12 **OPEN** Core Spray *TORUS SUCTION VLV, E21-F001A,* **AND RECORD** the valve stroke time and full-stroke exercise on Attachment 3. Y

1. **CONFIRM** Core Spray *TORUS SUCTION VLV, E21-F001A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.6.13 **ENSURE** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* is open. Y

7.6.14 **CLOSE** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* **AND RECORD** valve stroke time on Attachment 3. Y

1. **CONFIRM** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.6.15 **OPEN** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. Y

1. **CONFIRM** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. N/A

7.7 Filling and Venting Core Spray Loop A

NOTE:	**IF** air is observed in the discharge piping, a W/R should be prepared to correct any problems.

7.7.1 **IF** the keepfill station for *CORE SPRAY LOOP A* is available, **THEN PERFORM** the following:

1. **ENSURE** that a vent and drain rig is attached to *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* Y

7.0 PROCEDURAL STEPS

Initials

2. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* until a solid stream of water issues from the vent line, **THEN CLOSE** *E21-V23.* ɣ

CAUTION
Failure to follow Steps 7.7.2.1 through 7.7.2.7 in the order specified may cause the *KEEPFILL RELIEF VALVE, E21-F024A*, to lift and damage the seat of *KEEPFILL STATION PRESSURE CONTROL VALVE, E21-PCV-F026A.*

7.7.2 **IF** it is desired to use the *KEEPFILL STATION E21-PCV-F026A BYPASS VALVE, E21-F028A*, **OR** the valve is already open, **THEN PERFORM** the following:

1. **ENSURE** that a vent and drain rig is attached to *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* N/A

2. **ENSURE** *KEEPFILL STATION E21-PCV-F026A DOWNSTREAM ISOLATION VALVE, E21-F027A*, is closed. N/A

3. **IF** necessary, **THROTTLE OPEN** *KEEPFILL STATION E21-PCV-F026A BYPASS VALVE, E21-F028A.* N/A

4. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23*, until a solid stream of water issues from the vent line, **THEN CLOSE** *E21-V23.* N/A

5. **CLOSE** *KEEPFILL STATION E21-PCV-F026A BYPASS VALVE, E21-F028A.* N/A / N/A
Ind.Ver.

6. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* until *CORE SPRAY PUMP A DISCHARGE PRESSURE INDICATOR, E21-PI-R600A* (Panel H12-P601), indicates 40 to 70 psig, **THEN CLOSE** *E21-V23.* N/A

7.0 PROCEDURAL STEPS

Initials

7. **SLOWLY OPEN** *KEEPFILL STATION E21-PCV-F026A DOWNSTREAM ISOLATION VALVE, E21-F027A.* N/A / N/A Ind.Ver.

7.7.3 **IF** required, **REMOVE** the vent and drain rig from the *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* N/A

7.7.4 **CONFIRM** *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10) is cleared. Y

7.8 Pump Testing

7.8.1 **OBSERVE** *CORE SPRAY PUMP A* suction pressure (stopped) as indicated on *E21-PI-R001A* **AND RECORD** on Attachment 2. ____

CAUTION

Do **NOT** cross-connect the Nuclear and Conventional Service Water headers by simultaneously opening *NUC SW TO VITAL HEADER VLV, SW-V117*, and *CONV SW TO VITAL HEADER VLV, SW-V111.*

7.8.2 **ENSURE** one of the following valves is open:

1. *NUC SW TO VITAL HEADER VLV, SW-V117* ____

OR

2. *CONV SW TO VITAL HEADER VLV, SW-V111.* ____

7.8.3 **ENSURE** *VITAL HEADER XTIE VLV, SW-V118*, is open. ____

7.8.4 **ENSURE** *WELL WATER TO VITAL HEADER VALVE, SW-V141,* is closed. ____

7.8.5 **STATION** an operator to monitor system piping for excessive motion and water hammer when a Core Spray pump is started. ____

Initials

7.8.6 **ENSURE** proper *CORE SPRAY PUMP A* lubricant level. _____

NOTE: The following step requires that the time interval from pump start to discharge pressure at 300 psig be measured with a stopwatch. It may be advisable to place a temporary non-destructive mark on the pressure indicator at 300 psig to assist in timing.

R15

CAUTION

Operation of the core spray pump in the minimum flow mode should be minimized.

7.8.7 **START** *CORE SPRAY PUMP A* while monitoring pump discharge pressure on *E21-PI-R600A*, **AND CONFIRM** pressure increases to greater than or equal to 300 psig in less than or equal to 5.0 seconds. _____

Response Time _____ sec.

7.8.8 **RECORD** the time that *CORE SPRAY PUMP A* was started. _____

Time ________

7.8.9 **ENSURE** the following:

1. *CORE SPRAY DIVISION I ROOM COOLER FAN* has started. _____

2. *SERVICE WATER OUTLET VALVE, SW-V128*, is open. _____

7.8.10 **THROTTLE OPEN** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* to obtain greater than or equal to 4700 gpm as indicated on *E21-FI-R601A.* _____

7.8.11 **WHEN** flow is greater than 603 gpm, **CONFIRM** that the Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* closes. _____

R13 7.8.12 **CONFIRM** *CORE SPRAY PUMP A* discharge pressure is greater than or equal to 260 psig, as indicated on *E21-PI-R600A*. _____

> **NOTE:** A higher pressure indication on *E21-PI-R600A* than on *E21-PI-2651* verifies *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A*, go to the closed position. If indication on *E21-PI-2651* is "pegged", then proceed to Step 7.8.14. If test is satisfactory, then N/A Step 7.8.14.
>
> **NOTE:** Operability of the keep-fill check valves is performed as a pair. If the check valves cannot be determined to be closed, then a W/R shall be written to repair or replace both *E21-F030A* and *E21-F029A.*

7.8.13 **CONFIRM** *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A*, go to the closed position, **AND RECORD** on Attachment 3. _____

> **NOTE:** Verifying the absence of flow under pressure while venting at *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786*, satisfies reverse exercising requirements for *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A*. This does **NOT** imply that drainage will not be present.

R15 7.8.14 **IF** test conditions in Step 7.8.13 cannot be met, **THEN PERFORM** the following steps to satisfy exercising *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A*, to the closed position:

1. **CONNECT** hose at *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786*, **AND ROUTE** to floor drain. _____

2. **CLOSE** *KEEPFILL STATION E21-PCV-F026A UPSTREAM ISOLATION VALVE, E21-F025A.* _____

7.0 PROCEDURAL STEPS

Initials

3. **ENSURE** *CORE SPRAY LOOP A KEEPFILL ISOLATION VALVE, TD-V13,* is closed. _____

4. **OPEN** *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786,* **AND ALLOW** piping to drain for a minimum of three minutes. _____

5. **CONFIRM** the absence of pressurized flow from drain hose **AND RECORD** *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A* go to the closed position on Attachment 3. _____

6. **CLOSE** *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786.* ___/___ Ind.Ver.

> **CAUTION**
>
> Damage to the *KEEPFILL STATION PRESSURE CONTROL VALVE, E21-PCV-F026A,* may occur if it is placed in service too rapidly.

7. **SLOWLY OPEN** *KEEPFILL STATION E21-PCV-F026A UPSTREAM ISOLATION VALVE, E21-F025A.* ___/___ Ind.Ver.

7.8.15 **SLOWLY OPEN** *E21-PI-7119A INSTRUMENT ISOLATION VALVE, E21-V5000.* _____

> **NOTE:** The Core Spray Pump shall be operated for at least 2 minutes under conditions as stable as the system permits prior to recording test data.

7.8.16 **THROTTLE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* to obtain 4700 gpm as indicated on *E21-FI-R601A.* _____

7.8.17 **OBSERVE** *CORE SPRAY PUMP A* suction pressure (running) as indicated on *E21-PI-R001A* **AND RECORD** on Attachment 2. _____

7.0 PROCEDURAL STEPS

Initials

7.8.18 **OBSERVE** *CORE SPRAY PUMP A* discharge pressure as indicated on *E21-PI-7119A* **AND RECORD** on Attachment 2. _____

7.8.19 **OBSERVE** *CORE SPRAY PUMP A* System flow as indicated on *FLOW INDICATOR E21-FI-R601A* **AND RECORD** on Attachment 2. _____

7.8.20 **ENSURE** proper lubricant level **AND RECORD** on Attachment 2. _____

7.8.21 **MEASURE** *CORE SPRAY PUMP A* vibration velocity (in/sec peak) at the test positions indicated on Attachment 2. _____

7.8.22 **RECORD** the measured vibration velocities in the ACTUAL VALUE column on Attachment 2. _____

NOTE:	Flow indication of at least 5000 gpm on *FLOW INDICATOR E21-FI-R601A* confirms *CORE SPRAY PUMP A DISCHARGE CHECK VALVE, E21-F003A,* goes to the full open position.

7.8.23 **THROTTLE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A*, to obtain 5000 gpm as indicated on *E21-FI-R601A.* _____

7.8.24 **CONFIRM** *CORE SPRAY PUMP A DISCHARGE CHECK VALVE, E21-F003A,* fully opens **AND RECORD** on Attachment 3. _____

NOTE:	A leakage walkdown is required to be performed at least once per 24 months per TS 5.5.2.

7.8.25 **IF** required, **PERFORM** a leakage walkdown of the components identified on Attachment 6, **AND RECORD** leakage on Attachment 4, Leak Identification Data Sheet. _____

7.8.26 **CLOSE** *E21-PI-7119A INSTRUMENT ISOLATION VALVE, E21-V5000.* ___/___ Ind.Ver.

7.8.27 **CLOSE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A.* _____

7.0 PROCEDURAL STEPS

Initials

7.8.28 **WHEN** *CORE SPRAY LOOP A* flow is less than 603 gpm, **ENSURE** that Core Spray *MIN FLOW BYPASS VLV, E21-F031A*, opens. _____

7.8.29 **STOP** *CORE SPRAY PUMP A* **AND RECORD** the time. _____

Time ___________

7.8.30 **CONFIRM** the following:

1. *CORE SPRAY DIVISION I ROOM COOLER FAN* is off. _____

2. *SERVICE WATER OUTLET VALVE, SW-V128*, is closed. _____

7.8.31 **IF** required, **ENSURE** the following valves are closed:

1. *NUC SW TO VITAL HEADER VLV, SW-V117* ___/___ Ind.Ver.

2. *CONV SW TO VITAL HEADER VLV, SW-V111* ___/___ Ind.Ver.

7.8.32 **CALCULATE** *CORE SPRAY PUMP A* run time. _____

_________ - ________ = _________
7.8.29 7.8.8

7.8.33 **IF** required to relieve high system pressure condition or ensure the system is filled and vented, **THEN PERFORM** the following

1. **ENSURE** a vent and drain rig is attached to *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* _____

2. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* until a solid stream of water issues from the vent line, **THEN CLOSE** *E21-V23.* _____

3. **IF** required, **REMOVE** the vent and drain rig from *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* _____

7.0 PROCEDURAL STEPS

Initials

7.9 System Restoration

7.9.1 **ALIGN** valves as specified in Table 1. _____

NOTE: Independent verification is required for valve lineup.

TABLE 1
SYSTEM VERIFICATION LINEUP SHEET

VALVE NO.	DESCRIPTION	REQUIRED POSITION	INITIALS IND. VER.
E21-F001A	Core Spray Pump A Suppression Pool Suction Valve	OPEN	/
E21-F004A	Core Spray Outboard Injection Valve	OPEN	/
E21-F005A	Core Spray Inboard Injection Valve	CLOSED	/
E21-F031A	Core Spray Minimum Flow Bypass Valve	OPEN	/
E21-F015A	Core Spray Test Bypass Valve	CLOSED	/
E21-V23	Core Spray Division I Line Vent Valve	CLOSED	/

7.9.2 **IF** installed, **REMOVE** drain hose installed at *E21-PI-2651, INSTRUMENT DRAIN VALVE, E21-IV-786.* _____

7.9.3 **IF** necessary, **REMOVE** the temporary mark on pressure indicator *E21-PI-R600A*. _____

7.9.4 **ENSURE** the required information has been recorded on the cover page. _____

7.9.5 **NOTIFY** the IST Engineer when data has been recorded on Attachments 2 and 3 **AND RECORD** the following information. _____

IST Engineer ____________________ ____________ __________
Name Date Time

7.9.6 **NOTIFY** the Unit SCO when this test is complete or found to be unsatisfactory. _____

ATTACHMENT 1
Page 1 of 1
Certification and Review Form

General Comments and Recommendations ____________________

____

	Initials	Name (Print)
Performed by:	S	Sam Banger
	Y	Pete Enderoy

Exceptions to satisfactory performance ____________________

____

Corrective action required ____________________

____

NOTE:	Pump test data shall be analyzed within 96 hours after completion of this PT. SCO review/approval of the PT satisfies this ASME Code requirement.

Test procedure has been satisfactorily completed:

Unit SCO: ____________________ ____________
Signature Date

Test procedure has **NOT** been satisfactorily completed:

Unit SCO: ____________________ ____________
Signature Date

Test has been reviewed by:

Shift Superintendent ____________________ ____________
Signature Date

ATTACHMENT 2
Page 1 of 2
Unit 1 Core Spray Pump A Test Information Data Sheet

1. The lubricant level (pump running) is normal. N/A
2. Calculate pump dP as follows:

Pump discharge pressure - suction pressure (run) = pump dP

N/A - N/A = N/A

NOTE: Pump vibration is measured at the test point marked on the pump for the correct bearing number and direction as indicated by the Test Position number as follows:

- the number indicates the bearing number from Attachment 5
- for position, N=North, S=South, E=East, W=West
- for direction, A=Axial, H=Horizontal, V=Vertical

NOTE: Reference values for pump suction and discharge pressures are provided for determining the suitability of alternate test gauges, if used.

UNIT 1 CORE SPRAY PUMP A TEST DATA							
TEST PARAMETER	ACTUAL VALUE	REFERENCE VALUE	ACCEPTANCE VALUE RANGE	ALERT RANGE		REQUIRED ACTION RANGE	
				LOW	HIGH	LOW	HIGH
Suction Press. (Stopped) psig	N/A	6.0	4 to 8	N/A	N/A	< 4	> 8
Suction Press. (Running) psig		4.0	N/A	N/A	N/A	N/A	N/A
Discharge Press. Psig		290.0	N/A	N/A	N/A	N/A	N/A
Pump DP psid		290.9	261.9 to 319.9	N/A	N/A	< 261.9	> 319.9
Flow Rate gpm		4,700	N/A	N/A	N/A	N/A	N/A
Vibration-vel (in/s peak) Position 1S H		0.133	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W A		0.195	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W H	N/A	0.144	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700

Performed By (Signature) N/A Date N/A Time N/A

Reviewed, IST Group (Signature) N/A Date N/A

Unit 2 Core Spray Pump A Test Information Data Sheet

1. The lubricant level (pump running) is normal. ____________

2. Calculate pump dP as follows:

   Pump discharge pressure - suction pressure (run) = pump dP

   __________ - ____________ = ____________

NOTE: Pump vibration is measured at the test point marked on the pump for the correct bearing number and direction as indicated by the Test Position number as follows:

- the number indicates the bearing number from Attachment 5
- for position, N=North, S=South, E=East, W=West
- for direction, A=Axial, H=Horizontal, V=Vertical

NOTE: Reference values for pump suction and discharge pressures are provided for determining the suitability of alternate test gauges, if used.

UNIT 2 CORE SPRAY PUMP A TEST DATA							
TEST PARAMETER	ACTUAL VALUE	REFERENCE VALUE	ACCEPTANCE VALUE RANGE	ALERT RANGE		REQUIRED ACTION RANGE	
				LOW	HIGH	LOW	HIGH
Suction Press. (Stopped) psig		6.0	4 to 8	N/A	N/A	< 4	> 8
Suction Press. (Running) psig		4.0	N/A	N/A	N/A	N/A	N/A
Discharge Press. Psig		290.0	N/A	N/A	N/A	N/A	N/A
Pump DP psid		283.1	260.0 to 311.4	N/A	N/A	< 260.0	> 311.4
Flow Rate gpm		4,700	N/A	N/A	N/A	N/A	N/A
Vibration-vel (in/s peak) Position 1S H		0.230	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W A		0.212	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W H		0.156	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700

Performed By (Signature) ______________________ Date ________ Time _______

Reviewed, IST Group (Signature) __________________ Date _________

Unit 1 Core Spray System (Loop A) Valve Test Information Sheet

Valve Number	Stroke Direction	Remote Position Indication (Initials)		Stroke Time Test (sec)	Stroke Time Acceptance Criteria (Seconds)				Fail-Safe Test (Initials)	Full-Stroke Exercise (Initials)	Check Valve Exercise (Initials)	Valve SAT/ UNSAT
		Stem	Ind. Lights		Acceptable Range Minimum (≥)	Acceptable Range Maximum (≤)	Limiting (≤)	Ref. Stroke Time				
1-E21-F015A	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1-E21-F015A	CLOSED			N/A	35.90	48.50	52.70	42.20	N/A	N/A	N/A	
1-E21-F004A	CLOSED				9.85	13.33	14.49	11.59	N/A	N/A	N/A	
1-E21-F005A	OPEN				10.01	13.55	14.73	11.78	N/A	N/A	N/A	
1-E21-F005A	CLOSED				9.88	13.36	14.53	11.62	N/A	N/A	N/A	
1-E21-F004A	OPEN				9.99	13.51	14.69	11.75	N/A	N/A	N/A	
1-E21-F001A	CLOSED				68.51	92.69	100.75	80.60	N/A	N/A	N/A	
1-E21-F001A	OPEN				72.73	98.39	106.95	85.56	N/A	N/A	N/A	
1-E21-F031A	CLOSED				11.00	14.80	16.10	12.90	N/A	N/A	N/A	
1-E21-F031A	OPEN	N/A	N/A	N/A	12.30	16.50	18.00	14.40	N/A	N/A	N/A	
1-E21-F029A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1-E21-F030A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E21-F003A	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTE: Spaces next to valve numbers shall be filled in with an appropriate entry, initials, or N/A.

Performed by (signature) N/A Date N/A

Performed by (signature) N/A Date N/A

Reviewed, IST Group (signature) N/A Date N/A

ATTACHMENT 3
Page 2 of 2

Unit 2 Core Spray System (Loop A) Valve Test Information Sheet

Valve Number	Stroke Direction	Remote Position Indication (Initials)		Stroke Time Test (sec)	Stroke Time Acceptance Criteria (Seconds)				Fail-Safe Test (Initials)	Full-Stroke Exercise (Initials)	Check Valve Exercise (Initials)	Valve SAT/ UNSAT
		Stem	Ind. Lights		Acceptable Range		Limiting (≤)	Ref. Stroke Time				
					Minimum (≥)	Maximum (≤)						
2-E21-F015A	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-E21-F015A	CLOSED			N/A	36.30	49.10	53.30	42.70	N/A	N/A	N/A	N/A
2-E21-F004A	CLOSED			11.0	9.38	12.70	13.80	11.04	N/A	N/A	N/A	SAT
2-E21-F005A	OPEN			11.6	10.20	13.80	15.00	12.00	N/A	N/A	N/A	SAT
2-E21-F005A	CLOSED			11.7	10.30	13.94	15.15	12.12	N/A	Y	N/A	SAT
2-E21-F004A	OPEN			11.2	9.61	13.01	14.14	11.31	N/A	Y	N/A	SAT
2-E21-F001A	CLOSED			80.6	70.00	94.60	102.90	82.34	N/A	N/A	N/A	SAT
2-E21-F001A	OPEN			78.6	67.20	90.80	98.70	79.03	N/A	Y	N/A	SAT
2-E21-F031A	CLOSED			13.7	12.20	16.40	17.90	14.33	N/A	N/A	N/A	SAT
2-E21-F031A	OPEN	N/A	N/A	15.2	13.10	17.70	19.20	15.41	N/A	Y	N/A	SAT
2-E21-F029A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E21-F030A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E21-F003A	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

NOTE: Spaces next to valve numbers shall be filled in with an appropriate entry, initials, or N/A.

Performed by (signature) Pete Enderny Date

Performed by (signature) Date

Reviewed, IST Group (signature) Date

R25

Leak Identification Data Sheet

NOTE:	For packing and gaskets, a WR is required to be initiated and documented if leakage exceeds 5 dpm.
NOTE:	Each WR/WO listed is required to state that identified leakage is to be corrected or minimized as required by TS 5.5.2.

SYSTEM: Core Spray System A Loop　　　Unit ____________

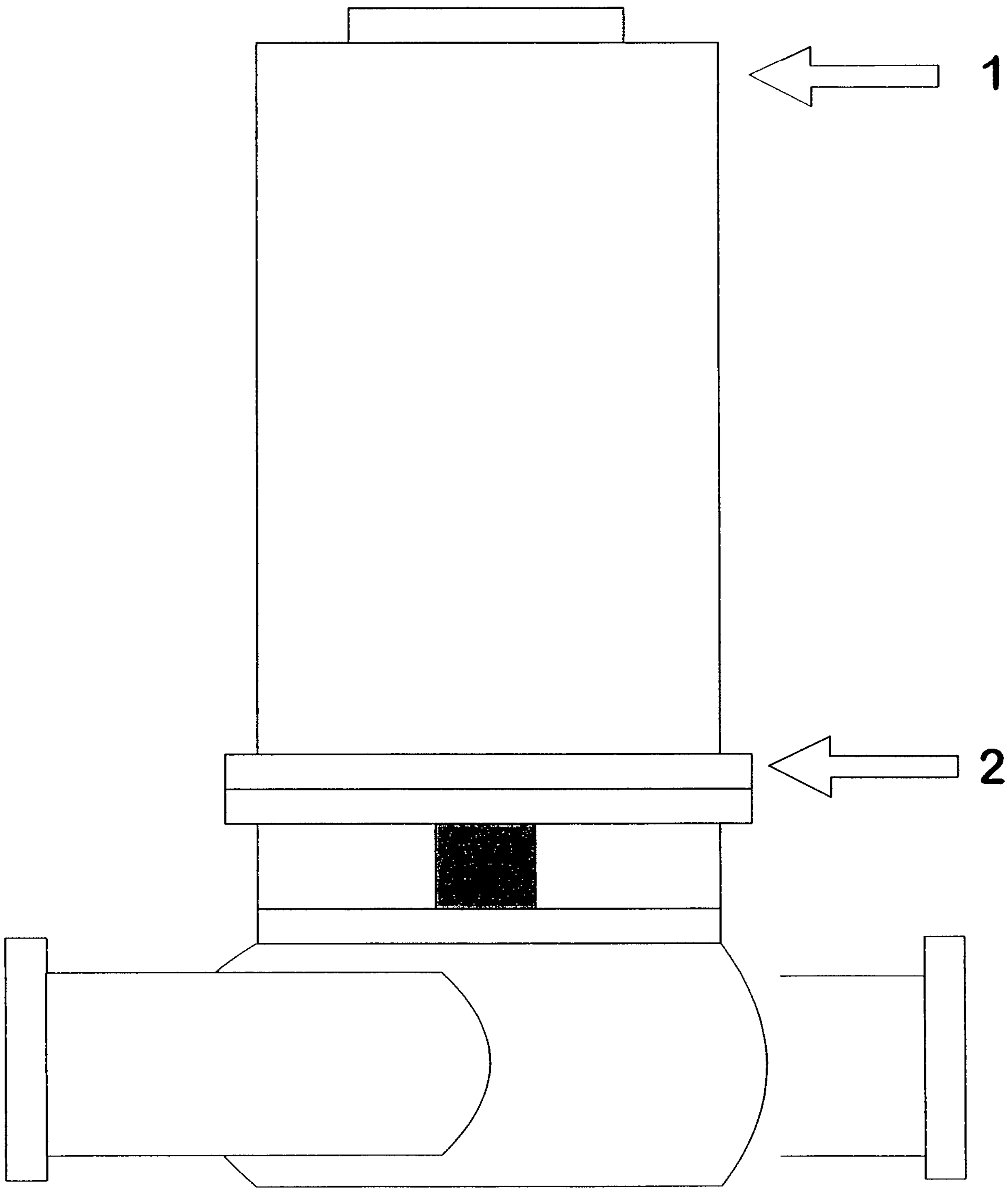
Component	Nature of Leak	Leakage Rate[1]	WR/WO#
	Sum of Identified Leakage:		
	AST Combined Leakage Log value from 0AP-054:	+	
	Total:	=	

[1] Conversion Factor: (dpm x 1.6×10^{-3}) ÷ 60 = gpm

Examination Performed by: ________________/____________________ Date _________
(Signature)　　(Print Name)

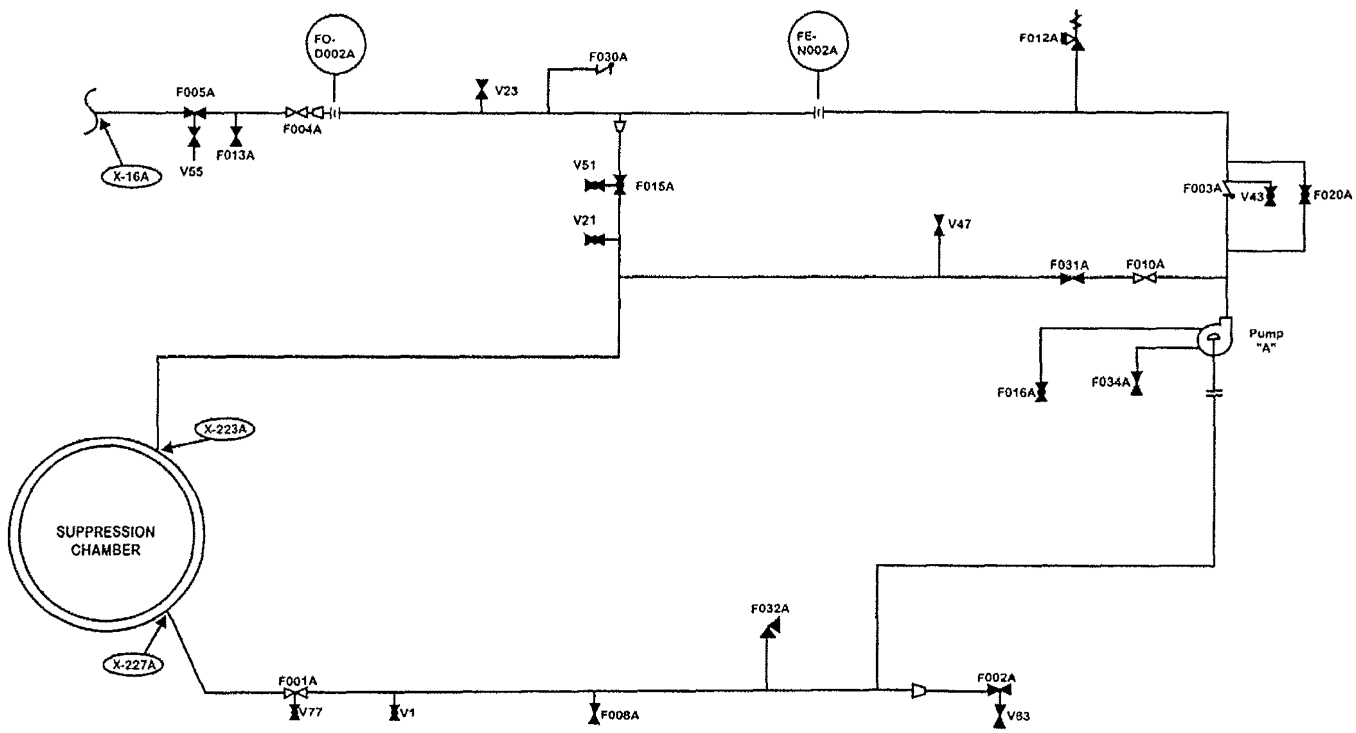
Examination Performed by: ________________/____________________ Date _________
(Signature)　　(Print Name)

Core Spray Pump
Pump Vibration Test Position Numbers (Bearing Numbers)



Leakage Inspection Boundary

NOTE:	Because of drawing limitations, instrumentation lines connected to boundaries are not shown. The leakage inspection boundary for instrumentation lines extends to and includes the last instrument root valve before the instrument.
NOTE:	The Suppression Chamber is **NOT** required to be examined. It is shown for clarification only



Leakage Inspection Guidance

When performing leakage inspections for TS 5.5.2, the following guidance should be followed to the extent practical.

1. The leakage inspection should be conducted by examining the accessible exposed surfaces for evidence of leakage.

2. For insulated components or components whose external surfaces are inaccessible for direct inspection, the leakage inspection should be performed on surrounding areas (i.e. floors or equipment surfaces located under the component) for evidence of leakage or other areas to which leakage may be channeled.

3. For vertical surfaces, the inspection of the lowest elevation where leakage may be detected should be performed.

4. For ALARA, a leakage inspection using remote visual equipment or the use of an installed leakage detection system to identify leakage is acceptable.

REVISION SUMMARY

Revision 57 incorporates PRR214582 (CORR 207570-14) and PRR20653 (CORR 207575-16) program changes to perform a Leakage Walkdown in accordance with TS 5.5.2. Changes include documenting leakage as required for Alternate Source Term (License Amendments 221 and 246 dated May 30, 2002).

Revision 56 adds Step 7.8.33 to vent system as required.

Revision 55 incorporated EC63657 by changing pump flow rate from 4626 to 4700 gpm (steps 6.1.1 and 7.8.10), adding a new step (7.8.23) to increase flow to 5000 gpm, changing Note prior to new step (7.8.23) to 5000 gpm, remove the statement inside the "( )" in Step 2.13, and changed the IST pump psid value to 260.

Revision 54 makes an editorial correction to add the Tech Spec reference to Section 6.3 per NAS Observation 69604 (This reference is already listed in the Purpose Section).

Revision 53 revises the stroke time acceptance criteria for 1-E21-F004A and 1-E21-F005A to reflect the gear ratio change incorporated IAW EC 51210/54126.

Revision 52 makes editorial corrections to update the cover page and word processing format and makes changes to reflect EC 46949, Rev 2, re-evaluation of CS injection valve and pump performance requirements.

Revision 51 revises the stroke time acceptance criteria for 2-E21-F004A and 2-E21-F005A to reflect the gear ratio change incorporated IAW EC 46949/EC 50010.

Revision 50 adds "if performing during a refueling outage" to clarify required testing associated with stroking E21-F015A.

Revision 49 updates stroke time data for 2-E21-F005A iaw the IST program; added frequency of each refueling outage for stroking/timing E21-F015A; added NOTES/step informing operators E21-F015A is required to be stroked/timed during refuel outages only and routes procedure users to applicable sections if test is being performed only to test E21-F015A

Revision 48 removes reference to specific vibration instrument, IRD Model 890, and replaces with generic reference; Add P&L and caution identifying Core Spray Loop A is inop during valve stroking and until the Loop A low pressure alarm clears.

Revision 47 revises purpose to include Tech Spec Section 5.5.2.a and adds Precaution and Limitations regarding actions if air is found in the system during testing.

Revision 46 revises gear ratio thus stroke times for 1-E21-F004A in accordance with ESR 98-00285. This revision also incorporates new stroke times for 1-E21-F001A in accordance with ESR 98-00284.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-4

TITLE: Restore Shutdown Cooling following a spurious isolation

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

Read the following to applicant.

TASK CONDITIONS:

Unit 2 has been shutdown for maintenance for 5 days.

A spurious Group 8 isolation caused a loss of the B loop of shutdown cooling.

RHR flow prior to the loss was ≈ 6000 gpm

The cause of the isolation was found and repaired and the isolation has been reset.

RPS is energized

Reactor Level band is 200” to 220”

Reactor pressure is 0 psig

RHR system cooldown and draindown are not a concern

0PT-01.7 is being performed and monitored by another operator

INITIATING CUE:

You are directed by the unit SCO to return the B loop of RHR to Shutdown Cooling IAW AOP-15 (Start the “B” RHR pump).

STEP 1- References AOP-15.0 step 3.2.11 & Precautions

Refers to step AOP -15.0 step 3.2.11

SAT/UNSAT

NOTE: If asked, all precautions are met

Step 2 - CLOSE Loop (B) OUTBOARD INJECTION VALVE, E11-F017 (B).

Closes Loop (B) OUTBOARD INJECTION VALVE, E11-F017(B).

** **CRITICAL STEP****

SAT/UNSAT

Step 3 - OPEN Loop (B) INBOARD INJECTION VALVE, E11-F015(B)

Opens Loop (B) INBOARD INJECTION VALVE, E11-F015(B)

** **CRITICAL STEP****

SAT/UNSAT

Step 4 - Unit 2 Only: OPEN RHR SHUTDOWN COOLING INBOARD

ISOLATION VALVE, E11-F009.

Opens valve E11-F009

** **CRITICAL STEP****

SAT/UNSAT

Step 5 - Unit 2 Only: SLOWLY OPEN RHR SHUTDOWN COOLING OUTBOARD ISOLATION VALVE, E11-F008.

Slowly Opens valve E11-F008

****CRITICAL STEP****

SAT/UNSAT

NOTE: Caution is prior to next step.

CAUTION

Failure to minimize RHR Pump operation while deadheaded may cause pump damage.

Step 6 - START an RHR Pump in the loop being used for Shutdown Cooling.

Starts the "B" RHR pump.

****CRITICAL STEP****

SAT/UNSAT

Step 7 - SLOWLY THROTTLE OPEN Loop (B) OUTBOARD INJECTION VALVE, E11-F017 (B) to re-establish the "B" RHR loop in Shutdown Cooling.

Throttles Open E11-F017B

****CRITICAL STEP****

SAT/UNSAT

Step 8 - WHEN RHR loop conditions have stabilized, FULLY OPEN Loop (B) OUTBOARD INJECTION VALVE, E11-F017 (B).

Fully Opens E11-F017B

****CRITICAL STEP****

SAT/UNSAT

Step 9 - IF the reactor coolant temperature is less than 212°F, THEN ENSURE the following valves are open:

- INBOARD RX HEAD VENT VLV, B21-F003
- OUTBOARD RX HEAD VENT VLV, B21-F004.

Ensures that valves B21-F003 & F004 are Open

SAT/UNSAT

TERMINATING CUE: When the next step is reached, and B RHR pump is in shutdown cooling, the JPM may be terminated

Step 10 - MAINTAIN RHR in Shutdown Cooling in accordance with 2OP-17.

Refers to 2OP-17

SAT/UNSAT

COMMENTS:

REFERENCES:
0AOP-15.0, Rev.17 section 3.2.11

KA Reference:
205000 A4.01, A4.02, A4.03 Ability to monitor and/or manually in the control room SDC/RHR pumps and valves

TOOLS AND EQUIPMENT:
None

SAFETY FUNCTION (from NUREG 1123, Rev 2.):
4 – Heat removal From the Core

Time Required for Completion: 15 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate	**Actual**		Unit:	2
Setting:	Control Room	**Simulator**			
Time Critical:	Yes **No**	Time Limit	N/A		
Alternate Path:	Yes **No**				

EVALUATION

JPM: Pass Fail

TASK CONDITIONS:

Unit 2 has been shutdown for maintenance for 5 days.

A spurious Group 8 isolation caused a loss of the B loop of shutdown cooling.

RHR flow prior to the loss was ≈ 6000 gpm

The cause of the isolation was found and repaired and the isolation has been reset.

RPS is energized

Reactor Level band is 200" to 220"

Reactor pressure is 0 psig

RHR system cooldown and draindown are not a concern

0PT-01.7 is being performed and monitored by another operator

INITIATING CUE:

You are directed by the unit SCO to return the B loop of RHR to Shutdown Cooling IAW AOP-15 (Start the "B" RHR pump).

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-5

TITLE: Primary Containment Ventilation During Personnel Entry

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. The plant is in Mode 4.
2. Primary Containment purging is complete IAW 2OP-24, Section 7.3.
3. Primary Containment oxygen concentration is >18%.
4. An E&RC air sample has determined radioactive gases are less than 1 DAC.
5. Five drywell volumes have been purged.
6. The Reactor Building Ventilation System is in operation per 2OP-37.1 and SBGT is in STANDBY per 2OP-10.
7. Personnel entry into primary containment is necessary.
8. The requirements for isolation of all nitrogen sources to containment and TIP System have been met.
9. E&RC has been notified of changing ventilation in primary containment.

INITIATING CUE:

You are directed by the Unit SCO to startup Primary Containment Ventilation During Personnel Entry, per 2OP-24 using both purge exhaust fans and inform the Unit SCO when the actions are complete.

Step 1 - Obtain a current revision of 2OP-24, Section 5.4.

Current Revision of 2OP-24, Section 5.4 obtained and verified if applicable.

SAT/UNSAT

Step 2 - WHEN the unit is in Mode 4, THEN STOP PURGE EXHAUST FAN, 2A-PS-EF-RB AND 2B-PS-EF-RB, if running.

Ensures Purge Exhaust Fans are not running

SAT/UNSAT

Step 3 – Ensure the following valves are OPEN (Procedure Steps 5.4.2.3 thru 5.4.3.10)

OPENS the following valves: ****ALL ARE CRITICAL STEPS****

1. ENSURE D/W N2 INLET VLV, CAC-V6. SAT/ UNSAT
2. ENSURE TORUS N2 INLET VLV, CAC-V5. SAT/ UNSAT
3. ENSURE TORUS PURGE EXH VLV, CAC-V7. SAT/ UNSAT
4. ENSURE TORUS PURGE EXH VLV, CAC-V8. SAT/ UNSAT
5. ENSURE DRYWELL PURGE EXH VLV, CAC-V9. SAT/ UNSAT
6. ENSURE DRYWELL PURGE EXH VLV, CAC-V10. SAT/ UNSAT
7. ENSURE DW HEAD PURGE EXH VLV, CAC-V49. SAT/ UNSAT
8. ENSURE DW HEAD PURGE EXH VLV, CAC-V50. SAT/ UNSAT

Step 4 - IF running, THEN STOP SBGT A and B.

Ensures SBGT A & B are not running

SAT/UNSAT

Step 5 - ENSURE SBGT DW SUCT DAMPER, 2F-BFV-RB, is closed.

Ensures SBGT DW SUCT DAMPER, 2F-BFV-RB, is closed

SAT/UNSAT

Step 6 - OPEN PURGE SUCTION & INBD EXHAUST ISOL, 2I-BFV-RB AND 2N-BFV-RB.

Opens PURGE SUCTION & INBD EXHAUST ISOL, 2I-BFV-RB AND 2N-BFV-RB.

****CRITICAL STEP****

SAT/UNSAT

Step 7 - OPEN PURGE OTBD EXHAUST ISOL, 2A-BFV-RB.

OPENs PURGE OTBD EXHAUST ISOL, 2A-BFV-RB

****CRITICAL STEP****

SAT/UNSAT

Step 8 - ENSURE DW PURGE AIR INLET VLV, CAC-V15, is open.

Ensures DW PURGE AIR INLET VLV, CAC-V15, is open.

SAT/UNSAT

Step 9 - PLACE DW/TORUS PURGE DAMPER, 2C-TPD-RB, in MAX.

Places DW/TORUS PURGE DAMPER, 2C-TPD-RB, in MAX.

****CRITICAL STEP****

SAT/UNSAT

NOTE: The following caution is prior to the next step

CAUTION

Starting a second fan when one is already running causes excessive thermal stress to the motor. This is due to the reverse rotation of the non-running fan while the suction and discharge dampers are opening. Starting of fan(s) should be in the slow mode of operation until system pressure stabilizes and then shifted to the fast mode of operation as desired.

EXAMINER NOTE: A dual fan start was specified in the initiating cue. Slow speed is required by the caution noted above.

Step 10 - PERFORM the following to start Purge Exhaust Fan(s).

a. IF a single fan start is desired, THEN START 2A-PS-EF-RB or 2B-PS-EF-RB.

b. IF dual fan starts are desired, THEN SIMULTANEOUSLY START 2A-PS-EF-RB and 2B-PS-EF-RB.

c. IF a second fan start is desired AND one fan is already running, THEN PERFORM the following:

– STOP the running fan.

– WHEN the suction and discharge dampers indicate full closure, THEN SIMULTANEOUSLY START 2A& 2B-PS-EF-RB

Performs a dual fan start in slow speed (step b. above)

****CRITICAL STEP****

SAT/UNSAT

Step 11 - ENSURE SBGT TRAIN 2A REACTOR BUILDING SUCTION VALVE, 2D-BFV-RB, is open.

Ensures SBGT TRAIN 2A REACTOR BUILDING SUCTION VALVE, 2D-BFV-RB, is open

SAT/UNSAT

Step 12 - ENSURE SBGT TRAIN 2B REACTOR BUILDING SUCTION VALVE,

2H-BFV-RB, is open.

Ensures SBGT TRAIN 2B REACTOR BUILDING SUCTION VALVE,

2H-BFV-RB, is open.

SAT/UNSAT

TERMINATING CUE/NOTE: The JPM is complete when the next step is addressed. Another operator will perform that step.

COMMENTS:

KA Reference

288000 A4.01 3.1/2.9: Ability to manually operate and/or monitor in the control room: Start and stop fans.

REFERENCES:
2OP-24, Rev.139

TOOLS AND EQUIPMENT:
None.

SAFETY FUNCTION (from NUREG 1123, Rev 2.):
9 – Rad Release – Plant ventilation

Time Required for Completion: 15 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate	**Actual**		Unit: 2
Setting:	Control Room	**Simulator**		
Time Critical:	Yes **No**	Time Limit	N/A	
Alternate Path:	Yes **No**			

EVALUATION

JPM: Pass Fail

TASK CONDITIONS:

1. The plant is in Mode 4.

2. Primary Containment purging is complete IAW 2OP-24, Section 7.3.

3. Primary Containment oxygen concentration is >18%.

4. An E&RC air sample has determined radioactive gases are less than 1 DAC.

5. Five drywell volumes have been purged.

6. The Reactor Building Ventilation System is in operation per 2OP-37.1 and SBGT is in STANDBY per 2OP-10.

7. Personnel entry into primary containment is necessary.

8. The requirements for isolation of all nitrogen sources to containment and TIP System have been met.

9. E&RC has been notified of changing ventilation in primary containment.

INITIATING CUE:

You are directed by the Unit SCO to startup Primary Containment Ventilation During Personnel Entry, per 2OP-24 using both purge exhaust fans and inform the Unit SCO when the actions are complete.

5.4 Primary Containment Ventilating During Personnel Entry

C
Continuous
Use

5.4.1 Initial Conditions

1. Primary containment purging is complete in accordance with Section 5.3 or 8.13. ☐

2. **IF** the unit is in Mode 1, 2, or 3, **THEN** drywell purge is in service in accordance with Section 5.3. ☐

3. Primary containment oxygen concentration is greater than 18%. ☐

4. An E&RC air sample determined radioactive gases are less than 1 DAC. ☐

5. Five drywell volumes have been purged. ☐

6. The Reactor Building Ventilation System is in operation in accordance with 2OP-37.1. ☐

7. Personnel entry into primary containment is necessary. ☐

5.4.2 Procedural Steps

NOTE:	The performance of Step 5.4.2.1 completes the conditions necessary to make drywell entry in Modes 1, 2, or 3 and the remainder of this section is not applicable. This step must also be completed to satisfy personnel entry requirements for Modes 4 and 5.

R27

CAUTION

Simultaneous ventilating the drywell and suppression chamber shall **NOT** be performed in Modes 1, 2, or 3.

1. **ENSURE** the requirements for isolation of all nitrogen sources to containment **AND** TIP System have been met as specified by 0OI-01.02 for drywell entry. ☐

5.4.2 Procedural Steps

NOTE:	E&RC should be notified prior to changing ventilation through primary containment.

2. **WHEN** the unit is in Mode 4, **THEN STOP** *PURGE EXHAUST FAN, 2A-PS-EF-RB* **AND** *2B-PS-EF-RB*, if running. ☐

3. **ENSURE** *D/W N_2 INLET VLV, CAC-V6*, is open. ☐

4. **ENSURE** *TORUS N_2 INLET VLV, CAC-V5*, is open. ☐

5. **ENSURE** *TORUS PURGE EXH VLV, CAC-V7*, is open. ☐

6. **ENSURE** *TORUS PURGE EXH VLV, CAC-V8*, is open. ☐

7. **ENSURE** *DRYWELL PURGE EXH VLV, CAC-V9*, is open. ☐

8. **ENSURE** *DRYWELL PURGE EXH VLV, CAC-V10*, is open. ☐

9. **ENSURE** *DW HEAD PURGE EXH VLV, CAC-V49,* is open. ☐

10. **ENSURE** *DW HEAD PURGE EXH VLV, CAC-V50*, is open. ☐

11. **IF** running, **THEN STOP** *SBGT A* and *B.* ☐

12. **ENSURE** *SBGT DW SUCT DAMPER, 2F-BFV-RB*, is closed. ☐

13. **OPEN** *PURGE SUCTION & INBD EXHAUST ISOL, 2I-BFV-RB AND 2N-BFV-RB.* ☐

14. **OPEN** *PURGE OTBD EXHAUST ISOL, 2A-BFV-RB.* ☐

5.4.2 Procedural Steps

15. **ENSURE** *DW PURGE AIR INLET VLV, CAC-V15*, is open. ☐

16. **PLACE** *DW/TORUS PURGE DAMPER, 2C-TPD-RB*, in *MAX*. ☐

CAUTION

Starting a second fan when one is already running causes excessive thermal stress to the motor. This is due to the reverse rotation of the non-running fan while the suction and discharge dampers are opening. Starting of fan(s) should be in the slow mode of operation until system pressure stabilizes and then shifted to the fast mode of operation as desired.

17. **PERFORM** the following to start Purge Exhaust Fan(s).

    a. **IF** a single fan start is desired, **THEN START** *2A-PS-EF-RB* or *2B-PS-EF-RB*. ☐

    b. **IF** dual fan starts are desired, **THEN SIMULTANEOUSLY START** *2A-PS-EF-RB* and *2B-PS-EF-RB*. ☐

    c. **IF** a second fan start is desired **AND** one fan is already running, **THEN PERFORM** the following:

    – **STOP** the running fan. ☐

    – **WHEN** the suction and discharge dampers indicate full closure, **THEN SIMULTANEOUSLY START** *2A-PS-EF-RB* and *2B-PS-EF-RB*. ☐

18. **ENSURE** *SBGT TRAIN 2A REACTOR BUILDING SUCTION VALVE, 2D-BFV-RB*, is open. ☐

5.4.2 Procedural Steps

19. **ENSURE** *SBGT TRAIN 2B REACTOR BUILDING SUCTION VALVE, 2H-BFV-RB*, is open. ☐

20. **IF** Section 7.3 was **NOT** performed prior to this section, **THEN ENSURE** SBGT System in standby in accordance with 2OP-10. ☐

NOTE:	The Control Operator may adjust primary containment flow as specific activities in the primary containment require.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-6

TITLE: Manual Transfer of 4160 Emergency Bus Supply from the DG to the Normal Feeder IAW 0OP-50.1

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

TASK CONDITIONS:

1. Unit Two is operating at 100% power.

2. Emergency Bus E3 is being carried by the #3 EDG due to a relay trip of the E3 Bus feeder breaker.

3. The Unit 2 alignment has been restored to normal configuration following the restoration of power to Bus E3.

4. Repairs have been completed to the E3 feeder breaker relay.

5. Normal feeder bus for emergency bus is energized.

3. The Load Dispatcher has been notified that the 4160V E Bus power supply is being shifted to the Normal Feeder.

INITIATING CUE:

You are directed by the Unit SCO to manually transfer the 4160 Emergency Bus Supply from the DG to the Normal Feeder IAW 0OP-50.1.

EXAMINER NOTE: The following note and caution must be noted prior to performing step 1 of JPM (End of Procedure Step 8.6.1)

NOTE:
WHEN transferring the diesel generator from Auto Mode to Control Room Manual, diesel generator frequency is expected to drop approximately 3 Hz at rated load. Since the range of frequency drop to diesel generator load is linear (e.g., transfer to Control Room Manual at half load results in a frequency drop of 1.5 Hz), adjustments to lower diesel generator load or raise diesel frequency can be made to compensate for frequency drop prior to the transfer. See Figure 1.

CAUTION:
Failure to reduce load or raise frequency on the diesel generator as necessary, prior to transferring to Control Room Manual may result in trip of the RPS EPA breakers on underfrequency (57.7 Hz decreasing).

Step 1- PERFORM one or more of the following as necessary to prevent RPS EPA breaker trip. (See Figure 1.)

- RAISE diesel generator frequency (limiter set at 61 Hz)
- REDUCE diesel generator load

Raises frequency and/or reduces load to maintain 60 hertz

****CRITICAL STEP****

SAT/UNSAT

Step 2 - PLACE the appropriate diesel generator control in control room manual mode by depressing applicable push button on Panel XU-2.

Depresses PB and places the #3 EDG control in control room manual

CRITICAL STEP*

SAT/UNSAT

Step 3 - PLACE appropriate synchroscope switch in ON for normal feed to emergency bus: E3 *BUS 2D TO BUS E3 (2AD1).*

Places E3 BUS 2D TO BUS E3 (2AD1) synchroscope switch in ON

****CRITICAL STEP****

SAT/UNSAT

NOTE: Procedure Caution Prior to next step

CAUTION
Incoming voltage is from the grid and running voltage is from the diesel generator.

Step 4 - ENSURE incoming and running voltages are matched.

Ensures incoming and running voltages are matched.

****CRITICAL STEP****

SAT/UNSAT

NOTE: Procedure Caution Prior to next step

CAUTION

WHEN the synchroscope is rotating slowly in the fast direction during this method of transfer, it will be necessary to raise DG frequency to obtain rotation in the slow direction. Failure to follow this guidance could result in an RPS MG set trip on low frequency at 57.7 Hz decreasing.

Step 5 - ADJUST diesel generator GOVERNOR motor control switch as necessary so the synchroscope is rotating slowly in the SLOW direction (counterclockwise).

ADJUST diesel generator GOVERNOR motor control switch as necessary so the synchroscope is rotating slowly in the SLOW direction (counterclockwise).

****CRITICAL STEP****

SAT/UNSAT

Step 6 - WHEN synchroscope is at "12 o'clock", THEN PLACE AND HOLD control switch for appropriate normal feed to emergency bus in CLOSE until both MSTR and SLAVE breakers indicate closed:
BUS 2D TO BUS E3 Master - 2AD1 Slave - AI2.

Places AND Holds control switch for appropriate normal feed to emergency bus in CLOSE until both MSTR (2AD1) and SLAVE (AI2) breakers indicate closed:

****CRITICAL STEP****

SAT/UNSAT

Step 7 - CONFIRM synchroscope remains at "12 o'clock".

Confirms synch scope remains at 12 o'clock.

SAT/UNSAT

Step 8 - PLACE synchroscope used in Step 8.6.2.3 in OFF.

PLACEs synchroscope E3 BUS 2D TO BUS E3 (2AD1) in OFF.

SAT/UNSAT

NOTE: Procedure Caution Prior to next step

CAUTION
To prevent a diesel generator from tripping on reverse power, do NOT reduce DG load below 450KW.

Step 9 - MAINTAIN generator vars with voltage adjusting rheostat while lowering diesel generator load.

Maintains vars with voltage by adjusting rheostat while lowering load

****CRITICAL STEP****

SAT/UNSAT

Step 10 - LOWER diesel generator load to between 450 and 550 KW by momentarily placing the GOVERNOR motor control switch in LOWER.

Lowers load to between 450 and 550 KW (not <450KW)

****CRITICAL STEP****

SAT/UNSAT

Step 11 - **OPEN** the appropriate diesel generator output breaker:
DIESEL GEN 3 TO BUS E3 (AI5)

Opens output breaker DIESEL GEN 3 TO BUS E3 (AI5)

****CRITICAL STEP****

SAT/UNSAT

Step 12 - OBSERVE the following indications:

a. Breaker open in accordance with indicating lights.
b. Emergency bus voltage remains constant.
c. Diesel generator load and amps are zero.
d. NO LOAD and AVAIL lights are illuminated on the diesel generator control module.

Observes indications noted above

SAT/UNSAT

TERMINATING CUE/PROMPT: The JPM is complete. The next step will be performed by another operator

COMMENTS:

K/A REFERENCE AND IMPORTANCE RATING:

264000 A4.05 3.6/3.7
Ability to manually operate and/or monitor in the control room: Transfer of the EDG with load to grid

REFERENCES:

0OP-50.1, Revision 65

TOOLS AND EQUIPMENT:

None.

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

6 - Electrical

APPLICABLE METHOD OF TESTING

Performance:	Simulate ___	Actual	X	Unit:	2
Setting:	Control Room ___	Simulator	X	In-Plant:	
Time Critical:	Yes ___	No	X	Time Limit	
Alternate Path:	Yes ___	No	X		

EVALUATION

Performer:

JPM: Pass _____ Fail

TASK CONDITIONS:

1. Unit Two is operating at 100% power.

2. Emergency Bus E3 is being carried by the #3 EDG due to a relay trip of the E3 Bus feeder breaker.

3. The Unit 2 alignment has been restored to normal configuration following the restoration of power to Bus E3.

4. Repairs have been completed to the E3 feeder breaker relay.

5. Normal feeder bus for emergency bus is energized.

3. The Load Dispatcher has been notified that the 4160V E Bus power supply is being shifted to the Normal Feeder.

INITIATING CUE:

You are directed by the Unit SCO to manually transfer the 4160 Emergency Bus Supply from the DG to the Normal Feeder IAW 0OP-50.1.

R36 **8.6 Control Room Manual Transfer of 4160V Emergency Bus Supply from Diesel Generator to Normal Feeder**

C
Continuous
Use

8.6.1 Initial Conditions

R38

> **NOTE:** **IF** this procedure is being used to recover from a loss of grid event (such as 0AOP-36.1 or 0AOP-36.2), **THEN** the Shift Superintendent and Operations Manager should be included during consultation with the Load Dispatcher to obtain assurance that Off-site power is reliable enough to support reconnection of the Emergency Buses.

1. Diesel generator is supplying the associated emergency bus. ☐
2. Normal feeder bus for emergency bus is energized. ☐
3. Notify the Load Dispatcher that the 4160V E Bus power supply is being shifted to the Normal Feeder. ☐

8.6.2 Procedural Steps

R35

> **NOTE:** **WHEN** transferring the diesel generator from Auto Mode to Control Room Manual, diesel generator frequency is expected to drop approximately 3 Hz at rated load. Since the range of frequency drop to diesel generator load is linear (e.g., transfer to Control Room Manual at half load results in a frequency drop of 1.5 Hz), adjustments to lower diesel generator load or raise diesel frequency can be made to compensate for frequency drop prior to the transfer. See Figure 1.

R35

> **CAUTION**
>
> Failure to reduce load or raise frequency on the diesel generator as necessary, prior to transferring to Control Room Manual may result in trip of the RPS EPA breakers on underfrequency (57.7 Hz decreasing).

R35

8.6.2 Procedural Steps

1. **PERFORM** one or more of the following as necessary to prevent RPS EPA breaker trip. (See Figure 1.)

   – **RAISE** diesel generator frequency (limiter set at 61 Hz) ☐

   – **REDUCE** diesel generator load ☐

2. **PLACE** the appropriate diesel generator control in control room manual mode by depressing applicable push button on Panel XU-2. ☐

3. **PLACE** appropriate synchroscope switch in *ON* for normal feed to emergency bus:

	Emergency Bus	Synchroscope	
a.	E1	*BUS 1D TO BUS E1 (1AD1).*	☐
b.	E2	*BUS 1C TO BUS E2 (1AC8).*	☐
c.	E3	*BUS 2D TO BUS E3 (2AD1).*	☐
d.	E4	*BUS 2C TO BUS E4 (2AC8).*	☐

CAUTION

Incoming voltage is from the grid and running voltage is from the diesel generator.

4. **ENSURE** incoming and running voltages are matched. ☐

CAUTION

WHEN the synchroscope is rotating slowly in the fast direction during this method of transfer, it will be necessary to raise DG frequency to obtain rotation in the slow direction. Failure to follow this guidance could result in an RPS MG set trip on low frequency at 57.7 Hz decreasing.

5. **ADJUST** diesel generator *GOVERNOR* motor control switch as necessary so the synchroscope is rotating slowly in the SLOW direction (counterclockwise). ☐

8.6.2 Procedural Steps

6. **WHEN** synchroscope is at "12 o'clock", **THEN PLACE AND HOLD** control switch for appropriate normal feed to emergency bus in *CLOSE* until both *MSTR* and *SLAVE* breakers indicate closed: ☐

	Breaker Feed	Master Breaker	Slave Breaker	
a.	*BUS 1D TO BUS E1*	1AD1	AE6.	☐
b.	*BUS 1C TO BUS E2*	1AC8	AG4.	☐
c.	*BUS 2D TO BUS E3*	2AD1	AI2.	☐
d.	*BUS 2C TO BUS E4*	2AC8	AJ9.	☐

7. **CONFIRM** synchroscope remains at "12 o'clock". ☐

8. **PLACE** synchroscope used in Step 8.6.2.3 in *OFF*. ☐

CAUTION

To prevent a diesel generator from tripping on reverse power, do **NOT** reduce DG load below 450KW.

9. **MAINTAIN** generator vars with voltage adjusting rheostat while lowering diesel generator load. ☐

10. **LOWER** diesel generator load to between 450 and 550 KW by momentarily placing the *GOVERNOR* motor control switch in *LOWER*. ☐

8.6.2 Procedural Steps

11. **OPEN** the appropriate diesel generator output breaker: ☐

Diesel Generator	Breaker	
No. 1	*DIESEL GEN 1 TO BUS E1 (AE9)*	☐
No. 2	*DIESEL GEN 2 TO BUS E2 (AG7)*	☐
No. 3	*DIESEL GEN 3 TO BUS E3 (AI5)*	☐
No. 4	*DIESEL GEN 4 TO BUS E4 (AK2)*	☐

12. **OBSERVE** the following indications: ☐

    a. Breaker open in accordance with indicating lights. ☐

    b. Emergency bus voltage remains constant. ☐

    c. Diesel generator load and amps are zero. ☐

    d. *NO LOAD* and *AVAIL* lights are illuminated on the diesel generator control module. ☐

13. **SHUT DOWN** the diesel in accordance with 0OP-39. ☐

NOTE: The emergency bus is now energized from normal feeder and the diesel generator is returned to standby automatic upon completion of shutdown section.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-7

TITLE: Rod Worth Minimizer Functional Test – Failure To Enforce Blocks.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

   (0PT-01.6.2)

Read the following to applicant.

TASK CONDITIONS:

1. Unit Two startup is planned following a forced outage.
2. GP-01, Pre-startup Checklist is being performed and is complete up to Section 6.3.6
3. The Mode Switch has been placed in Start/Hot Stby.
4. 0PT-01.10, IRM Detector Position Rod Block Functional Test has been completed satisfactorily.
5. 0PT-01.6.2, Rod Worth Minimizer Operability Test has been completed to Section 7.4, RWM Functional Test.
6. A reactor startup was performed six months ago with RWM inoperable.
7. GP-10, sequence A2 has been loaded into RWM for startup.

INITIATING CUE:

You are directed by the Unit SCO to perform RWM Functional Test per 0PT-01.6.2, and then complete actions of 0GP-01, Section 6.3. Inform the Unit SCO when the actions are complete.

Step 1 – Procedure 0PT-01.6.2 obtained and precautions, limitations and prerequisites reviewed. Reviews section 7.4

Reviews procedure precautions, limitations and prerequisites & Section 7.4.

SAT/UNSAT

Step 2 – Ensure rod select power ON and confirm RWM Operator Display indicates Insert and Withdraw blocks.

Ensures Rod select power is On and confirms indication of Insert & Withdraw blocks

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

Step 3 – Select a Step 01 rod per GP-10 and withdraw the rod to position 04.

Step 01 rod selected and withdrawn to position 04.

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

Step 4 – Confirm no Insert or Withdraw blocks are indicated on RWM.

Confirmed no Insert or Withdraw blocks are indicated on RWM.

SAT/UNSAT

Step 5 – Confirm Withdraw permissive light is on.

Confirmed Withdraw permissive light is on.

SAT/UNSAT

Step 6 – Confirm selected rod is indicated at Position 04 on the RWM Operator Display.

Confirmed selected rod is indicated at Position 04 on the RWM Operator Display.

SAT/UNSAT

Step 7 – Select a rod from any GP-10 step other than Step 01.

A rod from any GP-10 step other than Step 01 is selected.

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

Step 8 – Confirm a Select Error (SE) and a Withdraw Block (WB) are indicated on the RWM Operator Display.

Confirmed a Select Error (SE) and a Withdraw Block (WB) are indicated on the RWM Operator Display.

SAT/UNSAT

Step 9 – Select the Step 01 rod at Position 04 and insert to position 00.

The Step 01 rod at Position 04 is inserted to position 00.

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

EXAMINER NOTE:

AT THIS TIME THE SIM BOOTH OPERATOR MUST BE NOTIFIED TO INSERT TRIGGER 1 FOR RWM MALFUNCTION

Step 10 – Place the RWM Operator Display keylock switch on RTGB Panel H12-P603 in the Test position.

RWM Operator Display keylock switch on RTGB Panel H12-P603 is in the Test position.

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

Step 11 – Press the Etc softkey on the Operator Display until the Rod Test selection appears.

Presses the Etc softkey until the Rod Test selection appears.

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

Step 12 – Press the Rod Test softkey on the Operator Display.

Rod Test softkey on the Operator Display is pressed.

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

Step 13 – Select a Step 13 rod per GP-10 and withdraw it to Position 04.

A Step 13 rod per GP-10 is selected and withdrawn to Position 04.

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

EXAMINER NOTE:

The withdraw permissive light will be lit even though RWM displays a Withdraw Block. The examinee must determine the RWM has failed at this point and applicant must then insert the control rod selected in Step 13 to "00".

If the operator decides to continue on in the procedure, they may continue however, the critical task to diagnose the RWM failure has been missed. The applicant may diagnose the problem later on but the problem was not recognized when it first occurred.

Step 14 – Place the RWM Operator Display keylock switch in Operate.

RWM Operator Display keylock switch is in Operate. Recognizes that the withdraw permissive light will be lit even though RWM displays a Withdraw Block..

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

Step 15 – Ensures all control rods are at "00" due to RWM problem

Selects the rod selected at Step 13 and inserts it to Position 00.

Control rod is at Position 00.

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

Step 16 – Inform Unit SCO that test is found to be unsatisfactory.

Unit SCO informed that test is found to be unsatisfactory.

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

Prompt: As SCO, acknowledge the RWM issue.

TERMINATING CUE: When the RWM functional test is determined to be unsatisfactory, and all control rods are at "00", this JPM is complete.

COMMENTS:

K/A REFERENCE AND IMPORTANCE RATING:

201006 A3.04 3.5/3.4

REFERENCES:

0GP-01

0PT-01.6.2

TOOLS AND EQUIPMENT:

None.

SAFETY FUNCTION (from NUREG 1123):

7 – Instrumentation

Validation Time: 15 Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate **Actual** Unit: 2

Setting: Control Room **Simulator**

Time Critical: Yes **No** Time Limit N/A

Alternate Path: Yes **No**

EVALUATION

JPM: Pass Fail

DATE COMPLETED ______________________
UNIT __________ % PWR______GMWE__________
SUPERVISOR______________________________
REASON FOR TEST (check one or more):
____ Routine surveillance
____ W/O # ______________________________
____ Other (explain)_______________________

FREQUENCY:
Within 1 hour after any control rod is withdrawn at less than or equal to 8.75% RTP in Mode 2, if not performed within the previous 92 days.

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
0

0PT-01.6.2

ROD WORTH MINIMIZER SYSTEM OPERABILITY TEST

REVISION 10

1.0 PURPOSE

1.1 This test is performed to determine the operability of the Rod Worth Minimizer System in conformance with the requirements specified in Technical Specifications SR 3.3.2.1.2.

1.2 This test involves observation of alarm and trip functions in response to trip signals and will exercise the RWM System self-test options.

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR, Section 4.3

2.3 SD-07, Reactor Manual Control System

2.4 SD-07.1, Rod Worth Minimizer System (RWM)

2.5 OI-53, Rod Worth Minimizer (RWM)

3.0 PRECAUTIONS AND LIMITATIONS

3.1 The RWM System is able to diagnose a number of internal and external faults. It will identify these as CRITICAL or NONCRITICAL based on their impact upon the RWM's ability to perform its rod conformance function. Thus it may (for example) identify a NONCRITICAL fault related to the RWM's inability to backlight the rod groups or a loss of communication to the ERFIS computer. Neither of these failures would impact its rod conformance function, hence the NONCRITICAL designation.

3.2 Self-test failures and failed system integrity checks will activate the *ROD BLOCK RWM/RMCS SYS TROUBLE (A-05 5-2)* annunciator although only CRITICAL problems will actually cause rod blocks.

3.3 Steps 7.1 through 7.3 may be performed at any power level to perform the RWM Self-Test Check.

4.0 PREREQUISITES

4.1 No other testing or maintenance is in progress that will adversely affect the performance of this test.

4.0 PREREQUISITES

4.2 The following systems are in operation:

4.2.1 Control Rod Drive System (CRD).

4.2.2 Reactor Manual Control System (RMCS).

4.2.3 Rod Worth Minimizer System (RWM).

4.3 If Section 7.4 (RWM Functional Test) is to be performed, Reactor Mode Switch is in START-HOT STBY.

4.4 The following annunciators are not in the alarm condition:

- *ROD BLOCK RWM/RMCS SYS TROUBLE (A-05 5-2).*
- *ROD OUT BLOCK (A-05 2-2).*

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Signed copy of GP-10, Rod Sequence Checkoff Sheets.

5.2 Keys to the RWM Computer Display (H12-P607) and RWM Operator Display (H12-P603).

6.0 ACCEPTANCE CRITERIA

6.1 This test may be considered satisfactory when the following criteria are met:

6.1.1 The RWM self-test check is performed with no CRITICAL faults detected.

6.1.2 A rod block is indicated on the RWM Operator Display and alarm is indicated on RTGB Panel H12-P603 for insert or withdraw errors.

7.0 PROCEDURAL STEPS

Step		Initials
7.1	**OBTAIN** permission from the Unit SCO to perform this test **AND OBTAIN** keys for the RWM Operator Display and Computer Display.	_____
7.2	**ENSURE** that all applicable prerequisites listed in Section 4.0 are met.	_____

7.0 PROCEDURAL STEPS

Initials

7.3 RWM Self-Test Check

7.3.1 **ENSURE** the RWM Operator Display keylock switch on RTGB Panel H12-P603 is in the *OPERATE* position. _____

7.3.2 **SELECT** a Step 01 rod per GP-10. _____

> **NOTE:** Steps 7.3.3 through 7.3.11 are performed at the RWM Computer Display on H12-P607.

7.3.3 **PLACE** the RWM Computer Display keylock switch on H12-P607 in the *INOP* position, **AND CONFIRM** that *INOP* is displayed after a few seconds. _____

7.3.4 **ENSURE** that proper SET PARAMETERS options are selected as follows:

> **CAUTION**
>
> Improper changes to the SET PARAMETERS options can interfere with the correct operation of the RWM. Make only those changes called for by this procedure.

1. **PRESS** the *ETC* softkey until the *SET PARAMETERS* option appears. _____

2. **PRESS** the *SET PARAMETERS* softkey to select the *SELFTEST OPTIONS* screen. _____

3. **IF NECESSARY, PRESS** the "1", "→", and "←" softkeys to toggle the self-test options to "YES" **AND THEN PRESS** the *ACCEPT* softkey. _____

4. **PRESS** the *NEXT DATA* softkey until the *GROUP LIGHTS ABOVE LPAP* screen appears. _____

7.0 PROCEDURAL STEPS

Initials

5. **IF NECESSARY, PRESS** the "1" softkey to toggle the *GROUP LIGHTS* test option to "YES" **AND THEN PRESS** the *ACCEPT* softkey. _____

6. **PRESS** the *EXIT* softkey to exit the *SET PARAMETERS* display. _____

7.3.5 **PRESS** the *ETC* softkey until the *SELFTEST* option appears. _____

7.3.6 **PRESS** the *SELFTEST* softkey **AND OBSERVE** that the *SELFTEST* screen appears. _____

7.3.7 **IF NECESSARY, PRESS** the *SKIP* softkey to locate the start arrow to the CPU test. _____

> **NOTE:** The SELFTEST function is conducted from the Computer Display on H12-P607, but several indications are observed at H12-P603 and H12-P616 making it necessary to establish communications between the Electronic Equipment Room (EER) and the Control Room (CR).
>
> **NOTE:** The various SELFTEST functions are automatically sequenced. The order of the tests and their corresponding indications are listed in Attachment 2.

7.3.8 **ESTABLISH** communications between the Electronic Equipment Room (P607 and P616) **AND** the Control Room (P603) to coordinate observation of expected test indications. _____

> **NOTE:** If necessary to interrupt the test sequence, press the STOP TEST softkey and wait for the current test to end. A test may be restarted by using the SKIP and START TEST softkeys.

7.3.9 **PRESS** the *START TEST* softkey to initiate the testing sequence **AND CONFIRM** indications listed in Attachment 2 are observed. ___/___ EER/CR

7.3.10 **WHEN** the last test (GEDAC RS-232) is running, **PRESS** the *STOP TEST* softkey **AND** wait for the test to end. _____

7.0 PROCEDURAL STEPS

Initials

7.3.11 **PLACE** the RWM Computer Display keylock switch on H12-P607 in the *OPER* position **AND VERIFY** that *OPERATE* is displayed after a few seconds. ___/___ Ind.Ver

7.3.12 **DESELECT** the selected rod at RTGB Panel H12-P603. _____

> **CAUTION**
>
> The Reactor Mode Switch must be in START-HOT STBY to perform Section 7.4 (RWM Functional Test).

7.4 RWM Functional Test

7.4.1 **ENSURE** rod select power *ON* **AND CONFIRM** the RWM Operator Display indicates *INSERT* **AND** *WITHDRAW* blocks. _____

7.4.2 **SELECT** a Step 01 rod per GP-10 **AND WITHDRAW** the rod to Position 04. _____

7.4.3 **CONFIRM** the following indications:

1. No *INSERT* **OR** *WITHDRAW* blocks are indicated by the RWM. _____
2. *WITHDRAW PERMISSIVE* light is on. _____
3. The selected rod is indicated at Position 04 on the RWM Operator Display. _____

7.4.4 **SELECT** a rod from any GP-10 step other than Step 01. _____

7.4.5 **CONFIRM** a Select Error *(SE)* **AND** Withdraw Block *(WB)* are indicated on the RWM Operator Display. _____

7.4.6 **SELECT** the Step 01 rod at Position 04 **AND INSERT** it to Position 00. _____

7.0 PROCEDURAL STEPS

Initials

7.4.7 **PLACE** the RWM Operator Display keylock switch on RTGB Panel H12-P603 in the *TEST* position. _____

7.4.8 **PRESS** the *ETC* softkey on the Operator Display until the *ROD TEST* selection appears. _____

7.4.9 **PRESS** the *ROD TEST* softkey on the Operator Display. _____

7.4.10 **SELECT** a Step 13 rod per GP-10 **AND WITHDRAW** it to Position 04. _____

7.4.11 **PLACE** the RWM Operator Display keylock switch on RTGB Panel H12-P603 in the *OPERATE* position **AND CONFIRM** the following: _____

1. Withdraw block *(WB)* is indicated on the Operator Display. _____
2. Withdraw error *(WE)* is indicated on the Operator Display identifying the Step 13 rod at Position 04. _____
3. Latched step is Step 01. _____
4. *OPERATE* mode is indicated on the Operator Display. _____

7.4.12 **SELECT** any other control rod **AND CONFIRM:**

1. *ROD BLOCK RWM/RMCS SYS TROUBLE (A-05 5-2)* alarms. _____
2. Select Error *(SE)* is indicated on the Operator Display. _____
3. The selected control rod **CANNOT** be withdrawn. _____

7.4.13 **PRESS** the *ETC* softkey on the Operator Display until the *MESSAGES* selection appears. _____

7.0 PROCEDURAL STEPS

Initials

7.4.14 **PRESS** the *MESSAGES* softkey on the Operator Display **AND CONFIRM** the Step 13 rod at Position 04 is identified as the cause for the withdraw rod block. _____

7.4.15 **PRESS** the *EXIT* softkey on the Operator Display. _____

7.4.16 **SELECT** the Step 13 rod at Position 04 **AND INSERT** it to Position 00. _____

7.4.17 **CONFIRM** the following indications:

1. *ROD BLOCK RWM/RMCS SYS TROUBLE (A-05 5-2)* clears. _____
2. **NO** withdraw errors are indicated on the Operator Display. _____

7.4.18 **SELECT** a Step 01 rod per GP-10 **AND CONFIRM** the following indications: _____

1. *ROD BLOCK RWM/RMCS SYS TROUBLE (A-05 5-2)* is clear. _____
2. Withdraw block is not indicated on the RWM Operator Display. _____
3. Insert block is not indicated on the RWM Operator Display. _____
4. RWM Operator Display indicates **NO** errors **OR** rod position violations. _____
5. Step 001 is indicated on the RWM Operator Display. _____

7.4.19 **VERIFY** the RWM Operator Display keylock switch on RTGB Panel H12-P603 is in the *OPERATE* position. ___/___ Ind.Ver

7.4.20 **IF DESIRED, TURN OFF** rod select power. _____

7.0 PROCEDURAL STEPS

Initials

7.4.21 **ENSURE** required information has been recorded on the cover page. _____

7.4.22 **NOTIFY** the Unit SCO when this test is complete **OR** found to be unsatisfactory. _____

Certification and Review Form

General Comments and Recommendations: ______________________________

____

____

	Initials	Name (Print)
Performed by:	______	______________________
	______	______________________
	______	______________________
	______	______________________
	______	______________________

Exceptions to satisfactory performance: ______________________________

____

Corrective action required: ______________________________

____

Test procedure has been satisfactorily completed:

Unit SCO: ______________________________ ____________
Signature Date

Test procedure has **NOT** been satisfactorily completed:

Unit SCO: ______________________________ ____________
Signature Date

Test has been reviewed by
Shift Superintendent: ______________________________ ____________
Signature Date

ATTACHMENT 2
Page 1 of 2
Selftest Function Description

Self Test	Indication	Where observed	Length of time
CPU	OK (No fault)	P607	20 seconds
ANALOG	OK (No fault)	P607	04 seconds
LVPS	OK (No fault)	P607	04 seconds
Digital In	OK (No fault)	P607	04 seconds
Hi Lvl I/O	Annunciator (A-05 5-2)	P603	05 seconds
	Withdraw permissive	P603	05 seconds
	Indicator light **(NOTE 1)**		
	Withdraw block **(NOTE 2)**		05 seconds
	Insert block **(NOTE 2)**		05 seconds
	Settle Indicator light	P603	05 seconds
	Annunciator (A-05 5-2)	P603	05 seconds
Gedac I/O	OK (No fault)	P607	07 seconds
Quad bus	OK (No fault)	P607	120 seconds
Gedac RS232	[A12] group lights	P603/P616 **(NOTE 3)**	25 seconds
	[A34] group lights	P603/P616	25 seconds
	[B12] group lights	P603/P616	25 seconds
	[B34] group lights	P603/P616	25 seconds
	A5 group lights	P603/P616	8 seconds
	A6 group lights	P603/P616	8 seconds
	A7 group lights	P603/P616	8 seconds
	A8 group lights	P603/P616	8 seconds
	A9 group lights	P603/P616	8 seconds
	A10 group lights	P603/P616	8 seconds
	A11 group lights	P603/P616	8 seconds
	A12 group lights	P603/P616	8 seconds
	A13 group lights	P603/P616	8 seconds
	A14 group lights	P603/P616	8 seconds
	A15 group lights	P603/P616	8 seconds
	A16 group lights	P603/P616	8 seconds
	B5 group lights	P603/P616	8 seconds
	B6 group lights	P603/P616	8 seconds
	B7 group lights	P603/P616	8 seconds
	B8 group lights	P603/P616	8 seconds

NOTE 1: Observable only if all other systems currently allow rod withdrawal.

NOTE 2: Not observable.

NOTE 3: Group lights are located on the Series 1 controller in P616, just above the RWM output buffer label.

ATTACHMENT 2
Page 2 of 2
Selftest Function Description

Self Test	Indication	Where observed	Length of time
Gedac RS232	B9 group lights	P603/P616	8 seconds
	B10 group lights	P603/P616	8 seconds
	B11 group lights	P603/P616	8 seconds
	B12 group lights	P603/P616	8 seconds
	B13 group lights	P603/P616	8 seconds
	B14 group lights	P603/P616	8 seconds
	B15 group lights	P603/P616	8 seconds
	B16 group lights	P603/P616	8 seconds
	B17 group lights	P603/P616	8 seconds
	B18 group lights	P603/P616	8 seconds

REVISION SUMMARY

Revision 10 deletes option step to return the reactor mode switch to Shutdown following test completion, this test is performed in Mode 2 and placing the mode switch to shutdown would insert a scram.

Revision 9 incorporates EC 46773 'Digital Feedwater Control' by adjusting reactor power in the frequency designation for Unit 2

Revision 8 incorporates EC 46861 (power up-rate) by adjusting reactor power parameter in the frequency designation for Unit 1.

Revision 7 incorporates new Improved Technical Specifications and 0AP-005 format enhancements.

6.0 PROCEDURAL STEPS

Initials

6.3.4 **IF** 0PT-01.10 is **NOT** completed satisfactorily, **THEN PLACE** reactor mode switch to *SHUTDOWN* **AND REPEAT** Steps 6.2 and 6.3 as necessary. N/A

Date/Time Completed: ________ / ________

6.3.5 **IF** 0PT-01.10 is completed satisfactorily, **THEN LEAVE** the reactor mode switch in *START/HOT STANDBY.* SP

6.3.6 **DOCUMENT** entry into Mode 2. CF

Date/Time Completed: XY / XY

> **CAUTION**
>
> **WHEN** a control rod is withdrawn to perform 0PT-01.6.2, Rod Worth Minimizer System Operability Test, completion of the test must occur within the next hour to ensure compliance with SR 3.3.2.1.2.

6.3.7 **IF** 0PT-01.6.2 is **NOT** current (within 92 days), **THEN PERFORM** 0PT-01.6.2 **AND RECORD** completion date. ____

Date Satisfactorily Completed: __________

6.3.8 **IF** 0PT-01.6.2 is current, **THEN RECORD** date of last satisfactory performance **AND PERFORM** the following: ____

Date Completed: ____________

1. **ENSURE** the RWM Operator Display keylock switch on RTGB Panel H12-P603 is in *OPERATE*. ____ / ____ Ind.Ver.

2. **CONFIRM** *ROD BLOCK RWM/RMCS SYS TROUBLE* (A-05 5-2) is clear. ____

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

NRC SIM JPM S-8

TITLE: **Re-establishing Drywell Cooling with an RBCCW Pump per 0AOP-36.2**

SAFETY CONSIDERATIONS:

NONE.

EVALUATOR NOTES: (Do not read to examinee)

1. The applicable procedure section WILL be provided to the examinee.

Read the following to examinee.

TASK CONDITIONS:

The sequence of events was as follows:

1. Both Units have lost all off-site power.
2. DG3 is under clearance and DG4 tripped on differential overcurrent.
3. DG1 is running and tied to E1, DG2 is running tied to E2.
4. E1 was cross-tied to E3 (including required load stripping).
5. E8 was cross-tied to E7 (including required stripping).
6. E4 cannot be energized due to trip of 86DP on E4.
7. Drywell cooler LOCA lockout circuit alterations have been performed per the guidance of EOP-02-PCCP and SEP-10.
8. NSW 2A has been started per AOP-36.2 Section 3.2.14.
9. The WCC SRO is available for any necessary circuit alterations.

INITIATING CUE:

You have been directed by the Unit SCO to continue re-establishing Drywell Cooling with the "A" RBCCW pump per AOP-36.2, Section 3.2.14 Step 8. and inform him when those actions are complete.

Step 1 - Obtain a current revision of AOP-36.2, Section 3.2.14.

Current Revision of AOP-36.2, Section 3.2.14 obtained and verified if applicable. Refers to Step 8. when beginning JPM

SAT/UNSAT

SIMULATOR PROMPT: WHEN requested as WCC, INSERT REMOTE FUNCTION EP_IAEOPJ14 (V103)[AOP-36.2 Step 3.2.14.8.a] to defeat the LOOP closure signal and inform the examinee that the leads have been lifted and taped.

Step 8

Step 2 - Open the 2-SW-V103 as follows:

8.a a. Request lifting and taping black wire 2-DK7-26 in Panel 2-XU-30 (ESS Logic Cabinet H61) on Terminal TA47.

Black wire 2-DK7-26 has been requested to be lifted and taped.

SAT/UNSAT

PROMPT: WHEN asked as the AO to energize MCC 2XB (AOP-36.2 step 3.2.14.8.b), DELETE MALFUNCTION EE030M, 2XB to energize MCC 2XB and inform examinee.

8.b b. Ensure MCC 2XB is energized (E8, AO2, row D1).

MCC 2XB verified energized.

SAT/UNSAT

8.c c. OPEN RBCCW HXS SW INLET VLV, 2-SW-V103.

2-SW-V103 OPENED.

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

PROMPT: WHEN asked as the AO to de-energize MCC 2XB (AOP-36.2 Step 3.2.14.8.d), THEN INITIATE MALFUNCTION EE030M, 2XB to de-energize MCC 2XB and inform examinee.

Step 2.d. - IF closed for this section, THEN OPEN Sub E8, Compt AO2, MCC

8.d 2XB (Row-D1).

MCC 2XB de-energized

SAT/UNSAT

SIMULATOR PROMPT: WHEN requested as WCC, INSERT REMOTE FUNCTION EP_IAEOPJ15 (V106) [AOP-36.2 Step3.2.14.9.a] to defeat the LOOP closure signal and inform the examinee that the leads have been lifted and taped.

Step 9

Step 3 - Open the 2-SW-V106 as follows:

9.a a. Request lifting and taping grey wire AB6 in Panel 2-XU-29 (ESS Logic Cabinet H60) on Terminal TE24.

Grey wire AB6 has been requested to be lifted and taped.

SAT/UNSAT

PROMPT: WHEN asked as the AO to energize MCC 2XA (AOP-36.2 step 3.2.14.9.b), DELETE MALFUNCTION EE030M, 2XA to energize MCC 2XA and inform examinee.

9.b b. Ensure MCC 2XA is energized (E7, AY2, row C1).

MCC 2XA verified energized.

SAT/UNSAT

9.c c. OPEN RBCCW HXS SW INLET VLV, 2-SW-V106.

OPENS 2-SW-V106.

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

PROMPT: IF asked as the AO to de-energize MCC 2XA (AOP-36.2 Step 3.2.14.9.d), THEN INITIATE MALFUNCTION EE030M, 2XA to de-energize MCC 2XA and inform examinee.

Step 3.d - De-energize MCC 2XA.

9.d *MCC 2XA de-energized.*

SAT/UNSAT

Step 4 - Ensure NSW is being supplied to the RBCCW Heat Exchangers.

Step 10 *Examinee notes SW flow on SW-FI-1158-1 on XU-2.*

SAT/UNSAT

PROMPT: Inform examinee that it is desired to reenergize 480V MCC 2XE (AOP-36.2 Step 3.2.14.11)

Step 5 - Place RBCCW Pump 2A & 2C control switch to OFF.

Step 11.a 2A & *2C RBCCW pump control switch in OFF.*

SAT/UNSAT

PROMPT: IF asked as WCC to install jumpers to defeat the LOCA and LOOP trips of the RBCCW pumps (AOP-36.2 Step 3.2.14.11.b), THEN MODIFY REMOTE FUNCTION EP_IAEOP12, IN and inform examinee that the requested jumper has been installed.

Step 6 – Request installation of jumper in Panel 2-XU-29 (ESS Logic Cabinet

Step 11.b H60) between terminals TB71 and TB72.

Jumper requested to be installed in 2-XU-29.

SAT/UNSAT

PROMPT: IF asked as the AO to energize MCC 2XE (AOP-36.2 Step 3.2.14.13), THEN DELETE MALFUNCTION EE030M, 2XE to energize MCC 2XE and inform examinee.

Step 7 - Ensure MCC 2XE is energized at Compt AY4 on E7.

MCC 2XE is energized.

SAT/UNSAT

EXAMINER NOTE: The following steps will have the operator determine drywell temperatures prior to starting the RBCCW pump. Procedure 2OP-21 is referenced to determine when the pump can be started.

Depending on the time taken by the operator to perform the task to this point, temperatures may have risen above the limits below and the correct section of 2OP-21 must be referenced for guidance prior to pump start.

Step 8 - PLACE RBCCW in service as following:

a. DETERMINE if any local drywell temperature is or has been above the limit given below since initiation of the event:

- Greater than or equal to 260°F as indicated on Control Room recorder CAC-TR-4426 (if data is available).
- Greater than or equal to 258°F as indicated on Points 1, 3 & 4 of RSDP recorder CAC-TR-778.

Determines temperatures are 230 degrees

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

Step 8.b. IF local drywell temperature has NOT exceeded the limits of Step 3.2.14.14.a, THEN START RBCCW in accordance with the normal startup section of 2OP-21.

Determines a normal startup of RBCCW IAW 2OP-21 is required and refers to 2OP-21 Section 5.2

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

c. IF local drywell temperature has exceeded the limits of Step 3.2.14.14.a, THEN START RBCCW in accordance with the startup with high drywell temperature section of 2OP-21.

Determines drywell temperature is lower than limits and a normal startup is required

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

NOTE: EXAMINEE SHOULD NOW BE IN 2OP-21 SECTION 5.2 FOR STARTING THE 'A' RBCCW PUMP

Step 9 – Place an RBCCW Heat Exchanger in service by opening one of the following: RBCCW HX A OUTLET VALVE, RCC-V45

RBCCW HX B OUTLET VALVE, RCC-V46

RBCCW HX C OUTLET VALVE, RCC-V47

Opens any one of the above valves

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

Step 10 – Throttle 80% to 90% closed one of the following

RBCCW PUMP A DISCHARGE VALVE, RCC-V38

RBCCW PUMP B DISCHARGE VALVE, RCC-V36

RBCCW PUMP C DISCHARGE VALVE, RCC-V34

Throttles RBCCW PUMP A DISCHARGE VALVE, RCC-V38 80% to 90% Closed

SAT/UNSAT

Step 11 - Start ONE of the following corresponding to the discharge valve throttled in the previous step. RBCCW PP 2A, 2B, 2C

Starts RBCCW Pump 2A

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

Step 12 Slowly open RCC-V38.

RCC-V38 Opened. ****CRITICAL STEP**** SAT/UNSAT

TERMINATING CUE: When an RBCCW pump has been started and its discharge valve opened, the JPM is complete.

Comments:

K/A REFERENCE AND IMPORTANCE RATING:

400000 A4.01 3.1, 3.0, Ability to manually operate CCW indications and.controls

REFERENCES:

AOP-36.2, Revision 32

2OP-21, Revision 61

TOOLS AND EQUIPMENT:

NONE

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

8 - Component Cooling Water System

Time Required for Completion: 20 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate Actual ☐ Unit: 2

Setting: Control Room **Simulator**

Time Critical: Yes **No** Time Limit N/A

Alternate Path: Yes **No**

EVALUATION

JPM: Pass Fail

TASK CONDITIONS:

The sequence of events was as follows:

1. Both Units have lost all off-site power.
2. DG3 is under clearance and DG4 tripped on differential overcurrent.
3. DG1 is running and tied to E1, DG2 is running tied to E2.
4. E1 was cross-tied to E3 (including required load stripping).
5. E8 was cross-tied to E7 (including required stripping).
6. E4 cannot be energized due to trip of 86DP on E4.
7. Drywell cooler LOCA lockout circuit alterations have been performed per the guidance of EOP-02-PCCP and SEP-10.
8. NSW 2A has been started per AOP-36.2 Section 3.2.14.
9. The WCC SRO is available for any necessary circuit alterations.

INITIATING CUE:

You have been directed by the Unit SCO to continue re-establishing Drywell Cooling with the "A" RBCCW pump per AOP-36.2, Section 3.2.14 Step 8. and inform him when those actions are complete.

5.2 System Startup

5.2.1 Initial Conditions

1. Applicable prerequisites listed in Section 4.0 are met. ☐

5.2.2 Procedural Steps

1. **IF** system has been shutdown for greater than 72 hours or maintenance has been performed, **THEN GO TO** Section 5.1 to fill and vent system **AND RETURN TO** Step 5.2.2.2. ☐

2. **PLACE** an RBCCW heat exchanger in service by opening one of the following:

   – *RBCCW HX A OUTLET VALVE, RCC-V45* ☐

   – *RBCCW HX B OUTLET VALVE, RCC-V46* ☐

   – *RBCCW HX C OUTLET VALVE, RCC-V47* ☐

3. **THROTTLE** 80% to 95% closed one of the following:

   – *RBCCW PUMP A DISCHARGE VALVE, RCC-V38* ☐

   – *RBCCW PUMP B DISCHARGE VALVE, RCC-V36* ☐

   – *RBCCW PUMP C DISCHARGE VALVE, RCC-V34* ☐

5.2.2 Procedural Steps

CAUTION

IF RBCCW pumps are operated with the following conditions present, **THEN** damage to pump or heat exchanger could occur:

- Reduced flow or high discharge pressure for extended periods of time
- Increased flow or low discharge pressure for extended periods of time
- Number of pumps in operation **NOT** equal to number of heat exchangers in operation

4. **START** one of the following corresponding to the discharge valve throttled in Step 5.2.2.3:
   - *RBCCW PUMP 2A* ☐
   - *RBCCW PUMP 2B* ☐
   - *RBCCW PUMP 2C* ☐

5. **SLOWLY OPEN** the discharge valve throttled closed for pump start:
   - *RBCCW PUMP A DISCHARGE VALVE, RCC-V38* ☐
   - *RBCCW PUMP B DISCHARGE VALVE, RCC-V36* ☐
   - *RBCCW PUMP C DISCHARGE VALVE, RCC-V34* ☐

6. **ENSURE** a vent and drain rig is connected to *FUEL POOL COOLING HX B SHELL SIDE VENT VALVE, RCC-V81.* ☐

7. **OPEN** *FUEL POOL COOLING HX B SHELL SIDE VENT VALVE, RCC-V81.* ☐

8. **WHEN** a steady stream of water is present, **CLOSE** *FUEL POOL COOLING HX B SHELL SIDE VENT VALVE, RCC-V81.* ☐

5.2.2 Procedural Steps

9. **DISCONNECT** vent and drain rig from *FUEL POOL COOLING HX B SHELL SIDE VENT VALVE, RCC-V81.* ☐

CAUTION

IF a single RBCCW pump is operated with more than one heat exchanger in operation for extended periods of time, **THEN** pump damage may occur.

10. **PLACE** a second RBCCW heat exchanger in service by opening one of the following:

    – *RBCCW HX A OUTLET VALVE, RCC-V45* ☐

    – *RBCCW HX B OUTLET VALVE, RCC-V46* ☐

    – *RBCCW HX C OUTLET VALVE, RCC-V47* ☐

11. **PLACE** a second RBCCW pump in service by starting one of the following:

    – *RBCCW PUMP 2A* ☐

    – *RBCCW PUMP 2B* ☐

    – *RBCCW PUMP 2C* ☐

12. **PLACE** the third RBCCW pump control switch in *AUTO.* ☐

CAUTION

Nuclear Service Water flow in excess of 7200 gpm in Modes 1, 2, and 3, **OR** 4000 gpm in Modes 4 and 5, through the RBCCW heat exchangers can render the Nuclear Service Water header inoperable for design accident flow conditions. 2OP-43 should be referred to for further guidance.

13. **IF** the RBCCW temperature control valve can **NOT** maintain RBCCW heat exchanger outlet temperature less than 104°F, **THROTTLE OPEN** *RBCCW HX SERVICE WATER OUTLET FLOW CONTROL VALVE, SW-V382,* until temperature is less than 104°F. ☐

3.2.14 Reestablishing Unit 2 Drywell Cooling (Requires 600 KW of Load)

NOTE:	MCCs may already be deenergized, and 4160V Bus motor control power fuses removed, due to previous cross-tie operations.
NOTE:	Reenergizing MCC 2PA(2PB) requires approximately 65 KW of load.

CAUTION

WHEN one diesel generator is supplying all AC power, the reenergization of MCCs for reestablishing drywell cooling to a Blacked Out unit should be closely coordinated with loading requirements of the diesel generator to prevent tripping of the only available AC power source. Maximum diesel generator loading is 3850 KW.

___ 1. **ENSURE** Sub E7(E8), Compt AY5(AO5), *MCC 2PA(MCC 2PB)* (Row-C4(D4)) is closed.

___ 2. **ENSURE** closed *NUCLEAR SERVICE WATER PUMP 2A(2B) DISCHARGE VLV, SW-V19(V20).*

___ 3. **PLACE** *NUC SERV WTR PMP 2A(2B)* Normal-Local keylock switch on Bus E3(E4), Compt AJ3(AL1) in *LOCAL*. (Row-L1(M1))

___ 4. **REINSTALL** control power fuses for *NUC SERV WTR PMP 2A(2B)* at Bus E3(E4), Compt AJ3(AL1). (Row-L1(M1))

NOTE:	Operating a NSW pump requires approximately 225 KW of load.

___ 5. **START** *NUCLEAR SERVICE WATER PUMP 2A(2B)* by placing the *NUC SERV WTR PMP 2A(2B)* Normal-Local keylock switch on Bus E3(E4), Compt AJ3(AL1) in *NORM*. (Row-L1(M1))

___ 6. **IF** *NUCLEAR SERVICE WATER PUMP 2A(2B)* did **NOT** start automatically, **THEN START** *NUCLEAR SERVICE WATER PUMP 2A(2B)* from the Control Room.

3.2.14 Reestablishing Unit 2 Drywell Cooling (Requires 600 KW of Load)

___ 7. **ENSURE** *NUCLEAR SERVICE WATER PUMP 2A(2B) DISCHARGE VLV, SW-V19(V20)*, automatically opens.

NOTE:	The wires lifted in the next steps defeat the LOOP closure signals to the *RBCCW HXS SW INLET VLV, SW-V103*, and *RBCCW HXS SW INLET VLV, SW-V106*.
NOTE:	Energizing MCC 2XA(2XB) requires approximately 35 KW of load.

8. **PERFORM** the following actions for *RBCCW HXS SW INLET VLV, 2-SW-V103*:

___ a. **LIFT AND TAPE** black wire 2-DK7-26 in Panel 2-XU-30 (ESS Logic Cabinet H61) on terminal TA47.

___ b. **ENSURE** Sub E8, Compt AO2, *MCC 2XB* (Row-D1) is closed.

___ c. **OPEN** *RBCCW HXS SW INLET VLV, 2-SW-V103.*

___ d. **IF** closed for this section, **THEN OPEN** Sub E8, Compt AO2, *MCC 2XB* (Row-D1).

9. **PERFORM** the following actions for *RBCCW HXS SW INLET VLV, 2-SW-V106*:

___ a. **LIFT AND TAPE** grey wire AB6 in Panel 2-XU-29 (ESS Logic Cabinet H60) on terminal TE24.

___ b. **ENSURE** Sub E7, Compt AY2, *MCC 2XA* (Row-C1) is closed.

___ c. **OPEN** *RBCCW HXS SW INLET VLV, 2-SW-V106.*

___ d. **IF** closed for this section, **THEN OPEN** Sub E7, Compt AY2, *MCC 2XA* (Row-C1).

3.2.14 Reestablishing Unit 2 Drywell Cooling (Requires 600 KW of Load)

___ 10. **ENSURE** Nuclear Service Water is being supplied to the RBCCW heat exchangers.

NOTE:	Reenergization of 480V MCC 2XE may result in auto starting of RBCCW Pump 2A and 2C if **NOT** defeated.
NOTE:	The jumpers installed in the next steps defeat the LOCA **AND** LOOP trips of the RBCCW pumps, and are located in the RO desk locked drawer.
NOTE:	Operating one RBCCW pump requires approximately 48 KW of load.

11. **IF** reenergizing MCC 2XE, **THEN PERFORM** the following:

R33 ___ a. **ENSURE** control switches of *RBCCW PUMP 2A* and *2C* are in *OFF* to prevent an auto start.

___ b. **INSTALL** a jumper in Panel 2-XU-29 (ESS Logic Cabinet H60) between terminals TB71 and TB72.

12. **IF** reenergizing MCC 2XF, **THEN PERFORM** the following:

R33 ___ a. **ENSURE** control switch of *RBCCW PUMP 2B* is in *OFF* to prevent an auto start.

___ b. **INSTALL** a jumper in Panel 2-XU-30 (ESS Logic Cabinet H61) between terminals TB71 and TB72.

___ 13. **ENSURE** Sub E7(E8), Compt AY4(AO4), *MCC 2XE(MCC 2XF)* (Row-C3(D3)) is closed.

R33 14. **PLACE** RBCCW in service as following:

___ a. **DETERMINE** if any local drywell temperature is or has been above the limit given below since initiation of the event:

- Greater than or equal to 260°F as indicated on Control Room recorder CAC-TR-4426 (if data is available).
- Greater than or equal to 258°F as indicated on Points 1, 3 & 4 of RSDP recorder CAC-TR-778.

3.2.14 **Reestablishing Unit 2 Drywell Cooling (Requires 600 KW of Load)**

___ b. **IF** local drywell temperature has **NOT** exceeded the limits of Step 3.2.14.14.a, **THEN START** RBCCW in accordance with the normal startup section of 2OP-21.

___ c. **IF** local drywell temperature has exceeded the limits of Step 3.2.14.14.a, **THEN START** RBCCW in accordance with the startup with high drywell temperature section of 2OP-21.

___ 15. **DEFEAT** the Drywell Cooler LOCA Lockout logic when allowed by 0EOP-02-PCCP.

NOTE:	Operating one set of drywell cooler fans and its associated MCC requires approximately 155 KW of load.
NOTE:	During a Station Blackout, with one diesel generator supplying both units, a maximum of two drywell cooling units are aligned to operate.

16. **ENSURE** closed the following compartments at the appropriate substation:

___ a. Sub E7, Compt AX6, *MCC 2XL* (Row-D2)

___ b. Sub E8, Compt AO7, *MCC 2XM* (Row-E2)

17. **ENSURE** the supply fans for the following drywell coolers have started as applicable:

___ a. *DRYWELL COOLER 2A.*

___ b. *DRYWELL COOLER 2B.*

END OF SECTION