PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM1SROCOO

LESSON TITLE: Perform SRM/IRM overlap per GP-02.

LESSON NUMBER: ADM1SROCOO

REVISION NO: 0

RECOMMENDED BY: Curt Robert
Instructor/Developer Date

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor Date

APPROVED BY: ______________________
Superintendent/Supervisor Training Date

SAFETY CONSIDERATIONS:

1. None.

SIMULATOR SETUP

IC-3	BOC
Rx Pwr	%

Insert malfunction NI059F, SRM/IRM overlap incorrect and then withdraw control rods and establish a reactor period of approximately 120 sec. Allow reactor power to increase until the first SRM reaches approximately 5×10^5 cps. Snap as an IC if required for multiple performers.

EVALUATOR NOTES: (Do not read to performer)

1. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.
2. **START LOCATION:** Simulator.
3. **PROVIDE A COPY:** The applicable procedure section **WILL NOT** be provided to the trainee. If performed in the classroom setting the evaluator may provide GP-02, Technical Specifications and TRM **ONLY** if the trainee requests these procedures.
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is not a time critical JPM.

Read the following to the JPM performer.

TASK CONDITIONS:

1. Unit One startup is being performed per 0GP-02. Unit One reactor is critical with a period of approximately 120 seconds established. GP-02 has been completed up through Step 5.2.17 and reactor power is currently on range one (1) of the IRMs and rising.

2. Initial pre-startup IRM data recorded in the Reactor Operator's log (Step 5.2.7) as follows:

IRM Channel	Reading*
A	0.5%
B	0.6%
C	0.4%
D	0.4%
E	0.2%
F	0.3%
G	0.1%
H	0.2%

*** All IRM Readings taken on Range One from the digital readout 0-125 scale.**

INITIATING CUE:

You are directed to perform Step 5.2.18 of GP-02 and continue the plant startup until all SRMs have been withdrawn.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.
Comments required for any step evaluated UNSAT.

START TIME: ___________

PERFORMANCE CHECKLIST

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

NOTE:	If desired, the examiner may provide a copy GP-02 to the examinee.

Step 1 - Obtain a current revision of 0GP-02.

Current Revision of 0GP-02 obtained and verified, if applicable.

SAT/UNSAT*

Step 2 – Determine SRM/IRM overlap criteria is ONLY met for IRM B. No other IRMs have reached a reading 10% of scale before the first SRM reached 5 x 10^5 cps.

Determined that SRM/IRM overlap criteria is not met for IRMs A, C, E, G, D, F, and H based on not reading 10% of scale.

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

Step 3 – **IF** correct SRM/IRM overlap is **NOT** verified, **THEN** the Reactor Engineer shall be notified **AND** Technical Specification LCO 3.3.1.1 referenced.

Notifies SCO that Reactor Engineer shall be notified ***AND*** *Technical Specification LCO 3.3.1.1 referenced.*

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

PROMPT:	**If examinee states that the Reactor Engineer shall be notified AND Technical Specification LCO 3.3.1.1 referenced direct him to assess Technical Specifications and determine the required actions.**

NOTE:	**If examinee does not detect an error in SRM/IRM overlap he/she may continue with step 5.2.19 and withdraw SRM detectors as required to maintain an indicated count rate between 10^2 cps and 5×10^4 cps.** **SR 3.3.1.1.6 states that SRM/IRM overlap must be verified prior to withdrawing SRMs from the fully inserted position.** **Examiner should consider the JPM UNSAT if it is apparent that this error will not be self corrected and can terminate the JPM task.**

Step 4 – Determine LCO 3.3.1.1, Condition A is applicable.

Determined that LCO 3.3.1.1 Condition A applies. Required Action is to place the channel or associated trip system in trip within 12 hours.

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

TERMINATING CUE:	**When Technical Specification determination has been made and the SCO has been informed of the results, this JPM is complete.**

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

STOP TIME: ___________

RELATED TASKS:

215201B101, Verify Correct Overlap Between SRMs And IRMs Per GP-02

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.7 3.7/4.4
Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation.

REFERENCES:

0GP-02

TOOLS AND EQUIPMENT:

None.

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

Generic (Administrative)

REASON FOR REVISION:

Modified to produce substantively different results for use on 2004 NRC exam.

Time Required for Completion: **10 Minutes** (approximate).

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate x__ Actual __ Unit: ____

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

Time Critical: Yes ___ No _ Time Limit **NA**

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

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Unit One startup is being performed per 0GP-02. Unit One reactor is critical with a period of approximately 120 seconds established. GP-02 has been completed up through Step 5.2.17 and reactor power is currently on range one (1) of the IRMs and rising.

2. Initial pre-startup IRM data recorded in the Reactor Operator's log (Step 5.2.7) as follows:

IRM Channel	Reading*
A	0.5%
B	0.6%
C	0.4%
D	0.4%
E	0.2%
F	0.3%
G	0.1%
H	0.2%

*** All IRM Readings taken on Range One from the digital readout 0-125 scale.**

INITIATING CUE:

You are directed to perform Step 5.2.18 of GP-02 and continue the plant startup until all SRMs have been withdrawn.

PLANT OPERATING MANUAL

VOLUME IV

GENERAL PLANT OPERATING PROCEDURE

UNIT
0

0GP-02

APPROACH TO CRITICALITY AND PRESSURIZATION OF THE REACTOR

REVISION 77

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides the precautions, limitations, and instructional guidance for starting up the reactor and raising pressure to rated. This procedure is also used to satisfy Technical Specifications SR 3.4.9.1, SR 3.4.9.3, and SR 3.3.1.1.6.

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR

2.3 0AI-81, Water Chemistry Guidelines

2.4 0GP-10, Rod Sequence Checkoff Sheets

2.5 0GP-11, Second Operator Rod Sequence Checkoff Sheets

2.6 0OI-01.01, Operations Unit Organization and Administration

2.7 0OI-01.02, Shift Routines and Operating Practices

2.8 0OI-53, Rod Worth Minimizer (NUMAC-RWM)

2.9 1(2)OP-07, Reactor Manual Control System Operating Procedure

2.10 1(2)OP-09, Neutron Monitoring System Operating Procedure

2.11 1(2)OP-25, Main Steam System Operating Procedure

2.12 1(2)OP-26, Turbine System Operating Procedure

2.13 1(2)OP-26.1, Gland Sealing Steam System Operating Procedure

2.14 1(2)OP-30, Condenser Air Removal and Off Gas Recombiner System

2.15 1(2)OP-32, Condensate and Feedwater System Operating Procedure

2.16 1(2)OP-34, Extraction Steam System Operating Procedure

2.17 0PT-01.6.2, Rod Worth Minimizer System Operability Test

2.18 1(2)PT-01.7, Heatup/Cooldown Monitoring

2.0 REFERENCES

2.19 0PT-09.2, HPCI System Operability Test

2.20 0PT-09.3, HPCI System-165 Psig Flow Test

2.21 0PT-10.1.1, RCIC System Operability Test

2.22 0PT-10.1.3, RCIC System Operability Test-Flow Rates at 150 Psig

2.23 0PT-11.1.2, Automatic Depressurization System and Safety Relief Valve Operability Test

2.24 0PT-14.3, Shutdown Margin Demonstration

2.25 0PT-14.3.1, Insequence Critical Shutdown Margin Calculation

2.26 0MST-IRM25R, IRM Channels Range Correlation Adjustment

2.27 Operational Experience Feedback Report, Serial Number B2352

R28 2.28 NCR S-90-022

2.29 GE SIL No. 430

R30 2.30 LER 1-91-016

R31 2.31 INPO SOER 84-2

2.32 ACR 94-01020

2.33 EER 91-0301, Rev. 1, Acceptability of Operation of Both Units Under Boron Conditions

R34 2.34 LER 2-98-003, MSIV Closure Due to Procedure Deficiency

2.35 ESRs 98-00628, 98-00629, 98-00630, 98-00631, HPCI/RCIC Steam Line Low Pressure Isolation Setpoint Change

R36 2.36 SEN 185 Evaluation, Action Item 98-02223

R37 2.37 INPO SOER 88-2, Premature Criticality Events During Reactor Startup, Recommendation Number 6 (Facts 89B0924)

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 **WHEN** any neutron monitoring system channel is bypassed, **THEN** reference should be made to the technical specifications to verify operability requirements are met. **WHEN** a channel is inoperable **OR** a required surveillance is being performed, **THEN** bypass switches on Panel H12-P603 provide a means of disabling the control functions of the selected neutron monitoring system channel.

3.3 With less than 17 LPRM inputs total **OR** less than 3 LPRM detectors per level, an APRM channel is considered inoperable.

3.4 With less than 50% of its required LPRM inputs, a RBM channel is considered inoperable.

3.5 A minimum of 3 IRM channels for each trip system must be operable for the control rod withdrawal block instrumentation to be considered operable.

3.6 The main turbine and RFP turbines should be on turning gear **OR** isolated from the system prior to starting steam seal system.

3.7 Gland Sealing System must be in operation when a vacuum exists in main condenser.

3.8 **WHEN** CDD vessel effluent is directed to the reactor vessel **OR WHEN** the CDD influent conductivity is greater than 0.1 µmho/cm, **THEN** low flow through CDD vessels could result in higher than desirable pH and conductivity in the reactor vessel. **WHEN** *B21-F032A* or *B21-F032B* is open **AND** CDD influent conductivity is greater than 0.1 µmho/cm, **THEN** each in-service CDD vessel flow should be maintained at 2000-3000 gpm.

3.9 Surveillance Procedures which must be current prior to changing reactor mode switch position in accordance with this procedure are included in 0GP-01, Attachments 1 and 2.

R36 3.10 Repositioning IRM range switches should be performed by one Operator, using one hand on one trip system at a time.

3.0 PRECAUTIONS AND LIMITATIONS

3.11 Momentarily depressing the increase or decrease push button on the following controllers will cause the selected parameter to change in increments of 0.1%. Continually depressing the increase or decrease push button on the following controllers will cause the selected parameter to change at an exponential rate:

3.11.1 *SULCV FW-LIC-3269*, Control Station.

3.11.2 *RFPT A(B) SP CTL C32-SIC-R601A(B)*, Control Stations.

3.11.3 *MSTR RFPT SP/RX LVL CTL C32-SIC-R600*, Control Station.

3.12 The time during which sealing steam is applied to the turbine seals without the steam packing exhauster should be minimized to avoid radioactive contamination.

3.13 Operation in the cross-hatched area of Figure 3.4.9-2 in Technical Specifications is permitted only when reactor water level is above the SCRAM setpoint and below the Reactor Feed Pump trip setpoint.

4.0 PREREQUISITES

Unit 2 Date/Time Started Today / 0001

	Initials
4.1 Preparations for a reactor startup are in progress in accordance with 0GP-01.	CR
4.2 Reactor water level is between 182 and 192 inches.	CR

5.0 PROCEDURAL STEPS

5.1 Administrative

R37 5.1.1 **ENSURE** review and implementation of 0GP-02, Attachment 1 is complete.	CR
5.1.2 **ANNOUNCE** on the PA System primary and secondary containment are in effect **AND** reactor startup is commencing.	CR
5.1.3 **NOTIFY** Load Dispatcher of impending startup.	CR
5.1.4 **OBTAIN** guidance from the Reactor Engineer for single notch or continuous rod withdrawal.	CR

5.0 PROCEDURAL STEPS

Initials

5.2 Pulling Rods to Achieve Criticality

5.2.1 **CONFIRM** all four RPS Trip System A white Scram Group lights 1, 2, 3, and 4, located on Panel H12-P603 or RPS Panel A H12-P609, are on. CR

5.2.2 **CONFIRM** all four RPS Trip System B white Scram Group lights 1, 2, 3, and 4, located on Panel H12-P603 or RPS Panel B H12-P611, are on. CR

5.2.3 **IF** the mode switch is in *SHUTDOWN*, **THEN PLACE** the switch in *START/HOT STBY*. CR

5.2.4 **ENSURE** RWM Scram Data Buffers are deleted to prepare for future scram data recording in accordance with 0OI-53. CR

1. **IF** the RWM was placed in *BYPASS* or *INOP* to delete Scram Data Buffers, **THEN ENSURE** the following RWM switches have been returned to *OPERATE*:

   a. *RWM COMPUTER KEYLOCK SWITCH* N/A
   Ind.Ver.

   b. *OPERATOR'S DISPLAY KEYLOCK SWITCH* N/A
   Ind.Ver.

5.2.5 **NOTIFY** E&RC to obtain a start-up chemistry sample in accordance with ODCMS Table 7.3.7-1, Note (C). CR

5.0 PROCEDURAL STEPS

Initials

R37 **NOTE:** Control rod movement should be stopped periodically to observe source range instrument (SRM recorders, indicators, and period meters) response and allow neutron level stabilization.

R37 **NOTE:** Source range doubling must be used as a method of monitoring for criticality.

NOTE: Coupling integrity of a control rod shall be checked anytime a control rod is fully withdrawn by verifying the rod does **NOT** reach the over travel position (see SR 3.1.3.5).

NOTE: All rod select push buttons should be deselected whenever rod movement has stabilized to minimize select switch damage from overheating.

NOTE: **WHEN** the Rod Worth Minimizer is inoperable during startup before the first 12 control rods are withdrawn, **THEN** one startup in a calendar year, with the RWM inoperable for reasons other than bypassed control rod(s), may be performed provided that control rod movement and compliance with the prescribed Bank Position Withdrawal Sequence (BPWS) control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff (Engineer, Control Operator, SRO, or Auxiliary Operator) in accordance with 0GP-11.

NOTE: **WHEN** the Rod Worth Minimizer is inoperable after the first 12 control rods have been fully withdrawn on a startup, **THEN** operation may continue provided that control rod movement and compliance with the prescribed Bank Position Withdrawal Sequence (BPWS) control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff (Engineer, Control Operator, SRO, or Auxiliary Operator) in accordance with 0GP-11.

R31 **NOTE:** Any deviation from the original withdrawal sequence should be recommended by the Reactor Engineer, approved by the Unit SCO, and documented on the proper rod sequence checkoff sheet.

5.0 PROCEDURAL STEPS

Initials

CAUTION

During a hot startup following a reactor Scram from power, extremely high rod notch worths can be encountered due to peak xenon with no moderator voids. Continuous control rod withdrawal should **NOT** be utilized when approaching criticality.

CAUTION

The reactor should **NOT** be operated with a stable period of less than 100 seconds. **IF** single notch withdrawals result in reactor periods approaching 20 seconds, **THEN** the control rod(s) should be inserted to achieve a stable period of greater than 100 seconds **AND** the rod withdrawal sequence discontinued until a thorough assessment has been performed by the Reactor Engineer and approved by the Unit SCO.

CAUTION

IF a reactor period of less than or equal to 12 seconds is reached, **THEN** the reactor shall be shut down until a margin to criticality is achieved. **IF** this is done, **THEN** at least ten control rods shall be fully inserted past the step in 0GP-10 at which the short period was experienced. The reactor startup shall be discontinued until a thorough assessment as to the cause/recommendation to prevent recurrence has been made by the Reactor Engineer and approved by the Unit SCO.

5.2.6 **RECORD** the SRM channel count rates in the Reactor Operator's Log. CR

1. **CALCULATE** the three SRM "doublings" count rate. CR
2. **CALCULATE** the five SRM "doublings" count rate. CR
3. **VERIFY** both calculations are correct. CR / RC Ind.Ver.
4. **RECORD** the three and five SRM "doubling" values in the Reactor Operator's Log. CR

5.2.7 **RECORD** the IRM channel indications in the Reactor Operator's Log for use in determining SRM/IRM overlap in Step 5.2.18. CR

5.0 PROCEDURAL STEPS

Initials

5.2.8 **CONFIRM**, using pressure and temperature instruments identified in 1(2)PT-01.7, reactor vessel pressure and reactor coolant system temperature coordinates are to the right of the criticality limit line on Technical Specification Figure 3.4.9-2 within 15 minutes prior to the withdrawal of control rods to bring the reactor to criticality (SR 3.4.9.3). CR

1. **RECORD** the time of the above verification in the Reactor Operator's Log. CR

5.2.9 **WITHDRAW** control rods in accordance with 1(2)OP-07 in the sequence designated by 0GP-10. CR

5.2.10 **RECORD** the time and number of the first control rod withdrawn in the Reactor Operator's Log. CR

> **NOTE:** Upon achieving three SRM "doublings" in the neutron count rate, control rod withdrawal should be in the single notch mode for all subsequent rods unless continuous withdrawal is recommended by the Reactor Engineer and approved by the Unit SRO. The single notch withdrawal requirement is also applicable to all high worth control rods, as designated by the Reactor Engineer, regardless of the SRM count rate or number of "doublings".

R37 5.2.11 **MONITOR** the following for indications of criticality **AND CONFIRM** SRM levels are increasing as control rods are being withdrawn: CR

1. SRM Recorders.
2. SRM Count Rate Indicators.
3. SRM Period Meters.

5.2.12 **CONFIRM** the green *RETRACT PERMIT* Light for each SRM detector comes on when the SRM level exceeds 100 cps. CR

5.0 PROCEDURAL STEPS

Initials

R37 5.2.13 **OBSERVE** the SRM channels for the following indications of criticality: CR

1. SRM period meters indicate a stable, positive period.
2. SRM levels increasing without requiring additional control rod withdrawal.

5.2.14 **WHEN** criticality is achieved, **THEN RECORD** the time, control rod, and notch position in the Reactor Operator's Log **AND CONTINUE** rod withdrawal until the desired period has been established. CR

5.2.15 **WHEN** the desired period is obtained, **THEN RECORD** the following information in the Reactor Operator's Log: CR

1. Time
2. Rod sequence
3. Item number
4. Control rod
5. Notch position
6. Period (Period = 1.44 times the doubling time)
7. Reactor pressure
8. Recirculation loop A temperature
9. Recirculation loop B temperature

5.2.16 **ANNOUNCE** the reactor is critical on the PA system. CR

5.0 PROCEDURAL STEPS

Initials

5.2.17 **IF** any MSIV pit shield plug is **NOT** installed, **THEN** **INITIATE** MSIV pit entry requirements in accordance with 0OI-01.03, Non-Routine Activities. N/A

NOTE: SRM/IRM overlap must be demonstrated prior to withdrawing SRMs from the fully inserted position. SRM/IRM overlap exists when at least three IRM channels in each RPS trip system show an increase to at least twice their pre-startup levels **AND** indicate at least 10% of scale (i.e.,12.5 on the digital readout 0-125 scale) before the first SRM channel reaches 5×10^5 cps. (TS SR 3.3.1.1.6)

If desired, the level of the highest reading IRM (pre-startup) may be doubled and that value used as overlap criteria for all IRMs. This method will allow the operator to compare IRM channel response to a single value which is at least twice the pre-startup levels of the individual IRMs.

CAUTION

IF correct SRM/IRM overlap is NOT verified, THEN the Reactor Engineer shall be notified AND Technical Specification LCO 3.3.1.1 referenced.

5.2.18 **CONFIRM** correct overlap between SRM and IRM channels based on the pre-startup IRM data recorded in the Reactor Operator's log (Step 5.2.7). ____

NOTE: With IRM channels below range 3, the SRM channels will initiate a rod withdrawal block when either of the following conditions exists:

1. SRM channel indicates greater than 5×10^4 cps.
2. SRM channel indicates less than 10^2 cps with its detector **NOT** full in.

NOTE: SRM detectors should be withdrawn two at a time so that the reactor flux level conditions are being monitored by channels that are **NOT** being affected by detector movement.

5.2.19 **WHEN** SRM/IRM overlap has been verified, **THEN** **WITHDRAW** SRM detectors as required to maintain an indicated SRM count rate between 10^2 and 5×10^4. ____

5.0 PROCEDURAL STEPS

Initials

R36

CAUTION

Repositioning IRM range switches should be performed by one Operator, using one hand on one trip system at a time.

CAUTION

WHEN repositioning the IRM range switches, **THEN** care should be taken in order to prevent a reactor scram from occurring.

5.2.20 **REPOSITION** the IRM range switches, as reactor power increases, to maintain IRM indication on recorders between 15 and 50 on the 0-125 scale. _____

5.2.21 **WHEN** all operable IRM channels are above range 3 **AND** prior to reaching range 7, **THEN FULLY WITHDRAW** all SRM detectors. _____

5.2.22 **IF** this is the initial startup following a refuel outage, **THEN PERFORM** the following:

1. 0PT-14.3.1 (if 0PT-14.3 was **NOT** completed prior to startup). _____

2. IRM Range 6 and 7 Correlation in accordance with 0MST-IRM25R. _____

5.0 PROCEDURAL STEPS

Initials

5.3 Heating and Pressurization of the Reactor

> **NOTE:** Main Steam System startup in accordance with 1(2)OP-25 should be performed concurrently with this procedure.
>
> **NOTE:** This procedure assumes startup is being conducted with the MSIVs open. **IF** the startup is being conducted with the MSIVs closed, **THEN** OP-25, Section 5.2, should be performed concurrently with this procedure.

5.3.1 **COMMENCE** Reactor Coolant System (RCS) monitoring in accordance with 1(2)PT-01.7 (SR 3.4.9.1). _____

5.3.2 **CONTINUE** to withdraw rods in the sequence prescribed by 0GP-10 to establish and maintain a heatup rate of less than 100°F an hour as monitored by 1(2)PT-01.7. _____

> **NOTE:** The opening of EQ MCCs or Nodes only creates an operability concern when a high energy line break (HELB) can occur. Therefore, breaching an EQ envelope is a concern (i.e., an HELB can occur) when reactor temperature is above 200°F **OR** reactor pressure is above 275 psig.

5.3.3 **PERFORM** the following:

1. **ENSURE** all work in progress Work Orders are reviewed for breach of an EQ envelope. _____

2. **ENSURE** any identified Work Orders with EQ concerns are confirmed completed, OR applicable LCOs are initiated prior to reactor temperature reaching 200°F. _____

5.3.4 **REJECT** reactor water using the Reactor Water Cleanup System to the hotwell (preferred) or to Radwaste as necessary to maintain reactor water level. _____

5.0 PROCEDURAL STEPS

Initials

5.3.5 **WHEN** the reactor temperature approaches, but does **NOT** exceed 212°F, **THEN CLOSE** the following:

1. *INBOARD RX HEAD VENT VLV, B21-F003,* ___/___ Ind.Ver.

2. *OUTBOARD RX HEAD VENT VLV, B21-F004.* ___/___ Ind.Ver.

5.3.6 **WHEN** reactor temperature reaches 212°F, **THEN NOTIFY** E&RC to obtain a reactor coolant sample for dissolved oxygen analysis. ______

5.3.7 **MAINTAIN** reactor coolant temperature at 212°F for a minimum of one hour **OR** until dissolved oxygen content is shown to be less than 200 ppb. ______

5.3.8 **PERFORM** the following prior to starting Steam Packing Exhauster SPE A(B):

1. **START** a second condensate pump, in accordance with 1(2)OP-32, to provide adequate flow through the SPE. ______

2. **PERFORM** the following to drain both SPE's inlet piping:

   a. **OPEN** *SPE 1(2)A SHELL DRAIN VALVE, 1(2)MVD-V39,* **AND** *SPE 1(2)A SHELL DRAIN VALVE, 1(2)MVD-V40.* ______

   b. **THROTTLE OPEN** *STEAM SEAL SPE 1(2)A MO INLET VLV, 1(2)OG-MOV-E1,* 10 to 20%. ______

   c. **OPEN** *SPE 1(2)B SHELL DRAIN VALVE, 1(2)MVD-V42,* **AND** *SPE 1(2)B SHELL DRAIN VALVE, 1(2)MVD-V43.* ______

   d. **THROTTLE OPEN** *STEAM SEAL SPE 1(2)B MO INLET VLV, 1(2)OG-MOV-E2,* 10 to 20%. ______

e. **WHEN** approximately 30 minutes have elapsed, **THEN CLOSE** the following:

- *STEAM SEAL SPE 1(2)A MO INLET VLV, 1(2)OG-MOV-E1* _____
- *STEAM SEAL SPE 1(2)B MO INLET VLV, 1(2)OG-MOV-E2* _____

3. **OPEN** the associated *FLOAT TRAP OUTLET VALVE* for the SPE to be started:

- *MVD-V51* for 1(2)A SPE _____
- *MVD-V52* for 1(2)B SPE _____

5.3.9 **CONFIRM** one of the following conditions exist:

1. Reactor feed pumps are on turning gear in accordance with 1(2)OP-32, _____

OR

2. The following RFPT A(B) valves are closed:

- *RFP A(B) EXHAUST ISOL VLV, RFE-V1(V2),* _____
- *RFP A(B) SEAL SUPPLY VLV, MVD-V119(MVD-V117),* _____
- *RFP A(B) SEAL EXHAUST VLV, MVD-V120(MVD-V118).* _____

5.3.10 **OPEN** the following demineralized water supply valves for 15-20 seconds to fill the 1.8 minute hold-up loop seals:

1. Unit 1 only:

- *DEMIN WTR SUPPLY VLV, DW-V387* (located in Reactor Building - 10' El., behind OGDT) _____
- *LOOP SEAL VLV, 1-MUD-V434* (located in Stack Filter House east wall above sump) _____

5.0 PROCEDURAL STEPS

Initials

2. Unit 2 only:

   - *DEMIN WTR SUPPLY VLV, DW-V387* (located in N-RHR Pump Room - 17' El., behind OGDT) _____

   - *LOOP SEAL VLV, 2-MUD-V435* (located in Stack Filter House behind sump). _____

5.3.11 **OPEN** *MECHANICAL VACUUM PUMP 1(2)A SUCTION VALVE, 1(2)OG-V16.* _____

5.3.12 **OPEN** *MECHANICAL VACUUM PUMP 1(2)B SUCTION VALVE, 1(2)OG-V17.* _____

5.3.13 **ENSURE** the following valves are closed:

1. *RESERVOIR DRAIN VALVE, 1(2)OG-V71.* _____

2. *RESERVOIR DRAIN VALVE, 1(2)OG-V81.* _____

5.3.14 **OPEN** the following demineralized water supply valves to mechanical vacuum pump reservoirs:

1. *DEMINERALIZED WATER SUPPLY VALVE TO RESERVOIR, 1(2)MUD-V21.* _____

2. *DEMINERALIZED WATER SUPPLY VALVE TO RESERVOIR, 1(2)MUD-V22.* _____

CAUTION

The amount of time sealing steam is applied without the Steam Packing Exhauster in operation should be minimized to prevent excessive seal steam leakage into the Turbine Building.

5.3.15 **WHEN** reactor pressure is greater than 50 psig, **THEN PERFORM** the following:

1. **ENSURE** *STEAM SEAL BYPASS UNLOADING VALVE, MVD-B*, is closed. _____
2. **OPEN** *MN STEAM TO SEALS VLV, MVD-S1*. _____
3. **THROTTLE OPEN** *STEAM SEAL BYP VLV, MVD-S2*, as necessary to maintain *STEAM SEAL HEADER PRESSURE, OG-PI-EPT-4*, located on Panel XU-2, between 1.5 and 4.0 psig. _____
4. **PLACE** the Steam Packing Exhauster in operation, whose float trap outlet was opened in step 5.3.8.3, in accordance with 1(2)OP-26.1. _____

5.0 PROCEDURAL STEPS

Initials

NOTE: The Bypass valve jack meter indicates bypass jack output opening demand signal to the bypass valve system. **IF** a low vacuum condition is present (< 7"), **THEN** all bypass valves will be closed **BUT** bypass jack demand will remain at the last requested position. **IF** bypass jack demand is greater than 0%, **THEN** the bypass jack *OPEN* (red) light indication will be lit.

R34

CAUTION

IF bypass valve jack demand is greater than 0% **AND** the bypass jack *CLOSED* light indication is **NOT** lit, **THEN** bypass valves will automatically open when the low vacuum condition has cleared.

R34 5.3.16 **ENSURE** the Bypass Valve Opening Jack device is run down to the minimum setting as follows:

1. **DEPRESS** the Bypass *DECREASE* push button **UNTIL** the *CLOSED* (green) indicator is lit. _____

2. **CONFIRM** the *BYP VLV OPENING JACK* meter indicates approximately zero percent (0%). _____

CAUTION

Once vacuum is raised above the low vacuum turbine trip setpoint, the trip is armed. **IF** for any reason, such as cycling MVPs, vacuum decreases below the trip setpoint, **THEN** the turbine will trip. **IF** in shell or chest warming, **THEN** a restart of these will be required.

5.3.17 **PERFORM** the following to place the vacuum pump in service:

1. **ENSURE** the Heater Drain System is secured from cold cleanup in accordance with 1(2)OP-35. _____

2. **PLACE** the condenser hogging valve control switch in *HOG*. _____

3. **ENSURE** *CONDENSER HOGGING VALVE, OG-V7,* opens. _____

5.0 PROCEDURAL STEPS

Initials

4. **ENSURE** *VACUUM PUMP 1A(2A)* starts. _____

5. **ENSURE** *VACUUM PUMP 1B(2B)* starts. _____

5.3.18 **IF** the second vacuum pump is **NOT** required, **THEN PLACE** its control switch to *STOP*. _____

> **CAUTION**
>
> Excessive seal water flow will damage the mechanical vacuum pump seals by forcing the mechanical vacuum pump to pump water. Seal water flow should be between 1.5 and 2 gpm.

5.3.19 **CONFIRM** seal water flow to the operating vacuum pumps is between 1.5 and 2 gpm:

1. *VACUUM PUMP 1A(2A).* _____

2. *VACUUM PUMP 1B(2B).* _____

> **NOTE:** The Off-Gas H_2/O_2 Analyzers, *OG-AIT-4284* and *OG-AIT-4324*, may be placed in operation in accordance with 1(2)OP-30, at any time after I&C Maintenance reports the analyzers are ready for operation; however, they are **NOT** required to be in operation until the SJAE is placed in service.

> **CAUTION**
>
> The mechanical vacuum pump motor will overload if it is operated for prolonged periods of time at greater than 23 inches Hg vacuum.

5.3.20 **WHEN** condenser vacuum has been established, **THEN NOTIFY** I&C Maintenance to perform any necessary adjustments, calibrations, and surveillances to ensure the Off-Gas H_2/O_2 Analyzers, *OG-AIT-4284* and *OG-AIT-4324*, are ready for operation. _____

5.0 PROCEDURAL STEPS

Initials

5.3.21 **ENSURE** *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, is closed. _____

NOTE: To ensure full closure of *FW HTR 4A INLET VLV, FW-V118*, **AND** *FW HTR 4B INLET VLV, FW-V119*, the associated control switch must be held in *CLOSE* for at least 20 seconds after receiving full closed indication.

CAUTION

To minimize the possibility of addition of cold feedwater into the reactor, *FW HTRS 4 & 5 BYP VLV, FW-V120, FW HTR 4A INLET VLV, FW-V118*, **AND** *FW HTR 4B INLET VLV, FW V119* must be fully closed prior to opening *FEEDWATER ISOL VLV, B21-F032A* **OR** *FEEDWATER ISOL VLV, B21-F032B*. **WHEN** these valves are closed, the associated control switch must be held in *CLOSE* for at least 20 seconds after receiving full closed indication. **IF** any of these valves are already closed when this section is performed, **THEN** the associated valve control switch should be placed in *CLOSE* and the green light observed. **IF** the green closed light blinks, **THEN** the control switch should be held in *CLOSE* for at least 20 seconds.

5.3.22 **ENSURE** *FW HTRS 4 & 5 BYP VLV, FW-V120*, is closed. _____

5.3.23 **ENSURE** *FW HTR 4A INLET VLV, FW-V118*, is closed. _____

5.3.24 **ENSURE** *FW HTR 4B INLET VLV, FW-V119*, is closed. _____

5.3.25 **PERFORM** the following to close the Startup Level Control Valve:

1. **ENSURE** *SULCV, FW-LIC-3269*, in *M* (manual). _____
2. **OBTAIN** display *VALVE DEM* on *SULCV, FW-LIC-3269*, using *SEL* pushbutton. _____
3. **DECREASE** *VALVE DEM* signal on *SULCV, FW-LIC-3269*, until *VALVE DEM* indicates 0%. _____

NOTE: The CDD condensate conductivity should be less than 0.065 µmho/cm before commencing feeding the vessel. This limit may be waived with the permission of the Unit SCO and the E&RC Chemistry Supervisor. **WHEN** CDD vessel effluent is directed to the reactor vessel **OR** CDD influent conductivity is greater than 0.1 µmho/cm, **THEN** low flow through CDD vessels could result in higher than desirable pH and conductivity in the reactor vessel. **WHEN** *B21-F032A* or *B21-F032B* is open **AND** CDD influent conductivity is greater than 0.1 µmho/cm, **THEN** each in-service CDD vessel flow should be maintained at 2000-3000 gpm.

NOTE: Unit 1 only: **WHEN** opening valves *1-B21-F032A* and *1-B21-F032B*, the spring return control switch must be held in the *OPEN* position in order for the valve to stroke to the full open position. Valve open travel may be stopped by releasing the spring return control switch at any time during the valve stroke. Only momentary operation of the control switch in the *CLOSE* position is necessary to cause the valve to go full closed.

CAUTION

Addition of cold feedwater into the reactor may cause significant reactor power increases.

CAUTION

Unit 1 only: Valves *1-B21-F032A* and *1-B21-F032B* are **NOT** to be throttled. These valves are to be left in mid-position long enough to observe vessel level changes. At least 3 seconds should elapse between valve motor starts with no more than 6 starts in an hour. Frequent starting may cause motor overheating and thermal overload trips.

5.3.26 **OPEN** *FEEDWATER ISOL VLV, B21-F032A.* ____/____ Ind.Ver.

5.3.27 **OPEN** *FEEDWATER ISOL VLV, B21-F032B.* ____/____ Ind.Ver.

5.3.28 **REQUEST** Chemistry to assess the need for Boron sampling and analysis using 0AI-81 start-up guidelines for concentrations in the reactor. ______

5.3.29 **PERFORM** the following to place the Startup Level Control Valve in service:

1. **IF** necessary, **THEN DEPRESS** *SEL* pushbutton on *SULCV, FW-LIC-3269*, until *VALVE DEM* is displayed. ______

5.0 PROCEDURAL STEPS

Initials

2. **SLOWLY INCREASE** *SULCV FW-LIC-3269, VALVE DEM* signal to maintain reactor water level between 182 and 192 inches. _____

3. **IF** *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, malfunctions, **THEN THROTTLE OPEN** one or more of the following valves to maintain reactor vessel level at 182 through 192 inches:

   a. *FW HTRS 4 & 5 BYP VLV, FW-V120.* _____

   b. *FW HTR 4A INLET VLV, FW-V118.* _____

   c. *FW HTR 4B INLET VLV, FW-V119.* _____

4. **WHEN** reactor level is between 182 and 192 inches, **THEN PERFORM** the following to place the Startup Level Control Valve in automatic:

   a. **ENSURE** *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, in *M* (manual). _____

   b. **DEPRESS** *SEL* pushbutton on either *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *LVL ERROR* is displayed. _____

   c. **DEPRESS** *SEL* pushbutton on *MSTR RFPT SP/RX LVL CTL C32-SIC-R600*, until *SETPOINT* is displayed. _____

   d. **ADJUST** *SETPOINT* on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, until *LVL ERROR* display on selected *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, is approximately 0 inches. _____

   e. **DEPRESS** *A/M* pushbutton on *SULCV, FW-LIC-3269*, **AND CHECK** *A/M* indication changes to *A* (automatic). _____

   f. **SLOWLY ADJUST** *SETPOINT* on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, for desired level between 182 and 192 inches. _____

5.0 PROCEDURAL STEPS

Initials

5.3.30 **WHEN** the Startup Level Control Valve is in service **AND** RWCU reject no longer required for reactor vessel level, **THEN ENSURE** the following valves are closed:

1. *ORIFICE BYPASS VLV, G31-F031.* _____
2. *RWCU REJECT FLOW CONTROL VLV, G31-F033.* _____
3. *REJECT TO CNDSR VLV, G31-F034.* _____
4. *REJECT TO RADWASTE VLV, G31-F035.* _____

> **NOTE:** **IF** optimal control of *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, is desired, **THEN** the control band should be maintained between 25% and 55% on the controller output demand signal.

> **CAUTION**
>
> Opening *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, more than *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, may cause feedwater line depressurization and loss of flow to the reactor vessel.

5.3.31 **IF** desired, **THEN ADJUST** *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, to maintain *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, output demand signal between 25% and 55%. _____

5.3.32 **WHEN** condenser vacuum is greater than 12 inches Hg, **THEN TEST** the operation of the Low Condenser Vacuum Switches *OG-PS-110* and *OG-PS-111* as follows:

1. **OPEN** one bypass valve 15% using the Bypass Valve Opening Jack. _____
2. **CLOSE** the bypass valve using the Bypass Valve Opening Jack. _____

5.0 PROCEDURAL STEPS

Initials

3. **CONFIRM** the following extraction steam line moisture removal valves are open:

   a. LP Turbine B 9th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *MVD-LV-267*. _____

   b. LP Turbine A 9th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *MVD-LV-266*. _____

   c. 4th Stage Extraction To FW Heater 5A Moisture Removal Valve, *MVD-LV-268*. _____

   d. 4th Stage Extraction To FW Heater 5B Moisture Removal Valve, *MVD-LV-269*. _____

   e. LP Turbine A 11th Stage Extraction Moisture Removal Valve, *LV-262*. _____

   f. LP Turbine A 11th Stage Extraction Moisture Removal Valve, *LV-263*. _____

   g. LP Turbine B 11th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *LV-264*. _____

   h. LP Turbine B 11th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *LV-265*. _____

5.0 PROCEDURAL STEPS

Initials

> **NOTE:** Main turbine shell and chest warming should be performed concurrently with pressurizing of the reactor.

5.3.33 **WHEN** reactor pressure is greater than 60 psig, **THEN COMMENCE** shell/chest warming in accordance with 1(2)OP-26. _____

> **NOTE:** RCIC should be placed in Standby as soon as the low steam supply pressure isolation signal is reset but prior to 150 psig in accordance with Tech Spec 3.5.3. Reset value is 80-90 psig.

5.3.34 **WHEN** reactor pressure reaches approximately 85 psig, **THEN PLACE** RCIC in standby in accordance with 1(2)OP-16. _____

R30 5.3.35 **IF** the unit was in cold shutdown for longer than one week, **THEN NOTIFY** the Work Control Center to schedule a RCIC System Operability Test within one week. _____

5.3.36 **PLACE** the RFPT gland seals in operation in accordance with 1(2)OP-32. _____

NOTE: Main steam line temperature heatup rate is limited to less than or equal to 100°F an hour. Control of the heatup rate shall be accomplished by monitoring steam line pressure and utilizing steam tables. It should be assumed the steam is saturated steam. Pressure can be monitored from the Plant Process Computer.

NOTE: HPCI should be placed in Standby as soon as the Low steam supply pressure Isolation signal is reset, but prior to 150 psig in accordance with Tech Spec 3.5.1. Reset value is ≤ 138 psig.

5.3.37 **WHEN** reactor pressure reaches 120 - 140 psig, **THEN** **PERFORM** the following:

1. **ENSURE** *MAIN STEAM LINE DRAIN VLV, MVD-F021*, is closed. _____

2. **PLACE** HPCI in standby in accordance with 1(2)OP-19. _____

NOTE: **IF** the following periodic tests are **NOT** current, **THEN** the PTs should be performed at the indicated pressure:

Periodic Test	Turbine Inlet Pressure
1) 0PT-10.1.3, RCIC System Operability Test-Flow Rates at 150 Psig	135-165 psig*
	Reactor Pressure
2) 0PT-09.3, HPCI System-165 Psig Flow Test	150-180 psig**

*Complete within 24 hours after reactor pressure reaches 135 psig and prior to exceeding 165 psig.
**Complete within 48 hours after reactor pressure reaches 150 psig and prior to exceeding 180 psig.

5.0 PROCEDURAL STEPS Initials

5.3.38 **IF** 0PT-10.1.3 is **NOT** current, **THEN RECORD** when reactor pressure reaches 135 psig to document the start of the 24-hour interval allowed to perform 0PT-10.1.3. _____

_______________ _______________

Date Time

5.3.39 **IF** 0PT-09.3 is **NOT** current, **THEN RECORD** when reactor pressure reaches 150 psig to document the start of the 48-hour interval allowed to perform 0PT-09.3. _____

_______________ _______________

Date Time

5.3.40 **WHEN** reactor pressure reaches 150 psig **AND** the main condenser vacuum is greater than or equal to 7.5 inches, **THEN CONFIRM** Turbine Bypass Valve No. 1 opens to prove operability of the pressure regulator. _____

CAUTION

Operation of the pressure regulator should be accomplished smoothly and slowly to avoid sudden oscillations of reactor water and power levels.

5.3.41 **MAINTAIN** the pressure regulator setpoint 15 to 20 psig above reactor pressure during heatup, (do **NOT** exceed 100°F an hour heatup rate). _____

5.3.42 **WHEN** reactor pressure reaches 150 psig, **THEN THROTTLE CLOSED** *STEAM SEAL BYPASS VALVE, MVD-S2*, as necessary to maintain seal header less than 4.0 psig. _____

5.3.43 Unit 2 Only: **ENSURE** *MN STM TO BPV CHEST DRN VLV, MS-V35*, is closed. _____

Initials

<u>Unit 2 Only</u>:

NOTE: Past history indicates the pressure sensing lines for Condenser Pressure Transmitters *2-B21-PT-N056 A-D* fill with condensate during shutdown periods. A pipe wrench will be required to remove the drain valve cap from *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026*, if draining is required.

NOTE: The *2-B21-PT-N056 A-D* sensing line slope was corrected to design in accordance with SPEC 248-117 under W/O 00069871 during the B215R1 outage. Condenser vacuum should be monitored during startup and an instrument channel check performed on *2-B21-PTM-N056 A(B,C,D)-1* to determine if this resolved the problem.

5.3.44 <u>Unit 2 Only</u>: **IF** condenser vacuum appears unstable **OR** a problem is indicated during the instrument channel check, **THEN PERFORM** the following to drain the condenser pressure sensing lines:

1. **ENSURE** the following low condenser vacuum bypass switches at Panels 2H12-P609 and 2H12-P611 are in *BYPASS*:

   - *LOW COND VAC LOGIC A, A71B-S34A* _____
   - *LOW COND VAC LOGIC C, A71B-S34C* _____
   - *LOW COND VAC LOGIC B, A71B-S34B* _____
   - *LOW COND VAC LOGIC D, A71B-S34D* _____

2. **REMOVE** drain valve cap from *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026*. _____

5.0 PROCEDURAL STEPS

Initials

3. **SLOWLY OPEN** *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026.* _____

4. **ALLOW** line to drain to condenser for 30 seconds. _____

5. **CLOSE** *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026.* ___/___ Ind.Ver.

6. **REPLACE** drain valve cap **AND CHECK** for vacuum leaks. _____

7. **REMOVE** drain valve cap from *2-B21-PT-N056C AND N056D INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1028.* _____

8. **SLOWLY OPEN** *2-B21-PT-N056C AND N056D INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1028.* _____

9. **ALLOW** line to drain to condenser for 30 seconds. _____

10. **CLOSE** *2-B21-PT-N056C AND N056D INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1028.* ___/___ Ind.Ver.

11. **REPLACE** drain valve cap **AND CHECK** for vacuum leaks. _____

R28

CAUTION

Reactor pressure shall **NOT** be allowed to exceed 500 psig with the low condenser vacuum bypass switches in *BYPASS*. Reference UFSAR 7.3.1.1.6.20 (UFSAR Change 97-FSAR-153).

R28

5.3.45 **WHEN** main condenser vacuum is 15 in. Hg or greater, **THEN PERFORM** the following:

1. **CONFIRM** the following:

   a. Condenser vacuum is greater than 15 inches Hg. _____

   b. *GRP I ISOL LOGIC A/C TRIPPED* (A-05 5-3), is clear. _____

   c. *GRP I ISOL LOGIC B/D TRIPPED* (A-05 5-4), is clear. _____

   d. *MSIV AC LOGIC* and *MSIV DC LOGIC* lights on Panels H12-P622 and H12-P623 are on. _____

2. **PLACE** the following low condenser vacuum bypass switches at Panel H12-P609 to *NORMAL* **AND REMOVE** the associated keys:

   a. *LOW COND VAC LOGIC A, A71B-S34A.* _____

   b. *LOW COND VAC LOGIC C, A71B-S34C.* _____

3. **CONFIRM** the following Panel H12-P609 main steam isolation valve low vacuum trip relays are energized (pulled in from the stop screws):

   a. *A71B-K10A.* _____

   b. *A71B-K10C.* _____

5.0 PROCEDURAL STEPS

Initials

4. **PLACE** the following low condenser vacuum bypass switches at Panel H12-P611 to *NORMAL* **AND** **REMOVE** the associated keys:

   a. *LOW COND VAC LOGIC B, A71B-S34B.* ____

   b. *LOW COND VAC LOGIC D, A71B-S34D.* ____

5. **CONFIRM** the following Panel H12-P611 main steam isolation valve low vacuum trip relays are energized (pulled in from the stop screws):

   a. *A71B-K10B.* ____

   b. *A71B-K10D.* ____

> **NOTE:** **WHEN** reactor pressure reaches 200 psig, **THEN** a steam jet air ejector should be placed in service.

5.3.46 **CLOSE** the following drain valves:

1. *STM TO SJAE DRAIN VLV, MS-V36.* ____
2. *SJAE NORMAL PRV DRAIN VLV, SJE-V8.* ____
3. *SJAE ALT PRV DRAIN VLV, SJE-V9.* ____

5.3.47 **PLACE** an off-gas train in operation in accordance with 1(2)OP-30. _____

5.3.48 **PLACE** the AOG Charcoal Absorber System in service in accordance with 1(2)OP-33. _____

5.3.49 **WHEN** condenser vacuum is greater than or equal to 20" Hg, **THEN CLOSE** *SPE A(B) SHELL DRAIN VALVE, MVD-V39(MVD-V42)* and *SPE A(B) SHELL DRAIN VALVE, MVD-V40(MVD-V43).* _____

5.3.50 **WHEN** reactor pressure reaches 250 psig, **THEN ALLOW** a turbine bypass valve to come open at least 20% to prevent reactor power oscillations due to variation in RFP steam demand. _____

5.3.51 **IF** any SRV tailpipe temperature is more than 50°F greater than the average of the others when reactor pressure reaches 250 psig, **THEN IMMEDIATELY CONTACT** Engineering for guidance. _____

CAUTION

A reactor feed pump should be placed in service at 250 psig. A reactor pressure of approximately 300-350 psig exceeds the condensate booster pump discharge head requiring a reactor feed pump in service to ensure a continued source of feedwater.

5.3.52 **PLACE** Reactor Feed Pumps in service in accordance with 1(2)OP-32. _____

5.0 PROCEDURAL STEPS

Initials

NOTE: The nominal setpoint of the pressure regulator is 928 psig for Unit 1 and 945 psig for Unit 2, as read on the plant computer or Control Room pressure indication. Pressure may be raised as high as necessary to accommodate testing, but must be reduced to the nominal setpoint before rolling the main turbine.

NOTE: ERFIS computer points EHCPA002 and EHCPA003, on Group Point Display # 38, can be accessed to more precisely adjust the pressure regulator setpoint.

CAUTION

WHEN raising reactor pressure using pressure set, **THEN** depressing the push button for long periods of time could cause a reactor scram due to power spikes.

5.3.53 **WHEN** one reactor feedpump is in operation, **THEN** **INCREASE** the setpoint of the pressure regulator to 928 psig for Unit 1 or 945 psig for Unit 2, while maintaining a heatup rate of less than 100°F an hour. _____

5.3.54 **PLACE** Zinc Injection System (GEZIP) in service in accordance with 1(2)OP-32. _____

5.3.55 **WHEN** reactor pressure reaches 400 psig, **THEN** **ENSURE** *STEAM SEAL BYPASS VALVE, MVD-S2*, is closed **AND** Steam Seal System operating in accordance with 1(2)OP-26.1. _____

5.3.56 **WHEN** reactor pressure reaches 500 psig, **THEN** **ENSURE** the following valves are closed:

1. *MAIN STEAM LINE DRAIN VLV, MS-F038A.* _____
2. *MAIN STEAM LINE DRAIN VLV, MS-F038B.* _____
3. *MAIN STEAM LINE DRAIN VLV, MS-F038C.* _____
4. *MAIN STEAM LINE DRAIN VLV, MS-F038D.* _____
5. *MAIN STEAM LINE DRAIN OTBD ISOL VLV, B21-F019.* ___/___ Ind.Ver.

5.0 PROCEDURAL STEPS Initials

6. *MAIN STEAM LINE DRAIN INBD ISOL VLV, B21-F016.* ___/___ Ind.Ver.

5.3.57 **WHEN** Reactor Feedpump discharge pressure is greater than 900 psig, **THEN PLACE** *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, in *A* (automatic) as follows:

1. **ENSURE** *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, in *M* (manual). _____

2. **ENSURE** *FEEDWATER CONTROL MODE SELECT* in *1 ELEM.* _____

3. **DEPRESS** *SEL* pushbutton on *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *A(B) BIAS* is indicated **AND ENSURE** bias is set to 0%. _____

4. **DEPRESS** *SEL* pushbutton on *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *PMP A(B) DEM* is displayed. _____

5. **DEPRESS** *SEL* pushbutton on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, until *MASTR DEM* is displayed. _____

6. **SET** *MASTR DEM* to equal *PMP A(B) DEM* value displayed on *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, using the raise and lower pushbuttons on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600.* _____

7. **DEPRESS** *A/M* pushbutton on *RPFT A(B) SP CTL, C32-SIC-R601A(B)*, **AND CHECK** the indicator on control station changes to *A* (automatic) **AND** *PMP DEM* signal remains unchanged. _____

8. **DEPRESS** *SEL* pushbutton on the out-of-service *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *LVL ERROR* is indicated **AND CHECK** *LVL ERROR* is approximately 0 inches. _____

9. **DEPRESS** *A/M* pushbutton on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, **AND CHECK** the indicator on the control station changes to *A* (automatic). _____

10. **ENSURE** *PMP A(B) DEM* and *VALVE DEM* signals remain unchanged. _____

11. **DEPRESS** *A/M* pushbutton on *SULCV, FW-LIC-3269,* **AND CHECK** the indicator on the control station changes to *M* (manual). _____

CAUTION

Momentarily depressing the raise or lower pushbuttons on *FW-LIC-3269* will cause valve demand to change in increments of 0.1%. Continually depressing the raise or lower pushbuttons will cause valve demand to change at an exponential rate.

12. **SLOWLY OPEN** *SULCV*, using raise pushbutton on *FW-LIC-3269*, until *VALVE DEM* is 100% **AND CHECK** reactor water level is being maintained between 182 and 192 inches. _____

NOTE: **IF** the following periodic tests are **NOT** current, **THEN** the PTs should be performed at the indicated reactor pressure. Reactor pressure may be increased using pressure set to facilitate required test pressure.

Periodic Test	Reactor Pressure
1) 0PT-10.1.1, RCIC System Operability Test	945-1045 psig*
2) 0PT-09.2, HPCI System Operability Test	945-1045 psig**
3) 0PT-11.1.2, Automatic Depressurization System and Safety Relief Valve Operability Test	945-1045 psig***

*Complete within 24 hours after reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2.

**Complete within 48 hours after reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2.

***Complete within 12 hours after reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2.

5.0 PROCEDURAL STEPS Initials

5.3.58 **IF** 0PT-11.1.2 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2 to document the start of the 12-hour interval allowed to perform 0PT-11.1.2. _____

_______________ _______________
Date Time

5.3.59 **IF** 0PT-10.1.1 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2 to document the start of the 24-hour interval allowed to perform 0PT-10.1.1. _____

_______________ _______________
Date Time

5.3.60 **IF** 0PT-09.2 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2 to document the start of the 48-hour interval allowed to perform 0PT-09.2. _____

_______________ _______________
Date Time

Date/Time Completed _______________

Performed By (Print) Initials

_______________________ _____

_______________________ _____

_______________________ _____

_______________________ _____

Reviewed By: _______________________
Unit SCO

COMMENTS

____

____

____

R37

NRC Licensed Personnel Instructions for Reactor Startup

1.0 PURPOSE

This appendix to 0GP-02 is provided to give instruction for NRC licensed personnel to follow during a reactor startup evolution.

2.0 CONTROL ROOM DISCIPLINE

2.1 During the approach to criticality, the teller's window for the affected unit should be closed and a note attached to the window stating "reactor startup in progress." This will prevent unnecessary confusion and distraction for Control Room personnel. The SRO in charge of the Work Control Center should **NOT** authorize MSTs, PTs, or maintenance, etc., **NOT** directly associated with the reactor startup.

2.2 Prior to the withdrawal of control rods to bring the reactor to criticality, the Unit SCO should conduct a "pre-evolution" briefing with the Control Operators and all personnel in the Control Room on the affected unit (i.e., OJT trainees, extra SROs, etc.). This briefing should include the following:

1. Discussion concerning appropriate conservative actions (i.e., repositioning of further control rods in the case of inaccurate ECPs, manual scram, etc.) in the event of an unexpected situation with respect to reactivity, criticality, power level, or any other anomalous behavior of the reactor core. Additionally, the need for strict procedural compliance during withdrawal of control rods must be stressed.

2. Discussion of any inoperable nuclear instrumentation and related LCO requirements.

3. Discussion of any unusual plant conditions surrounding the startup which may require extra attentiveness and assignment of individuals to these tasks.

2.3 As determined by the Unit SCO in charge of startup, shift turnover for those persons directly involved with bringing the reactor critical will be permitted **ONLY** when the reactor is stable (i.e., prior to the approach to criticality or after reaching the point of adding heat).

R37

NRC Licensed Personnel Instructions for Reactor Startup

2.4 The Control Operators responsibilities for startup are delineated in 0OI-01.01. These job functions should be strictly adhered to during the unit startup/synchronization. During the approach to criticality, it is especially important **NOT** to distract the Control Operator responsible for reactivity manipulations.

3.0 RESPONSIBILITIES FOR THE APPROACH TO CRITICALITY

IF a trainee is involved with control rod withdrawal during the reactor startup, **THEN** the Control Operator responsible for reactivity manipulations will maintain absolute and positive control over the OJT trainee individual. **IF** there is more than one OJT trainee allowed in the Control Room for startup, **THEN** only one OJT trainee may be directly involved with repositioning control rods under the strict supervision of the licensed Control Operator.

4.0 ACHIEVING CRITICALITY

Prior to the withdrawal of control rods to bring the reactor to criticality, nuclear instrumentation recorders (SRM/IRM) should be checked per 0OI-01.02 for operability. The guidelines listed below should be followed during the approach to criticality:

4.1 During control rod withdrawal the Control Operator should continuously monitor the following instrumentation:

- SRM Period Meters *C51-R601*
- SRM Count Level Meters *C51-R600*
- SRM Recorder *C51-R602*

This will allow early detection of errors associated with the estimated critical position and nuclear instrumentation:

4.2 During the approach to criticality, "source range doubling" must be used as a method of monitoring for criticality.

As a rule of thumb, five "doubles" in the neutron count rate will yield criticality; however, this rule may **NOT** always hold true due to initial core conditions and time between control rod withdrawal.

R37 **NRC Licensed Personnel Instructions for Reactor Startup**

Upon achieving three SRM "doublings" in the neutron count rate, control rod withdrawal should be in the single notch mode for all subsequent rods unless continuous withdrawal is recommended by the Reactor Engineer and approved by the Unit SRO. The single notch withdrawal requirement is also applicable to all high worth control rods, as designated by the Reactor Engineer, regardless of the SRM count rate or number of "doublings".

4.3 The estimated critical position (ECP) is a rough approximation of the control rod positioning needed to achieve criticality of the reactor. This estimate should **NOT** be relied upon for the approach and declaration of criticality. **IF** criticality occurs before the lower range, or does **NOT** occur prior to the upper range of the ECP, **THEN** the operator shall insert control rods in accordance with the 0GP-10 sequence sheets to less than three doubles of the SRM counts. The Reactor Engineer and Nuclear Fuels personnel should be contacted immediately. Nuclear Fuels will examine the subcritical data and recommend a course of action. The margin to criticality should be determined by the Reactor Engineer and should include factors such as moderator temperature, fuel temperature, and Xenon.

4.4 While repositioning control rods, time must be taken to initial GP-10 steps and to monitor all operable nuclear instrumentation. This time allocation will provide pauses in the approach to criticality, which allows for neutron level stabilization while the reactor is still subcritical.

5.0 POWER INCREASE AFTER CRITICALITY

5.1 IRM and APRM instruments should be monitored while withdrawing control rods to open bypass valves.

5.2 Heatup of the reactor coolant system with reactor heat should be coordinated with the BOP operator to prevent the reactor coolant system from being heated at a faster rate than the BOP can be placed in service.

5.3 1(2)PT-01.7, Heatup/Cooldown Monitoring, shall be initiated during reactor coolant system heatup to confirm compliance with Technical Specification SR 3.4.9.1.

REVISION SUMMARY

Revision 77 drains both SPE's inlet piping during startup.

Revision 76 adds Notes and Cautions regarding operation of Unit 1 B21-F032A and B valves following removal of seal-in on valve open stroke iaw EC 46918; changed initial pressure set value to 928 psig for Unit 1 iaw EC 50552; deleted Caution regarding possible scram during turbine warming, bypass switches installed iaw EC 50051; clarified the degree to which a bypass valve should be opened to coincide with prerequisites in 0GP-03; added applicable TS LCO if IRM/SRM overlap not established; deleted reference to 0-40 scale on IRMs when verifying overlap since digital readouts 0-125 scale is normally used

Revision 75 identifies instruments to be used to confirm pressure/temperature coordinates on Tech Spec Figure 3.4.9-2 prior to startup.

Revision 74 incorporated changes for the following: 1) EC 47894, Seismic Qualification for EPU & AST, and 2) EC 46730, Replacement of Unit 2 Power Range Neutron Monitoring System.

Revision 73 added changes to open the MVD-V51(MVD-V52) prior to starting the associated SPE A (B). The float trap isolation valve is maintained closed when the associated SPE A (B) is out of service and only open when the associated SPE is in service to prevent loss of the loop seal.

Revision 72 incorporated changes for ESR 00-00442, Unit 1 Replacement of the Power Range Neutron Monitoring System, and ESR 01-00188, which established an alternate leakage path for directing Unit 1 post-LOCA MSIV/Steam Line Drain Valve Leakage to the condenser that required MVD-F021 to be closed prior to exceeding 140 psig reactor pressure.

Revision 71 incorporated the following:

1. Added SOER 88-2 to references and annotated appropriate steps,
2. Incorporated FSAR change to address 1SJAE operation at 100% (AR 00024816),
3. AR 00030042 added a caution concerning the steps to ensure FW-V118, FW-V119 and FW-V120 are closed prior to opening B21-F032-A/B,
4. AR 00028144 to add steps to calculate "three and five SRM doublings" and record the calc results (calcs to be independently verified).

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM2SROCOO

LESSON TITLE: Core Performance Parameter Check.

REVISION NO: 0

RECOMMENDED BY: Curt Robert
Instructor/Developer Date

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor Date

APPROVED BY: ______________________
Superintendent/Supervisor Training Date

SAFETY CONSIDERATIONS:

1. None.

EVALUATOR NOTES: (Do not read to performer)

1. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.
2. **START LOCATION:** This JPM can be performed at any location because it is an administrative task.
3. **PROVIDE A COPY:**
   a. Provide a clean copy of 2PT-01.11, Core Performance Parameter Check if requested.
   b. As typical in plant, provide completed 2PT-01.11 as Cover Page, Certification and Review Form only with Core Performance Log Printout (CMFLPD is >1.0) attached.
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is not a time critical JPM.

Read the following to the JPM performer.

TASK CONDITIONS:

1. Unit Two (2) is operating at rated power and the CODSR requires performance of 2PT-01.11 Core Performance Parameter Check.
2. The Core Performance Log printout included was used by the RO to complete 2PT-01.11.
3. The revision of 2PT-01.11 that was used is the current revision.

INITIATING CUE:

You are directed by the Shift Superintendent to perform the Unit SCO review 2PT-01.11, Core Performance Parameter Check and supporting documentation. Document your results on the Certification and Review form and inform the Shift Superintendent when you have completed the review.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.
Comments required for any step evaluated UNSAT.

START TIME: ___________

PERFORMANCE CHECKLIST

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

PROMPT: Provide the Core Performance Log edit before administering this JPM for use throughout the remainder of this JPM.

NOTE: If desired, the examiner may provide a copy 2PT-01.11 to the examinee.

Step 1 – Reviews Core Performance Log Printout and determines the CMFLPD has been exceeded. This contradicts the satisfactory results shown on the Certification and Review Form.

Determines CMFLPD is greater than 1.

.

SAT/UNSAT*

Step 2 – Verifies that the acceptance criteria of section 6.0 has been satisfied.

CMFLPD is not required by Technical Specifications. Documents as an "Exception to Satisfactory Performance" that CMFLPD is UNSAT.

SAT/UNSAT*

Step 3 – Determine corrective action required for UNSAT CMFLPD.

2PT-01.11 requires that the Reactor Engineer be informed to take action to restore CMFLPD within limits within 4 hours, or to be below 23% power within the next 4 hours.

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

Step 7 - Notify Shift Superintendent that 2PT-01.11 was completed with *CMFLPD >1.00.*

SCO signs on the Certification and Review form that test procedure has ***NOT*** *been satisfactorily completed. Notifies SS that 2PT-01.11 was completed with CMFLPD >1.00. 2PT-01.11 is UNSAT but Technical Specifications are met.*

*** SAT/UNSAT***

TERMINATING CUE: When review of 2PT-01.11 has been completed, this JPM is complete.

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

STOP TIME: ___________

RELATED TASKS:
299201B201: Perform Daily Surveillance Report Per OI-3.1 Or OI-3.2.

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.7 3.7/4.4
Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation.

GEN 2.1.19 3.0/3.0
Ability to use plant computer to obtain and evaluate parametric information on system or component status.

REFERENCES:

2PT-01.11 CORE PERFORMANCE PARAMETER CHECK

TOOLS AND EQUIPMENT:

None.

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

Generic (Administrative)

REASON FOR REVISION:

New for use on 2004 NRC exam.

Time Required for Completion: **10 Minutes** (approximate).

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate x_ Actual __ Unit: ____

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

Time Critical: Yes __ No x_ Time Limit **NA**

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

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Unit Two (2) is operating at rated power and the CODSR requires performance of 2PT-01.11 Core Performance Parameter Check.
2. The Core Performance Log printout included was used by the RO to complete 2PT-01.11.
3. The revision of 2PT-01.11 that was used is the current revision.

INITIATING CUE:

You are directed by the Shift Superintendent to perform the Unit SCO review 2PT-01.11, Core Performance Parameter Check and supporting documentation. Document your results on the Certification and Review form and inform the Shift Superintendent when you have completed the review.

FTO

CP&L CAROLINA POWER & LIGHT COMPANY
BRUNSWICK NUCLEAR PLANT

C
Continuous Use

DATE COMPLETED 22 July 04
UNIT 2 % PWR 95.9 GMWE 938.34
SUPERVISOR You
REASON FOR TEST (check one or more)
✓ Routine Surveillance
__ W/O # ____
__ Other (explain)

FREQUENCY:

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

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

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
2

2PT-01.11

CORE PERFORMANCE PARAMETER CHECK

REVISION 1

1.0 PURPOSE

This PT provides a procedure for obtaining the basic core performance parameters required by Technical Specifications and calibrates APRM channels to read greater than or equal to actual core thermal power. The procedure satisfies Technical Specifications SR 3.2.1.1, SR 3.2.2.1, SR 3.3.1.1.3.

2.0 REFERENCES

2.1 Technical Specifications

2.2 NEDE-24011-P-A (GESTAR II), Amendment 19

2.3 NRC Generic Letter 88-16, Removal of Cycle-Specific Parameter Limits from Technical Specifications

2.4 Core Operating Limits Report

2.5 Letter, L. M. Quintana to B. A. Morgan, "Linear Heat Generation Rate Monitoring," October 9, 1989, LMQ: 89-241

2.6 0OI-72, Plant Process Computer System Operating Instruction

2.7 0OP-55, Process and ERFIS Computer System Operating Procedure

2.8 0PT-01.8C, Hand Calculation of AGAFs

2.9 0PT-01.8D, Core Thermal Power Calculation

2.10 0ENP-24.19, Operation of the BWR Process Computer Backup Program

2.11 2OP-09, Neutron Monitoring System Operating Procedure

2.12 GE SIL 516 Supplement 1, Recirculation Drive Flow/Core Flow Correlation

2.13 NEDO-32465-A, Licensing Topical Report: Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applicability GE Nuclear Energy, August 1996.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Special care should be taken in verifying data. Errors on the nonconservative side could cause operation that might lead to a violation of Technical Specifications.

3.2 **IF** the value of a core performance parameter exceeds its limits, **THEN** the Unit SCO should be immediately notified.

3.3 During APRM gain adjustments, the plant should be held at a steady state operating condition. During APRM gain adjustments, the affected APRMs may be bypassed.

3.4 **IF** APRM gain adjustments are made, **THEN** Independent Verification is required.

3.5 **IF** measured core flow (WT) is less than core flow calculated from WD (WTSUB), **AND** if the difference can be attributed to operation on a rod line above the rated line, **THEN** the measured core flow value may be manually entered into the process computer if determined to be appropriate by the Reactor Engineer.

4.0 PREREQUISITES

Thermal power is greater than or equal to 23%.

5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 ACCEPTANCE CRITERIA

NOTE:	Attachment 3 contains definitions and abbreviations of terms.

6.1 This PT is acceptable when it is shown by the certifying signature that the parameters have been obtained correctly according to this instruction and these conditions exist:

6.1.1 CMFLCPR is less than or equal to 1.0 (See Attachment 2, Note N4, for parameter location on the core performance edit).

6.1.2 CMAPRAT is less than or equal to 1.0 (See Attachment 2, Note N3, for parameter location on the core performance edit).

6.2 At least three operable APRMs are adjusted such that the APRM gain adjustment factors (GAFs) are less than or equal to 1.00. The APRM gain adjustment factor is determined by either the periodic NSS Core Performance Log (Attachment 2, Note N2), Display 820 (Heat Balance/Core Mon), or hand calculation of AGAFs (0PT-01.8C). **IF** APRM gain adjustments are performed, **THEN** the postadjustment AGAFs are verified by a second Display 820 or 0PT-01.8C.

7.0 PROCEDURAL STEPS

Initials

NOTE: Attachments 2 and 3 may be discarded after completion of test.

NOTE: **IF** unable to obtain the required process computer edits, **THEN** the On-Shift Reactor Engineer should be contacted prior to performance of Section 7.2.

7.1 Using the Process Computer

NOTE: Plant process computer operating instructions and report codes are contained within procedures 0OI-72 and 0OP-55.

7.1.1 **OBTAIN** an edit of the process computer core performance program. CR

7.1.2 **IF** there are failed inputs on the failed sensor list, **THEN ENSURE** correct values have been substituted where appropriate. N/A

7.1.3 **LOCATE** WTFLAG on the Core Performance Log (Attachment 2, N16): CR

1. **IF** WTFLAG is equal to 2, **THEN GO TO** Step 7.1.5. CR

2. **IF** WTFLAG is **NOT** equal to 2, **THEN NOTIFY** the On-Shift Reactor Engineer to evaluate if core flow is accurate for thermal limit calculations (Precaution 3.5). N/A

7.1.4 **IF** core flow was changed by the Reactor Engineer in Step 7.1.3, **THEN OBTAIN** a new Core Performance Log edit. N/A

7.1.5 **DETERMINE** from the core performance edit, if criteria listed in Section 6.1 are met. (Locations on the core performance edit where thermal limit parameters are found are indicated on Attachment 2). CR

7.0 PROCEDURAL STEPS

Initials

7.1.6 **IF** limits specified in Section 6.1 are **NOT** satisfied, **THEN NOTIFY** the Unit SCO of the condition. N/A

1. **NOTIFY** the On-Shift Reactor Engineer to take action to restore the thermal limits to acceptable values. N/A

> **NOTE:** Note N2 on Attachment 2 shows the location of the APRM GAFs. The APRMs are ordered: APRMs 1, 2, 3, 4.

7.1.7 **DETERMINE**, from the core performance edit, if Acceptance Criteria listed in Section 6.2 are satisfied (at least three APRM gain adjustment factors are less than or equal to 1.00). CR

7.1.8 **IF** an APRM gain adjustment is necessary, **THEN PERFORM** applicable section of 2OP-09. N/A

7.1.9 **IF** an APRM gain change was performed, **THEN OBTAIN** from the process computer a copy of Display 820, Heat Balance/Core Mon, **OR PERFORM** 0PT-01.8C to ensure APRM GAFs satisfy the requirements of Acceptance Criteria, Section 6.2. N/A N/A Ind.Ver.

7.1.10 **DETERMINE**, from the core performance edit, if CMFLPD is less than or equal to 1.00 (Attachment 2, Note N5, for CMFLPD location on the core performance edit). CR

7.1.11 **IF** CMFLPD is greater than 1.00, **THEN NOTIFY** the Unit SCO of the condition. N/A

1. **NOTIFY** the On-Shift Reactor Engineer to take action to restore the limit to an acceptable value. N/A

7.0 PROCEDURAL STEPS

Initials

7.1.12 **ENSURE** Acceptance Criteria listed in Section 6.0 have been satisfied. CR

7.1.13 **ATTACH** the collected edits. CR

7.2 Using a Process Computer Backup Program

> **NOTE:** This section is performed only when Section 7.1 can **NOT** be completed. The On-Shift Reactor Engineer should be contacted to perform this section.

7.2.1 **PERFORM** 0PT-01.8D to calculate core thermal power. N/A

> **NOTE:** 0ENP-24.19 should be referenced for instructions on utilizing the backup program.

7.2.2 **OBTAIN** LPRM readings, control rod pattern, core flow, reactor pressure, and additional data as required by the computer backup program **AND RUN** the program.

7.2.3 **OBTAIN** the output of the backup program.

7.2.4 **DETERMINE** from the backup edit, if criteria listed in Section 6.1 are met.

7.2.5 **IF** limits specified in Section 6.1 are **NOT** satisfied, **THEN NOTIFY** the Unit SCO of the condition.

1. **RESTORE** thermal limits to acceptable values.

7.2.6 **PERFORM** 0PT-01.8C to determine if acceptance criteria listed in Section 6.2 are satisfied. N/A

7.0 PROCEDURAL STEPS

Initials

7.2.7 **IF** an APRM gain adjustment is necessary, **THEN PERFORM** applicable section of 2OP-09. N/A

7.2.8 **IF** an APRM gain change was performed, **THEN PERFORM** another 0PT-01.8C to ensure APRM gain adjustment factor satisfies the requirements of Acceptance Criteria, Section 6.2. N/A N/A
Ind.Ver.

7.2.9 **DETERMINE**, from the backup edit, if CMFLPD is less than or equal to 1.00.

7.2.10 **IF** CMFLPD is greater than 1.00, **THEN NOTIFY** the Unit SCO of the condition.

1. **RESTORE** the limit to an acceptable value (see definition for CMFLPD).

7.2.11 **ENSURE** Acceptance Criteria listed in Section 6.0 have been met satisfactorily.

7.2.12 **ATTACH** the backup program edits. N/A

7.3 **ENSURE** the required information has been recorded on the cover page. Cr

7.4 **NOTIFY** the Unit SCO when this test is complete or found to be unsatisfactory. Cr

Certification and Review Form

General Comments and Recommendations

None

	Initials	Name (Print)
Test procedure performed by	CR	Curt Robert

Exceptions to satisfactory performance None

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

Limit Positions on the Core Performance Log – Long Edit

```
BRUNSWICK-1     WK-0303 03JAN15-10.52.53  7620 MWD/MTU  TRIGR=1HR    REV=SEP02

                       CORE PERFORMANCE LOG --- LONG EDIT
        B1C14 BOC TO EOFPC-2026MWD/MT ODYNB POW DEP MCPR
    CALCULATION TYPE : NORMAL          CONVERGENCE : TIGHT    SYMMETRY : FULL
    CTP CALCULATION  : HEAT BALANCE                           CYCLE :    14

  STATE CONDITIONS     FLOW RATES   CORE PARAMETERS   NUCLEAR LIMITS   LOCATION
   GMWE  926.54        WT      79.0  CMEQ    0.2740   P-PCS        1.86  35-26-15
N16 CMWT  2759.9 (94.4%) WTSUB  77.96  CAEQ    0.1535   FCBB        2.517  <- N8
   PR     1044.3 PSIA  WTFLAG     2  CAQA    0.1444   CMPF        2.793  11-12-04
   DHS     20.62       WFW    11.90  CAVF    0.4697   CMFLCPR     0.929  31-26 <- N4
   WT      79.03(102.6%) WD   34.71  CAPD   55.6943    P=1.466 F=1.260
   CRD    0.1144                     RWL   187.5547   CMAPRAT     0.917  39-42-04 <- N3
  CYCEXP  7620 MWD/MTU    ERATIO 0.99 CDLP   19.5695    P=1.000 F=1.000
  MEASURED/CALCULATED  LPRM READINGS DPCC   24.9112   CMFLPD      0.861  11-12-04 <- N5
  AVG:  6.30%    MAX:  16.65%        KEFF    0.9945   CMFLEX      0.844  11-48-06

   LOCATION             1    2    3    4    5    6    7    8    9   10   11   12
   AXIAL REL POWER    0.65 1.39 1.41 1.27 1.14 1.08 1.07 1.02 1.00 0.87 0.71 0.38
   REGION REL POWER   0.93 1.01 0.92 1.02 1.18 1.03 0.91 1.00 0.92
   RING REL POWER     0.74 1.26 1.17 1.14 1.07 1.10 0.70
N2 -> APRM GAFS       1.00 1.00 0.97 0.99

   CORE MINIMUM CPR/LOCATION: 1.5776 LOC 31-26  <- N17

                ****** THE 10 MOST LIMITING BUNDLES ******
   FLCPR  LOC    CPR  LIMIT|APRAT     LOC   APLHGR LIMIT| FLPD      LOC      LPD  LIMIT
   ----- -----  ----- -----|-----  --------  ----- -----|-----  --------   -----  -----
   0.929 31-26 1.578 1.466|0.917 39-42-04   9.36 10.21|0.861 11-12-04 11.54 13.40
   0.917 29-24 1.598 1.466|0.911 41-40-04   9.42 10.34|0.849 07-32-04 11.38 13.40
   0.915 31-22 1.602 1.466|0.876 37-40-04   8.79 10.04|0.843 39-44-04 11.30 13.40
   0.908 33-24 1.614 1.466|0.873 39-38-04   8.84 10.13|0.843 43-40-04 11.30 13.40
   0.908 27-22 1.615 1.466|0.873 11-12-04   9.43 10.80|0.842 07-30-04 11.29 13.40
   0.898 37-24 1.632 1.466|0.864 07-32-04   9.33 10.80|0.838 39-40-04 11.23 13.40
   0.893 29-20 1.641 1.466|0.861 39-40-04   9.77 11.35|0.836 21-08-04 11.20 13.40
   0.881 23-16 1.664 1.466|0.856 39-44-04   9.24 10.80|0.828 29-46-04 11.10 13.40
   0.880 39-22 1.667 1.466|0.855 43-40-04   9.24 10.80|0.819 37-44-04 10.98 13.40
   0.868 21-14 1.689 1.466|0.854 07-30-04   9.22 10.80|0.817 43-38-04 10.95 13.40
   # ASSYS W LIMITS > 1   | FLCPR      0 | APRAT      0 | FLPD       0

               ********* NUCLEAR LIMITS BY REGION *********
                   7           |        8            |         9
          0.840   13-40        |  0.867   29-38      |  0.844   39-40
          0.829  13-44-04      |  0.833  31-46-04    |  0.847  41-42-04
          0.905  13-42-04      |  0.846  31-46-04    |  0.917  39-42-04
          ---------------------+---------------------+-----------------
                   4           |        5            |         6          **********
          0.876   15-30        |  0.929   31-26      |  0.898   37-24     * MFLCPR *
          0.849  07-32-04      |  0.759  31-28-17    |  0.844  45-32-04   * MFLPD  *
          0.864  07-32-04      |  0.844  33-26-14    |  0.857  45-32-04   * MAPRAT *
          ---------------------+---------------------+-----------------   **********
                   1           |        2            |         3
          0.859   13-14        |  0.881   23-16      |  0.863   39-14
          0.861  11-12-04      |  0.836  21-08-04    |  0.818  43-14-04
          0.902  13-12-04      |  0.846  21-08-04    |  0.869  41-14-05
```

See Attachment 3 for definitions/abbreviations.

ATTACHMENT 2

Page 2 of 2

Limit Positions on the Core Performance Log – Long Edit

```
                 BRUNSWICK-1     WK-0303 03JAN15-10.52.53  7620 MWD/MTU  TRIGR=1HR    REV=SEP02
                                  CORE PERFORMANCE LOG --- LONG EDIT  (PAGE 2)
                           ***** CONTROL ROD POSITIONS AND CALIBRATED LPRM READINGS *****

                02     06     10     14     18     22     26     30     34     38     42     46     50

          51                               --     --     --     --     --                               51

          47                 -- 23 --      -- 28 --      -- 26 --      -- 27 --      -- 19              47
                                34            42            39            40            29
                                46            47            51            46            37
          43          --     -- 69 --      20 70 --      00 71 --      20 68 --      -- 49 --           43

          39       20 --     -- 35 --      -- 35 --      -- 43 --      -- 37 --      -- 27 --           39
                   29           50            50            61            51            40
                   39           54            55            58            57            45
          35    -- 52 --     20 74 --      00 66 --      24 64 --      00 73 --      20 68 --     --    35

          31    -- 23 --     -- 34 --      -- 43 --      -- 42 --      -- 44 --      -- 28 --     --    31
                   35           50            62            58            62            41
                   49           55            55            58            58            54
          27    -- 70 --     00 71 --      24 60 --      00 57 --      24 66 --      00 73 --     --    27

          23    -- 22 --     -- 36 --      -- 41 --      -- 42 --      -- 37 --      -- 29 --     --    23
                   33           52            56            63            53            45
                   46           54            58            56            55            50
          19    -- 63 --     20 70 --      00 62 --      24 62 --      00 65 --      20 70 --     --    19

          15          --     -- 29 --      -- 36 --      -- 35 --      -- 35 --      -- 24 --           15
                                45            54            51            52            36
                                57            55            56            54            47
          11          --     -- 87 --      20 72 --      00 67 --      20 71 --      -- 67 --           11

          07    D            --     --     -- 21 --      -- 22 --      -- 21 --      --                 07
                C                             32            34            30
                B                             45            47            38
          03    A                          -- 62 --      -- 67 --      -- 48                            03

                02     06     10     14     18     22     26     30     34     38     42     46     50

       CONTROL ROD SYMMETRY : EIGHT-FOLD     CONTROL ROD SEQUENCE : A-2     CONTROL ROD DENSITY : 0.1144
```

```
***************
* LPRM FAILED *
* SENSOR DATA *
***************
LOCATION STATUS
-------- ------
 44-37-D  BYP
 36-29-D  BYP
```

```
***************
* OTHER FAILED *
* SENSOR DATA  *
***************
 SENSOR   STATUS
 -------  ------
 1GENY508  BAD
```

Definitions and Abbreviations Found on Core Performance Edit

1.	APLHGR	Nodal Average Planar Linear Heat Generation Rate (kw/ft).
2.	APRM GAFS	Average Power Range Monitor Gain Adjustment Factors.
3.	CMAPRAT	Core Maximum APRAT (T/S 3.2.1). Maintaining this value $\leq$ 1.00 ensures that the peak cladding temperature will be kept < 2200°F and, therefore, core geometry will be maintained during a LOCA.
4.	CMFLCPR	Core Maximum Fraction of limiting CPR (T/S 3.2.2). Maintaining this value $\leq$ 1.00 ensures that departure from nucleate boiling will not occur.
5.	CMFLPD	Core Maximum Fraction of Limiting Power Density. Formerly a technical specification limit, maintaining this value $\leq$ 1.00 ensures that the fuel cladding does not exceed 1% plastic strain. Reference 2.5 states that the NRC expects LHGR monitoring to remain the same as CPR and APLHGR (i.e., to restore LHGR within limits within 4 hours, or to be below 23% power within the next 4 hours).
6.	CPR	Critical Power Ratio.
7.	CPR LIMIT	The limiting CPR.
8.	FCBB	Fraction of Core Boiling Boundary (stability monitor)
9.	LHGR	Power generation in 1 foot of a fuel rod (kw/ft).
10.	APLHGR LIMIT	Nodal limiting value of APLHGR (kw/ft).
11.	APRAT	Maximum fraction of limiting APHLGR rate. = Maximum of $\frac{\text{APLHGR}}{\text{APLHGR LIMIT}}$.
12.	FLCPR	Maximum Fraction of Limiting CPR. = Maximum of $\frac{\text{CPR LIMIT}}{\text{CPR}}$.

Definitions and Abbreviations Found on Core Performance Edit

13. FLPD Maximum Fraction of Limiting Power Density (kw/ft).

$$= \frac{MRPD}{RPDLIM} = \text{Maximum of } \frac{LPD}{LPD\ LIMIT}$$

14. LPD Limiting fuel rod Power Density (LHGR).

15. LPD LIMIT Fuel Rod Power Density Limit (LHGR limit).

16. WTFLAG WTFLAG on the core performance log indicates which core flow value is used for thermal limit calculations.

    WTFLAG = 2 indicates WT, which is WTCF Total Core Flow analog signal representing the summation of the 20 single tap jet pumps.

    WTFLAG = 4 indicates WTSUB, which is the flow resulting from the drive flow (WD) to core flow (WT) correlation.

    WTFLAG = 5 indicates WT, which is using an operator substituted core flow in WTCF Total Core Flow.

    WTFLAG = 7 indicates WT, and states the difference between WTSUB correlated core flow and WT is greater than 5%.

17. CORE MINIMUM CPR/ LOCATION The MCPR used to determine the requirement for RBM operability iaw Tech Spec 3.3.2.1. This is the lowest core CPR and corresponding bundle location.

REVISION SUMMARY

Revision 1 incorporated EC, 47907, Unit 2 Extended Power Uprate Implementation, and EC 46730, Replace Unit 2 Power Range Neutron Monitoring System, required changes and updated to Word 2000 software.

Revision 0 was issued in accordance with ESR 00-00442, Unit 1 Power Range Neutron Monitoring Replacement, which required the 0PT-01.11 be separated into unit specific procedures.

CORE PERFORMANCE LOG — LONG EDIT

B2C16 BOC TO 16000 MWD/MT ODYNB POW DEP MCPR

CALCULATION TYPE : NORMAL		CONVERGENCE : TIGHT	SYMMETRY : FULL
CTP CALCULATION : HEAT BALANCE			CYCLE : 16

STATE CONDITIONS		FLOW RATES		CORE PARAMETERS		NUCLEAR LIMITS		LOCATION
GMWE	938.34	WT	77.1	CMEQ	0.2600	P-PCS	1.02	27-26-05
CMWT	2802.5 (95.9%)	WTSUB	75.41	CAEQ	0.1476	FCBB	2.530	
PR	1044.1 PSIA	WTFLAG	2	CAQA	0.1471	CMPF	2.873	35-12-10
DHS	21.06	WFW	11.03	CAVF	0.4579	CMFLCPR	0.921	27-24
WT	77.11 (100.1%)	WD	33.10	CAPD	51.6674	P=1.432	F=1.260	
CRD	0.0742			RWL	185.4821	CMAPRAT	0.906	33-10-10
CYCEXP	0 MWD/MTU	ERATIO	0.99	CDLP	17.4552	P=1.000	F=1.000	
AVG:	0.00% MAX:	0.00%		KEFF	1.0016	CMFLPD	1.012	35-12-10
						CMFLEX	0.782	45-44-05

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12
AXIAL REL POWER	0.60	1.31	1.39	1.36	1.38	1.31	1.17	0.95	0.88	0.76	0.58	0.31
REGION REL POWER	0.91	1.03	0.91	1.02	1.18	1.02	0.90	1.02	0.91			
RING REL POWER	1.13	1.28	1.12	1.15	1.13	1.08	0.68					
APRM GAFS	0.99	0.99	0.99	0.99								

CORE MINIMUM CPR/LOCATION: 1.5549 LOC 39-24

********************** THE 10 MOST LIMITING BUNDLES **********************

FLCPR	LOC	CPR	LIMIT	APRAT	LOC	APLHGR	LIMIT	FLPD	LOC	LPD	LIMIT
0.921	27-24	1.555	1.432	0.906	33-10-10	8.51	9.40	1.012	35-12-10	13.56	13.40
0.920	29-26	1.557	1.432	0.899	09-20-10	8.45	9.40	0.982	29-22-04	13.16	13.40
0.918	37-40	1.559	1.432	0.888	39-42-04	8.35	9.40	0.972	33-10-10	13.03	13.40
0.914	29-22	1.566	1.432	0.885	35-12-10	8.39	9.48	0.969	31-24-04	12.98	13.40
0.914	39-38	1.567	1.432	0.882	29-22-04	8.39	9.51	0.966	11-18-10	12.94	13.40
0.913	31-24	1.567	1.432	0.881	41-40-04	8.28	9.40	0.962	27-24-04	12.89	13.40
0.905	33-14	1.582	1.432	0.880	31-24-04	8.37	9.51	0.953	39-42-04	12.77	13.40
0.901	13-20	1.589	1.432	0.879	41-36-10	8.33	9.48	0.943	29-26-04	12.64	13.40
0.901	21-16	1.590	1.432	0.878	27-24-04	8.35	9.51	0.938	09-20-10	12.57	13.40
0.900	37-10	1.591	1.432	0.877	29-26-04	8.34	9.51	0.937	41-40-04	12.55	13.40
# ASSYS W LIMITS > 1				FLCPR	0	APRAT	0	FLPD	1		

**************** NUCLEAR LIMITS BY REGION **********************

	7		8		9
0.898	13-38	0.918	33-40	0.918	37-40
0.966	11-36-10	1.012	35-12-10	0.847	35-42-10
0.906	11-36-10	0.936	33-44-10	0.888	39-42-10
	4		5		6
0.901	13-20	0.921	27-24	0.899	39-20
0.938	09-20-10	0.982	29-22-04	0.966	43-34-10
0.899	09-20-10	0.882	29-22-04	0.903	43-34-10
	1		2		3
0.901	15-14	0.905	33-14	0.903	37-14
0.810	17-12-10	0.972	33-10-10	1.012	35-12-10
0.880	17-12-10	0.906	33-10-10	0.885	35-12-10

****
* MFLCPR *
* MFLPD *
* MAPRAT *
****

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM3SROEC

LESSON TITLE: Develop a Clearance Boundary - RBCCW Pump 2C.

REVISION NO: 0

RECOMMENDED BY: Curt Robert ______________________
Instructor/Developer DATE

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor DATE

APPROVED BY: ______________________
Superintendent/Supervisor Training DATE

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee.
2. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
3. If desired, the evaluator may provide the examinee with a copy of OPS-NGGC-1301 and the referenced prints.
4. The evaluator should have available copies of prints D-02538 SH1 & 2, LL-9241 SH8 & 24 to support performance of JPM, or perform JPM in a location where a print machine is available.

Read the following to trainee.

TASK CONDITIONS:

1. You are an operator in the Work Control Center. PASSPORT (Equipment Tag Out) is not available for use. No historical clearances are available for review.

2. A Clearance has been requested by maintenance to place RBCCW Pump 2C under clearance, isolated, vented, and drained for scheduled work. RBCCW Pumps 2A and 2B will be running.

3. This clearance is to allow maintenance to replace the pump packing.

INITIATING CUE:

The WCC SRO directs you to propose a Clearance Boundary for RBCCW Pump 2C by completing Attachment 4 of OPS-NGGC-1301. The Attachment 4 columns for Sequence, Position, and Equipment/Component are to be filled in. Other columns of Attachment 4 may be filled in later.

ANSWER KEY

ATTACHMENT 4
Sheet 1 of 1
OPERATIONS CLEARANCE TAG SHEET

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					RTGB Control Switch 2-RCC-CS-449		
2				OFF LOCKED	Motor Feeder 2XE Compt EA7		
3				CLOSE	Discharge Valve 2-RCC-V34		
4				CLOSE	Suction Valve 2-RCC-V30		
5				OPEN	Pump Drain Valve 2-RCC-V128		
6				OPEN	Pump Drain Valve 2-RCC-V129		
7				OPEN	Pump Vent Valve 2-RCC-V301		

Sequence must have breaker OFF/LOCKED prior to operating discharge/suction valves, and discharge/suction valves closed before operating drain/vent valves.

It is acceptable for the performer to provide control switch clearance information tag position as an extra measure of protection but position is not required by procedure.

Minimum requirements for satisfactory boundary are breaker, discharge valve, suction valve, at least one drain valve, and vent valve.

PERFORMANCE CHECKLIST

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

NOTE: If desired, the examiner may provide a copy OPS-NGGC-1301 to the examinee.

Step 1 - Obtain a current revision of OPS-NGGC-1301.

Current Revision of OPS-NGGC-1301 obtained.

SAT/UNSAT*

NOTE: If desired, the examiner may provide a copy of the required prints to the examinee (D-02538, Sheets 1 & 2, LL-9241, Sheets 8 & 24).

Step 2 – Obtain copies of required prints (D-02538, Sheets 1 & 2, LL-9241, Sheet 24).

Drawings D-02538, Sheets 1 & 2, LL-9241, Sheets 8 & 24 obtained.

SAT/UNSAT*

Step 3 - Identify control switch 2-RCC-CS-449 should be placed to OFF.

Determine 2-RCC-CS-449 should be placed to OFF.

SAT/UNSAT*

Step 4 - Identify breaker 2XE Compt EA7 should be placed to OFF.
Determine 2XE Compt EA7 should be placed to OFF.

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

Step 5 - Identify discharge valve 2-RCC-V34 should be closed.
Determine 2-RCC-V34 should be closed.

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

Step 6 - Identify suction valve 2-RCC-V30 should be closed.
Determine 2-RCC-V30 should be closed.

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

NOTE: Either 2-RCC-V128 or 2-RCC-V129 is critical. Both are not required to meet critical task standards.

Step 7 - Identify drain valve 2-RCC-V128 should be open.
Determine 2-RCC-V128 should be open.

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

Step 8 - Identify drain valve 2-RCC-V129 should be open.
Determine 2-RCC-V129 should be open.

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

Step 9 - Identify vent valve 2-RCC-V301 should be open.
Determine 2-RCC-V301 should be open.

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

Step 10 – Submit proposed boundary to WCC SRO.
Proposed boundary submitted to *WCC SRO.*

SAT/UNSAT*

TERMINATING CUE: When the proposed boundary has been submitted, this JPM is complete.

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

RELATED TASKS:

299020B301, Develop A Clearance Per OPS-NGGC-1301

K/A REFERENCE AND IMPORTANCE RATING:

2.2.13 3.6/3.8

Knowledge of tagging and clearance procedures

REFERENCES:

OPS-NGGC-1301, Revision 3

TOOLS AND EQUIPMENT:

Referenced prints.

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

A.2 - Equipment Control

REASON FOR REVISION:

Revised task condition to meet OPS-NGGC-1301 procedural requirement for maintenance to specify the conditions of the clearance. (LOT-OJT-JP-201-E04)

Time Required for Completion: 20 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ✓ Actual ___ Unit: 2

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

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

Alternate Path: Yes ___ No ✓

EVALUATION

Trainee:______________________ SSN: ______________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ______________________ Date:__________

TASK CONDITIONS:

1. You are an operator in the Work Control Center. PASSPORT (Equipment Tag Out) is not available for use. No historical clearances are available for review.
2. A Clearance has been requested by maintenance to place RBCCW Pump 2C under clearance, isolated, vented, and drained for scheduled work. RBCCW Pumps 2A and 2B will be running.
3. This clearance is to allow maintenance to replace the pump packing.

INITIATING CUE:

The WCC SRO directs you to propose a Clearance Boundary for RBCCW Pump 2C by completing Attachment 4 of OPS-NGGC-1301. The Attachment 4 columns for Sequence, Position, and Equipment/Component are to be filled in. Other columns of Attachment 4 may be filled in later.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM4SRORC

LESSON TITLE: Evaluate Liquid Discharge Release Permit.

REVISION NO: 0

RECOMMENDED BY: Curt Robert ______________________
Instructor/Developer DATE

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor DATE

APPROVED BY: ______________________
Superintendent/Supervisor Training DATE

Special Instructions

Prepare a Liquid Release Permit, OP-06.4, Attachment 4. Complete Part I, Part II and Part III up to the Unit SCO approval line.

Complete Part I as follows:

PART I. TANK DATA
A. Tank to be released **SWRT**
B. Tank to be released will be recirculated and sampled as in accordance with section **5.7** of 0OP-06.4.
C. Level **85** % Volume **27187.5** gallons.
D. Required Recirculation Time **0.9** min / % Level X **85** % Level = **76.5** Min
E. Start Recirculation Date/Time **date of jpm/0830**
Required recirc time completed Date/Time **date of jpm/0947**
Sample Taken Date/Time **date of jpm/1000**
(After required recirc time)

The remainder of the data should be correct.

Fill out 0E&RC-2009, Attachment 2, Part I. Ensure sample time matches time specified in the OP-06.4, Attachment 4.

Obtain a copy of an E&RC Pre-Release Permit. NOTE: Electronic file available on K:\Training\JPM\Admin JPMS

An actual release may be obtained from the E&RC counting room to aid in filling out the required data.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee.
2. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
3. Provide examinee with prepared copy of 0OP-06.4, Attachment 4, 0E&RC-2009, Attachment 2, and the E&RC Pre-Release Permit.

Read the following to trainee.

TASK CONDITIONS:

1. The Unit 1 Salt Water Release Tank is nearing capacity, and is scheduled to be released.
2. A Radioactive Liquid Release Permit has been prepared in accordance with 0OP-06.4.
3. A Pre-Release Permit has been prepared by E&RC in accordance with E&RC-2009.

INITIATING CUE:

You are directed by the Shift Superintendent to **COMPLETELY** review the Radioactive Liquid Release Permit, and the Pre-Release Permit, and determine if the Unit 1 Salt Water Release Tank can be released per the supporting documentation, and inform the Shift Superintendent of the results of your review.

PERFORMANCE CHECKLIST

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

> **NOTE:** The examiner should have a copy of 0OP-06.4, Section 5.7 to provide to the examinee if requested, or allow examinee access to the entire procedure.

Step 1 - Obtain a current revision of 0OP-06.4.

Current Revision of 0OP-06.4 obtained and verified, if applicable.

SAT/UNSAT*

Step 2 – Verify that Volume determination of U/1 SWRT corresponds to a level of 85% as specified on the Radioactive Liquid Release Permit.

Determine that volume of U/1 SWRT of 27187.5 gallons is NOT correct as specified on the Radioactive Liquid Release Permit. Should be 30812.5.

SAT/UNSAT*

Step 3 – Verify that required Recirculation time for a U/1 SWRT at a tank level of 85% is correct as specified on the Radioactive Liquid Release Permit.

Determine that required Recirculation time for the U/1 SWRT at a tank level of 85% of 76.5 minutes is NOT correct as specified on the Radioactive Liquid Release Permit. Should be 4 min/% X 85% = 340 min. The 0.9 min/% recirculation requirements applies to FDST and WST NOT SWRT.

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

Step 4 – Determine with a Start Recirculation time of 0830, the required Recirc completion time should be 1410 (not 0947) and that the sample taken time must be after 1410 (not 1000) as specified on the Radioactive Liquid Release Permit.

Determines requirements for Recirculation time and/or sample time per 0OP-06.4 have not been satisfied, and that the release should not be approved.

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

Step 5 – Informs Shift Superintendent that the Release Permit may not be approved.
Shift Superintendent informed that the Release Permit may not be approved.

SAT/UNSAT*

TERMINATING CUE: When the Radioactive Liquid Release Permit has been evaluated as unsatisfactory, this JPM is complete.

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

RELATED TASKS:

341012B302, Review Radioactive Waste Discharge/Release Permits Per E&RC-2009 prior To Approval.

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.3.6 3.1

REFERENCES:

0OP-06.4
0E&RC-2009
BSEP Radioactive Liquid Release Permit 02-0044

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123):

Radiation Control

REASON FOR REVISION:

Modified a new JPM developed for NRC 2003 Initial License Exam for NRC 2004 Initial License Exam.

Time Required for Completion: 15 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:______________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. The Unit 1 Salt Water Release Tank is nearing capacity, and is scheduled to be released.

2. A Radioactive Liquid Release Permit has been prepared in accordance with 0OP-06.4.

3. A Pre-Release Permit has been prepared by E&RC in accordance with E&RC-2009.

INITIATING CUE:

You are directed by the Shift Superintendent to **COMPLETELY** review the Radioactive Liquid Release Permit, and the Pre-Release Permit, and determine if the Unit 1 Salt Water Release Tank can be released per the supporting documentation, and inform the Shift Superintendent of the results of your review.

5.7 Recirculation and Sampling of Saltwater Release Tank #1

5.7.1 Initial Conditions

1. All applicable prerequisites as listed in Section 4.0 are met. ☑ CL

5.7.2 Procedural Steps

Saltwater Release Tank Unit 1

1. **PERFORM** the following to ensure the Saltwater Release Tank can **NOT** receive inputs from the following sources during recirculation and sampling:

    a. **ENSURE** the Unit 1 Breezeway North end West side mop water drain tube is locked. ☑ CL

    b. **DISCONNECT** electrical supply to pipe tunnel dike portable bilge pump. ☑ CL

    c. **REMOVE** Turbine Building portable sump pump discharge hose from Saltwater Release Tank. ☑ CL

2. **IF** the tank is being recirculated through the Saltwater Release System Filters in accordance with Section 5.8, **THEN GO TO** Step 5.7.2.6. ☑

3. **OPEN** *SALTWATER RELEASE SYSTEM RECIRCULATION VALVE, 1-SWR-V11.* N/A

NOTE: Saltwater Release Tank level may drop 0-4% when placed in recirculation.

4. **WHEN** placing Saltwater Release Tank in recirculation, **THEN RECORD** tank level prior to starting pump. N/A

    N/A
    Tank Level

5. **START** Saltwater Release System Pump #1. N/A

5.7.2 Procedural Steps

6. **SAMPLE** Saltwater Release Tank #1 by completing the following:

   a. **ALLOW** Saltwater Release Tank to recirculate for 4 minutes for each percent of indicated tank volume.

   b. **OPEN** *SALTWATER RELEASE SYSTEM SAMPLE STATION VALVE, 1-SWR-V17.*

   c. **ALLOW** sample to run for at least 5 minutes to ensure a representative sample is obtained.

   d. **OBTAIN** sample in accordance with E&RC-2009.

   e. **CLOSE** *SALTWATER RELEASE SYSTEM SAMPLE VALVE, 1-SWR-V17.*

7. **IF** tank activity is greater than ODCM limits, **OR** additional filtration is desired, **AND** the tank is being recirculated through the Saltwater Release System Filters in accordance with Section 5.8, **THEN CONTINUE** recirculation.

8. **IF** tank activity is greater than allowed ODCM limits, **OR** additional filtration is desired, **AND** the tank is **NOT** being recirculated in accordance with Section 5.8, **THEN**:

   a. **PERFORM** Section 7.6 **AND,**

   b. **PERFORM** Section 5.8 to conduct cleanup.

9. **IF** tank activity is within ODCM limits **AND** it is desired to release Saltwater Release Tank #1, **THEN PERFORM** Section 5.9.

10. **IF** desired, **THEN SHUT DOWN** recirculation in accordance with:

    a. Section 7.6 **OR**

    b. Section 7.5.

BSEP Radioactive Liquid Release Permit

Release# 04-0001
Date 11/2/2004

BSEP RADIOACTIVE LIQUID RELEASE PERMIT

PART I. TANK DATA

A. Tank to be released Salt Water Release Tank #1

B. Tank to be released will be recirculated and sampled as in accordance with section 5.7 of 0OP-06.4.

C. Level 85 % Volume 27187.5 gallons.

1. *Batch Release Tank Volumes

> **NOTE:** Attachment 3 of 0E&RC-2009, Radioactive Effluent Releases and Reports, lists abnormal release volumes for miscellaneous tanks.

WSTs	= 208.4 gallons/% level
FDSTs	= 209.4 gallons/% level
DDTs	= 10.9 gallons/% level
U/1 SWRT	= 362.5 gallons/percent

D. Required Recirculation Time 0.9 min / % Level X 85 % Level = 76.5 Min

E. Start Recirculation — Date/Time 11/2/04 0900
Required recirc time completed — Date/Time 11/2/04 1017
Sample Taken (After required recirc time) — Date/Time 11/2/04 1100

F. Source of water Condenser Inlet Pit / mop water

G. Treatment prior to release Filter

H. *Has the tank to be released been subjected to PH adjustments due to NA0H or H2S04? Yes ______ No ✓

*Reference procedure E&RC-2009.

BSEP Radioactive Liquid Release Permit

I. Tank to be released will be discharged in accordance with Section 5.9 of 0OP-06.4.

J. Part I completed

Date/Time 11/2/04 1100

Tom Ragsdale
Radwaste Operator (signature)

PART II. RADIATION MONITOR STATUS

A. Monitor is being used for discharge (General Electric D12-RM-K604)
Yes X No ______

(If monitor is **NOT** being used, list special instructions in Part III. See ODCMS 7.3.1 for additional sampling requirements.)

B. Monitor Hi-Hi setpoint is at 5000 cps.

(If monitor is **NOT** being used, set monitor Hi-Hi setpoint to maximum to prevent spurious trip during release.)

C. Monitor Hi-Hi setpoint set between background and maximum monitor setpoint (E&RC-2009). Yes X No ______

D. Monitor indication prior to release (chart) 300 cps.

(Circle one used) Unit 1 / Unit 2

E. **CONFIRM** Radwaste effluent isolation valves are closed.

1-D12-V27A Position CR (Unit 1) 2-D12-V27B Position RC (Unit 2)

BSEP Radioactive Liquid Release Permit

Part III. APPROVAL FOR USE

A. Both unit Reactor Operators have been informed of release and are aware of Circulating Water/Service Water Pump requirements.

Unit 1 RO Curt Robert
Signature

Unit 2 RO Robert Curt
Signature

B. 1. Liquid Radwaste effluent flow measurement device operable (if inoperable, ODCMS 7.3.1 Required Compensatory Measure C1, requires the flow rate be estimated at least once/4 hours during actual releases.)

Yes X No ______

2. Liquid Radwaste radioactivity effluent monitor operable (if inoperable, reference ODCMS 7.3.1)

Yes X No ______

C. Special instructions for release: ______________________

____

____

____

____

D. Approval to release: ______________________
Unit SCO Date/Time

E. Approval to release: ______________________
Shift Superintendent Date/Time

Key(s) ________ Received by ______________________
Radwaste Operator (signature)

BSEP Radioactive Liquid Release Permit

Part IV. RELEASE DATE

A. Maximum permissible release rate ______________________ gpm

B. Special instructions in Part III understood

____
Radwaste Operator (signature)

C. Release times:

Start (Date/Time)	Stop (Date/Time)	Time Interval
____________	____________	__________ minutes
____________	____________	__________ minutes
____________	____________	__________ minutes

Total release time: ____________________ minutes

> **NOTE:** Post-Trip and DDT Flushes go to the Floor Drains or the Oily Drain Collector Tank. Flush water flows through the radiation monitor and flow totalizer, while the 1-D12-V27A and 2-D12-V27B are closed. If a Post-Trip or DDT flush is performed, then the number of gallons of flush water should be logged below as this water is not released. If a post trip or DDT flush is not performed, N/A this reading.

D. Flow rate instrument verification in accordance with ODCMS TR 7.3.1.2

Flow Totalizer
2-G16-FIQ-3497
(Discharge via
2-G16-F187)

Release Zero Set ________________

Flush to ODCT or Floor Drains ______________ gallons.

Release Final Reading ________________

BSEP Radioactive Liquid Release Permit

E. Flow rate instrument verification (in accordance with TR 7.3.1.2).

Flow rates (recorder) 2-G16-FR-R039

Start _______ GPM Stop _______ GPM

> **NOTE:** Completion of Part F is **NOT** required if the *2-G16-FIT-N057* is operable. Reference ODCMS 7.3.1 Required Compensatory Measure C1.

F. Flow estimate using tank level indicator.

Formula: (Start % - Stop % = Difference % X Gallons /% =

Gallons from tank decrease ÷ total release time = GPM)

Start % _________- Stop % _________ = Difference ____________ %

Difference _______ % X __________ *Gallons/% = __________________
(From line above) (Gal. from tank decrease)

Gallons from tank decrease ÷ ________ Total release time = __________ GPM
(From line above) (In minutes)

G. Monitor Flush:

Flow Totalizer
(Discharge via
2-G16-F187)

Flush Start ____________________

Flush Total ____________________

Difference ____________________

*Gallons/% obtained from E&RC-2009.

BSEP Radioactive Liquid Release Permit

Post-flush readings (chart) _______________ CPS Unit 1 / Unit 2 (Circle one used)

Comments: ____

____

____

____

H. Release completed Date _______________________ Time ____________

____
Radwaste Operator (signature)

Part V. Review

A. Key(s) _______ returned to Main Control Room __________________
Initials

B. Radiation monitor channel check in accordance with ODCMS 7.3.1, and TR 7.3.1.1.

NOTE: Use same monitor as used in Part II. D.

Highest reading during release (chart) ______________ CPS

Average reading during release (chart) _____________ CPS

C. Monitor Hi and Hi-Hi setpoints set above background reading.

____
Initials

______________________________ ______________________________
Unit SCO (signature) Date

CAROLINA POWER AND LIGHT COMPANY		PAGE 1	
BRUNSWICK STEAM ELECTRIC PLANT			
LIQUID RADIOACTIVE WASTE RELEASE PERMIT NUMBER:		04-0001	
PRE-RELEASE PERMIT	DATE:	11/02/2004	11:00:00

PART I: PRE-RELEASE DATA:

RELEASE POINT:	SALT WATER TANK U1	WASTE SAMPLE PERMIT:	04-0001
		PERMIT REQUESTED BY:	CJR
PERMIT TIME:	11/02/2004/1100	SAMPLE PH	8.0
RAD MONITOR NUMBER:	D12-RM-K604	RAD MONITOR BACKGRD:	3.000E+02 CPS
# CIRC WATER PUMPS:	6.0	RAD MONITOR EFF:	1.251E+07
# SERVICE WATER PUMPS:	4.0	DILUTION FACTOR:	1.547E-01

PART II: PRE-RELEASE CALCULATIONS

TOTAL ACTIVITY:	1.677E-06 CI	TOTAL GAMMA ACTIVITY:	1.547E-8 UCI/ML
TOTAL CONC/EC:	5.000E-02	RELEASE VOLUME:	2.864E+04 GAL
MAX MONITOR SETPOINT:	1.348E+04 CPS	MAX RELEASE RATE:	2.271E+06 GPM

PART III: SPECIAL INSTRUCTIONS

PRE-RELEASE COMPLIANCE CHECK PASSES
PRE-RELEASE ADMIN LIMIT PASSES

PRE-DILUTION DATA

NUCLIDES	(UCI/ML)	EC (UCI/ML)
I-131	1.547E-08	1.000E-06

BRUNSWICK STEAM ELECTRIC PLANT
LIQUID RADIOACTIVE WASTE RELEASE PERMIT NUMBER: 04-0001
PRE-RELEASE PERMIT DATE: 11/02/2004 11:00:00

CUMULATIVE DOSE REPORT FROM THE PRE-RELEASE CALCULATIONS
CRITICAL AGE: ADULT
CONTROLLING LOCATION FOR LIQUID RELEASES: SW SECTOR AT 0.1 MILES

DOSE CALCULATIONS (MREM)

	BONE	LIVER	TOT-BODY	THYROID	KIDNEY	LUNG	GI-LLI
FROM THIS RELEASE	2.29E-09	3.28E-09	1.88E-09	1.07E-06	5.62E-09	0.00E+00	8.65E-10
WEEK PRIOR TO RELEASE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WEEK AFTER RELEASE	2.29E-09	3.28E-09	1.88E-09	1.07E-06	5.62E-09	0.00E+00	8.65E-10
ADMIN WEEKLY LIMIT	3.85E-01	3.85E-01	1.15E-01	3.85E-01	3.85E-01	3.85E-01	3.85E-01
PERCENT WEEKLY LIMIT	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
MONTH PRIOR TO RELEASE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MONTH AFTER RELEASE	2.29E-09	3.28E-09	1.88E-09	1.07E-06	5.62E-09	0.00E+00	8.65E-10
ADMIN MONTHLY LIMIT	1.67E+00	1.67E+00	5.00E-01	1.67E+00	1.67E+00	1.67E+00	1.67E+00
PERCENT MONTHLY LIMIT	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

LIQUID RADIOACTIVE WASTE RELEASE PERMIT NUMBER: 04-0001
PRE-RELEASE PERMIT DATE: 11/02/2004 11:00:00

CUMULATIVE DOSE REPORT FROM THE PRE-RELEASE CALCULATIONS
CRITICAL AGE: ADULT
CONTROLLING LOCATION FOR LIQUID RELEASES: SW SECTOR AT 0.1 MILES

DOSE CALCULATIONS (MREM)

	BONE	LIVER	TOT-BODY	THYROID	KIDNEY	LUNG	GI-LLI
QUARTER PRIOR TO RELEASE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
QUARTER AFTER RELEASE	2.29E-09	3.28E-09	1.88E-09	1.07E-06	5.62E-09	0.00E+00	8.65E-10
ODCMS QUARTER LIMIT	1.00E+01	1.00E+01	3.00E+00	1.00E+01	1.00E+01	1.00E+01	1.00E+01
PERCENT QUARTER LIMIT	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
YEAR PRIOR TO RELEASE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
YEAR AFTER RELEASE	2.29E-09	3.28E-09	1.88E-09	1.07E-06	5.62E-09	0.00E+00	8.65E-10
ODCMS ANNUAL LIMIT	2.00E+01	2.00E+01	6.00E+00	2.00E+01	2.00E+01	2.00E+01	2.00E+01
PERCENT ANNUAL LIMIT	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

C
Continuous

Routine Release Sample Data Sheet

Circle one: FDST A FDST B WST A WST B DDT A DDT B U/1 SWRT

I. **TO BE COMPLETED BY E&C**

Liquid radwaste monitor in service: Yes X No* ___
SDCP Release in Progress Yes** ___ No X

Sample location: Unit #1 SWRT Date: 11/2/04 Time: 1100

Sample by: Howard O. Dew ___
E&C or OPS E&C or OPS*

Release Permit Number 04-0001 pH 8.0

File # U1SWRT040001 Detector 8@JOES RW Bkg 300 cps

Unit 1	Unit 2	Total # Pumps
# Circ Pumps 3	#Circ Pumps 3	Circ 6
# Serv Pumps 2	#Serv Pumps 2	Serv 4

Release Rate Calculation: Malcolm X. Loy ___
E&C Technician E&C Technician*

II. **REFER TO PART III OF THE ATTACHED BSEP RADIOACTIVE LIQUID RELEASE PERMIT FOR SPECIAL INSTRUCTIONS.**

Reviewed Prior to Release ___
Shift Superintendent / Date

III. **POSTRELEASE REVIEW**

Reviewed by: ___ / ___
E&C Technician Date

*Two independent samples, and verification thereof, are required when radwaste effluent monitor is declared inoperative and two technically qualified E&C personnel are required to verify and sign the release rate calculations.

**If SDCP Release is in Progress, subtract two Service Pumps from total service pumps used in the release.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM5SROEP

LESSON TITLE: Make Protective Action Recommendations per 0PEP-02.6.28.

REVISION NO: 0

RECOMMENDED BY: Curt Robert
Instructor/Developer Date

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor Date

APPROVED BY: ______________________
Superintendent/Supervisor Training Date

SAFETY CONSIDERATIONS:

1. None.

EVALUATOR NOTES: (Do not read to performer)

1. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.
2. **START LOCATION:** This JPM can be performed at any location because it is an administrative task.
3. **PROVIDE A COPY:**
   a. Provide a clean copy of OPEP-02.6.28, Core OFF-SITE PROTECTIVE ACTION RECOMMENDATIONS.
   b. Provide a completed Emergency Notification form. (Except blocks 3, 15 and 16)
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is a time critical JPM based upon the fact that 0PEP-02.6.28 Rev. 8 Section 5.2 requires that the SEC ensures that PARs be issued within 15 minutes from the General Emergency Declaration.

Read the following to the JPM performer.

This is a time critical JPM.

TASK CONDITIONS:

1. A General Emergency has just been declared due to an unisolable Main Steam Line break with fuel failure.
2. Weather Conditions are as follows:

Temperature	82 °F
Upper Wind Speed	7.8 mph
Lower Wind Speed	7.3 mph
Upper Wind Direction	246.3 °
Lower Wind Direction	246.7 °
Stability Class	E

3. Projected off-site dose per 0PEP03.4.7 is 515 mrem at the site boundary.

INITIATING CUE:

As Site Emergency Coordinator (SEC) complete Block 15, Recommended Protective Actions, of the Emergency Notification form and sign for approval.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.
Comments required for any step evaluated UNSAT.

START TIME: ___________

PERFORMANCE CHECKLIST

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

PROMPT: Remind examinee that this is a time critical JPM.

Step 1 – Obtain current revision of 0PEP-02.6.28, Off-site Protective Action Recommendations.

Obtains 0PEP-02.6.28.

SAT/UNSAT*

Step 2 – Determine Protective Action Recommendations.

Determines PAR to Evacuate Zones A, B, C, G, H, K and Shelter Zones D, E, F.

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

Step 3 – Fill in Item 15 Blocks B and C and indicate the zones to be evacuated and sheltered.

Fill B Evacuate Zones A, B, C, G, H, K
Fill C Shelter Zones D, E, F

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

Step 7 – Sign Notification form as SEC for approval.

Sign and dated as SEC.

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

TERMINATING CUE: When Notification Form has been approved, this JPM is complete.

NOTE: This JPM must be completed within 12 minutes. This time is based on allowing 3 minutes to complete all other portions of the Emergency Notification Form and the remaining 12 minutes for the performer to determine PARs and complete notification form. PEP-02.6.28 requires that PARs be made within 15 minutes of classification of a General Emergency.

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

STOP TIME: __________

RELATED TASKS:
344005B102: Recommend Protective Actions to States and Counties per 0PEP-02.6.28.

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.4.44 2.1/4.0
Knowledge of emergency plan protective action recommendations..

REFERENCES:

0PEP-02.6.28 OFF-SITE PROTECTIVE ACTION RECOMMENDATIONS

0PEP-02.6.21 EMERGENCY COMMUNICATOR

TOOLS AND EQUIPMENT:

None.

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

Generic (Administrative)

REASON FOR REVISION:

New for use on 2004 NRC exam.

Time Required for Completion: **3 Minutes** (approximate).

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate __ Actual x Unit: ____

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

Time Critical: Yes x No __ Time Limit **12 min.**

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

Evaluator Signature: ______________________________ Date:__________

This is a time critical JPM.

TASK CONDITIONS:

4. A General Emergency has just been declared due to an unisolable Main Steam Line break with fuel failure.
5. Weather Conditions are as follows:

Temperature	82 °F
Upper Wind Speed	7.8 mph
Lower Wind Speed	7.3 mph
Upper Wind Direction	246.3 °
Lower Wind Direction	246.7 °
Stability Class	E

6. Projected off-site dose per 0PEP03.4.7 is 515 mrem at the site boundary.

INITIATING CUE:

As Site Emergency Coordinator (SEC) complete Block 15, Recommended Protective Actions, of the Emergency Notification form and sign for approval.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM5SROEP

LESSON TITLE: Make Protective Action Recommendations per 0PEP-02.6.28.

REVISION NO: 0

RECOMMENDED BY: Curt Robert
Instructor/Developer — Date

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor — Date

APPROVED BY: ______________________
Superintendent/Supervisor Training — Date

SAFETY CONSIDERATIONS:

1. None.

EVALUATOR NOTES: (Do not read to performer)

1. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.
2. **START LOCATION:** This JPM can be performed at any location because it is an administrative task.
3. **PROVIDE A COPY:**
    a. Provide a clean copy of OPEP-02.6.28, Core OFF-SITE PROTECTIVE ACTION RECOMMENDATIONS.
    b. Provide a completed Emergency Notification form. (Except blocks 3, 15 and 16)
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is a time critical JPM based upon the fact that 0PEP-02.6.28 Rev. 8 Section 5.2 requires that the SEC ensures that PARs be issued within 15 minutes from the General Emergency Declaration.

Read the following to the JPM performer.

This is a time critical JPM.

TASK CONDITIONS:

1. A General Emergency was declared at 0001 11/02/2004 due to an unisolable Main Steam Line break with fuel failure on Unit Two (2).
2. Unit One (1) is at 60% power.
3. Unit Two (2) was SHUTDOWN at 2100 11/01/04
4. The time is now 0004 11/2/2004.
5. Weather Conditions are as follows:

Temperature	82 °F
Upper Wind Speed	7.8 mph
Lower Wind Speed	7.3 mph
Upper Wind Direction	246.3 °
Lower Wind Direction	246.3 °
Stability Class	E

INITIATING CUE:

As Site Emergency Coordinator (SEC) complete Block 15, Recommended Protective Actions, of the Emergency Notification form and sign for approval.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.
Comments required for any step evaluated UNSAT.

START TIME: ___________

PERFORMANCE CHECKLIST

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

PROMPT: Remind examinee that this is a time critical JPM.

Step 1 – Obtain current revision of 0PEP-02.6.28, Off-site Protective Action Recommendations.

Obtains 0PEP-02.6.28.

SAT/UNSAT*

Step 2 – Determine Protective Action Recommendations.

Determines PAR to Evacuate Zones A, B, C, G, H, K and Shelter Zones D, E, F.

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

Step 3 – Fill in Item 15 Blocks B and C and indicate the zones to be evacuated and sheltered.

Fill B Evacuate Zones A, B, C, G, H, K
Fill C Shelter Zones D, E, F

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

Step 7 – Sign Notification form as SEC for approval.

Sign and dated as SEC.

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

TERMINATING CUE: When Notification Form has been approved, this JPM is complete.

NOTE: This JPM must be completed within 12 minutes. This time is based on allowing 3 minutes to complete all other portions of the Emergency Notification Form and the remaining 12 minutes for the performer to determine PARs and complete notification form. PEP-02.6.28 requires that PARs be made within 15 minutes of classification of a General Emergency.

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

STOP TIME: ___________

RELATED TASKS:
344005B102: Recommend Protective Actions to States and Counties per 0PEP-02.6.28.

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.4.44 2.1/4.0
Knowledge of emergency plan protective action recommendations..

REFERENCES:

0PEP-02.6.28 OFF-SITE PROTECTIVE ACTION RECOMMENDATIONS

0PEP-02.6.21 EMERGENCY COMMUNICATOR

TOOLS AND EQUIPMENT:

None.

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

Generic (Administrative)

REASON FOR REVISION:

New for use on 2004 NRC exam.

Time Required for Completion: **10 Minutes** (approximate).

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate x Actual __ Unit: ____

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

Time Critical: Yes ___ No x Time Limit **NA**

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

Evaluator Signature: ______________________________ Date:__________

This is a time critical JPM.

TASK CONDITIONS:

1. A General Emergency was declared at 0001 11/02/2004 due to an unisolable Main Steam Line break with fuel failure on Unit Two (2).
2. Unit One (1) is at 60% power.
3. Unit Two (2) was SHUTDOWN at 2100 11/01/04
4. The time is now 0004 11/2/2004.
5. Weather Conditions are as follows:

Temperature	82 °F
Upper Wind Speed	7.8 mph
Lower Wind Speed	7.3 mph
Upper Wind Direction	246.3 °
Lower Wind Direction	246.3 °
Stability Class	E

INITIATING CUE:

As Site Emergency Coordinator (SEC) complete Block 15, Recommended Protective Actions, of the Emergency Notification form and sign for approval.

FOR TRAINING EXAM PURPOSES ONLY

EMERGENCY NOTIFICATION

1. [A] THIS IS A DRILL ■ ACTUAL EMERGENCY ■ INITIAL [ ] FOLLOW-UP MESSAGE NUMBER 4

SITE: BRUNSWICK UNIT: 2 REPORTED BY: Will B. Callen

3. TRANSMITTAL TIME/DATE: ________ (Eastern) ___/___/___ MM DD YY CONFIRMATION PHONE NUMBER: 910 457 2579

4. AUTHENTICATION (If Required): N/A (Number) ________ (Codeword)

5. EMERGENCY CLASSIFICATION: [A] NOTIFICATION OF UNUSUAL EVENT [B] ALERT [C] SITE AREA EMERGENCY ■ GENERAL EMERGENCY

6. ■ Emergency Declaration At [B] Termination At: TIME/DATE: 0001 (Eastern) 11/02/04 MM DD YY (If B, go to item 16.)

7. EMERGENCY DESCRIPTION/REMARKS: Loss of three fission product barriers on Unit Two due to an unisolable main steam line break with fuel cladding failure.

8. PLANT CONDITION [A] IMPROVING [B] STABLE ■ DEGRADING

9. REACTOR STATUS: U1 [A] SHUTDOWN: TIME/DATE: ________ (Eastern) ___/___/___ MM DD YY ■ 60 % POWER

U2 ■ SHUTDOWN: TIME/DATE: 2100 (Eastern) 11/01/04 MM DD YY [B] ____ % POWER

10. EMERGENCY RELEASE(S): [A] NONE (Go to item 14.) [B] POTENTIAL (Go to item 14.) ■ IS OCCURRING [D] HAS OCCURRED

**11. TYPE OF RELEASE: [ ] ELEVATED ■ GROUND LEVEL

[A] AIRBORNE: Started: ________ Time (Eastern) ___/___/___ MM DD YY Stopped: ________ Time (Eastern) ___/___/___ MM DD YY

[B] LIQUID: Started: ________ Time (Eastern) ___/___/___ MM DD YY Stopped: ________ Time (Eastern) ___/___/___ MM DD YY

**12. RELEASE MAGNITUDE [ ] CURIES PER SEC [ ] CURIES NORMAL OPERATING LIMITS [ ] BELOW [ ] ABOVE

[A] NOBLE GASES ________ [B] IODINES ________

[C] PARTICULATES ________ [D] OTHER ________

**13. ESTIMATE OF PROJECTED OFFSITE DOSE: [ ] NEW [ ] UNCHANGED PROJECTION TIME: ________ (EASTERN)

	TEDE mrem	Thyroid CDE mrem
SITE BOUNDARY		
2 MILES		
5 MILES		
10 MILES		

ESTIMATED DURATION: ____ HRS.

**14. METEOROLOGICAL DATA: ■ WIND DIRECTION (from) 246 ° ■ SPEED (MPH) 7.8

■ STABILITY CLASS E ■ PRECIPITATION (type) RAIN

15. RECOMMENDED PROTECTIVE ACTIONS

[A] NO RECOMMENDED PROTECTIVE ACTIONS

[B] EVACUATE ________

[C] SHELTER IN-PLACE ________

[D] OTHER ________

16. APPROVED BY: ________ (Name) ________ (Title) TIME/DATE: ________ (Eastern) ___/___/___ MM DD YY

* If items 8-14 have not changed, only items 1-7 and 15-16 are required to be completed.

** Information may not be available on Initial Notifications.

PLANT OPERATING MANUAL

VOLUME XIII

PLANT EMERGENCY PROCEDURE

UNIT
0

0PEP-02.6.28

OFF-SITE PROTECTIVE ACTION RECOMMENDATIONS

REVISION 8

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this procedure is to describe the process for making Protective Action Recommendations (PARs) to off-site agencies.

2.0 REFERENCES

2.1 0PEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency

2.2 0PEP-02.6.26, Activation and Operation of the Technical Support Center (TSC)

2.3 0PEP-02.6.27, Activation and Operation of the Emergency Operations Facility (EOF)

2.4 0PEP-02.6.21, Emergency Communicator

2.5 0PEP-03.4.7, Automation of Off-Site Dose Projection

2.6 NUREG-0654 Rev. 1 Supp. 3, Criteria for Protective Action Recommendations for Severe Accidents

3.0 GENERAL

3.1 Protective Action Recommendations (PARs) shall be made by the Emergency Response Manager in the EOF.

3.2 The Site Emergency Coordinator shall make Protective Action Recommendations, if necessary, prior to EOF activation.

3.3 This procedure provides the process for making Protective Action Recommendations within 15 minutes of a General Emergency declaration. PARs shall be transmitted to the decision makers on an approved Emergency Notification Form.

3.4 The Protective Action Recommendation is subject to acceptance or modification by state or county decision makers.

3.5 The State/Counties shall assume the responsibility for implementing protective actions taken to protect the health and safety of the general public.

4.0 DEFINITIONS/ABBREVIATIONS

None

5.0 RESPONSIBILITIES

5.1 The Emergency Response Manager shall:

5.1.1 Use the guidance in this procedure to ensure Protective Action Recommendations are made within 15 minutes of the declaration of a General Emergency.

5.1.2 Verbally communicate this information to off-site decision makers.

5.1.3 Approve the Emergency Notification Form.

5.1.4 Maintain an awareness of the state/county acceptance or modification of the Protective Action Recommendations.

5.2 The Site Emergency Coordinator shall:

5.2.1 Prior to EOF activation:

1. Use the guidance in this procedure to ensure Protective Action Recommendations are made within 15 minutes of the declaration of a General Emergency.
2. Verbally communicate this information to off-site decision makers.
3. Approve the Emergency Notification Form.
4. Maintain an awareness of the state/county acceptance or modification of the Protective Action Recommendations.

5.3 The Radiological Control Manager shall:

5.3.1 Recommend PARs to the Emergency Response Manager.

5.3.2 Continually assess Dose Assessment results on radiological conditions and advise the Emergency Response Manager if the initial PAR should be modified.

5.3.3 Immediately provide radiological and meteorological information to the Communications Manager for inclusion on the Emergency Notification Form.

5.4 The Communications Managers, Communications Director, and Emergency Communicator (as applicable) shall:

1. Ensure an Emergency Notification which includes the PAR is made to off-site agencies within 15 minutes of the declaration of a General Emergency.

6.0 PROCEDURE

6.1 Perform the following actions for making predetermined **initial** and **modified** Protective Action Recommendations (PARs) when a General Emergency has been declared.

6.1.1 Initial PAR implementation will be recommended by the Radiation Control Manager (RCM) and approved by the Emergency Response Manager (ERM).

6.1.2 The RCM should obtain the **current** wind direction from the Dose Projection Coordinator or use the EOF Meteorology Status Board.

6.1.3 Using Attachment 2 of this procedure the RCM should select the appropriate wind sector from the column labeled **Wind From**. The wind sector is defined by a range of wind directions.

6.1.4 After identifying the appropriate wind sector, using Attachment 2, the RCM should select the corresponding Local Planning Zones from the **Evacuation Zones** column and recommend evacuating these Zones.

6.1.5 After identifying the appropriate Local Planning Zones for evacuation, using Attachment 2, the RCM should select the corresponding Local Planning Zones from the **Shelter Zones** column and recommend sheltering these Zones.

6.1.6 The RCM should communicate the Local Planning Zones being recommended for **evacuation** and Local Planning Zones being recommended for **sheltering** to the Emergency Response Manger, Communications Managers, and State Liaison.

6.1.7 The Communication Managers should ensure Protective Action Recommendations are included on the Emergency Notification Form and issued within 15 minutes from the General Emergency declaration or Modified PAR development.

6.1.8 The Communications Managers and Emergency Response Manager will ensure off-site decision makers are contacted verbally. Phone talkers will normally make this contact.

1. Brunswick County

2. New Hanover County

3. State

6.1.9 The RCM should ensure PARs are posted on the status board in the EOF.

6.1.10 The RCM and ERM should continually work with the EOF State Representatives to ensure an understanding of off-site recommendations.

6.1.11 The RCM should continually monitor changes in meteorological and radiological conditions and compare to EPA Protective Action Guides. The Dose Projection Coordinator normally provides updates to the RCM on this action.

6.2 The RCM should review and recommend a **modified** Protective Action Recommendation, as necessary, using Attachment 1 and Attachment 2 for guidance.

1. Protective Action Recommendations should be extended to the point (**beyond the 10 mile EPZ**, as necessary) where protective action guideline doses (i.e., ≥ 1 Rem TEDE or ≥ 5 Rem CDE child thyroid) **WILL NOT** be exceeded.

2. A Protective Action Recommendation should not be reduced from the initial recommendation for any Local Planning Zones until the release is terminated and the decision is coordinated with the State and County decisions makers.

3. The following guides apply prior to reducing the initial Protective Action Recommendations:

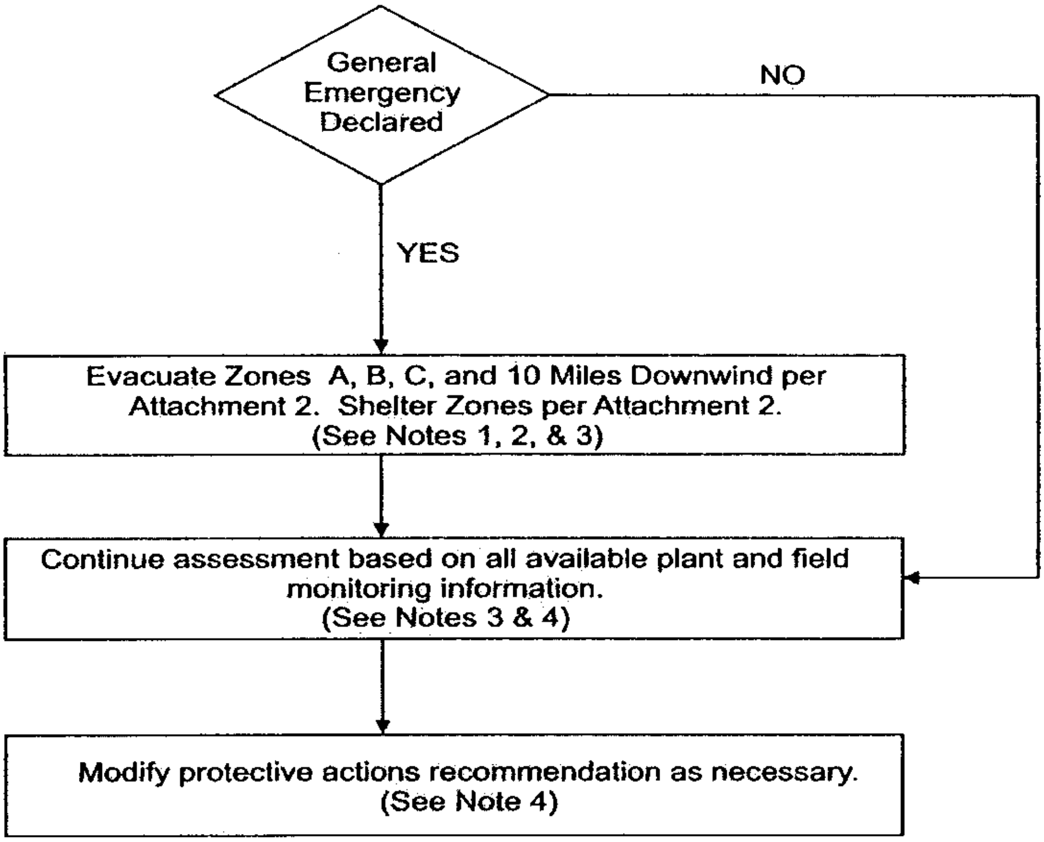
   a. Long term weather forecast conditions are obtained with a high degree of confidence in the forecast.

   b. Radiological environmental conditions are defined.

   c. Plant conditions are stabilized and no additional release as a result of the initiating accident is anticipated.

   d. Population dose savings is quantifiable as a result of the modified PAR and the decision is **ALARA**.

ATTACHMENT 1
Page 1 Of 1
PAR Flowchart



1. Shelter remaining zones to have population indoors to monitor EAS broadcasts.

2. Shelter may be the appropriate action for controlled releases of radioactive material from containment If there is assurance that the release is short term (puff release) and the area near the plant cannot be evacuated before the plume arrives.

3. For actual or projected doses > 1 Rem TEDE or > 5 Rem CDE (Thyroid), declare a General Emergency and recommend evacuation of the general public from the affected areas.

4. A protective action recommendation should not be reduced from the initial recommendation for any zone until the release is terminated, and the decision is coordinated with the state and counties. The following guides should be considered prior to reducing a protective action recommendation:
   a) Long term weather forecast conditions are obtained with a high degree of confidence in the forecast. No sea-breeze in effect.
   b) Radiological environmental conditions are defined.
   c) Plant conditions are stabilized.
   d) Population dose savings are quantifiable as a result of the PAR change, and the decision is ALARA.

BRUNSWICK OCT/NOV 2004

EXAM 50-325, 324/2004-301
OCTOBER 29, 2004 &
NOVEMBER 2 - 10, 2005

FINAL ADMIN JPMS

ATTACHMENT 2 - PAGE 1 OF 1

INTENTIONALLY OMITTED

PER SISP REVIEW

REVISION SUMMARY

Revision 8 of 0PEP-02.6.28 consists of:

- Changed "CP&L" to "Progress Energy" and deleted "Carolina Power & Light Company" on cover page to reflect company name change.
- Changed reference from "Communications Manager" to "Communications Managers" throughout procedure to reflect NUREG-0654, Table B-1 required minimum staffing levels for EOF.
- Added information in Section 5.4.1 to clarify the time limit for notifying offsite agencies with a Protective Action Recommendation at a General Emergency classification.
- Updated Attachment 2, Evacuation Zones and Time Estimates / 10 Mile EPZ Map, to reflect revised evacuation time estimates for 10-Mile EPZ.
- Added guidance for establishing initial Protective Action Recommendations in Section 6.1.
- Added guidance to modify a Protective Action Recommendation in Section 6.2.
- Added guidance in Attachment 1, PAR Flowchart, for protective action recommendation decision-making as an enhancement.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM1ROCOO

LESSON TITLE: Perform SRM/IRM overlap per GP-02.

LESSON NUMBER: ADM1ROCOO

REVISION NO: 0

RECOMMENDED BY: Curt Robert
Instructor/Developer — Date

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor — Date

APPROVED BY: ______________________
Superintendent/Supervisor Training — Date

SAFETY CONSIDERATIONS:

1. None.

SIMULATOR SETUP

IC-3	BOC
Rx Pwr	0%

Insert malfunction NI059F, SRM/IRM overlap incorrect and then withdraw control rods and establish a reactor period of approximately 120 sec. Allow reactor power to increase until the first SRM reaches approximately 5×10^5 cps. Snap as an IC if required for multiple performers.

EVALUATOR NOTES: (Do not read to performer)

1. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.
2. **START LOCATION:** Simulator.
3. **PROVIDE A COPY:** The applicable procedure section **WILL NOT** be provided to the trainee. If performed in the classroom setting the evaluator may provide GP-02, Technical Specifications and TRM **ONLY** if the trainee requests these procedures.
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is not a time critical JPM.

Read the following to the JPM performer.

TASK CONDITIONS:

1. Unit One startup is being performed per 0GP-02. Unit One reactor is critical with a period of approximately 120 seconds established. GP-02 has been completed up through Step 5.2.17 and reactor power is currently on range one (1) of the IRMs and rising.

2. Initial pre-startup IRM data recorded in the Reactor Operator's log (Step 5.2.7) as follows:

IRM Channel	Reading*
A	0.5%
B	0.6%
C	0.4%
D	0.4%
E	0.2%
F	0.3%
G	0.1%
H	0.2%

*** All IRM Readings taken on Range One from the digital readout 0-125 scale.**

INITIATING CUE:

You are directed to perform Step 5.2.18 of GP-02 and continue the plant startup until all SRMs have been withdrawn.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.
Comments required for any step evaluated UNSAT.

START TIME: ___________

PERFORMANCE CHECKLIST

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

NOTE: If desired, the examiner may provide a copy GP-02 to the examinee.

Step 1 - Obtain a current revision of 0GP-02.

Current Revision of 0GP-02 obtained and verified, if applicable.

SAT/UNSAT*

Step 2 – Determine SRM/IRM overlap criteria is ONLY met for IRM B. No other IRMs have reached a reading 10% of scale before the first SRM reached 5 x 10^5 cps.

Determined that SRM/IRM overlap criteria is not met for IRMs A, C, E, G, D, F, and H based on not reading 10% of scale.

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

Step 3 – **IF** correct SRM/IRM overlap is **NOT** verified, **THEN** the Reactor Engineer shall be notified **AND** Technical Specification LCO 3.3.1.1 referenced.

Notifies SCO that Reactor Engineer shall be notified ***AND*** *Technical Specification LCO 3.3.1.1 referenced.*

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

NOTE: If examinee does not detect an error in SRM/IRM overlap he/she may continue with step 5.2.19 and withdraw SRM detectors as required to maintain an indicated count rate between 10^2 cps and 5×10^4 cps.

SR 3.3.1.1.6 states that SRM/IRM overlap must be verified prior to withdrawing SRMs from the fully inserted position.

Examiner should consider the JPM UNSAT if it is apparent that this error will not be self corrected and can terminate the JPM task.

TERMINATING CUE: When SRM/IRM overlap determination has been made and the SCO has been informed of the results, this JPM is complete.

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

STOP TIME: __________

RELATED TASKS:
215201B101, Verify Correct Overlap Between SRMs And IRMs Per GP-02

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.7 3.7/4.4
Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation.

REFERENCES:

0GP-02

TOOLS AND EQUIPMENT:

None.

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

Generic (Administrative)

REASON FOR REVISION:

Modified to produce substantively different results for use on 2004 NRC exam.

Time Required for Completion: **10 Minutes** (approximate).

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate x_ Actual __ Unit: ____

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

Time Critical: Yes ___ No _ Time Limit **NA**

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

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Unit One startup is being performed per 0GP-02. Unit One reactor is critical with a period of approximately 120 seconds established. GP-02 has been completed up through Step 5.2.17 and reactor power is currently on range one (1) of the IRMs and rising.

2. Initial pre-startup IRM data recorded in the Reactor Operator's log (Step 5.2.7) as follows:

IRM Channel	Reading*
A	0.5%
B	0.6%
C	0.4%
D	0.4%
E	0.2%
F	0.3%
G	0.1%
H	0.2%

*** All IRM Readings taken on Range One from the digital readout 0-125 scale.**

INITIATING CUE:

You are directed to perform Step 5.2.18 of GP-02 and continue the plant startup until all SRMs have been withdrawn.

PLANT OPERATING MANUAL

VOLUME IV

GENERAL PLANT OPERATING PROCEDURE

UNIT
0

0GP-02

APPROACH TO CRITICALITY AND PRESSURIZATION OF THE REACTOR

REVISION 77

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides the precautions, limitations, and instructional guidance for starting up the reactor and raising pressure to rated. This procedure is also used to satisfy Technical Specifications SR 3.4.9.1, SR 3.4.9.3, and SR 3.3.1.1.6.

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR

2.3 0AI-81, Water Chemistry Guidelines

2.4 0GP-10, Rod Sequence Checkoff Sheets

2.5 0GP-11, Second Operator Rod Sequence Checkoff Sheets

2.6 0OI-01.01, Operations Unit Organization and Administration

2.7 0OI-01.02, Shift Routines and Operating Practices

2.8 0OI-53, Rod Worth Minimizer (NUMAC-RWM)

2.9 1(2)OP-07, Reactor Manual Control System Operating Procedure

2.10 1(2)OP-09, Neutron Monitoring System Operating Procedure

2.11 1(2)OP-25, Main Steam System Operating Procedure

2.12 1(2)OP-26, Turbine System Operating Procedure

2.13 1(2)OP-26.1, Gland Sealing Steam System Operating Procedure

2.14 1(2)OP-30, Condenser Air Removal and Off Gas Recombiner System

2.15 1(2)OP-32, Condensate and Feedwater System Operating Procedure

2.16 1(2)OP-34, Extraction Steam System Operating Procedure

2.17 0PT-01.6.2, Rod Worth Minimizer System Operability Test

2.18 1(2)PT-01.7, Heatup/Cooldown Monitoring

2.0 REFERENCES

2.19 0PT-09.2, HPCI System Operability Test

2.20 0PT-09.3, HPCI System-165 Psig Flow Test

2.21 0PT-10.1.1, RCIC System Operability Test

2.22 0PT-10.1.3, RCIC System Operability Test-Flow Rates at 150 Psig

2.23 0PT-11.1.2, Automatic Depressurization System and Safety Relief Valve Operability Test

2.24 0PT-14.3, Shutdown Margin Demonstration

2.25 0PT-14.3.1, Insequence Critical Shutdown Margin Calculation

2.26 0MST-IRM25R, IRM Channels Range Correlation Adjustment

2.27 Operational Experience Feedback Report, Serial Number B2352

R28 2.28 NCR S-90-022

2.29 GE SIL No. 430

R30 2.30 LER 1-91-016

R31 2.31 INPO SOER 84-2

2.32 ACR 94-01020

2.33 EER 91-0301, Rev. 1, Acceptability of Operation of Both Units Under Boron Conditions

R34 2.34 LER 2-98-003, MSIV Closure Due to Procedure Deficiency

2.35 ESRs 98-00628, 98-00629, 98-00630, 98-00631, HPCI/RCIC Steam Line Low Pressure Isolation Setpoint Change

R36 2.36 SEN 185 Evaluation, Action Item 98-02223

R37 2.37 INPO SOER 88-2, Premature Criticality Events During Reactor Startup, Recommendation Number 6 (Facts 89B0924)

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 **WHEN** any neutron monitoring system channel is bypassed, **THEN** reference should be made to the technical specifications to verify operability requirements are met. **WHEN** a channel is inoperable **OR** a required surveillance is being performed, **THEN** bypass switches on Panel H12-P603 provide a means of disabling the control functions of the selected neutron monitoring system channel.

3.3 With less than 17 LPRM inputs total **OR** less than 3 LPRM detectors per level, an APRM channel is considered inoperable.

3.4 With less than 50% of its required LPRM inputs, a RBM channel is considered inoperable.

3.5 A minimum of 3 IRM channels for each trip system must be operable for the control rod withdrawal block instrumentation to be considered operable.

3.6 The main turbine and RFP turbines should be on turning gear **OR** isolated from the system prior to starting steam seal system.

3.7 Gland Sealing System must be in operation when a vacuum exists in main condenser.

3.8 **WHEN** CDD vessel effluent is directed to the reactor vessel **OR WHEN** the CDD influent conductivity is greater than 0.1 µmho/cm, **THEN** low flow through CDD vessels could result in higher than desirable pH and conductivity in the reactor vessel. **WHEN** *B21-F032A* or *B21-F032B* is open **AND** CDD influent conductivity is greater than 0.1 µmho/cm, **THEN** each in-service CDD vessel flow should be maintained at 2000-3000 gpm.

3.9 Surveillance Procedures which must be current prior to changing reactor mode switch position in accordance with this procedure are included in 0GP-01, Attachments 1 and 2.

R36 3.10 Repositioning IRM range switches should be performed by one Operator, using one hand on one trip system at a time.

3.0 PRECAUTIONS AND LIMITATIONS

3.11 Momentarily depressing the increase or decrease push button on the following controllers will cause the selected parameter to change in increments of 0.1%. Continually depressing the increase or decrease push button on the following controllers will cause the selected parameter to change at an exponential rate:

3.11.1 *SULCV FW-LIC-3269*, Control Station.

3.11.2 *RFPT A(B) SP CTL C32-SIC-R601A(B)*, Control Stations.

3.11.3 *MSTR RFPT SP/RX LVL CTL C32-SIC-R600*, Control Station.

3.12 The time during which sealing steam is applied to the turbine seals without the steam packing exhauster should be minimized to avoid radioactive contamination.

3.13 Operation in the cross-hatched area of Figure 3.4.9-2 in Technical Specifications is permitted only when reactor water level is above the SCRAM setpoint and below the Reactor Feed Pump trip setpoint.

4.0 PREREQUISITES

Unit 2 Date/Time Started Today / 0001

		Initials
4.1	Preparations for a reactor startup are in progress in accordance with 0GP-01.	Cr
4.2	Reactor water level is between 182 and 192 inches.	Cr

5.0 PROCEDURAL STEPS

5.1 Administrative

R37	5.1.1	**ENSURE** review and implementation of 0GP-02, Attachment 1 is complete.	Cr
	5.1.2	**ANNOUNCE** on the PA System primary and secondary containment are in effect **AND** reactor startup is commencing.	Cr
	5.1.3	**NOTIFY** Load Dispatcher of impending startup.	Cr
	5.1.4	**OBTAIN** guidance from the Reactor Engineer for single notch or continuous rod withdrawal.	Cr

5.0 PROCEDURAL STEPS

Initials

5.2 Pulling Rods to Achieve Criticality

5.2.1 **CONFIRM** all four RPS Trip System A white Scram Group lights 1, 2, 3, and 4, located on Panel H12-P603 or RPS Panel A H12-P609, are on. CR

5.2.2 **CONFIRM** all four RPS Trip System B white Scram Group lights 1, 2, 3, and 4, located on Panel H12-P603 or RPS Panel B H12-P611, are on. CR

5.2.3 **IF** the mode switch is in *SHUTDOWN*, **THEN PLACE** the switch in *START/HOT STBY*. CR

5.2.4 **ENSURE** RWM Scram Data Buffers are deleted to prepare for future scram data recording in accordance with 0OI-53. CR

1. **IF** the RWM was placed in *BYPASS* or *INOP* to delete Scram Data Buffers, **THEN ENSURE** the following RWM switches have been returned to *OPERATE*:

    a. *RWM COMPUTER KEYLOCK SWITCH* N/A Ind.Ver.

    b. *OPERATOR'S DISPLAY KEYLOCK SWITCH* N/A Ind.Ver.

5.2.5 **NOTIFY** E&RC to obtain a start-up chemistry sample in accordance with ODCMS Table 7.3.7-1, Note (C). CR

5.0 PROCEDURAL STEPS

Initials

R37

NOTE: Control rod movement should be stopped periodically to observe source range instrument (SRM recorders, indicators, and period meters) response and allow neutron level stabilization.

R37

NOTE: Source range doubling must be used as a method of monitoring for criticality.

NOTE: Coupling integrity of a control rod shall be checked anytime a control rod is fully withdrawn by verifying the rod does **NOT** reach the over travel position (see SR 3.1.3.5).

NOTE: All rod select push buttons should be deselected whenever rod movement has stabilized to minimize select switch damage from overheating.

NOTE: **WHEN** the Rod Worth Minimizer is inoperable during startup before the first 12 control rods are withdrawn, **THEN** one startup in a calendar year, with the RWM inoperable for reasons other than bypassed control rod(s), may be performed provided that control rod movement and compliance with the prescribed Bank Position Withdrawal Sequence (BPWS) control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff (Engineer, Control Operator, SRO, or Auxiliary Operator) in accordance with 0GP-11.

NOTE: **WHEN** the Rod Worth Minimizer is inoperable after the first 12 control rods have been fully withdrawn on a startup, **THEN** operation may continue provided that control rod movement and compliance with the prescribed Bank Position Withdrawal Sequence (BPWS) control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff (Engineer, Control Operator, SRO, or Auxiliary Operator) in accordance with 0GP-11.

R31

NOTE: Any deviation from the original withdrawal sequence should be recommended by the Reactor Engineer, approved by the Unit SCO, and documented on the proper rod sequence checkoff sheet.

CAUTION

During a hot startup following a reactor Scram from power, extremely high rod notch worths can be encountered due to peak xenon with no moderator voids. Continuous control rod withdrawal should **NOT** be utilized when approaching criticality.

CAUTION

The reactor should **NOT** be operated with a stable period of less than 100 seconds. **IF** single notch withdrawals result in reactor periods approaching 20 seconds, **THEN** the control rod(s) should be inserted to achieve a stable period of greater than 100 seconds **AND** the rod withdrawal sequence discontinued until a thorough assessment has been performed by the Reactor Engineer and approved by the Unit SCO.

CAUTION

IF a reactor period of less than or equal to 12 seconds is reached, **THEN** the reactor shall be shut down until a margin to criticality is achieved. **IF** this is done, **THEN** at least ten control rods shall be fully inserted past the step in 0GP-10 at which the short period was experienced. The reactor startup shall be discontinued until a thorough assessment as to the cause/recommendation to prevent recurrence has been made by the Reactor Engineer and approved by the Unit SCO.

5.2.6 **RECORD** the SRM channel count rates in the Reactor Operator's Log. Cr

1. **CALCULATE** the three SRM "doublings" count rate. Cr
2. **CALCULATE** the five SRM "doublings" count rate. Cr
3. **VERIFY** both calculations are correct. Cr / Rc Ind.Ver.
4. **RECORD** the three and five SRM "doubling" values in the Reactor Operator's Log. Cr

5.2.7 **RECORD** the IRM channel indications in the Reactor Operator's Log for use in determining SRM/IRM overlap in Step 5.2.18. Cr

5.0 PROCEDURAL STEPS

Initials

5.2.8 **CONFIRM**, using pressure and temperature instruments identified in 1(2)PT-01.7, reactor vessel pressure and reactor coolant system temperature coordinates are to the right of the criticality limit line on Technical Specification Figure 3.4.9-2 within 15 minutes prior to the withdrawal of control rods to bring the reactor to criticality (SR 3.4.9.3). Ca

1. **RECORD** the time of the above verification in the Reactor Operator's Log. Ca

5.2.9 **WITHDRAW** control rods in accordance with 1(2)OP-07 in the sequence designated by 0GP-10. Ca

5.2.10 **RECORD** the time and number of the first control rod withdrawn in the Reactor Operator's Log. Ca

> **NOTE:** Upon achieving three SRM "doublings" in the neutron count rate, control rod withdrawal should be in the single notch mode for all subsequent rods unless continuous withdrawal is recommended by the Reactor Engineer and approved by the Unit SRO. The single notch withdrawal requirement is also applicable to all high worth control rods, as designated by the Reactor Engineer, regardless of the SRM count rate or number of "doublings".

R37 5.2.11 **MONITOR** the following for indications of criticality **AND CONFIRM** SRM levels are increasing as control rods are being withdrawn: Ca

1. SRM Recorders.
2. SRM Count Rate Indicators.
3. SRM Period Meters.

5.2.12 **CONFIRM** the green *RETRACT PERMIT* Light for each SRM detector comes on when the SRM level exceeds 100 cps. Ca

5.0 PROCEDURAL STEPS

Initials

R37 5.2.13 **OBSERVE** the SRM channels for the following indications of criticality: CR

1. SRM period meters indicate a stable, positive period.
2. SRM levels increasing without requiring additional control rod withdrawal.

5.2.14 **WHEN** criticality is achieved, **THEN RECORD** the time, control rod, and notch position in the Reactor Operator's Log **AND CONTINUE** rod withdrawal until the desired period has been established. CR

5.2.15 **WHEN** the desired period is obtained, **THEN RECORD** the following information in the Reactor Operator's Log: CR

1. Time
2. Rod sequence
3. Item number
4. Control rod
5. Notch position
6. Period (Period = 1.44 times the doubling time)
7. Reactor pressure
8. Recirculation loop A temperature
9. Recirculation loop B temperature

5.2.16 **ANNOUNCE** the reactor is critical on the PA system. CR

5.2.17 **IF** any MSIV pit shield plug is **NOT** installed, **THEN** **INITIATE** MSIV pit entry requirements in accordance with 0OI-01.03, Non-Routine Activities. N/A

NOTE: SRM/IRM overlap must be demonstrated prior to withdrawing SRMs from the fully inserted position. SRM/IRM overlap exists when at least three IRM channels in each RPS trip system show an increase to at least twice their pre-startup levels **AND** indicate at least 10% of scale (i.e.,12.5 on the digital readout 0-125 scale) before the first SRM channel reaches 5×10^5 cps. (TS SR 3.3.1.1.6)

If desired, the level of the highest reading IRM (pre-startup) may be doubled and that value used as overlap criteria for all IRMs. This method will allow the operator to compare IRM channel response to a single value which is at least twice the pre-startup levels of the individual IRMs.

CAUTION:

IF correct SRM/IRM overlap is **NOT** verified, **THEN** the Reactor Engineer shall be notified **AND** Technical Specification LCO 3.3.1.1 referenced.

5.2.18 **CONFIRM** correct overlap between SRM and IRM channels based on the pre-startup IRM data recorded in the Reactor Operator's log (Step 5.2.7). _____

NOTE: With IRM channels below range 3, the SRM channels will initiate a rod withdrawal block when either of the following conditions exists:

1. SRM channel indicates greater than 5×10^4 cps.

2. SRM channel indicates less than 10^2 cps with its detector **NOT** full in.

NOTE: SRM detectors should be withdrawn two at a time so that the reactor flux level conditions are being monitored by channels that are **NOT** being affected by detector movement.

5.2.19 **WHEN** SRM/IRM overlap has been verified, **THEN** **WITHDRAW** SRM detectors as required to maintain an indicated SRM count rate between 10^2 and 5×10^4. _____

5.0 PROCEDURAL STEPS

Initials

R36

CAUTION

Repositioning IRM range switches should be performed by one Operator, using one hand on one trip system at a time.

CAUTION

WHEN repositioning the IRM range switches, **THEN** care should be taken in order to prevent a reactor scram from occurring.

5.2.20 **REPOSITION** the IRM range switches, as reactor power increases, to maintain IRM indication on recorders between 15 and 50 on the 0-125 scale. ____

5.2.21 **WHEN** all operable IRM channels are above range 3 **AND** prior to reaching range 7, **THEN FULLY WITHDRAW** all SRM detectors. ____

5.2.22 **IF** this is the initial startup following a refuel outage, **THEN PERFORM** the following:

1. 0PT-14.3.1 (if 0PT-14.3 was **NOT** completed prior to startup). ____

2. IRM Range 6 and 7 Correlation in accordance with 0MST-IRM25R. ____

5.0 PROCEDURAL STEPS

Initials

5.3 Heating and Pressurization of the Reactor

> **NOTE:** Main Steam System startup in accordance with 1(2)OP-25 should be performed concurrently with this procedure.
>
> **NOTE:** This procedure assumes startup is being conducted with the MSIVs open. **IF** the startup is being conducted with the MSIVs closed, **THEN** OP-25, Section 5.2, should be performed concurrently with this procedure.

5.3.1 **COMMENCE** Reactor Coolant System (RCS) monitoring in accordance with 1(2)PT-01.7 (SR 3.4.9.1). _____

5.3.2 **CONTINUE** to withdraw rods in the sequence prescribed by 0GP-10 to establish and maintain a heatup rate of less than 100°F an hour as monitored by 1(2)PT-01.7. _____

> **NOTE:** The opening of EQ MCCs or Nodes only creates an operability concern when a high energy line break (HELB) can occur. Therefore, breaching an EQ envelope is a concern (i.e., an HELB can occur) when reactor temperature is above 200°F **OR** reactor pressure is above 275 psig.

5.3.3 **PERFORM** the following:

1. **ENSURE** all work in progress Work Orders are reviewed for breach of an EQ envelope. _____

2. **ENSURE** any identified Work Orders with EQ concerns are confirmed completed, OR applicable LCOs are initiated prior to reactor temperature reaching 200°F. _____

5.3.4 **REJECT** reactor water using the Reactor Water Cleanup System to the hotwell (preferred) or to Radwaste as necessary to maintain reactor water level. _____

5.3.5 **WHEN** the reactor temperature approaches, but does **NOT** exceed 212°F, **THEN CLOSE** the following:

1. *INBOARD RX HEAD VENT VLV, B21-F003,* ___/___ Ind.Ver.

2. *OUTBOARD RX HEAD VENT VLV, B21-F004.* ___/___ Ind.Ver.

5.3.6 **WHEN** reactor temperature reaches 212°F, **THEN NOTIFY** E&RC to obtain a reactor coolant sample for dissolved oxygen analysis. _____

5.3.7 **MAINTAIN** reactor coolant temperature at 212°F for a minimum of one hour **OR** until dissolved oxygen content is shown to be less than 200 ppb. _____

5.3.8 **PERFORM** the following prior to starting Steam Packing Exhauster SPE A(B):

1. **START** a second condensate pump, in accordance with 1(2)OP-32, to provide adequate flow through the SPE. _____

2. **PERFORM** the following to drain both SPE's inlet piping:

   a. **OPEN** *SPE 1(2)A SHELL DRAIN VALVE, 1(2)MVD-V39,* **AND** *SPE 1(2)A SHELL DRAIN VALVE, 1(2)MVD-V40.* _____

   b. **THROTTLE OPEN** *STEAM SEAL SPE 1(2)A MO INLET VLV, 1(2)OG-MOV-E1,* 10 to 20%. _____

   c. **OPEN** *SPE 1(2)B SHELL DRAIN VALVE, 1(2)MVD-V42,* **AND** *SPE 1(2)B SHELL DRAIN VALVE, 1(2)MVD-V43.* _____

   d. **THROTTLE OPEN** *STEAM SEAL SPE 1(2)B MO INLET VLV, 1(2)OG-MOV-E2,* 10 to 20%. _____

e. **WHEN** approximately 30 minutes have elapsed, **THEN CLOSE** the following:

- *STEAM SEAL SPE 1(2)A MO INLET VLV, 1(2)OG-MOV-E1* _____
- *STEAM SEAL SPE 1(2)B MO INLET VLV, 1(2)OG-MOV-E2* _____

3. **OPEN** the associated *FLOAT TRAP OUTLET VALVE* for the SPE to be started:

- *MVD-V51* for 1(2)A SPE _____
- *MVD-V52* for 1(2)B SPE _____

5.3.9 **CONFIRM** one of the following conditions exist:

1. Reactor feed pumps are on turning gear in accordance with 1(2)OP-32, _____

OR

2. The following RFPT A(B) valves are closed:

- *RFP A(B) EXHAUST ISOL VLV, RFE-V1(V2),* _____
- *RFP A(B) SEAL SUPPLY VLV, MVD-V119(MVD-V117),* _____
- *RFP A(B) SEAL EXHAUST VLV, MVD-V120(MVD-V118).* _____

5.3.10 **OPEN** the following demineralized water supply valves for 15-20 seconds to fill the 1.8 minute hold-up loop seals:

1. <u>Unit 1 only</u>:

- *DEMIN WTR SUPPLY VLV, DW-V387* (located in Reactor Building - 10' El., behind OGDT) _____
- *LOOP SEAL VLV, 1-MUD-V434* (located in Stack Filter House east wall above sump) _____

5.0 PROCEDURAL STEPS

<u>Initials</u>

2. <u>Unit 2 only</u>:

   - *DEMIN WTR SUPPLY VLV, DW-V387* (located in N-RHR Pump Room - 17' El., behind OGDT) _____

   - *LOOP SEAL VLV, 2-MUD-V435* (located in Stack Filter House behind sump). _____

5.3.11 **OPEN** *MECHANICAL VACUUM PUMP 1(2)A SUCTION VALVE, 1(2)OG-V16.* _____

5.3.12 **OPEN** *MECHANICAL VACUUM PUMP 1(2)B SUCTION VALVE, 1(2)OG-V17.* _____

5.3.13 **ENSURE** the following valves are closed:

1. *RESERVOIR DRAIN VALVE, 1(2)OG-V71.* _____

2. *RESERVOIR DRAIN VALVE, 1(2)OG-V81.* _____

5.3.14 **OPEN** the following demineralized water supply valves to mechanical vacuum pump reservoirs:

1. *DEMINERALIZED WATER SUPPLY VALVE TO RESERVOIR, 1(2)MUD-V21.* _____

2. *DEMINERALIZED WATER SUPPLY VALVE TO RESERVOIR, 1(2)MUD-V22.* _____

5.0 PROCEDURAL STEPS

Initials

CAUTION

The amount of time sealing steam is applied without the Steam Packing Exhauster in operation should be minimized to prevent excessive seal steam leakage into the Turbine Building.

5.3.15 **WHEN** reactor pressure is greater than 50 psig, **THEN PERFORM** the following:

1. **ENSURE** *STEAM SEAL BYPASS UNLOADING VALVE, MVD-B*, is closed. _____

2. **OPEN** *MN STEAM TO SEALS VLV, MVD-S1.* _____

3. **THROTTLE OPEN** *STEAM SEAL BYP VLV, MVD-S2*, as necessary to maintain *STEAM SEAL HEADER PRESSURE, OG-PI-EPT-4*, located on Panel XU-2, between 1.5 and 4.0 psig. _____

4. **PLACE** the Steam Packing Exhauster in operation, whose float trap outlet was opened in step 5.3.8.3, in accordance with 1(2)OP-26.1. _____

NOTE: The Bypass valve jack meter indicates bypass jack output opening demand signal to the bypass valve system. **IF** a low vacuum condition is present (< 7"), **THEN** all bypass valves will be closed **BUT** bypass jack demand will remain at the last requested position. **IF** bypass jack demand is greater than 0%, **THEN** the bypass jack *OPEN* (red) light indication will be lit.

R34

CAUTION

IF bypass valve jack demand is greater than 0% **AND** the bypass jack *CLOSED* light indication is **NOT** lit, **THEN** bypass valves will automatically open when the low vacuum condition has cleared.

R34 5.3.16 **ENSURE** the Bypass Valve Opening Jack device is run down to the minimum setting as follows:

1. **DEPRESS** the Bypass *DECREASE* push button **UNTIL** the *CLOSED* (green) indicator is lit. _____

2. **CONFIRM** the *BYP VLV OPENING JACK* meter indicates approximately zero percent (0%). _____

CAUTION

Once vacuum is raised above the low vacuum turbine trip setpoint, the trip is armed. **IF** for any reason, such as cycling MVPs, vacuum decreases below the trip setpoint, **THEN** the turbine will trip. **IF** in shell or chest warming, **THEN** a restart of these will be required.

5.3.17 **PERFORM** the following to place the vacuum pump in service:

1. **ENSURE** the Heater Drain System is secured from cold cleanup in accordance with 1(2)OP-35. _____

2. **PLACE** the condenser hogging valve control switch in *HOG*. _____

3. **ENSURE** *CONDENSER HOGGING VALVE, OG-V7*, opens. _____

5.0 PROCEDURAL STEPS

<u>Initials</u>

4. **ENSURE** *VACUUM PUMP 1A(2A)* starts. _____

5. **ENSURE** *VACUUM PUMP 1B(2B)* starts. _____

5.3.18 **IF** the second vacuum pump is **NOT** required, **THEN** **PLACE** its control switch to *STOP*. _____

> **CAUTION**
>
> Excessive seal water flow will damage the mechanical vacuum pump seals by forcing the mechanical vacuum pump to pump water. Seal water flow should be between 1.5 and 2 gpm.

5.3.19 **CONFIRM** seal water flow to the operating vacuum pumps is between 1.5 and 2 gpm:

1. *VACUUM PUMP 1A(2A)*. _____

2. *VACUUM PUMP 1B(2B)*. _____

> **NOTE:** The Off-Gas H_2/O_2 Analyzers, *OG-AIT-4284* and *OG-AIT-4324*, may be placed in operation in accordance with 1(2)OP-30, at any time after I&C Maintenance reports the analyzers are ready for operation; however, they are **NOT** required to be in operation until the SJAE is placed in service.

> **CAUTION**
>
> The mechanical vacuum pump motor will overload if it is operated for prolonged periods of time at greater than 23 inches Hg vacuum.

5.3.20 **WHEN** condenser vacuum has been established, **THEN NOTIFY** I&C Maintenance to perform any necessary adjustments, calibrations, and surveillances to ensure the Off-Gas H_2/O_2 Analyzers, *OG-AIT-4284* and *OG-AIT-4324*, are ready for operation. _____

5.0 PROCEDURAL STEPS

Initials

5.3.21 **ENSURE** *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, is closed. _____

NOTE: To ensure full closure of *FW HTR 4A INLET VLV, FW-V118*, **AND** *FW HTR 4B INLET VLV, FW-V119*, the associated control switch must be held in *CLOSE* for at least 20 seconds after receiving full closed indication.

CAUTION

To minimize the possibility of addition of cold feedwater into the reactor, *FW HTRS 4 & 5 BYP VLV, FW-V120, FW HTR 4A INLET VLV, FW-V118*, **AND** *FW HTR 4B INLET VLV, FW V119* must be fully closed prior to opening *FEEDWATER ISOL VLV, B21-F032A* **OR** *FEEDWATER ISOL VLV, B21-F032B*. **WHEN** these valves are closed, the associated control switch must be held in *CLOSE* for at least 20 seconds after receiving full closed indication. **IF** any of these valves are already closed when this section is performed, **THEN** the associated valve control switch should be placed in *CLOSE* and the green light observed. **IF** the green closed light blinks, **THEN** the control switch should be held in *CLOSE* for at least 20 seconds.

5.3.22 **ENSURE** *FW HTRS 4 & 5 BYP VLV, FW-V120*, is closed. _____

5.3.23 **ENSURE** *FW HTR 4A INLET VLV, FW-V118*, is closed. _____

5.3.24 **ENSURE** *FW HTR 4B INLET VLV, FW-V119*, is closed. _____

5.3.25 **PERFORM** the following to close the Startup Level Control Valve:

1. **ENSURE** *SULCV, FW-LIC-3269*, in *M* (manual). _____
2. **OBTAIN** display *VALVE DEM* on *SULCV, FW-LIC-3269*, using *SEL* pushbutton. _____
3. **DECREASE** *VALVE DEM* signal on *SULCV, FW-LIC-3269*, until *VALVE DEM* indicates 0%. _____

5.0 PROCEDURAL STEPS

Initials

NOTE: The CDD condensate conductivity should be less than 0.065 μmho/cm before commencing feeding the vessel. This limit may be waived with the permission of the Unit SCO and the E&RC Chemistry Supervisor. **WHEN** CDD vessel effluent is directed to the reactor vessel **OR** CDD influent conductivity is greater than 0.1 μmho/cm, **THEN** low flow through CDD vessels could result in higher than desirable pH and conductivity in the reactor vessel. **WHEN** *B21-F032A* or *B21-F032B* is open **AND** CDD influent conductivity is greater than 0.1 μmho/cm, **THEN** each in-service CDD vessel flow should be maintained at 2000-3000 gpm.

NOTE: Unit 1 only: **WHEN** opening valves *1-B21-F032A* and *1-B21-F032B*, the spring return control switch must be held in the *OPEN* position in order for the valve to stroke to the full open position. Valve open travel may be stopped by releasing the spring return control switch at any time during the valve stroke. Only momentary operation of the control switch in the *CLOSE* position is necessary to cause the valve to go full closed.

CAUTION

Addition of cold feedwater into the reactor may cause significant reactor power increases.

CAUTION

Unit 1 only: Valves *1-B21-F032A* and *1-B21-F032B* are NOT to be throttled. These valves are to be left in mid-position long enough to observe vessel level changes. At least 3 seconds should elapse between valve motor starts with no more than 6 starts in an hour. Frequent starting may cause motor overheating and thermal overload trips.

5.3.26	**OPEN** *FEEDWATER ISOL VLV, B21-F032A.*	___/___ Ind.Ver.
5.3.27	**OPEN** *FEEDWATER ISOL VLV, B21-F032B.*	___/___ Ind.Ver.
5.3.28	**REQUEST** Chemistry to assess the need for Boron sampling and analysis using 0AI-81 start-up guidelines for concentrations in the reactor.	_____
5.3.29	**PERFORM** the following to place the Startup Level Control Valve in service:	
1.	**IF** necessary, **THEN DEPRESS** *SEL* pushbutton on *SULCV, FW-LIC-3269*, until *VALVE DEM* is displayed.	_____

5.0 PROCEDURAL STEPS

Initials

2. **SLOWLY INCREASE** *SULCV FW-LIC-3269, VALVE DEM* signal to maintain reactor water level between 182 and 192 inches. ____

3. **IF** *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, malfunctions, **THEN THROTTLE OPEN** one or more of the following valves to maintain reactor vessel level at 182 through 192 inches:

   a. *FW HTRS 4 & 5 BYP VLV, FW-V120.* ____

   b. *FW HTR 4A INLET VLV, FW-V118.* ____

   c. *FW HTR 4B INLET VLV, FW-V119.* ____

4. **WHEN** reactor level is between 182 and 192 inches, **THEN PERFORM** the following to place the Startup Level Control Valve in automatic:

   a. **ENSURE** *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, in *M* (manual). ____

   b. **DEPRESS** *SEL* pushbutton on either *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *LVL ERROR* is displayed. ____

   c. **DEPRESS** *SEL* pushbutton on *MSTR RFPT SP/RX LVL CTL C32-SIC-R600*, until *SETPOINT* is displayed. ____

   d. **ADJUST** *SETPOINT* on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, until *LVL ERROR* display on selected *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, is approximately 0 inches. ____

   e. **DEPRESS** *A/M* pushbutton on *SULCV, FW-LIC-3269*, **AND CHECK** *A/M* indication changes to *A* (automatic). ____

   f. **SLOWLY ADJUST** *SETPOINT* on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, for desired level between 182 and 192 inches. ____

5.0 PROCEDURAL STEPS Initials

5.3.30 **WHEN** the Startup Level Control Valve is in service **AND** RWCU reject no longer required for reactor vessel level, **THEN ENSURE** the following valves are closed:

1. *ORIFICE BYPASS VLV, G31-F031.* _____

2. *RWCU REJECT FLOW CONTROL VLV, G31-F033.* _____

3. *REJECT TO CNDSR VLV, G31-F034.* _____

4. *REJECT TO RADWASTE VLV, G31-F035.* _____

NOTE: **IF** optimal control of *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, is desired, **THEN** the control band should be maintained between 25% and 55% on the controller output demand signal.

CAUTION

Opening *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, more than *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, may cause feedwater line depressurization and loss of flow to the reactor vessel.

5.3.31 **IF** desired, **THEN ADJUST** *FEEDWATER RECIRC TO CONDENSER VLV, FW-FV-177*, to maintain *STARTUP LEVEL CONTROL VALVE, FW-LV-3269*, output demand signal between 25% and 55%. _____

5.3.32 **WHEN** condenser vacuum is greater than 12 inches Hg, **THEN TEST** the operation of the Low Condenser Vacuum Switches *OG-PS-110* and *OG-PS-111* as follows:

1. **OPEN** one bypass valve 15% using the Bypass Valve Opening Jack. _____

2. **CLOSE** the bypass valve using the Bypass Valve Opening Jack. _____

5.0 PROCEDURAL STEPS

Initials

3. **CONFIRM** the following extraction steam line moisture removal valves are open:

   a. LP Turbine B 9th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *MVD-LV-267*. ____

   b. LP Turbine A 9th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *MVD-LV-266*. ____

   c. 4th Stage Extraction To FW Heater 5A Moisture Removal Valve, *MVD-LV-268*. ____

   d. 4th Stage Extraction To FW Heater 5B Moisture Removal Valve, *MVD-LV-269*. ____

   e. LP Turbine A 11th Stage Extraction Moisture Removal Valve, *LV-262*. ____

   f. LP Turbine A 11th Stage Extraction Moisture Removal Valve, *LV-263*. ____

   g. LP Turbine B 11th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *LV-264*. ____

   h. LP Turbine B 11th Stage Extraction To Heater Drains Deaerator Moisture Removal Valve, *LV-265*. ____

5.0 PROCEDURAL STEPS

Initials

> **NOTE:** Main turbine shell and chest warming should be performed concurrently with pressurizing of the reactor.

5.3.33 **WHEN** reactor pressure is greater than 60 psig, **THEN COMMENCE** shell/chest warming in accordance with 1(2)OP-26. ____

> **NOTE:** RCIC should be placed in Standby as soon as the low steam supply pressure isolation signal is reset but prior to 150 psig in accordance with Tech Spec 3.5.3. Reset value is 80-90 psig.

5.3.34 **WHEN** reactor pressure reaches approximately 85 psig, **THEN PLACE** RCIC in standby in accordance with 1(2)OP-16. ____

R30 5.3.35 **IF** the unit was in cold shutdown for longer than one week, **THEN NOTIFY** the Work Control Center to schedule a RCIC System Operability Test within one week. ____

5.3.36 **PLACE** the RFPT gland seals in operation in accordance with 1(2)OP-32. ____

NOTE: Main steam line temperature heatup rate is limited to less than or equal to 100°F an hour. Control of the heatup rate shall be accomplished by monitoring steam line pressure and utilizing steam tables. It should be assumed the steam is saturated steam. Pressure can be monitored from the Plant Process Computer.

NOTE: HPCI should be placed in Standby as soon as the Low steam supply pressure Isolation signal is reset, but prior to 150 psig in accordance with Tech Spec 3.5.1. Reset value is ≤ 138 psig.

5.3.37 **WHEN** reactor pressure reaches 120 - 140 psig, **THEN PERFORM** the following:

1. **ENSURE** *MAIN STEAM LINE DRAIN VLV, MVD-F021*, is closed. ____

2. **PLACE** HPCI in standby in accordance with 1(2)OP-19. ____

NOTE: **IF** the following periodic tests are **NOT** current, **THEN** the PTs should be performed at the indicated pressure:

Periodic Test	Turbine Inlet Pressure
1) 0PT-10.1.3, RCIC System Operability Test-Flow Rates at 150 Psig	135-165 psig*
	Reactor Pressure
2) 0PT-09.3, HPCI System-165 Psig Flow Test	150-180 psig**

*Complete within 24 hours after reactor pressure reaches 135 psig and prior to exceeding 165 psig.
**Complete within 48 hours after reactor pressure reaches 150 psig and prior to exceeding 180 psig.

5.0 PROCEDURAL STEPS

Initials

5.3.38 **IF** 0PT-10.1.3 is **NOT** current, **THEN RECORD** when reactor pressure reaches 135 psig to document the start of the 24-hour interval allowed to perform 0PT-10.1.3. _____

_______________ _______________
Date Time

5.3.39 **IF** 0PT-09.3 is **NOT** current, **THEN RECORD** when reactor pressure reaches 150 psig to document the start of the 48-hour interval allowed to perform 0PT-09.3. _____

_______________ _______________
Date Time

5.3.40 **WHEN** reactor pressure reaches 150 psig **AND** the main condenser vacuum is greater than or equal to 7.5 inches, **THEN CONFIRM** Turbine Bypass Valve No. 1 opens to prove operability of the pressure regulator. _____

CAUTION

Operation of the pressure regulator should be accomplished smoothly and slowly to avoid sudden oscillations of reactor water and power levels.

5.3.41 **MAINTAIN** the pressure regulator setpoint 15 to 20 psig above reactor pressure during heatup, (do **NOT** exceed 100°F an hour heatup rate). _____

5.3.42 **WHEN** reactor pressure reaches 150 psig, **THEN THROTTLE CLOSED** *STEAM SEAL BYPASS VALVE, MVD-S2*, as necessary to maintain seal header less than 4.0 psig. _____

5.3.43 Unit 2 Only: **ENSURE** *MN STM TO BPV CHEST DRN VLV, MS-V35*, is closed. _____

Unit 2 Only:

NOTE: Past history indicates the pressure sensing lines for Condenser Pressure Transmitters *2-B21-PT-N056 A-D* fill with condensate during shutdown periods. A pipe wrench will be required to remove the drain valve cap from *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026*, if draining is required.

NOTE: The *2-B21-PT-N056 A-D* sensing line slope was corrected to design in accordance with SPEC 248-117 under W/O 00069871 during the B215R1 outage. Condenser vacuum should be monitored during startup and an instrument channel check performed on *2-B21-PTM-N056 A(B,C,D)-1* to determine if this resolved the problem.

5.3.44 Unit 2 Only: **IF** condenser vacuum appears unstable **OR** a problem is indicated during the instrument channel check, **THEN PERFORM** the following to drain the condenser pressure sensing lines:

1. **ENSURE** the following low condenser vacuum bypass switches at Panels 2H12-P609 and 2H12-P611 are in *BYPASS*:

   - *LOW COND VAC LOGIC A, A71B-S34A* _____
   - *LOW COND VAC LOGIC C, A71B-S34C* _____
   - *LOW COND VAC LOGIC B, A71B-S34B* _____
   - *LOW COND VAC LOGIC D, A71B-S34D* _____

2. **REMOVE** drain valve cap from *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026.* _____

5.0 PROCEDURAL STEPS

Initials

3.	**SLOWLY OPEN** *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026.*	____
4.	**ALLOW** line to drain to condenser for 30 seconds.	____
5.	**CLOSE** *2-B21-PT-N056A AND N056B INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1026.*	__/__ Ind.Ver.
6.	**REPLACE** drain valve cap **AND CHECK** for vacuum leaks.	____
7.	**REMOVE** drain valve cap from *2-B21-PT-N056C AND N056D INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1028.*	____
8.	**SLOWLY OPEN** *2-B21-PT-N056C AND N056D INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1028.*	____
9.	**ALLOW** line to drain to condenser for 30 seconds.	____
10.	**CLOSE** *2-B21-PT-N056C AND N056D INSTRUMENT LINE DRAIN VALVE, 2-B21-IV-1028.*	__/__ Ind.Ver.
11.	**REPLACE** drain valve cap **AND CHECK** for vacuum leaks.	____

R28

CAUTION

Reactor pressure shall **NOT** be allowed to exceed 500 psig with the low condenser vacuum bypass switches in *BYPASS*. Reference UFSAR 7.3.1.1.6.20 (UFSAR Change 97-FSAR-153).

R28 5.3.45 **WHEN** main condenser vacuum is 15 in. Hg or greater, **THEN PERFORM** the following:

1. **CONFIRM** the following:

   a. Condenser vacuum is greater than 15 inches Hg. _____

   b. *GRP I ISOL LOGIC A/C TRIPPED* (A-05 5-3), is clear. _____

   c. *GRP I ISOL LOGIC B/D TRIPPED* (A-05 5-4), is clear. _____

   d. *MSIV AC LOGIC* and *MSIV DC LOGIC* lights on Panels H12-P622 and H12-P623 are on. _____

2. **PLACE** the following low condenser vacuum bypass switches at Panel H12-P609 to *NORMAL* **AND REMOVE** the associated keys:

   a. *LOW COND VAC LOGIC A, A71B-S34A.* _____

   b. *LOW COND VAC LOGIC C, A71B-S34C.* _____

3. **CONFIRM** the following Panel H12-P609 main steam isolation valve low vacuum trip relays are energized (pulled in from the stop screws):

   a. *A71B-K10A.* _____

   b. *A71B-K10C.* _____

5.0 PROCEDURAL STEPS

Initials

4. **PLACE** the following low condenser vacuum bypass switches at Panel H12-P611 to *NORMAL* **AND REMOVE** the associated keys:

   a. *LOW COND VAC LOGIC B, A71B-S34B.* _____

   b. *LOW COND VAC LOGIC D, A71B-S34D.* _____

5. **CONFIRM** the following Panel H12-P611 main steam isolation valve low vacuum trip relays are energized (pulled in from the stop screws):

   a. *A71B-K10B.* _____

   b. *A71B-K10D.* _____

> **NOTE:** **WHEN** reactor pressure reaches 200 psig, **THEN** a steam jet air ejector should be placed in service.

5.3.46 **CLOSE** the following drain valves:

1. *STM TO SJAE DRAIN VLV, MS-V36.* _____

2. *SJAE NORMAL PRV DRAIN VLV, SJE-V8.* _____

3. *SJAE ALT PRV DRAIN VLV, SJE-V9.* _____

5.0 PROCEDURAL STEPS

Initials

5.3.47 **PLACE** an off-gas train in operation in accordance with 1(2)OP-30. _____

5.3.48 **PLACE** the AOG Charcoal Absorber System in service in accordance with 1(2)OP-33. _____

5.3.49 **WHEN** condenser vacuum is greater than or equal to 20" Hg, **THEN CLOSE** *SPE A(B) SHELL DRAIN VALVE, MVD-V39(MVD-V42)* and *SPE A(B) SHELL DRAIN VALVE, MVD-V40(MVD-V43).* _____

5.3.50 **WHEN** reactor pressure reaches 250 psig, **THEN ALLOW** a turbine bypass valve to come open at least 20% to prevent reactor power oscillations due to variation in RFP steam demand. _____

5.3.51 **IF** any SRV tailpipe temperature is more than 50°F greater than the average of the others when reactor pressure reaches 250 psig, **THEN IMMEDIATELY CONTACT** Engineering for guidance. _____

CAUTION

A reactor feed pump should be placed in service at 250 psig. A reactor pressure of approximately 300-350 psig exceeds the condensate booster pump discharge head requiring a reactor feed pump in service to ensure a continued source of feedwater.

5.3.52 **PLACE** Reactor Feed Pumps in service in accordance with 1(2)OP-32. _____

5.0 PROCEDURAL STEPS

Initials

NOTE: The nominal setpoint of the pressure regulator is 928 psig for Unit 1 and 945 psig for Unit 2, as read on the plant computer or Control Room pressure indication. Pressure may be raised as high as necessary to accommodate testing, but must be reduced to the nominal setpoint before rolling the main turbine.

NOTE: ERFIS computer points EHCPA002 and EHCPA003, on Group Point Display # 38, can be accessed to more precisely adjust the pressure regulator setpoint.

CAUTION

WHEN raising reactor pressure using pressure set, **THEN** depressing the push button for long periods of time could cause a reactor scram due to power spikes.

5.3.53 **WHEN** one reactor feedpump is in operation, **THEN** **INCREASE** the setpoint of the pressure regulator to 928 psig for Unit 1 or 945 psig for Unit 2, while maintaining a heatup rate of less than 100°F an hour. _____

5.3.54 **PLACE** Zinc Injection System (GEZIP) in service in accordance with 1(2)OP-32. _____

5.3.55 **WHEN** reactor pressure reaches 400 psig, **THEN** **ENSURE** *STEAM SEAL BYPASS VALVE, MVD-S2*, is closed **AND** Steam Seal System operating in accordance with 1(2)OP-26.1. _____

5.3.56 **WHEN** reactor pressure reaches 500 psig, **THEN** **ENSURE** the following valves are closed:

1. *MAIN STEAM LINE DRAIN VLV, MS-F038A.* _____
2. *MAIN STEAM LINE DRAIN VLV, MS-F038B.* _____
3. *MAIN STEAM LINE DRAIN VLV, MS-F038C.* _____
4. *MAIN STEAM LINE DRAIN VLV, MS-F038D.* _____
5. *MAIN STEAM LINE DRAIN OTBD ISOL VLV, B21-F019.* ___/___ Ind.Ver.

 Initials

6. *MAIN STEAM LINE DRAIN INBD ISOL VLV, B21-F016.* ___/___ Ind.Ver.

5.3.57 **WHEN** Reactor Feedpump discharge pressure is greater than 900 psig, **THEN PLACE** *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, in *A* (automatic) as follows:

1. **ENSURE** *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, in *M* (manual). ____

2. **ENSURE** *FEEDWATER CONTROL MODE SELECT* in *1 ELEM.* ____

3. **DEPRESS** *SEL* pushbutton on *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *A(B) BIAS* is indicated **AND ENSURE** bias is set to 0%. ____

4. **DEPRESS** *SEL* pushbutton on *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *PMP A(B) DEM* is displayed. ____

5. **DEPRESS** *SEL* pushbutton on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, until *MASTR DEM* is displayed. ____

6. **SET** *MASTR DEM* to equal *PMP A(B) DEM* value displayed on *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, using the raise and lower pushbuttons on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600.* ____

7. **DEPRESS** *A/M* pushbutton on *RPFT A(B) SP CTL, C32-SIC-R601A(B)*, **AND CHECK** the indicator on control station changes to *A* (automatic) **AND** *PMP DEM* signal remains unchanged. ____

8. **DEPRESS** *SEL* pushbutton on the out-of-service *RFPT A(B) SP CTL, C32-SIC-R601A(B)*, until *LVL ERROR* is indicated **AND CHECK** *LVL ERROR* is approximately 0 inches. ____

9. **DEPRESS** *A/M* pushbutton on *MSTR RFPT SP/RX LVL CTL, C32-SIC-R600*, **AND CHECK** the indicator on the control station changes to *A* (automatic). ____

5.0 PROCEDURAL STEPS

<u>Initials</u>

10. **ENSURE** *PMP A(B) DEM* and *VALVE DEM* signals remain unchanged. _____

11. **DEPRESS** *A/M* pushbutton on *SULCV, FW-LIC-3269,* **AND CHECK** the indicator on the control station changes to *M* (manual). _____

CAUTION

Momentarily depressing the raise or lower pushbuttons on *FW-LIC-3269* will cause valve demand to change in increments of 0.1%. Continually depressing the raise or lower pushbuttons will cause valve demand to change at an exponential rate.

12. **SLOWLY OPEN** *SULCV*, using raise pushbutton on *FW-LIC-3269*, until *VALVE DEM* is 100% **AND CHECK** reactor water level is being maintained between 182 and 192 inches. _____

NOTE: **IF** the following periodic tests are **NOT** current, **THEN** the PTs should be performed at the indicated reactor pressure. Reactor pressure may be increased using pressure set to facilitate required test pressure.

Periodic Test	Reactor Pressure
1) 0PT-10.1.1, RCIC System Operability Test	945-1045 psig*
2) 0PT-09.2, HPCI System Operability Test	945-1045 psig**
3) 0PT-11.1.2, Automatic Depressurization System and Safety Relief Valve Operability Test	945-1045 psig***

*Complete within 24 hours after reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2.
**Complete within 48 hours after reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2.
***Complete within 12 hours after reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2.

5.0 PROCEDURAL STEPS

Initials

5.3.58 **IF** 0PT-11.1.2 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2 to document the start of the 12-hour interval allowed to perform 0PT-11.1.2. _____

_______________ _______________
Date Time

5.3.59 **IF** 0PT-10.1.1 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2 to document the start of the 24-hour interval allowed to perform 0PT-10.1.1. _____

_______________ _______________
Date Time

5.3.60 **IF** 0PT-09.2 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig for Unit 1 or 945 psig for Unit 2 to document the start of the 48-hour interval allowed to perform 0PT-09.2. _____

_______________ _______________
Date Time

Date/Time Completed _______________

Performed By (Print)	Initials

Reviewed By: _______________
Unit SCO

COMMENTS

____

____

____

R37

NRC Licensed Personnel Instructions for Reactor Startup

1.0 PURPOSE

This appendix to 0GP-02 is provided to give instruction for NRC licensed personnel to follow during a reactor startup evolution.

2.0 CONTROL ROOM DISCIPLINE

2.1 During the approach to criticality, the teller's window for the affected unit should be closed and a note attached to the window stating "reactor startup in progress." This will prevent unnecessary confusion and distraction for Control Room personnel. The SRO in charge of the Work Control Center should **NOT** authorize MSTs, PTs, or maintenance, etc., **NOT** directly associated with the reactor startup.

2.2 Prior to the withdrawal of control rods to bring the reactor to criticality, the Unit SCO should conduct a "pre-evolution" briefing with the Control Operators and all personnel in the Control Room on the affected unit (i.e., OJT trainees, extra SROs, etc.). This briefing should include the following:

1. Discussion concerning appropriate conservative actions (i.e., repositioning of further control rods in the case of inaccurate ECPs, manual scram, etc.) in the event of an unexpected situation with respect to reactivity, criticality, power level, or any other anomalous behavior of the reactor core. Additionally, the need for strict procedural compliance during withdrawal of control rods must be stressed.

2. Discussion of any inoperable nuclear instrumentation and related LCO requirements.

3. Discussion of any unusual plant conditions surrounding the startup which may require extra attentiveness and assignment of individuals to these tasks.

2.3 As determined by the Unit SCO in charge of startup, shift turnover for those persons directly involved with bringing the reactor critical will be permitted **ONLY** when the reactor is stable (i.e., prior to the approach to criticality or after reaching the point of adding heat).

R37

NRC Licensed Personnel Instructions for Reactor Startup

2.4 The Control Operators responsibilities for startup are delineated in 0OI-01.01. These job functions should be strictly adhered to during the unit startup/synchronization. During the approach to criticality, it is especially important **NOT** to distract the Control Operator responsible for reactivity manipulations.

3.0 RESPONSIBILITIES FOR THE APPROACH TO CRITICALITY

IF a trainee is involved with control rod withdrawal during the reactor startup, **THEN** the Control Operator responsible for reactivity manipulations will maintain absolute and positive control over the OJT trainee individual. **IF** there is more than one OJT trainee allowed in the Control Room for startup, **THEN** only one OJT trainee may be directly involved with repositioning control rods under the strict supervision of the licensed Control Operator.

4.0 ACHIEVING CRITICALITY

Prior to the withdrawal of control rods to bring the reactor to criticality, nuclear instrumentation recorders (SRM/IRM) should be checked per 0OI-01.02 for operability. The guidelines listed below should be followed during the approach to criticality:

4.1 During control rod withdrawal the Control Operator should continuously monitor the following instrumentation:

- SRM Period Meters *C51-R601*
- SRM Count Level Meters *C51-R600*
- SRM Recorder *C51-R602*

This will allow early detection of errors associated with the estimated critical position and nuclear instrumentation:

4.2 During the approach to criticality, "source range doubling" must be used as a method of monitoring for criticality.

As a rule of thumb, five "doubles" in the neutron count rate will yield criticality; however, this rule may **NOT** always hold true due to initial core conditions and time between control rod withdrawal.

R37 **NRC Licensed Personnel Instructions for Reactor Startup**

Upon achieving three SRM "doublings" in the neutron count rate, control rod withdrawal should be in the single notch mode for all subsequent rods unless continuous withdrawal is recommended by the Reactor Engineer and approved by the Unit SRO. The single notch withdrawal requirement is also applicable to all high worth control rods, as designated by the Reactor Engineer, regardless of the SRM count rate or number of "doublings".

4.3 The estimated critical position (ECP) is a rough approximation of the control rod positioning needed to achieve criticality of the reactor. This estimate should **NOT** be relied upon for the approach and declaration of criticality. **IF** criticality occurs before the lower range, or does **NOT** occur prior to the upper range of the ECP, **THEN** the operator shall insert control rods in accordance with the 0GP-10 sequence sheets to less than three doubles of the SRM counts. The Reactor Engineer and Nuclear Fuels personnel should be contacted immediately. Nuclear Fuels will examine the subcritical data and recommend a course of action. The margin to criticality should be determined by the Reactor Engineer and should include factors such as moderator temperature, fuel temperature, and Xenon.

4.4 While repositioning control rods, time must be taken to initial GP-10 steps and to monitor all operable nuclear instrumentation. This time allocation will provide pauses in the approach to criticality, which allows for neutron level stabilization while the reactor is still subcritical.

5.0 POWER INCREASE AFTER CRITICALITY

5.1 IRM and APRM instruments should be monitored while withdrawing control rods to open bypass valves.

5.2 Heatup of the reactor coolant system with reactor heat should be coordinated with the BOP operator to prevent the reactor coolant system from being heated at a faster rate than the BOP can be placed in service.

5.3 1(2)PT-01.7, Heatup/Cooldown Monitoring, shall be initiated during reactor coolant system heatup to confirm compliance with Technical Specification SR 3.4.9.1.

REVISION SUMMARY

Revision 77 drains both SPE's inlet piping during startup.

Revision 76 adds Notes and Cautions regarding operation of Unit 1 B21-F032A and B valves following removal of seal-in on valve open stroke iaw EC 46918; changed initial pressure set value to 928 psig for Unit 1 iaw EC 50552; deleted Caution regarding possible scram during turbine warming, bypass switches installed iaw EC 50051; clarified the degree to which a bypass valve should be opened to coincide with prerequisites in 0GP-03; added applicable TS LCO if IRM/SRM overlap not established; deleted reference to 0-40 scale on IRMs when verifying overlap since digital readouts 0-125 scale is normally used

Revision 75 identifies instruments to be used to confirm pressure/temperature coordinates on Tech Spec Figure 3.4.9-2 prior to startup.

Revision 74 incorporated changes for the following: 1) EC 47894, Seismic Qualification for EPU & AST, and 2) EC 46730, Replacement of Unit 2 Power Range Neutron Monitoring System.

Revision 73 added changes to open the MVD-V51(MVD-V52) prior to starting the associated SPE A (B). The float trap isolation valve is maintained closed when the associated SPE A (B) is out of service and only open when the associated SPE is in service to prevent loss of the loop seal.

Revision 72 incorporated changes for ESR 00-00442, Unit 1 Replacement of the Power Range Neutron Monitoring System, and ESR 01-00188, which established an alternate leakage path for directing Unit 1 post-LOCA MSIV/Steam Line Drain Valve Leakage to the condenser that required MVD-F021 to be closed prior to exceeding 140 psig reactor pressure.

Revision 71 incorporated the following:

1. Added SOER 88-2 to references and annotated appropriate steps,
2. Incorporated FSAR change to address 1SJAE operation at 100% (AR 00024816),
3. AR 00030042 added a caution concerning the steps to ensure FW-V118, FW-V119 and FW-V120 are closed prior to opening B21-F032-A/B,
4. AR 00028144 to add steps to calculate "three and five SRM doublings" and record the calc results (calcs to be independently verified).

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM2ROCOO

LESSON TITLE: Core Performance Parameter Check.

REVISION NO: 0

RECOMMENDED BY: Curt Robert
Instructor/Developer Date

CONCURRENCE BY: ______________________
Line Superintendent/Supervisor Date

APPROVED BY: ______________________
Superintendent/Supervisor Training Date

SAFETY CONSIDERATIONS:

1. None.

EVALUATOR NOTES: (Do not read to performer)

1. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the performer.
2. **START LOCATION:** This JPM can be performed at any location because it is an administrative task.
3. **PROVIDE A COPY:** Evaluator may provide 2PT-01.11, Core Performance Parameter Check. Provide Core Performance Log to be used for performance of 2PT-01.11 and ensure that CMFLPD is >1.0.
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is not a time critical JPM.

Read the following to the JPM performer.

TASK CONDITIONS:

1. Unit Two (2) is operating at rated power and the CODSR requires performance of 2PT-01.11 Core Performance Parameter Check.
2. All applicable prerequisites of 2PT-01.11 are met.
3. The Core Performance Log program has been executed and the edit printout provided should be used to complete 2PT-01.11.
4. There are no Failed Sensors.
5. If independent verification is required, assume the verification is complete as applicable.

INITIATING CUE:

The Unit SCO directs you to perform 2PT-01.11, Core Performance Parameter Check.

Circle any parameter on the Core Performance Log that you check during performance of 2PT-01.11.

Inform the SCO of the results upon completion by documenting results on Attachment 1, Certification and Review Form as follows.

"General Comments and Recommendations"

"Exceptions to satisfactory performance"

State whether Technical Specifications are met or not met.

You may leave the "Corrective action required" line on Attachment 1 blank as the SCO will make this determination if necessary.

PERFORMANCE CHECKLIST

NOTE: Sequence is assumed unless denoted in the **Comments**.
Comments required for any step evaluated UNSAT.

START TIME: ___________

PERFORMANCE CHECKLIST

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

PROMPT: Provide the Core Performance Log edit before administering this JPM for use throughout the remainder of this JPM.

NOTE: If desired, the examiner may provide a copy 2PT-01.11 to the examinee.

Step 1 - Obtain a current revision of 2PT-01.11.
Current Revision of 2PT-01.11 obtained and verified, if applicable.

SAT/UNSAT*

Step 2 – Locate WTFLAG on the Core Performance Log and proceed with step 7.1.5.
WTFLAG determined to equal 2, proceeds to Step 7.1.5 of 2PT-01.11.

.

SAT/UNSAT*

Step 3 – Determine if criteria listed in Section 6.1 of 2PT-1.11 are met.
Checks core performance log and verifies values for CMFLCPR CMAPRAT ≤1.00.

SAT/UNSAT*

Step 4 – Determine if the acceptance criteria listed in Section 6.2 of 2PT-01.11 are satisfied.
Determines APRMS 1, 2, 3, and 4.

*** SAT/UNSAT***

Step 5 – Determine if CMFLPD is > 1.00.
Checks core performance log and determines value for CMFLPD is >1.00. Should document this result in the General Comments and Recommendations section or Exception to satisfactory performance lines of Attachment 1.

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

NOTE:	**The Following Step** is likely already performed and is NOT required to be completed again.

Step 6 - Verify acceptance criteria listed in Section 6.0 met satisfactorily.
Acceptance criteria determined to be satisfactory.

*** SAT/UNSAT***

Step 7 - Notify Unit SCO that 2PT-01.11 is completed with *CMFLPD >1.00.*
SCO notified that 2PT-01.11 is completed with CMFLPD >1.00. 2PT-01.11 is UNSAT but Technical Specifications are met.

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

TERMINATING CUE: When 2PT-01.11 has been completed, this JPM is complete.	

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

STOP TIME: __________

RELATED TASKS:
299201B201: Perform Daily Surveillance Report Per OI-3.1 Or OI-3.2.

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.7 3.7/4.4
Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation.

GEN 2.1.19 3.0/3.0
Ability to use plant computer to obtain and evaluate parametric information on system or component status.

REFERENCES:

2PT-01.11 CORE PERFORMANCE PARAMETER CHECK

TOOLS AND EQUIPMENT:

None.

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

Generic (Administrative)

REASON FOR REVISION:

New for use on 2004 NRC exam.

Time Required for Completion: **10 Minutes** (approximate).

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate x Actual __ Unit: ____

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

Time Critical: Yes ___ No x Time Limit **NA**

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

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Unit Two (2) is operating at rated power and the CODSR requires performance of 2PT-01.11 Core Performance Parameter Check.
2. All applicable prerequisites of 2PT-01.11 are met.
3. The Core Performance Log program has been executed and the edit printout provided should be used to complete 2PT-01.11.
4. There are no Failed Sensors.
5. If independent verification is required, assume the verification is complete as applicable.

INITIATING CUE:

The Unit SCO directs you to perform 2PT-01.11, Core Performance Parameter Check.

Circle any parameter on the Core Performance Log that you check during performance of 2PT-01.11.

Inform the SCO of the results upon completion by documenting results on Attachment 1, Certification and Review Form as follows.

"General Comments and Recommendations"

"Exceptions to satisfactory performance"

State whether Technical Specifications are met or not met.

You may leave the "Corrective action required" line on Attachment 1 blank as the SCO will make this determination if necessary.

BF WICK-2 WK-0430 04JUL22-09.32.51 27960 MWD/MTU RIGR=USER REV-JAN03

CORE PERFORMANCE LOG — LONG EDIT

B2C16 BOC TO 16000 MWD/MT ODYNB POW DEP MCPR

CALCULATION TYPE : NORMAL	CONVERGENCE : TIGHT	SYMMETRY : FULL	
CTP CALCULATION : HEAT BALANCE		CYCLE : 16	

STATE CONDITIONS		FLOW RATES		CORE PARAMETERS		NUCLEAR LIMITS		LOCATION
GMWE	938.34	WT	77.1	CMEQ	0.2600	P-PCS	1.02	27-26-05
CMWT	2802.5 (95.9%)	WTSUB	75.41	CAEQ	0.1476	FCBB	2.530	
PR	1044.1 PSIA	WTFLAG	2	CAQA	0.1471	CMPF	2.873	35-12-10
DHS	21.06	WFW	11.03	CAVF	0.4579	CMFLCPR	0.921	27-24
WT	77.11 (100.1%)	WD	33.10	CAPD	51.6674	P=1.432	F=1.260	
CRD	0.0742			RWL	185.4821	CMAPRAT	0.906	33-10-10
CYCEXP	0 MWD/MTU	ERATIO	0.99	CDLP	17.4552	P=1.000	F=1.000	
AVG:	0.00%	MAX:	0.00%	KEFF	1.0016	CMFLPD	1.012	35-12-10
						CMFLEX	0.782	45-44-05

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12
AXIAL REL POWER	0.60	1.31	1.39	1.36	1.38	1.31	1.17	0.95	0.88	0.76	0.58	0.31
REGION REL POWER	0.91	1.03	0.91	1.02	1.18	1.02	0.90	1.02	0.91			
RING REL POWER	1.13	1.28	1.12	1.15	1.13	1.08	0.68					
APRM GAFS	0.99	0.99	0.99	0.99								

CORE MINIMUM CPR/LOCATION: 1.5549 LOC 39-24

*********************** THE 10 MOST LIMITING BUNDLES ************************

FLCPR	LOC	CPR	LIMIT	APRAT	LOC	APLHGR	LIMIT	FLPD	LOC	LPD	LIMIT
0.921	27-24	1.555	1.432	0.906	33-10-10	8.51	9.40	1.012	35-12-10	13.56	13.40
0.920	29-26	1.557	1.432	0.899	09-20-10	8.45	9.40	0.982	29-22-04	13.16	13.40
0.918	37-40	1.559	1.432	0.888	39-42-04	8.35	9.40	0.972	33-10-10	13.03	13.40
0.914	29-22	1.566	1.432	0.885	35-12-10	8.39	9.48	0.969	31-24-04	12.98	13.40
0.914	39-38	1.567	1.432	0.882	29-22-04	8.39	9.51	0.966	11-18-10	12.94	13.40
0.913	31-24	1.567	1.432	0.881	41-40-04	8.28	9.40	0.962	27-24-04	12.89	13.40
0.905	33-14	1.582	1.432	0.880	31-24-04	8.37	9.51	0.953	39-42-04	12.77	13.40
0.901	13-20	1.589	1.432	0.879	41-36-10	8.33	9.48	0.943	29-26-04	12.64	13.40
0.901	21-16	1.590	1.432	0.878	27-24-04	8.35	9.51	0.938	09-20-10	12.57	13.40
0.900	37-10	1.591	1.432	0.877	29-26-04	8.34	9.51	0.937	41-40-04	12.55	13.40
# ASSYS W LIMITS > 1				FLCPR	0	APRAT	0	FLPD	1		

***************** NUCLEAR LIMITS BY REGION *************************

7		8		9	
0.898	13-38	0.918	33-40	0.918	37-40
0.966	11-36-10	1.012	35-12-10	0.847	35-42-10
0.906	11-36-10	0.936	33-44-10	0.888	39-42-10
4		**5**		**6**	
0.901	13-20	0.921	27-24	0.899	39-20
0.938	09-20-10	0.982	29-22-04	0.966	43-34-10
0.899	09-20-10	0.882	29-22-04	0.903	43-34-10
1		**2**		**3**	
0.901	15-14	0.905	33-14	0.903	37-14
0.810	17-12-10	0.972	33-10-10	1.012	35-12-10
0.880	17-12-10	0.906	33-10-10	0.885	35-12-10

****
* MFLCPR *
* MFLPD *
* MAPRAT *
****

CP&L | CAROLINA POWER & LIGHT COMPANY
BRUNSWICK NUCLEAR PLANT | **C**
Continuous Use

DATE COMPLETED ____________________
UNIT __2__ % PWR______________ GMWE______
SUPERVISOR____________________
REASON FOR TEST (check one or more)
__ Routine Surveillance
__ W/O # ____________________
__ Other (explain)

FREQUENCY:

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

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

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
2

2PT-01.11

CORE PERFORMANCE PARAMETER CHECK

REVISION 1

1.0 PURPOSE

This PT provides a procedure for obtaining the basic core performance parameters required by Technical Specifications and calibrates APRM channels to read greater than or equal to actual core thermal power. The procedure satisfies Technical Specifications SR 3.2.1.1, SR 3.2.2.1, SR 3.3.1.1.3.

2.0 REFERENCES

2.1 Technical Specifications

2.2 NEDE-24011-P-A (GESTAR II), Amendment 19

2.3 NRC Generic Letter 88-16, Removal of Cycle-Specific Parameter Limits from Technical Specifications

2.4 Core Operating Limits Report

2.5 Letter, L. M. Quintana to B. A. Morgan, "Linear Heat Generation Rate Monitoring," October 9, 1989, LMQ: 89-241

2.6 0OI-72, Plant Process Computer System Operating Instruction

2.7 0OP-55, Process and ERFIS Computer System Operating Procedure

2.8 0PT-01.8C, Hand Calculation of AGAFs

2.9 0PT-01.8D, Core Thermal Power Calculation

2.10 0ENP-24.19, Operation of the BWR Process Computer Backup Program

2.11 2OP-09, Neutron Monitoring System Operating Procedure

2.12 GE SIL 516 Supplement 1, Recirculation Drive Flow/Core Flow Correlation

2.13 NEDO-32465-A, Licensing Topical Report: Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applicability GE Nuclear Energy, August 1996.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Special care should be taken in verifying data. Errors on the nonconservative side could cause operation that might lead to a violation of Technical Specifications.

3.2 **IF** the value of a core performance parameter exceeds its limits, **THEN** the Unit SCO should be immediately notified.

3.3 During APRM gain adjustments, the plant should be held at a steady state operating condition. During APRM gain adjustments, the affected APRMs may be bypassed.

3.4 **IF** APRM gain adjustments are made, **THEN** Independent Verification is required.

3.5 **IF** measured core flow (WT) is less than core flow calculated from WD (WTSUB), **AND** if the difference can be attributed to operation on a rod line above the rated line, **THEN** the measured core flow value may be manually entered into the process computer if determined to be appropriate by the Reactor Engineer.

4.0 PREREQUISITES

Thermal power is greater than or equal to 23%.

5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 ACCEPTANCE CRITERIA

NOTE:	Attachment 3 contains definitions and abbreviations of terms.

6.1 This PT is acceptable when it is shown by the certifying signature that the parameters have been obtained correctly according to this instruction and these conditions exist:

6.1.1 CMFLCPR is less than or equal to 1.0 (See Attachment 2, Note N4, for parameter location on the core performance edit).

6.1.2 CMAPRAT is less than or equal to 1.0 (See Attachment 2, Note N3, for parameter location on the core performance edit).

6.2 At least three operable APRMs are adjusted such that the APRM gain adjustment factors (GAFs) are less than or equal to 1.00. The APRM gain adjustment factor is determined by either the periodic NSS Core Performance Log (Attachment 2, Note N2), Display 820 (Heat Balance/Core Mon), or hand calculation of AGAFs (0PT-01.8C). **IF** APRM gain adjustments are performed, **THEN** the postadjustment AGAFs are verified by a second Display 820 or 0PT-01.8C.

7.0 PROCEDURAL STEPS

Initials

> **NOTE:** Attachments 2 and 3 may be discarded after completion of test.
>
> **NOTE:** **IF** unable to obtain the required process computer edits, **THEN** the On-Shift Reactor Engineer should be contacted prior to performance of Section 7.2.

7.1 Using the Process Computer

> **NOTE:** Plant process computer operating instructions and report codes are contained within procedures 0OI-72 and 0OP-55.

7.1.1 **OBTAIN** an edit of the process computer core performance program. _____

7.1.2 **IF** there are failed inputs on the failed sensor list, **THEN** **ENSURE** correct values have been substituted where appropriate. _____

7.1.3 **LOCATE** WTFLAG on the Core Performance Log (Attachment 2, N16): _____

1. **IF** WTFLAG is equal to 2, **THEN GO TO** Step 7.1.5. _____

2. **IF** WTFLAG is **NOT** equal to 2, **THEN NOTIFY** the On-Shift Reactor Engineer to evaluate if core flow is accurate for thermal limit calculations (Precaution 3.5). _____

7.1.4 **IF** core flow was changed by the Reactor Engineer in Step 7.1.3, **THEN OBTAIN** a new Core Performance Log edit. _____

7.1.5 **DETERMINE** from the core performance edit, if criteria listed in Section 6.1 are met. (Locations on the core performance edit where thermal limit parameters are found are indicated on Attachment 2). _____

7.0 PROCEDURAL STEPS

Initials

7.1.6 **IF** limits specified in Section 6.1 are **NOT** satisfied, **THEN NOTIFY** the Unit SCO of the condition. _____

1. **NOTIFY** the On-Shift Reactor Engineer to take action to restore the thermal limits to acceptable values. _____

NOTE: Note N2 on Attachment 2 shows the location of the APRM GAFs. The APRMs are ordered: APRMs 1, 2, 3, 4.

7.1.7 **DETERMINE**, from the core performance edit, if Acceptance Criteria listed in Section 6.2 are satisfied (at least three APRM gain adjustment factors are less than or equal to 1.00). _____

7.1.8 **IF** an APRM gain adjustment is necessary, **THEN PERFORM** applicable section of 2OP-09. _____

7.1.9 **IF** an APRM gain change was performed, **THEN OBTAIN** from the process computer a copy of Display 820, Heat Balance/Core Mon, **OR PERFORM** 0PT-01.8C to ensure APRM GAFs satisfy the requirements of Acceptance Criteria, Section 6.2. ___/___ Ind.Ver.

7.1.10 **DETERMINE**, from the core performance edit, if CMFLPD is less than or equal to 1.00 (Attachment 2, Note N5, for CMFLPD location on the core performance edit). _____

7.1.11 **IF** CMFLPD is greater than 1.00, **THEN NOTIFY** the Unit SCO of the condition. _____

1. **NOTIFY** the On-Shift Reactor Engineer to take action to restore the limit to an acceptable value. _____

7.0 PROCEDURAL STEPS

Initials

7.1.12 **ENSURE** Acceptance Criteria listed in Section 6.0 have been satisfied. _____

7.1.13 **ATTACH** the collected edits. _____

7.2 Using a Process Computer Backup Program

NOTE: This section is performed only when Section 7.1 can **NOT** be completed. The On-Shift Reactor Engineer should be contacted to perform this section.

7.2.1 **PERFORM** 0PT-01.8D to calculate core thermal power. _____

NOTE: 0ENP-24.19 should be referenced for instructions on utilizing the backup program.

7.2.2 **OBTAIN** LPRM readings, control rod pattern, core flow, reactor pressure, and additional data as required by the computer backup program **AND RUN** the program. _____

7.2.3 **OBTAIN** the output of the backup program. _____

7.2.4 **DETERMINE** from the backup edit, if criteria listed in Section 6.1 are met. _____

7.2.5 **IF** limits specified in Section 6.1 are **NOT** satisfied, **THEN NOTIFY** the Unit SCO of the condition. _____

1. **RESTORE** thermal limits to acceptable values. _____

7.2.6 **PERFORM** 0PT-01.8C to determine if acceptance criteria listed in Section 6.2 are satisfied. _____

7.0 PROCEDURAL STEPS

Initials

7.2.7 **IF** an APRM gain adjustment is necessary, **THEN PERFORM** applicable section of 2OP-09. ____

7.2.8 **IF** an APRM gain change was performed, **THEN PERFORM** another 0PT-01.8C to ensure APRM gain adjustment factor satisfies the requirements of Acceptance Criteria, Section 6.2. ___/___ Ind.Ver.

7.2.9 **DETERMINE**, from the backup edit, if CMFLPD is less than or equal to 1.00. ____

7.2.10 **IF** CMFLPD is greater than 1.00, **THEN NOTIFY** the Unit SCO of the condition. ____

1. **RESTORE** the limit to an acceptable value (see definition for CMFLPD). ____

7.2.11 **ENSURE** Acceptance Criteria listed in Section 6.0 have been met satisfactorily. ____

7.2.12 **ATTACH** the backup program edits. ____

7.3 **ENSURE** the required information has been recorded on the cover page. ____

7.4 **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)
Test procedure 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

Limit Positions on the Core Performance Log – Long Edit

```
BRUNSWICK-1     WK-0303 03JAN15-10.52.53  7620 MWD/MTU  TRIGR=1HR     REV=SEP02

                         CORE PERFORMANCE LOG --- LONG EDIT
          B1C14 BOC TO EOFPC-2026MWD/MT ODYNB POW DEP MCPR
    CALCULATION TYPE : NORMAL        CONVERGENCE : TIGHT   SYMMETRY : FULL
    CTP CALCULATION  : HEAT BALANCE                         CYCLE :    14

 STATE CONDITIONS      FLOW RATES    CORE PARAMETERS  NUCLEAR LIMITS   LOCATION
  GMWE   926.54        WT       79.0  CMEQ    0.2740   P-PCS        1.86  35-26-15
N16  CMWT  2759.9 (94.4%) WTSUB  77.96  CAEQ    0.1535   FCBB        2.517        N8
  PR     1044.3 PSIA   WTFLAG      2  CAQA    0.1444   CMPF        2.793  11-12-04
  DHS     20.62        WFW     11.90  CAVF    0.4697   CMFLCPR     0.929  31-26   N4
  WT      79.03(102.6%) WD     34.71  CAPD   55.6943    P=1.466 F=1.260
  CRD    0.1144                       RWL   187.5547   CMAPRAT     0.917  39-42-04  N3
 CYCEXP  7620 MWD/MTU    ERATIO 0.99  CDLP   19.5695    P=1.000 F=1.000
 MEASURED/CALCULATED   LPRM READINGS  DPCC   24.9112   CMFLPD      0.861  11-12-04  N5
 AVG:  6.30%    MAX:   16.65%         KEFF    0.9945   CMFLEX      0.844  11-48-06

  LOCATION               1    2    3    4    5    6    7    8    9   10   11   12
  AXIAL REL POWER     0.65 1.39 1.41 1.27 1.14 1.08 1.07 1.02 1.00 0.87 0.71 0.38
  REGION REL POWER    0.93 1.01 0.92 1.02 1.18 1.03 0.91 1.00 0.92
  RING REL POWER      0.74 1.26 1.17 1.14 1.07 1.10 0.70
N2  APRM GAFS         1.00 1.00 0.97 0.99

  CORE MINIMUM CPR/LOCATION: 1.5776 LOC 31-26                            N17

                  ****** THE 10 MOST LIMITING BUNDLES ******
  FLCPR  LOC    CPR  LIMIT|APRAT     LOC   APLHGR LIMIT| FLPD     LOC      LPD  LIMIT
  ----- -----  ----- -----|-----  --------  ----- -----|-----  --------   -----  -----
  0.929 31-26 1.578 1.466|0.917 39-42-04  9.36 10.21|0.861 11-12-04 11.54 13.40
  0.917 29-24 1.598 1.466|0.911 41-40-04  9.42 10.34|0.849 07-32-04 11.38 13.40
  0.915 31-22 1.602 1.466|0.876 37-40-04  8.79 10.04|0.843 39-44-04 11.30 13.40
  0.908 33-24 1.614 1.466|0.873 39-38-04  8.84 10.13|0.843 43-40-04 11.30 13.40
  0.908 27-22 1.615 1.466|0.873 11-12-04  9.43 10.80|0.842 07-30-04 11.29 13.40
  0.898 37-24 1.632 1.466|0.864 07-32-04  9.33 10.80|0.838 39-40-04 11.23 13.40
  0.893 29-20 1.641 1.466|0.861 39-40-04  9.77 11.35|0.836 21-08-04 11.20 13.40
  0.881 23-16 1.664 1.466|0.856 39-44-04  9.24 10.80|0.828 29-46-04 11.10 13.40
  0.880 39-22 1.667 1.466|0.855 43-40-04  9.24 10.80|0.819 37-44-04 10.98 13.40
  0.868 21-14 1.689 1.466|0.854 07-30-04  9.22 10.80|0.817 43-38-04 10.95 13.40
  # ASSYS W LIMITS > 1    | FLCPR      0 | APRAT      0 | FLPD      0

                  ********* NUCLEAR LIMITS BY REGION *********
                  7             |        8          |        9
           0.840   13-40        |  0.867   29-38    |  0.844   39-40
           0.829  13-44-04      |  0.833  31-46-04  |  0.847  41-42-04
           0.905  13-42-04      |  0.846  31-46-04  |  0.917  39-42-04
           ---------------------+-------------------+-----------------
                  4             |        5          |        6          **********
           0.876   15-30        |  0.929   31-26    |  0.898   37-24    * MFLCPR *
           0.849  07-32-04      |  0.759  31-28-17  |  0.844  45-32-04  * MFLPD  *
           0.864  07-32-04      |  0.844  33-26-14  |  0.857  45-32-04  * MAPRAT *
           ---------------------+-------------------+-----------------  **********
                  1             |        2          |        3
           0.859   13-14        |  0.881   23-16    |  0.863   39-14
           0.861  11-12-04      |  0.836  21-08-04  |  0.818  43-14-04
           0.902  13-12-04      |  0.846  21-08-04  |  0.869  41-14-05
```

See Attachment 3 for definitions/abbreviations.

ATTACHMENT 2

Page 2 of 2

Limit Positions on the Core Performance Log – Long Edit

```
                    BRUNSWICK-1     WK-0303 03JAN15-10.52.53  7620 MWD/MTU  TRIGR=1HR    REV=SEP02
                                      CORE PERFORMANCE LOG --- LONG EDIT  (PAGE 2)
                                 ***** CONTROL ROD POSITIONS AND CALIBRATED LPRM READINGS *****

                  02    06    10    14    18    22    26    30    34    38    42    46    50

            51                            --    --    --    --    --                              51

            47                -- 23 --    -- 28 --    -- 26 --    -- 27 --    -- 19                 47
                                 34          42          39          40          29
                                 46          47          51          46          37
            43          --    -- 69 --    20 70 --    00 71 --    20 68 --    -- 49 --              43

            39     20 --      -- 35 --    -- 35 --    -- 43 --    -- 37 --    -- 27 --              39
                   29            50          50          61          51          40
                   39            54          55          58          57          45
            35  -- 52 --      20 74 --    00 66 --    24 64 --    00 73 --    20 68 --      --      35

***************                                                                                          ***************
* LPRM FAILED *     31  -- 23 --      -- 34 --    -- 43 --    -- 42 --    -- 44 --    -- 28 --      --      31      * OTHER FAILED *
* SENSOR DATA *            35            50          62          58          62          41                       * SENSOR DATA  *
***************            49            55          55          58          58          54                       ****************
                    27  -- 70 --      00 71 --    24 60 --    00 57 --    24 66 --    00 73 --      --      27        SENSOR    STATUS
LOCATION STATUS                                                                                                       -------   ------
-------- ------                                                                                                       1GENY508   BAD
 44-37-D  BYP       23  -- 22 --      -- 36 --    -- 41 --    -- 42 --    -- 37 --    -- 29 --      --      23
 36-29-D  BYP              33            52          56          63          53          45
                           46            54          58          56          55          50
                    19  -- 63 --      20 70 --    00 62 --    24 62 --    00 65 --    20 70 --      --      19

            15          --    -- 29 --    -- 36 --    -- 35 --    -- 35 --    -- 24 --              15
                                 45          54          51          52          36
                                 57          55          56          54          47
            11          --    -- 87 --    20 72 --    00 67 --    20 71 --    -- 67 --              11

            07    D           --    --    -- 21 --    -- 22 --    -- 21 --    --                    07
                  C                          32          34          30
                  B                          45          47          38
            03    A                       -- 62 --    -- 67 --    -- 48                             03

                  02    06    10    14    18    22    26    30    34    38    42    46    50

        CONTROL ROD SYMMETRY : EIGHT-FOLD     CONTROL ROD SEQUENCE : A-2     CONTROL ROD DENSITY : 0.1144
```

Definitions and Abbreviations Found on Core Performance Edit

1.	APLHGR	Nodal Average Planar Linear Heat Generation Rate (kw/ft).
2.	APRM GAFS	Average Power Range Monitor Gain Adjustment Factors.
3.	CMAPRAT	Core Maximum APRAT (T/S 3.2.1). Maintaining this value ≤ 1.00 ensures that the peak cladding temperature will be kept < 2200°F and, therefore, core geometry will be maintained during a LOCA.
4.	CMFLCPR	Core Maximum Fraction of limiting CPR (T/S 3.2.2). Maintaining this value ≤ 1.00 ensures that departure from nucleate boiling will not occur.
5.	CMFLPD	Core Maximum Fraction of Limiting Power Density. Formerly a technical specification limit, maintaining this value ≤ 1.00 ensures that the fuel cladding does not exceed 1% plastic strain. Reference 2.5 states that the NRC expects LHGR monitoring to remain the same as CPR and APLHGR (i.e., to restore LHGR within limits within 4 hours, or to be below 23% power within the next 4 hours).
6.	CPR	Critical Power Ratio.
7.	CPR LIMIT	The limiting CPR.
8.	FCBB	Fraction of Core Boiling Boundary (stability monitor)
9.	LHGR	Power generation in 1 foot of a fuel rod (kw/ft).
10.	APLHGR LIMIT	Nodal limiting value of APLHGR (kw/ft).
11.	APRAT	Maximum fraction of limiting APHLGR rate. = Maximum of $\frac{\text{APLHGR}}{\text{APLHGR LIMIT}}$.
12.	FLCPR	Maximum Fraction of Limiting CPR. = Maximum of $\frac{\text{CPR LIMIT}}{\text{CPR}}$.

Definitions and Abbreviations Found on Core Performance Edit

13. FLPD — Maximum Fraction of Limiting Power Density (kw/ft).

$$= \frac{MRPD}{RPDLIM} = \text{Maximum of } \frac{LPD}{LPD\ LIMIT}$$

14. LPD — Limiting fuel rod Power Density (LHGR).

15. LPD LIMIT — Fuel Rod Power Density Limit (LHGR limit).

16. WTFLAG — WTFLAG on the core performance log indicates which core flow value is used for thermal limit calculations.

    WTFLAG = 2 indicates WT, which is WTCF Total Core Flow analog signal representing the summation of the 20 single tap jet pumps.

    WTFLAG = 4 indicates WTSUB, which is the flow resulting from the drive flow (WD) to core flow (WT) correlation.

    WTFLAG = 5 indicates WT, which is using an operator substituted core flow in WTCF Total Core Flow.

    WTFLAG = 7 indicates WT, and states the difference between WTSUB correlated core flow and WT is greater than 5%.

17. CORE MINIMUM CPR/ LOCATION — The MCPR used to determine the requirement for RBM operability iaw Tech Spec 3.3.2.1. This is the lowest core CPR and corresponding bundle location.

REVISION SUMMARY

Revision 1 incorporated EC, 47907, Unit 2 Extended Power Uprate Implementation, and EC 46730, Replace Unit 2 Power Range Neutron Monitoring System, required changes and updated to Word 2000 software.

Revision 0 was issued in accordance with ESR 00-00442, Unit 1 Power Range Neutron Monitoring Replacement, which required the 0PT-01.11 be separated into unit specific procedures.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM3ROEC

LESSON TITLE: Develop a Clearance Boundary - RBCCW Pump 2C.

REVISION NO: 0

RECOMMENDED BY: Curt Robert ____________________
Instructor/Developer DATE

CONCURRENCE BY: ____________________
Line Superintendent/Supervisor DATE

APPROVED BY: ____________________
Superintendent/Supervisor Training DATE

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee.
2. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
3. If desired, the evaluator may provide the examinee with a copy of OPS-NGGC-1301 and the referenced prints.
4. The evaluator should have available copies of prints D-02538 SH1 & 2, LL-9241 SH8 & 24 to support performance of JPM, or perform JPM in a location where a print machine is available.

Read the following to trainee.

TASK CONDITIONS:

1. You are an operator in the Work Control Center. PASSPORT (Equipment Tag Out) is not available for use. No historical clearances are available for review.

2. A Clearance has been requested by maintenance to place RBCCW Pump 2C under clearance, isolated, vented, and drained for scheduled work. RBCCW Pumps 2A and 2B will be running.

3. This clearance is to allow maintenance to replace the pump packing.

INITIATING CUE:

The WCC SRO directs you to propose a Clearance Boundary for RBCCW Pump 2C by completing Attachment 4 of OPS-NGGC-1301. The Attachment 4 columns for Sequence, Position, and Equipment/Component are to be filled in. Other columns of Attachment 4 may be filled in later.

ANSWER KEY

ATTACHMENT 4
Sheet 1 of 1
OPERATIONS CLEARANCE TAG SHEET

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					RTGB Control Switch 2-RCC-CS-449		
2				OFF LOCKED	Motor Feeder 2XE Compt EA7		
3				CLOSE	Discharge Valve 2-RCC-V34		
4				CLOSE	Suction Valve 2-RCC-V30		
5				OPEN	Pump Drain Valve 2-RCC-V128		
6				OPEN	Pump Drain Valve 2-RCC-V129		
7				OPEN	Pump Vent Valve 2-RCC-V301		

Sequence must have breaker OFF/LOCKED prior to operating discharge/suction valves, and discharge/suction valves closed before operating drain/vent valves.

It is acceptable for the performer to provide control switch clearance information tag position as an extra measure of protection but position is not required by procedure.

Minimum requirements for satisfactory boundary are breaker, discharge valve, suction valve, at least one drain valve, and vent valve.

PERFORMANCE CHECKLIST

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

NOTE:	If desired, the examiner may provide a copy OPS-NGGC-1301 to the examinee.

Step 1 - Obtain a current revision of OPS-NGGC-1301.

Current Revision of OPS-NGGC-1301 obtained.

SAT/UNSAT*

NOTE:	If desired, the examiner may provide a copy of the required prints to the examinee (D-02538, Sheets 1 & 2, LL-9241, Sheets 8 & 24).

Step 2 – Obtain copies of required prints (D-02538, Sheets 1 & 2, LL-9241, Sheet 24).

Drawings D-02538, Sheets 1 & 2, LL-9241, Sheets 8 & 24 obtained.

SAT/UNSAT*

Step 3 - Identify control switch 2-RCC-CS-449 should be placed to OFF.

Determine 2-RCC-CS-449 should be placed to OFF.

SAT/UNSAT*

Step 4 - Identify breaker 2XE Compt EA7 should be placed to OFF.
Determine 2XE Compt EA7 should be placed to OFF.

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

Step 5 - Identify discharge valve 2-RCC-V34 should be closed.
Determine 2-RCC-V34 should be closed.

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

Step 6 - Identify suction valve 2-RCC-V30 should be closed.
Determine 2-RCC-V30 should be closed.

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

NOTE: Either 2-RCC-V128 or 2-RCC-V129 is critical. Both are not required to meet the critical task standards.

Step 7 - Identify drain valve 2-RCC-V128 should be open.
Determine 2-RCC-V128 should be open.

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

Step 8 - Identify drain valve 2-RCC-V129 should be open.
Determine 2-RCC-V129 should be open.

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

Step 9 - Identify vent valve 2-RCC-V301 should be open.
Determine 2-RCC-V301 should be open.

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

Step 10 – Submit proposed boundary to WCC SRO.
Proposed boundary submitted to *WCC SRO.*

SAT/UNSAT*

TERMINATING CUE: When the proposed boundary has been submitted, this JPM is complete.

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

RELATED TASKS:

299020B301, Develop A Clearance Per OPS-NGGC-1301

K/A REFERENCE AND IMPORTANCE RATING:

2.2.13 3.6/3.8

Knowledge of tagging and clearance procedures

REFERENCES:

OPS-NGGC-1301, Revision 3

TOOLS AND EQUIPMENT:

Referenced prints.

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

A.2 - Equipment Control

REASON FOR REVISION:

Revised task condition to meet OPS-NGGC-1301 procedural requirement for maintenance to specify the conditions of the clearance. (LOT-OJT-JP-201-E04)

Time Required for Completion: 20 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ✓ Actual ___ Unit: 2

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

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

Alternate Path: Yes ___ No ✓

EVALUATION

Trainee:______________________________ SSN: ____________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. You are an operator in the Work Control Center. PASSPORT (Equipment Tag Out) is not available for use. No historical clearances are available for review.

2. A Clearance has been requested by maintenance to place RBCCW Pump 2C under clearance, isolated, vented, and drained for scheduled work. RBCCW Pumps 2A and 2B will be running.

3. This clearance is to allow maintenance to replace the pump packing.

INITIATING CUE:

The WCC SRO directs you to propose a Clearance Boundary for RBCCW Pump 2C by completing Attachment 4 of OPS-NGGC-1301. The Attachment 4 columns for Sequence, Position, and Equipment/Component are to be filled in. Other columns of Attachment 4 may be filled in later.

Progress Energy

R
Reference Use

NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

OPS-NGGC-1301

EQUIPMENT CLEARANCE

REVISION 14

NGG Nuclear Generation Group

TABLE OF CONTENTS

R 2.5.6

R 2.5.11

R 2.5.12

1.0 PURPOSE

This procedure provides methods to control equipment status and thus provide protection for personnel and plant equipment during operation, maintenance, and modification activities. Additionally, provisions of the procedure ensure that the status of safety-related and other important equipment is independently verified when the equipment is restored to service.

This procedure also provides guidance for controlling and documenting the installation and removal of grounding devices.

This procedure meets the requirements of ANSI N18.7 and 29 CFR 1910.269, and meets the intent of the Accident Prevention Manual (Florida) and the Safety Manual (Carolinas) related to equipment clearance.

This procedure outlines the steps necessary to "afford employees the same level of protection equivalent to that provided by the implementation of a personal lockout or tagout device" in accordance with 29 CFR 1910.269(d)(8)(ii). All employees working within the boundaries of a clearance will be responsible for personally signing onto the clearance through manual or electronic means.

2.0 REFERENCES

2.1 General References

2.1.1 ANSI N18.7 (ANS 3.2), Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

R 2.1.2

2.1.2 29 CFR 1910.269, Electric Power Generation, Transmission, and Distribution

2.1.3 SAF-SUBS-00065, Safety Manual

2.1.4 NGGM-PM-0007, Quality Assurance Program Manual

2.1.5 SAF-PGNC-00048, Protective Grounding Guidelines

2.1.6 ADM-NGGC-0104, Work Management Process

2.1.7 NGGM-IA-0003, Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants

2.1.8 MNT-NGGC-0007, Foreign Material Exclusion Program

R 2.1.10

R 2.1.11

R 2.2.1

R 2.2.2

R 2.2.3

R 2.2.4

R 2.2.5

R 2.2.6

R 2.2.7

2.1 General References (Cont.)

2.1.9 SAF-SUBS-00009, Lockout/Tagout

2.1.10 ANSI N45.2.9 - 1974, Section 3.2.7, Retention of Records and 10.0 Section A.4.4, Installation - Construction Records

2.1.11 SOER 98-01, Safety System Status Control Attach. 12

2.1.12 TRN-NGGC-0502, Personal Qualification Data System

2.1.13 SAF-FPCO-00065, Accident Prevention Manual

2.1.14 OPS-NGGC-1303, Independent Verification

2.2 Brunswick Nuclear Plant References

2.2.1 SOER 85-5

2.2.2 LER 88-029

2.2.3 NCR S-89-099

2.2.4 ER 87-39

2.2.5 IER 97-13-01

2.2.6 CR 98-00015-6

2.2.7 CR 98-01220-2

2.2.8 0TPP-224, Miscellaneous Training Programs

2.3 Harris Nuclear Plant References

2.3.1 AP-003, General Plant Personnel Safety and Housekeeping

2.3.2 OMM-001, Operations - Conduct of Operations

2.3.3 OMM-014, Operation of the Work Coordination Center

2.3.4 HNP Final Safety Analysis Report, Section 1.8

2.3.5 HNP Final Safety Analysis Report, Section 13.5.1.3

2.3 Harris Nuclear Plant References (Cont.)

2.3.6 HTMI-013, Final Safety Analysis Report Commitments

2.3.7 91H0813

2.3.8 92H0154

2.3.9 93H0255

2.3.10 93H0960

2.3.11 ACFR 93-00195-4

2.3.12 ACFR 94-01316-4

2.3.13 CR 95-02387-8

R 2.3.14

2.3.14 Reply to Notice of Violations dated March 3, 1997, Serial HNP-97-039

R 2.3.15

2.3.15 Response to NRC, i.e. Report R11; 500-400/87-31 Violation A (SHF/10-13510E)

2.3.16 NCR 76491, Personal Clearance Error

2.4 Robinson Nuclear Plant References

2.4.1 OMM-001, Operations - Conduct of Operations

2.4.2 OMM-004, Operations Work Procedure

2.4.3 OMM-007, Equipment Inoperable Record

2.4.4 PLP-033, Post Maintenance Testing (PMT) Program

2.4.5 PLP-049, Fuse Control Program

2.4.6 PLP-050, Plant Labeling and Stenciling

2.4.7 PLP-056, Work Control Process

2.4.8 MMM-003, Maintenance Work Requests and Work Request Planning

2.4.9 SCR 90-005, Men At Work Red Tags

2.4 Robinson Nuclear Plant References (Cont.)

2.4.10 ACR 91-061, Insufficient Clearance for PM

2.4.11 ACR 91-237, Sequence for Hanging and Removing Tags

2.4.12 ACR 92-352, Insufficient Understanding of Clearance Process

2.4.13 ACR 94-00127, EDG "A" Starting during Local Clearance Removal

2.4.14 ACR 94-00459, Valve Positioned within Local Clearance Boundary

2.4.15 ACR 94-00686, Removal of Clearance Boundary Valve

2.4.16 ACR 94-01421, Vent/Drain Caps Removed for Clearances

2.4.17 CR 95-0143, Potential Containment Isolation Valve Misposition

2.4.18 CR 95-0011, Incorrect Clearance Restoration Position

2.4.19 CR 95-01090, Improper Use of Sleeving for System Venting/Draining

2.4.20 CR 95-01352, Contaminated Local Clearance Tag Accountability

2.4.21 CR 95-01354, HVH Unit Damper Maintenance

2.4.22 CR 95-02114, IST Evaluation of Maintenance Activities

2.4.23 CR 95-02144, Verifying Personnel on QCHL

2.4.24 CR 95-02373, QCHL Maintenance

2.4.25 CR 96-03104, Clearance Preparation Without Controlled Documents

2.4.26 RAIL 94-R0645, Control of Equipment Inoperable Records

2.4.27 PGM 94-036, Plant General Manager Memo Addressing Review of OSHA Regulations for Electric Utilities

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2.4.28 NCR 80320, AFW-39 Misposition, Non-Cited Violation

2.5 Crystal River Nuclear Plant References

2.5.1 IE 78-31, Audit Clearance Log (NOCS 1861)

2.5.2 AI-1300, Engineering, Maintenance, and Support Interfaces

2.5.3 IE 85-41 & 85-42, SRO Documentation of Independent Review (NOCS 2556)

2.5.4 IE 85-26, Holder Notification of Boundary Changes (NOCS 5622)

2.5.5 IE 83-23 & NUREG 0737, Restoration and Authorization of a C/O (NOCS 5951)

2.5.6 IE 81-07, Ensure Control by Operations Department (NOCS 7398)

2.5.7 NRC Violation 87-17-01, Restore Positions per Applicable Procedures (NOCS 40004)

2.5.8 NRC Inspection Report 89-06-02, Direction for Partial Release of Clearances (NOCS 40257)

2.5.9 NRC Inspection Report 90-24-01, Separate Restoration Column & Sequence (NOCS 40610)

2.5.10 NCR 49526, Electrical Shock Received During a 4160V Bus Cleaning/Inspection

2.5.11 Letter to NRC 3F0797-09, Proceduralize Plant Practices (NOCS 62583)

2.5.12 Letter to NRC 3F0398-26, Addition of Personnel Danger Tags (NOCS 62838)

2.5.13 NCOR, Control of Equipment Outside of Clearance Boundary (NOT Tag) (NOCS 95031)

2.5.14 CP-116A, Foreign Material Exclusion (FME) Control Program

2.5.15 NCR 90037, FWP-2B Boundary Change Not Controlled IAW OPS-NGGC-1301

3.0 DEFINITIONS

3.1 Affected Employee

An individual whose work may be affected by a proposed boundary change.

3.2 Checklist Cross Reference

A section within an Operations Clearance that may be used to track work activities associated with work lists and other related clearances.

3.3 Clearance

Instructions used to remove equipment from service for personnel and equipment protection.

3.4 Clearance Holder

An individual accepting the clearance as appropriate for their assigned work task(s) by signing electronically in PassPort, (except as provided in paragraph 9.2.1.25). Personal Clearances are not accepted electronically in PassPort. The Clearance Holder maintains a current Clearance Holder Training Qualification in PQD.

3.5 Clearance Information Tags

Used to indicate that a component is out of service or is affected by a clearance. Clearance Information Tags are not part of the clearance boundary needed for personnel and/or equipment protection.

3.6 Clearance Preparer

An individual qualified to develop Clearance Orders and Checklists.

3.7 Clearance Tags

Red tags installed on boundary points that isolate equipment from hazards in order to permit work to be performed safely.

3.8 Clearance Worker

An individual signed onto Attachment 13, Operations Clearance Acceptance/Release Form, and authorized to work inside the clearance boundary. Persons signed onto Attachment 13 are not required to be listed as qualified in PQD.

3.9 Grounding Device

Equipment used to provide additional protection for personnel when working on electrical equipment. For example, ground straps or grounding breakers.

3.10 Ground Tag

Orange tags installed on grounding devices for the purpose of identifying and tracking installed grounding devices.

3.11 Group Tagout

Multiple Clearance Workers performing assigned work task(s) under the direction of a Principal Clearance Holder.

3.12 Model Clearances

A clearance model is used as a template for subsequent clearances to support preventive maintenance work activities. The model can be used repetitively to create clearances for the same regularly scheduled preventive maintenance work activity on the same piece of equipment. Clearance models are not used to create clearances to support corrective maintenance work activities. A clearance model can be derived from a historical clearance or independently developed and must be authorized for use by an individual knowledgeable with the clearance process.

3.13 Operations Clearance

A clearance that, because of its plant impact, personnel risk or equipment risk, is administered by the Operations organization. For example, removing a piece of safety related equipment from service that requires isolating support and interface systems.

3.14 Personal Clearance

A clearance that, because of the low level of complexity, the limited plant impact and low equipment risk is administered by the group responsible for the maintenance activity. For example, removing a non-safety air handler from service to replace fan belts.

Listed below are guidelines for when use of a Personal Clearance would be appropriate:

- Performance of Facilities or building maintenance
- Work that involves simple clearance boundaries and meets the following criteria:
- Does not cause Maintenance Rule unavailability time to be incurred
- Does not affect LCO equipment required for the current mode
- Does not involve breaching high energy systems (>500 psig or >200°F)

  Does not involve breaching hazardous chemical systems
- Does not impact plant production or reliability
- Normally can be completed within the shift; WCC concurrence is required if it is necessary to exist longer than the shift. This concurrence should be noted in the clearance Special Instructions.

For CR3 only, Personal Clearances are performed in accordance with site procedures.

3.15 Personal Clearance Preparer

An individual qualified to develop Personal Clearances.

3.16 Principal Clearance Holder

A designated Clearance Holder who has electronically accepted the clearance, (except as provided in paragraph 9.2.1.25), and who is providing coordination between multiple Clearance Workers performing an assigned work task under a Group Tagout. The Principal Clearance Holder will be identified on the "Contacts" panel of the clearance within PassPort.

3.17 Principal Equipment

The pieces of equipment cleared for work. The equipment must be a valid piece of equipment from the PassPort Equipment Database.

3.18 Release Of Clearance

Occurs when personnel who have been working under a clearance release their right to work and their right to protection under the clearance.

3.19 Requestor

The individual who initiates a clearance or a boundary change request.

3.20 Tag Hanger

An individual qualified to manipulate equipment and hang and remove tags according to the provisions of this procedure.

3.21 Tag Verifier

An individual qualified to verify components are positioned correctly and tags are installed and removed according to the provisions of this procedure.

3.22 Work Control Center (WCC)

An office located away from the Control Room where assigned personnel prepare, coordinate and track Operations Clearances and perform other administrative functions related to coordination of plant activities.

4.0 RESPONSIBILITIES

4.1 Manager - Operations

4.1.1 Responsible for the administration of the clearance procedure.

4.1.2 Ensuring that periodic audits are performed on the clearance process.

R 2.1.2 4.1.3 Ensure an independent inspection of the clearance process is performed on an interval not to exceed annually.

4.2 Manager - Maintenance

4.2.1 Ensure necessary Maintenance personnel are trained on the corporate requirements for the use and specification of grounding devices.

4.3 Manager - Training

4.3.1 Develop a single training program to qualify personnel on the clearance process and this procedure.

4.3.2 Provide training on the clearance process and this procedure.

4.3.3 Provide training on the Personal Clearance process.

4.3.4 Provide clearance retraining on an interval not to exceed two calendar years.

4.4 Supervisors

4.4.1 Ensure personnel within their work groups are qualified to perform duties related to the clearance process.

4.4.2 Ensure personnel under their supervision comply with the requirements of this procedure.

4.4.3 Administer the Personal Clearance process for their work group.

4.4.4 Verify Personal Clearance boundaries are adequate for the work being performed by their work group.

4.4.5 Verify equipment restoration positions and sequencing is correct for Personal Clearances used by their work groups.

4.4.6 Authorize installation and removal of Personal Clearances for their work groups.

4.4.7 Ensure Independent Verification (IV) is performed as required by site procedures.

4.4.8 Assign Personal Clearances to qualified personnel for installation and removal.

4.4.9 Ensure appropriate people are notified of the installation and removal of Personal Clearances.

4.4.10 Perform audits of Personal Clearances.

4.5 Senior Reactor Operator (SRO) / WCC SRO

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4.5.1 Review Operations Clearances to identify plant impact prior to authorization.

4.5.2 Authorize installation and removal of Operations Clearances.

4.5.3 Verify Operations Clearance is in a "RELEASED" status prior to distributing the final lift checklist.

4.5.4 Establish correct plant configuration to support hanging or removing Operations Clearances.

4.5.5 Coordinate hanging or removal of Operations Clearances.

4.5.6 Identify and initiate any required compensatory measures as a result of a clearance.

4.5.7 Ensure appropriate people are notified of the installation and removal of Operations Clearances.

4.5.8 (BNP, HNP, RNP) Determine the Affected Clearance Holder(s) on a clearance for a proposed boundary change.

4.5.9 Assign Operations Clearances to qualified personnel for installation or removal.

4.5.10 Determine when activities can be worked without clearances based on plant conditions.

4.5.11 (BNP only) Specify the sequence tags are to be removed.

4.6 Clearance Preparer

4.6.1 Prepare and verify clearances to ensure safe operating conditions exist while equipment is being removed from service, maintained, and returned to service.

4.6.2 Specify precautions and prerequisites to be observed prior to the installation and removal of a clearance.

4.6.3 Specify the sequence tags are to be installed.

4.6.4 Ensure the clearance boundary is adequate to provide personnel and equipment protection, and support the work requested.

4.6.5 Make changes to active clearances and ensure the changes provide an adequate clearance boundary.

4.6.6 Determine Independent Verification requirements based on site procedures.

4.6.7 Ensure equipment restoration positions are correct when preparing the clearance restoration.

4.6.8 (HNP, RNP, CR3) Specify the sequence tags are to be removed.

4.6.9 (CR3 only) Determine the Affected Employees on a Clearance for a proposed boundary change.

4.7 Requestor

4.7.1 Identify the need for a clearance to perform work activities.

4.7.2 Notify the appropriate personnel when a clearance is needed to support non-scheduled work.

4.8 Tag Hanger

4.8.1 Position components as specified on the Clearance Checklist.

4.8.2 Positioning components in the sequence specified on the Clearance Checklist.

4.8.3 Install and remove tags according to this procedure.

4.8.4 Notify the WCC any time questions or problems arise during the installation or removal of a clearance.

4.8.5 Notify the WCC prior to installation or removal of a Personal Clearance.

4.9 Tag Verifier

4.9.1 Ensure that components are in the position required by the Clearance Checklist.

4.9.2 Ensure that tags are installed and removed on the components specified on the Clearance Checklist.

4.9.3 Ensure that tags are installed and removed according to the requirements in this procedure.

4.10 Clearance Holder

4.10.1 Verify the clearance boundary is adequate for their assigned work prior to beginning work.

4.10.2 Prior to agreeing with a clearance boundary change, verify the equipment within the clearance boundary for which they are responsible is in a safe condition for the new boundary configuration.

4.10.3 Verify the work items for which they are responsible are complete prior to signing off a clearance for release.

4.10.4 Obtain a knowledgeable individual to assist in ground installation and removal as required.

4.10.5 Notify the WCC of any restrictions regarding returning equipment to service.

4.10.6 Ensure components are operationally intact prior to releasing a clearance.

NOTE:	Personnel who are listed in PQD as a qualified Clearance Holder may elect to sign onto Attachment 13, working under the direction of a Principal Clearance Holder. All personnel signed onto Attachment 13 are considered Clearance Workers.

4.10.7 Clearance Holders shall accept a clearance electronically, using PassPort, except as provided in paragraph 9.2.1.25. Personal Clearances are not accepted electronically in PassPort.

4.11 Principal Clearance Holder

4.11.1 A Principal Clearance Holder who accepts a clearance shall verify the clearance boundary is adequate for associated assigned work task(s) on a Group Tagout.

4.11.2 A Principal Clearance Holder shall initiate and have administrative control of the Operations Clearance Acceptance/Release Form, Attachment 13, ensuring that all individual Clearance Workers performing tasks under a Group Tagout have signed on the appropriate Operations Clearance Acceptance/Release Form prior to beginning work under the clearance. A separate Attachment 13 will be used for each clearance controlled by the Principal Clearance Holder.

4.11.3 A Principal Clearance Holder is responsible for remaining aware of hazardous energy sources that may affect the individual Clearance Workers during their work and communicate any change to the clearance boundary or changes to the clearance status to the individual Clearance Workers.

4.11.4 A Principal Clearance Holder will release the clearance when the assigned task(s) is complete, all applicable tools are removed, all personnel are in the clear, and all affected individual Clearance Workers have signed off the associated Operations Clearance Acceptance/Release Form, Attachment 13.

4.11.5 A Principal Clearance Holder is responsible to include the completed Operations Clearance Acceptance/Release Form, Attachment 13, in the work order package or deliver it to Operations for inclusion in the clearance package for record retention when the associated clearance is released.

4.11.6 The Principal Clearance Holder shall ensure that all personnel manually signed onto the clearance understand the clearance boundary, and allow them the opportunity to walkdown the clearance boundary and ask questions regarding the boundary as necessary.

4.11.7 A Principal Clearance Holder is responsible to enter their name and the associated Work Order and task number(s) on the "Contacts" panel of the clearance within PassPort.

5.0 PREREQUISITES

N/A

6.0 PRECAUTIONS AND LIMITATIONS

6.1 (BNP Only) Valves with Ball Screw Stem Actuators should not be manually torqued. The following valves have Ball Screw Stem Actuators:

BNP:

1-E41-F001	1-E41-F002	1-E41-F003
1-E41-F006	1-E41-F011	1-E11-F068A
1-E11-F068B	1-E11-F024A	1-E11-F024B

2-E41-F001	2-E41-F002	2-E41-F003
2-E41-F006	2-E41-F011	2-E11-F068A
2-E11-F068B	2-E11-F024A	2-E11-F024B

6.2 Motor operated valves using Limitorque Operators, under the following conditions, have experienced problems with the valves drifting open:

- Operator is in manual.
- Valve is shut.
- Valve is a globe valve.
- A high pressure is present beneath the disc.
- Valve has a fast operating time.(less than 10 sec)

The anomaly occurs because the drive gear train is disengaged when in the manual mode. With the high pressure under the seat and the fast operating time with no stem locking feature, the valve operator has insufficient resistance to prevent valves from drifting. An alternative clearance valve or a means for holding valves with these conditions should be used when using such valves for isolation. The following valves have been identified as susceptible to valve drift:

HNP:

1CS-182	1CS-240	1CS-382	1CS-472	1CS-752
1CS-196	1CS-278	1CS-423	1CS-745	1CS-753
1CS-210	1CS-341	1CS-470	1CS-746	

RNP:

SI-866A	SI-866B

7.0 SPECIAL TOOLS AND EQUIPMENT

N/A

8.0 ACCEPTANCE CRITERIA

N/A

9.0 INSTRUCTIONS

9.1 General Administration

9.1.1 Attempts have been made in this procedure to recognize organizational differences at the plants. Even though some position titles may vary, the responsibilities and functions of the position itself should be relatively consistent. Below is a list of the organizational positions, associated titles and a description of how they will be designated in this procedure:

1. Superintendent - Shift Operations (S-SO) - This organizational position indicates the second line of Operations management. Site titles include Superintendent - Shift Operations (HNP, RNP, CR3) and Shift Superintendent (BNP). For the purpose of this procedure, the title S-SO will be used.

2. Control Room Supervisor (CRS) - This title indicates the first line of Operations management. When used in this procedure, it represents a member of management and not a shift position.

3. Control Room SRO - This position is the SRO responsible for Control Room operations. Site shift position titles include Unit SCO (BNP, HNP), Control Room Shift Supervisor (CRSS) (RNP), and Control Room Supervisor (CRS) (CR3). Individuals filling this position may or may not be a Control Room Supervisor (member of management). When used in this procedure, it indicates an individual who is fulfilling the shift position of the SRO in the Control Room.

4. WCC SRO - This position is the SRO that is assigned to the WCC. If the WCC is not manned, the Control Room SRO performs the actions assigned to the WCC SRO in this procedure or other SROs designated by the S-SO. For CR3 only, a non-licensed Shift Technical Advisor (STA) may also perform the actions assigned to the WCC SRO as long as the CRS or S-SO are notified prior to removing a piece of equipment from service or returning a piece of equipment to service.

9.1.2 The clearance process is intended to be used when there is a potential for personnel injury or equipment damage associated with an activity. The clearance process is designed to maintain system configuration control but should not be used solely for that purpose. Other site processes should be used for configuration control purposes when the risk of personnel injury or equipment damage does not exist.

9.1.3 Clearances shall not be used with the sole intent of long-term disabling of equipment or in instances where a plant modification would be more appropriate.

9.1.4 When determining if a clearance is required, consider the following:

1. Is there a potential for personal injury or equipment damage from high temperature fluids or toxic chemicals?
2. Is there a potential for personal injury or equipment damage from applied pressure forces?
3. Is there a potential for personal injury or equipment damage from energized electrical components?
4. Is there a potential for personal injury or equipment damage from maintenance on or in the vicinity of rotating equipment?

9.1.5 A clearance shall always be required for grounds, if the ground installation/removal is not controlled by an approved procedure. An approved grounding procedure can be a site specific procedure or another Progress Energy work group procedure (such as a Transmission Department procedure).

9.1.6 A clearance is not required for the installation of test equipment, hoses, rigs and so forth when a local isolation is available. NGGC/Site configuration control methods will be used to document component position.

9.1.7 A clearance is not required for breaker maintenance when maintenance is restricted to the breaker. NGGC/Site configuration control methods will be used to document component position.

9.1.8 A clearance is not required to work on pneumatic components if a local pneumatic isolation is available and the pneumatic component is not a boundary isolation. NGGC/Site configuration control methods will be used to ensure the components are restored to correct position. The WCC should be notified prior to positioning any pneumatic isolation valves.

9.1.9 Electrical components should normally be de-energized by opening a breaker, operating a switch, or by pulling a fuse. In those cases where this is not feasible, it is permissible to lift leads or slide links. If leads have to be lifted or links slid, it is preferred that the leads are lifted/links slid locally at the component and documented using NGGC/Site configuration control methods. Leads/links shall be Independently Verified on those systems required by site procedures. Clearance tags should be installed on the lifted leads/links if the leads/links are lifted at a different location than the maintenance or if the component is a boundary isolation device.

9.1.10 If electrical isolation cannot be performed, it is permissible to work on energized electrical components as allowed by site and corporate safety procedures.

9.1.11 Special consideration should be given to clearances that involve systems that are common to other units.

9.1.12 Only those individuals who have been properly trained on the clearance process may perform related duties.

9.1.13 Rotating generators with field current breakers open may still create a source of electrical energy that must be accounted for when developing a clearance.

9.1.14 The requirements of MNT-NGGC-0007, Foreign Material Exclusion Program, (CP-116A, Foreign Material Exclusion (FME) Control Program for CR3), should be reviewed when system vents are left open and uncapped.

9.1.15 Clearance tags and ground tags are used to indicate a piece of equipment is adequately isolated/de-energized to prevent equipment damage or personnel injury. Other devices such as locks may supplement the tag, but the clearance tag or ground tag is the primary means of control. If locks are used in conjunction with an Operations Clearance, the WCC should be notified. The WCC should be provided a method to disposition the lock in an emergency situation.

9.1.16 Maintenance will be allowed on boundary isolation components provided that the work activity will not alter the ability of the boundary isolation component to perform its isolation function.

Examples of work activities that can be performed on boundary isolation devices are as follows:

- Limit switch grease inspection
- Flex conduit repairs
- Relugging of wire connections
- Electrical disconnect and reconnect of motor
- Limitorque grease inspection for rising stem and gate valves
- Anti-rotation device inspection
- Work on breakers

9.1.17 Clearance tagged or ground tagged equipment shall not be operated for any purpose while under clearance. The following are exceptions to this requirement:

1. Verification of required valve position according to site procedures.

2. Additional torquing of boundary valves to gain adequate isolation.

3. Removal and installation of MCC or power panel breakers where the breaker remains open. Concurrent verification is required to verify the breaker is open prior to installation.

4. 6.9 kV, 4160 volt and 480 volt breakers may be pulled out of their cubicle or placed in test as required if the breaker is tagged as "Not Racked In". WCC SRO concurrence is required prior to starting jobs that require placing a breaker in the test position. Concurrent verification is required to place the breaker in the test position.

9.1.18 Clearance Information Tagged (CIT) equipment may be operated as follows:

1. When no specific equipment position is specified for the CIT tagged equipment, the equipment may be operated as necessary.

2. When a specific equipment position is specified for the CIT tagged equipment, the equipment may be operated as long as it is restored to its tagged position after manipulation.

9.1 General Administration (Cont.)

9.1.19 When boundary valves leak by their seat and a complete draining cannot be accomplished, the WCC SRO and the Clearance Holder should determine when conditions are safe to perform the required maintenance.

R 2.2.3

9.1.20 If tags are noticed to be damaged, missing, or have fallen off, the WCC shall be notified. The WCC should consider stopping work within a clearance boundary if clearance tags or ground tags are discovered missing on isolation boundaries. The WCC shall replace any Operations tags. The WCC shall replace or notify the responsible supervisor of any Personal Clearance tags that need to be replaced.

9.1.21 The introduction of fluids, either gas or liquid, into a system within a clearance boundary may be performed by work groups other than Operations provided it is according to an approved procedure and with the concurrence of the CRS or S-SO. The location at which the fluid is to be introduced into the system shall be specified in the procedure.

9.1.22 There may be times that plant conditions require work to be performed and a clearance is not practical or possible (for example, installation of reactor nozzle dams). When this occurs, work may proceed with the verbal concurrence of both the work group's supervisor and S-SO.

9.1.23 A clearance is not required if the plant conditions eliminate the hazard; example, maintenance on the Main Steam system during an outage and the plant is cooled to less than 200°F (212°F at BNP). This process should only be used when a system and electrical lineup is required to be performed prior to placing the system in service. When relying on plant conditions to perform work safely without a clearance, perform the following:

1. An SRO should determine the plant Mode in which the maintenance activity can be performed safely without a clearance.
2. An SRO should insert the applicable plant Mode in the Clearance Requirements Block of the Work Order Task.
3. Prior to changing modes, Operations shall verify that the activities relying on the current plant conditions are completed or clearance orders are in place to support maintenance.
4. A system valve and electrical lineup shall be performed prior to placing the system in service.

9.1.24 Operations Clearances will be maintained by the Operations Department.

9.1.25 The responsible supervisor will maintain a crew Personal Clearance log book.

9.1.26 Station/Line Clearances are administered by System Operations. NGGM-IA-0003, Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants, should be used to identify responsibility boundaries between Nuclear Plant Operations and System Operations (BNP, HNP, RNP). AI-1300, Engineering, Maintenance, and Support Interfaces, will be used at CR3.

9.2 Clearance Preparation and Restoration

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2.5.7

9.2.1 Administrative

1. For Operations Clearances, the form used should be generated from a clearance computer program, or a copy from this procedure. The computer-generated form may not exactly match the form in this procedure, but the two forms should be similar and include similar information.

2. Personal Clearances should be generated using the forms in this procedure.

3. CITs shall not be used as a clearance boundary. CITs are used for information only. They are used to indicate that a component is out of service or is affected by the clearance.

4. When tagging of control switches is desired, CITs should be used if the switch does not form a part of the clearance boundary. For switches that are a part of the clearance boundary, a miniature clearance tag or a switch cap should be used.

5. Controlled copies of approved reference materials should be used in the preparation and restoration of clearances. When a controlled document is not available, other means may be used as deemed appropriate. For example: performing a field walkdown or using a technical manual.

6. Each Personal Clearance will have a unique number that will include the unit number (BNP only), the year, crew or work group ID and sequential clearance number. For example: 1-96-H72-001 where H72 is a crew ID.

7. Tagging on control panels requires the use of tags small enough to prevent obscuring plant status indications, controls, switches and labels.

8. The Clearance Preparer shall add components that need to be manipulated as part of planned maintenance to the clearance as "NOT" tags or ensure that other measures have been taken to ensure proper restoration.

9.2.1 Administrative (Cont.)

9. Before a clearance is issued for a component, system or electrical circuit, sources of energy that may cause personnel injury or equipment damage should be isolated from the work area. For example, when isolating a pump motor, the pump discharge and/or suction valves should be shut and tagged to prevent possible rotation due to fluid flow. In some cases it may not be practical or desirable to completely de-energize components within the work boundary. In these cases, components or circuits remaining energized will be clearly identified in the clearance Special Instructions.

R 2.2.2

10. The Clearance Preparer shall evaluate the requested equipment against current or expected plant conditions and determine required lineups necessary to isolate and restore the component, using controlled and approved references.

11. The 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.

9.2.1 **Administrative** (Cont.)

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
1. Secure pump/fan and hang a tag on its control switch.	1. Remove tags from handwheels of valves and reposition manual valves as required. For pumps, open the suction valve before opening the discharge valve.
2. 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.	2. Remove tags on power sources to valves and restore the power supply as required.
3. 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.	3. Remove tags from valve control switches and reposition valves as required.
4. Remove power source (electrical, air, hydraulic, and so forth) from valves, if applicable, and tag the power source removed.	4. Remove the tag from the power source for the pump/fan prime mover. Restore the power source as directed by restoration lineup.
5. 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.	5. Remove the tag on pump/fan control switch and reposition the switch as required.

13. For clearances that involve the removal of fuses, fuse control and accountability shall be according to site procedures.

9.2.1 Administrative (Cont.)

14. For devices having a remote operator, such as a valve reach rod, where both valve and reach rod have a handwheel and are accessible, the clearance should be written such that both mechanical devices are tagged. Tags for the valve handwheel may be excluded if radiation levels make entry into the area undesirable (as a guideline, anticipated dose greater than 10 mrem). If the valve handwheel is not tagged, it should be noted in the Special Instructions.

15. When plant design allows, systems that operate with temperatures greater than 200°F, pressures greater than 500 psig, caustic or acid systems (excluding boric acid) should be isolated from the work area by two in series closed valves when the system is to be breached. S-SO permission shall be obtained to hang any clearance that meets the above requirements and does not use double valve isolation. This permission and a notification to the workers of the clearance boundary limitations shall be noted in the clearance Special Instructions. If plant design does NOT allow double valve isolation to meet the above requirements, then S-SO permission is NOT required, but a notification to the workers shall still be noted in the clearance Special Instructions.

16. Electrical power to a motor should be secured before cooling water and/or lubrication is secured.

17. To prevent moisture buildup on motor windings, motor heaters should remain energized unless actual motor work is to be performed. If the motor heaters are placed under clearance, prompt restoration of the heaters is desired to minimize the effect on the motor.

18. Clearance boundary valves should be tagged. This is to prevent the possibility of a boundary valve being removed from the system because there is nothing identifying it as a clearance boundary valve. For valve operators that do not have handwheels, the operator should be tagged. For example, a solenoid operated valve should be tagged locally in addition to removing power to the solenoid. Exceptions to this requirement are allowed for ALARA or safety concerns.

9.2.1 Administrative (Cont.)

19. Motor operated valves may be used as an isolation boundary point provided, after the valve has been positioned for the clearance, its power supply is isolated and tagged and the handwheel is tagged to indicate the valve position. The valve should not be manually engaged to check position. This will prevent inadvertent damage to the torque switch and/or valve seat, and prevents the drifting problem associated with some Limitorque operated valves. Since the valve position may not be available after the motor breaker is turned off, concurrent verification may be used to determine valve position before isolating the power supply. If the valve is determined to have seat leakage, it is permissible to manually engage the handwheel and torque the valve shut. Refer to site procedures for positioning and position verification associated with motor operated valves.

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20. Conditions may exist such that it is not practical for a single Operations Clearance to cover the scope of planned work. It is permissible to use another Operations Clearance in conjunction with the original clearance to perform such work. When more than one Operations Clearance is used to allow work, the other clearance numbers should be listed on the Checklist Cross Reference screen for the existing clearance.

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21. If items are added to the Checklist Cross Reference, an entry should be made in the Clearance Order Special Instructions indicating the Checklist has cross references listed. Prior to making boundary changes, the Checklist Cross Reference Screen should be checked. Review of the Checklist Cross References is to ensure no other Clearance Order or Checklist is impacted by the change. The review should be completed by an SRO (CNO for CR3) prior to making any change to an established boundary.

9.2.1 Administrative (Cont.)

22. Systems, or portions of systems, and components that normally operate at temperatures and pressures above ambient should be vented and drained as necessary for the performance of work. Whenever possible, an atmospheric drain and/or vent between the work area and sources of pressure to the work area should be tagged in the open position with the cap/flange removed to release pressure in systems and to accommodate thermal expansion and contraction. If depressurization via vent and/or drain paths cannot be provided within the clearance boundary, other definitive measures should be taken to verify the system or component is adequately drained and depressurized. These measures include breaking of flanged connections, loosening of valve bonnets, removal of instrument tubing or other similar actions. If the system cannot be completely depressurized or drained, a comment should be included in the clearance Special Instructions.

23. System fill and vent should be performed according to site procedures.

24. If the component that was drained has a heater associated with the drained portion, the fill and vent shall be performed prior to energizing the heater.

25. If an Operations Clearance is needed and the clearance computer program is not available, the clearance can be prepared using the forms in this procedure. A Clearance Log Sheet (Attachment 1) will be filled out for tracking purposes starting with clearance number U-YY-99000, where U is the Unit number (BNP only) and YY is the current year. Consideration should be given to entering the clearance into the computer program once it becomes available.

26. When large portions of systems are removed from service and a complete system alignment is to be performed, it is permissible to remove a released clearance and leave the components position as is and rely on the required valve lineup to align and return the system to operation. A note should be added to clearance Special Instructions when this is the method of clearance restoration.

27. Activities may be added to an active Operations Clearance provided two Clearance Preparer qualified individuals verify that the clearance boundary is adequate for the activity.

9.2.1 Administrative (Cont.)

28. Activities may be added to an active Personal Clearance provided that a Personal Clearance qualified individual and a Supervisor verify that the clearance boundary is adequate for the activity.

R 2.5.10

29. (CR3 only) When performing electrical bus cleaning or inspections and it is not practical to secure the high side feed to the bus, place clearance tags on any cubicle doors that provide direct access to an energized high side feed with a required position of "Closed".

30. When isolating high pressure pumps without suction relief protection, consider aligning a recirculation or drain flow path prior to shutting the suction valve to protect the pump suction from over-pressurization until the high pressure isolations can be verified to be holding.

9.2.2 Procedure for Operations Clearances

1. A Clearance Preparer can use a Model clearance to create a new clearance to support preventive maintenance work activities. The Clearance Preparer and Verifier must confirm the accuracy of the model by reviewing the Step list, Checklists, and Special Instructions. If the Model clearance is not accurate for the preventive maintenance activity, then it must be revised and re-authorized before it can be used to create a new clearance.

2. Clearance information should be communicated using an electronic Clearance Request, a Clearance Request Form (Attachment 2), or by verbal communication with the Clearance Preparer.

3. The Clearance Preparer shall understand the scope of the maintenance activities and prepare a clearance ensuring that the administrative requirements of this procedure are met.

4. Applicable Work Orders should be listed on Principal Equipment. If a Work Order(s) must be listed on the Checklist Cross Reference, then an entry will be made in the Special Instructions indicating that Work Order(s) are included on the Checklist Cross Reference.

9.2.2 Procedure for Operations Clearances (Cont.)

5. Any pertinent information should be listed in the clearance Special Instructions.

6. The Clearance Preparer should use Attachment 11, Boundary Device Tagging Guidelines, for proper tagging of clearance boundary devices.

7. The Clearance Preparer shall specify the proper tagging sequence paying particular attention to removing systems from service in a sequence that will not cause personnel injury or equipment damage.

8. A second Clearance Preparer shall verify that the clearance is adequate for the work activities, the boundary components are tagged correctly and the tagging sequence is correct.

9. Grounds shall be installed and removed in accordance with Section 9.5, Boundary Changes. All grounds shall be removed when work activities are complete and prior to removal of any clearance tags associated with the electrical boundaries associated with the grounding device(s).

R 2.4.28

10. When removing a clearance, the "Final Checklist" button in PassPort may be used to ensure that all tags currently hanging are listed on the "Lift" checklist. If the "Final Checklist" button is not utilized, the Clearance Preparer shall verify that all tags currently hanging are listed on the "Lift" checklist to ensure that all tags are removed and the component/system is properly returned to service.

11. Prior to removing a clearance, a Clearance Preparer shall determine the restoration positions, restoration sequence, and Independent Verification requirements or add a statement to the clearance Special Instructions when relying on a system alignment to restore the system to service.

9.2.3 Personal Clearances Preparation and Restoration

1. The preparer shall review the scope of the maintenance and any related reference materials (CWDs, procedures, flow diagrams, and so forth) to determine the necessary clearance boundary.

R 2.3.16

2. The preparer should use Attachment 11, Boundary Device Tagging Guidelines, for proper tagging of clearance boundary devices.

3. The preparer will complete the next available entry on the Clearance Log (Attachment 1) with the following information:

   - The next sequential clearance number
   - The system number
   - The component description
   - The reason for the clearance (include the work item number or procedure)

4. The preparer will then complete the Personal Clearance Form (Attachment 7) by providing the following information:

   - The clearance number
   - Equipment to be cleared
   - Work Item number or Procedure to be performed
   - Tag numbers
   - Order to be hung (the sequence the tags are to be hung, if the sequence is not applicable, record N/A)
   - Equipment Description
   - Component clearance position
   - Ground tags as needed

5. The preparer will then complete the clearance and or ground tags by providing the following information:

   - The clearance number
   - The clearance or ground tag number
   - Equipment description
   - Component clearance position

6. Prior to removing a clearance, a preparer shall determine the restoration positions, sequence and Independent Verification requirements.

9.3 Clearance Installation and Removal

9.3.1 Administrative - Clearance Installation and Removal

1. Should plant need dictate release of a clearance and all Clearance Holders/Principal Clearance Holders are not available, the S-SO or associated responsible supervisor(s) may release the clearance, provided the Clearance Holders/Principal Clearance Holders have been verified to be off site, reasonable efforts to contact the absent Clearance Holders/Principal Clearance Holders have been made, and no personnel or equipment would be endangered by clearance removal. The Clearance Holders/Principal Clearance Holders must be informed of clearance removal prior to the Clearance Holders/ Principal Clearance Holders resuming work at the facility.

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2.2.2
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2. The Tag Hanger should verify that the alphanumeric component tag number on the tag matches the plant labeling. If any discrepancy is found while hanging a clearance, the Tag Hanger should consult with the WCC to resolve a discrepancy with an Operations Clearance or with their supervisor to resolve a discrepancy with a Personal Clearance.

3. The Tag Hanger or the person directing the Tag Hanger shall have the checklist or a copy during the installation or removal of the tags.

4. The Tag Hanger should place the affected component in the required position for the clearance, then install the tag.

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2.1.2

5. Clearance tags and ground tags should be attached using a non-reusable cable tie capable of withstanding a minimum of 50 pounds. Use of miniature tags or switch caps is allowed for control boards.

6. If clearance tags and ground tags cannot be attached using a cable tie capable of withstanding a minimum of 50 pounds due to the physical design of the component, other means of attachment are acceptable provided that the tag attachment means is as strong as possible.

9.3.1 **Administrative - Clearance Installation and Removal** (Cont.)

7. Clearance tags and ground tags should be installed in an obvious location on the component to clearly indicate that operation of that component is prohibited.

8. If the component is designed to accept a lock to prevent operation, the tag should be installed at the lock out point.

9. If the tag cannot be installed on the component, it should be installed as close as safely possible and in a location that is immediately obvious to anyone attempting to operate the device.

10. Installed grounds or the ground tags should remain visible from outside the cabinet or cubicle. If the grounds or the ground tags are not readily visible, a sign shall be posted indicating that grounds are installed inside.

11. Independent verification requirements may be waived by the CRS or S-SO under the following situations:

    a. Excessive radiation exposures would result. As a guideline, an exposure of greater than 10 mrem to conduct the Independent Verification would be considered excessive. Individual situations should be determined on a case-by-case basis by the respective supervisor. In these situations, an alternate means of Independent Verification not involving radiation exposure (such as observing process parameters) should be utilized.

    b. Entry into any area where personnel safety is compromised or jeopardized due to the presence of extreme temperatures (greater than 120°F), or other hazards potentially dangerous to health are present.

    c. During clearance restoration when the system or components are not required to be operable. Prior to declaring the system or components operable, a lineup and Independent Verification is required.

    The approval for waiving independent verification requirements shall be documented in the clearance Special Instructions.

9.3.1 Administrative - Clearance Installation and Removal (Cont.)

12. Prior to removal of clearance tags, Operations shall visually inspect the readily accessible portions of the work area to determine that the system appears intact and ready to return to service.

13. If, during the removal of a clearance, the system integrity is not intact, it is permissible to reinstall the clearance. The Checklist should be annotated to indicate the tags were reinstalled and positions initialed.

14. Tags should be accounted for. Tags should be recycled for reuse. If tags were hung in a contaminated area, they should be decontaminated as necessary.

9.3.2 Operations Clearances Installation and Removal

R 2.5.5

1. Each Checklist shall be authorized by an SRO. This authorization is indicated by the Checklist Status being "Distributed" and indicates the SRO has verified the following:

   - Plant conditions are correct for the clearance
   - Installation of the clearance will not adversely impact plant operation
   - Applicable Compensatory actions have been initiated
   - The Control Room has been notified, as necessary

R 2.5.9

2. After authorization, the clearance will be assigned to a Tag Hanger for clearance installation.

3. If necessary, place the component or system in proper configuration using the Operating Procedure prior to hanging the clearance.

4. The Tag Hanger shall position equipment and hang tags in the specified sequence. The Tag Hanger shall initial the "Completed By" block on the applicable Checklist signifying tag placement and component positioning or the completion of any applicable "Comment" steps. Tag Hangers shall print their name at least once with their initials for each Checklist.

5. A Tag Verifier shall verify the tags. The Tag Verifier shall initial in the "Verified By" block on the Checklist signifying proper verification. Tag Verifiers shall print their name at least once with their initials for each Checklist.

9.3.2 Operations Clearances Installation and Removal (Cont.)

6. Once all tags are hung and verified and system conditions allow safe performance of the maintenance, the Checklist shall be signed and dated for "Checklist Completion."

7. Prior to authorizing the clearance removal, the SRO shall verify that grounds, if used, have been removed by verifying a Checklist for ground removal has been completed.

R 2.3.15

8. Each clearance restoration sequence will be independently verified by routing the Checklist for approval. (HNP only)

9. Each clearance removal shall be authorized by an SRO. The SRO shall verify that the clearance order is in a "RELEASED" status prior to distributing the final lift checklist. The SRO should review the Checklist, the Special Instructions and any supporting procedures that will be used during the clearance removal.

10. Prior to the clearance removal, the Control Room should be notified, as necessary.

11. The clearance shall then be assigned to a Tag Hanger to remove tags and realign the system. The "Completed By" block on the Checklist should be initialed signifying tag removal and component restoration or the completion of any applicable "Comment" steps. Tag Hangers shall print their name at least once with their initials for each Checklist.

12. A Tag Verifier shall perform an Independent Verification on those systems required by site procedures and should initial in the "Verified By" section to indicate proper verification. Tag Verifiers verifying the restoration shall print their name at least once with their initials for each Checklist.

13. An SRO (CNO for CR3 only) should then review the Clearance Form to ensure that it is filled out correctly, the equipment is realigned as required, the Clearance is removed from required documents and the OP valve/electrical lineups are updated, as necessary.

9.3.3 Personal Clearances Installation and Removal

1. The responsible supervisor or designee shall perform the following prior to authorizing the clearance:

   - Verify that the work scope is within the Personal Clearance process scope.
   - Verify that the clearance boundary is adequate.
   - Verify that the tagging sequence is correct.

2. The hanger shall notify the WCC prior to hanging the Personal Clearance.

3. The hanger will position the components as required by the clearance form and in the correct sequence. The hanger will initial on the clearance form for each tag hung. The Tag hanger will initial and print their name at the bottom of the clearance form.

4. The responsible supervisor or designee shall perform the following prior to authorizing the clearance removal:

   - Verify that the activity that required the clearance is completed.
   - Verify that any PMTRs that need to be performed prior to clearance removal are completed.
   - Verify that the restoration positions and sequence are correct.
   - Verify that any required system restoration plans are adequate (Fill and vent, and so forth).
   - Verify the "Removed By" block is initialed for all ground tags, if used, prior to removing the clearance.

5. The hanger shall notify the WCC prior to removing a Personal Clearance.

6. The hanger will remove the clearance by positioning the components to the required positions in the sequence specified on the clearance form, and initial each step when completed. Any system restoration plans (fill and vent) should be coordinated with the removal of the clearance. The hanger will perform tag accountability prior to signing the clearance form.

9.3.3 Personal Clearances Installation and Removal (Cont.)

7. If required, a second hanger will perform an Independent Verification of the clearance by verifying the components are in the required positions and initialing on the clearance form. The second hanger will initial and print their name on the bottom of the Clearance form.

8. The Clearance Log Sheet shall be updated to indicate that the clearance has been removed.

9. The clearance form should be reviewed by the responsible supervisor to ensure proper completion prior to being filed.

9.4 Clearance Acceptance and Release

9.4.1 Administrative - Clearance Acceptance and Release

1. Plant configuration control will be maintained by the clearance process as follows:

   a. Equipment may be operated within a clearance boundary as directed by an approved procedure.

   R 2.5.13

   b. Components may be operated within the clearance boundary with approval of the WCC SRO. These components should be listed on the Checklist as a "NOT" tag or other measures shall be taken to ensure proper restoration.

2. Equipment that has tags attached shall not be removed from the system. Hinged covers that have tags attached may be opened provided that the tags do not specifically prohibit opening. Bolted-on covers that are tagged shall not be completely removed from the system in which they are attached.

3. If work requires a component to be removed from a system and tags would be removed with the component, the Clearance Holder shall have such tags removed by appropriate personnel before removing the component from the system.

4. Prior to beginning work, the Clearance Holder shall verify that the clearance boundary is adequate for their assigned work by performing zero energy checks as applicable for the work.

9.4.1 Administrative - Clearance Acceptance and Release (Cont.)

5. Prior to beginning work that involves breaching a system, the Clearance Holder shall perform pressure checks to ensure the system is depressurized. Examples of pressure checks include using local pressure indications or verifying vents and drains are open. In cases where complete depressurization could not be accomplished, the Clearance Holder should use caution when breaching the system and do so in such a manner that minimizes the safety hazard.

6. Safety practices associated with the installation and removal of grounds require that the individual performing the ground installation or removal be protected by the clearance boundary.

9.4.2 Operations Clearances Acceptance and Release

1. All personnel performing work within a clearance boundary shall accept the clearance electronically, (except as provided in paragraph 9.2.1.25), or sign on an Attachment 13 under the control of a Principal Clearance Holder.

2. When a Clearance Holder accepts a clearance, their signature signifies that the following has been met:

- The clearance boundary is adequate for their assigned work
- The work items they are responsible for that will be worked under the clearance are listed on Principal Equipment or the Checklist Cross Reference.
- The clearance Special Instructions have been read and understood

3. If grounds are needed, the Clearance Holder is responsible for ensuring the grounds are properly installed prior to commencing the work.

4. The ground installer shall install the grounding devices according to corporate and site safety and grounding procedures. The ground installer will attach the ground tags using a separate Checklist and initial the "Completed By" block on the Checklist. The ground installer shall print their name at least once with their initials for each Checklist.

9.4.2 Operations Clearances Acceptance and Release (Cont.)

5. A Tag Verifier shall verify ground tags. The Tag Verifier shall initial in the "Verified By" block on the Checklist signifying proper verification. Tag Verifiers shall print their name at least once with their initials for each Checklist.

6. Clearance Holders are to notify the WCC as soon as possible when a clearance problem is identified. Problems shall be resolved prior to work start. If problems arise during work activities, which introduce, a personnel or equipment risk, the work shall be halted and equipment placed in a safe condition until the problems are resolved.

7. As work items is completed, each Clearance Holder shall ensure work tasks on Principal Equipment and the Checklist Cross Reference are complete for the work items they are assigned, or if a work task is not complete but no longer requires the clearance boundary notify the WCC of any restrictions for placing the equipment in service, then release the clearance.

8. The last Clearance Holder requiring the use of grounds should notify the WCC that grounds may be removed.

9. The last Clearance Holder to release a clearance should notify the WCC that the clearance may be removed.

10. Principal Clearance Holders shall not release the clearance until all associated Clearance Workers have completed their work task(s) and are clear of the clearance boundary.

11. Should plant need dictate release of a clearance, and all Clearance Workers have not signed off Attachment 13, the Principal Clearance Holder may release the clearance provided the Clearance Worker(s) who are not available have been verified to be off site, and reasonable efforts to contact those Clearance Workers have been made. The Clearance Worker(s) must be informed of clearance release prior to the Clearance Worker(s) resuming work at the facility.

12. Each Clearance Holder shall ensure that all non-essential items have been removed from the work area, and that all components are operationally intact prior to releasing the clearance. This requirement is not intended to prohibit clearance release on portions of systems and partial system restoration and the continuation of other work in the area.

9.4.3 Personal Clearances Acceptance and Release

1. The individual that will be performing the maintenance activity will sign the Clearance Form, accepting the clearance.

2. If grounds are required, they will be installed, tagged, and initialed for on the Clearance Form after the clearance has been accepted.

3. If, at any time, a problem impacting personnel or equipment safety is noted with a clearance, the worker shall place the work in a safe condition and notify their supervisor. Work shall not continue until the problem has been resolved.

4. If grounds are installed, remove the grounds and initial in the "Removed By" block on the clearance form prior to clearance release.

5. If grounds were installed, perform an Independent Verification of ground removal and initial in the "Verif By" block on the clearance form prior to clearance release.

6. If the clearance extends beyond the shift, notify the WCC.

7. After the work is completed, the Clearance Holder will release the clearance by signing the Clearance Form.

9.5 Boundary Changes

9.5.1 Administrative – Boundary Changes

R 2.5.8

1. Boundary Changes include the addition and/or lifting of tags. Boundary Changes are processed by creating Checklists.

2. Should plant need dictate a boundary change, and all Clearance Holders are not available on site, tags may be removed provided the Clearance Holders who are not available have been verified to be off-site, reasonable efforts to contact those Clearance Holders have been made, all available Clearance Holders are agreeable to the change and no personnel or equipment would be endangered by the boundary change. The Clearance Holder/Principal Clearance Holder must be informed of clearance boundary change prior to the Clearance Holder/Principal Clearance Holder resuming work at the facility.

9.5.1 Administrative - Boundary Changes (Cont.)

3. For boundary changes that involve either temporarily lifting or permanently removing grounds, the Clearance Holders relying on those grounds for protection shall be notified of and agree with the lifting or removal of the grounds.

4. When a boundary change involves only adding tags to a clearance and the clearance boundary is not affected by the addition of tags, notification of Clearance Holders is not required, but the use of a Boundary Change Form (Attachment 6) is still required.

5. Work activities that will be placed in an unsafe condition during a boundary change shall be suspended until such time that the boundary change is completed.

NOTE:	It is permissible to notify all Clearance Holders of a pending boundary change or just the Affected Employees. When all Clearance Holders are to be notified, the determination of Affected Employees is not required.

6. Due to the personnel risk associated with boundary changes, when it is decided to only notify Affected Employees of a pending boundary change, determining Affected Employees shall be accomplished by two individuals knowledgeable of the clearance boundary and the associated work. Both of the individuals do not have to be from Operations but at least one of the two individuals shall be an SRO (CNO for CR3).

7. Boundary Changes can only be performed on Operations Clearances.

9.5.2 Procedure – Boundary Changes

R 2.5.15

1. The Requestor should notify the WCC of the need for a clearance boundary change. The request should include the reason for the boundary change and, if known, a description of the requested change. A Boundary Change Form (Attachment 6) shall be used for all Boundary Changes.

2. A Clearance Preparer shall develop the requested clearance boundary change.

3. A second Clearance Preparer shall verify the boundary change is adequate.

9.5.2 Procedure - Boundary Changes (Cont.)

NOTE:	At least one of the individuals determining Affected Employees shall be an SRO (BNP, HNP, RNP)
NOTE:	It is permissible to notify all Clearance Holders of a pending boundary change or just the Affected Employees. When all the Clearance Holders are to be notified, the verification of Affected Employees is not required.
NOTE:	When determining Affected Employees, ensure that any other clearances listed on the Checklist Cross Reference are evaluated as well.
NOTE:	If the Boundary Change only adds tags to the Clearance and the clearance boundary is not affected by the addition of tags, notification of Clearance Holders is not required.

4. If the clearance boundary will be affected by the Boundary Change, place a Holder lock on the clearance prior to determining the Affected Employees (or notifying all holders) to ensure that no holders can accept the clearance until the Boundary Change has been completed.

5. An individual knowledgeable of the clearance boundary and the associated work activities shall decide to notify all Clearance Holders of a pending boundary change or determine the Affected Employees. A Clearance Holder is NOT an Affected Employee only when that employee's work is clearly unaffected by the Boundary Change. When any doubt exists as to whether a Clearance Holder is an Affected Employee, consider the Clearance Holder as an Affected Employee.

6. A second individual shall verify the Affected Employees, if applicable. A Clearance Holder is NOT an Affected Employee only when that employee's work is clearly unaffected by the Boundary Change. When any doubt exists as to whether a Clearance Holder is an Affected Employee, consider the Clearance Holder as an Affected Employee.

R 2.5.4

7. The Requestor shall notify all Clearance Holders or just the Affected Employees, as required, of the pending boundary change. If necessary, work shall be suspended until the new boundary can be established.

9.5.2 **Procedure - Boundary Changes** (Cont.)

8. Principal Clearance Holders are responsible for obtaining concurrence for a Boundary Change from all associated work group employees manually signed onto the clearance using Attachment 13.

9. The Requestor shall notify the WCC when all appropriate personnel have been notified of the pending boundary change, as required, and work has been suspended as necessary, and shall sign Section 4.2 of Attachment 6.

10. Each boundary change shall be authorized by an SRO. This authorization is indicated by the Checklist Status being "Distributed" and indicates the SRO has verified the following:

    - Plant conditions are correct for the boundary change
    - The boundary change will not adversely impact plant operation
    - Applicable compensatory actions have been initiated
    - The Control Room has been notified, as necessary

11. The boundary change is then assigned to a Tag Hanger for implementation. The Tag Hanger shall initial each step and print their name at least once with their initials for each Checklist.

12. A Tag Verifier will perform an Independent Verification of the boundary change, if required. The Tag Verifier shall initial the Checklist and print their name at least once with their initials for each Checklist.

13. Once all tags are hung and/or pulled and verified and system conditions allow work to be recommenced safely, the Checklist shall be signed and dated for "Checklist Completion" and the clearance Holder lock can be removed.

14. The WCC will notify the Requestor when the boundary change has been completed.

15. The Requestor will accept the boundary change. This acceptance may be performed by telecom with WCC personnel.

16. If work was suspended pending the boundary change, the Requestor is responsible for notifying the appropriate employees that the boundary change is complete and work may resume.

9.6 Audits

NOTE:	Audits may be suspended during Refueling Outages providing that an audit is completed within thirty days of the completion of the Outage. S-SO approval is required to suspend the audits.

9.6.1 Quarterly, the S-SO should ensure an audit of the Operations Clearances is performed. The audit should consist of the following:

R 2.5.1

1. The audit should include physical verification that the tags for clearances in effect greater than 30 days are in place and undamaged and that components are in the position listed on the Checklist.

2. Clearances in High Radiation Areas or Locked High Radiation Areas are excluded from this audit.

3. Damaged, illegible or missing tags shall be reprinted and replaced. The Checklist should be reprinted to allow documentation of the hanging and verification of the replacement tag. A comment should be entered in the Clearance Special Instructions explaining the replacement. This tag replacement should be noted on the Operations Clearance Audit Form (Attachment 9).

4. The physical check should be performed by a Tag Verifier.

5. Audit discrepancies and corrective action should be noted on the Operations Clearance Audit Form (Attachment 9) and reviewed by the S-SO.

R 2.3.14

6. A Nuclear Condition Report (NCR) should be generated or verified to exist for each clearance that has been in effect for greater than three months. The purpose of the NCR is to have the Responsible Engineer evaluate system impact and determine the solution to long-term material deficiencies. The NCR number should be noted in the Clearance Special Instructions.

7. Clearances that have been in effect for greater than three months shall be listed on the Operations Clearance Audit Form, Attachment 9. The S-SO shall determine if any alternate methods should be utilized to resolve longstanding clearances.

9.6 **Audits** (Cont.)

8. The Operations Clearance Audit Form should be routed to the S-SO for approval. The S-SO should ensure that the Scheduling department is notified to evaluate the need to incorporate long-standing equipment deficiencies in the scheduling process.

9.6.2 Monthly, Supervisors should perform an audit of their Personal Clearances. The audit should consist of the following:

1. This audit should include a physical verification that the tags for Personal Clearances in effect greater than 30 days are in place and undamaged and that components are in the position listed on the clearance form.

2. Damaged, illegible or missing tags shall be replaced. This should be documented on the clearance form and a comment included in the Clearance Special Instructions.

3. Clearances that have been in effect for greater than three months shall be noted on the Personal Clearance Audit Form (Attachment 10).

R 2.3.14

4. A Nuclear Condition Report (NCR) should be generated or verified to exist for each Personal Clearance that has been in effect for greater than three months. The purpose of the NCR is to have the Responsible Engineer evaluate the system impact and determine the solution to long-term material deficiencies. The NCR number should be noted in the Clearance Special Instructions.

5. The Supervisor should review the Personal Clearance Audit Form (Attachment 10) with the WCC. The WCC will determine if the clearance can remain a Personal Clearance or if it should be converted to an Operations Clearance.

R 2.1.2

9.6.3 Annually an inspection of the Clearance Process is to be performed as required by 29CFR1910.269. This inspection shall be performed by an Operator or Clearance Holder qualified in accordance with this procedure, and shall consist of the following elements:

1. A review of OPS-NGGC-1301 to determine compliance with 29CFR1910.269(d).

2. A review of a representative sample of open clearances for compliance with OPS-NGGC-1301.

9.6 **Audits** (Cont.)

3. Field interviews with employees to review personnel responsibilities under the clearance process. Group meetings between the inspector and clearance qualified personnel constitutes compliance with this requirement.

4. Field observations to determine compliance with applicable personnel safety-related work practices.

5. Identification, documentation, and correction of any deviation or inadequacy, and communication of such to all personnel.

6. Inspectors shall not audit clearances with which they have been involved.

9.7 Qualifications

Individual clearance qualification status is maintained in the Personnel Qualification Data System (PQD).

9.7.1 Tag Verifier

1. A Tag Verifier is an individual that has successfully completed the requirements of the Tag Verifier training program.

2. These individuals can perform tag verification duties associated with both Operations and Personal Clearances.

9.7.2 Tag Hanger

1. A Tag Hanger is an individual that has successfully completed the requirements of the Tag Hanger training program.

2. A Tag Hanger can also perform the duties associated with a Tag Verifier.

3. These individuals can perform tag hanging duties associated with both Operations and Personal Clearances.

9.7 Qualifications (Cont.)

9.7.3 Clearance Preparer

1. A Clearance Preparer is an individual that has successfully completed the requirements of the Clearance Preparer training program.

2. A Clearance Preparer is also qualified to perform the duties of Tag Hangers and Tag Verifiers.

3. These individuals may perform clearance preparation, tag hanging and tag verification duties associated with both Operations and Personal Clearances.

9.7.4 Clearance Holder

1. A Clearance Holder is an individual that has successfully completed the requirements of the Clearance Holder training program (PQD Clearance Holder Certification "HLDR").

2. These individuals may perform Clearance Holder duties associated with both Operations and Personal Clearances.

9.7.5 Contractors and Non-Qualified Progress Energy Employees

1. For contractors and Progress Energy employees who are not qualified as a Clearance Holder as defined by Section 9.7 of this procedure, the Progress Energy employee responsible for the work task(s) being performed shall perform the function of Principal Clearance Holder and electronically accept the applicable clearance, (except as provided in paragraph 9.2.1.25). This employee shall be responsible to maintain an Operations Clearance Acceptance/Release Form, Attachment 13, for all individuals working under his direction. Attachment 13 shall be maintained and updated for the duration of the task, and included in the work order package or delivered to Operations for inclusion with the clearance package for record retention at the completion of work tasks.

9.7 **Qualifications** (Cont.)

9.7.6 Personal Clearance Preparer

1. Personnel qualified to prepare Personal Clearances have successfully completed the requirements of the Personal Clearance training program. This program qualifies individuals to perform only the duties associated with Personal Clearances.

10.0 RECORDS

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Clearances for safety-related equipment are QA Records; therefore, permanent retention is required. The following clearance related documents are QA Records:

- Attachment 3, Operations Clearance Form
- Attachment 4, Operations Clearance Checklist (all completed checklists)
- Attachment 5, Operations Clearance Principal Equipment
- Attachment 6, Boundary Change Form
- Attachment 7, Personal Clearance Form
- Attachment 9, Operations Clearance Audit Form
- Attachment 10, Personal Clearance Audit Form
- Attachment 13, Operations Clearance Acceptance/Release Form, as applicable
- Computer generated clearance forms including:
  - All completed Checklists
  - Holders
  - Principal Equipment List
  - Checklist Cross-Reference

ATTACHMENT 1
Sheet 1 of 1
Clearance Log Sheet

CLEARANCE NO.	SYSTEM NO.	COMPONENT DESCRIPTION	REASON	HUNG DATE	COMPLETED DATE	REMARKS

ATTACHMENT 2
Sheet 1 of 1
Clearance Request Form

To be completed by the Requestor. (Please print.)

A. Name ______________________________ Ext. No.______________

Work Group __________________________ Date _______________

B. (1) Unit # __________________

(2) System # _______________

(3) Equipment to be cleared _______________________________________

____

C. Clearance Specifications

- ____
- ____
- ____
- ____
- ____
- ____
- ____

D. Reference drawings and procedures (attach list if necessary)

- ____

E. Special requests, precautions, and prerequisites_________________________

____

F. Date/Time Needed _________/_________ or Event ______________________

ATTACHMENT 3
Sheet 1 of 1
Operations Clearance Form

Clearance No. ______________

System No. ______________

1.0 Operations Approval

Principal Equipment ______________________________

1.2 ______________________________ ______/______
Prepared By (Planned) Date / Time

1.3 ______________________________ ______/______
Verified By (Approved) Date / Time

2.0 Authorization to hang: Equipment may be removed from service per Checklist and required documents listed in 2.1 have been activated.

2.1 Tech Spec/ESF/Fire Protection System operability affected? Yes/No.

Required Documents:______________ ______________ ______________ ______________ ______________

______________________________ ______/______
Distributed By SRO Date / Time

3.0 Checklist completed. (Clearance Checklist completed as requested)

______________________________ ______/______
Signature Date / Time

4.0 Clearance Accepted: Individual signing has verified clearance establishes adequate boundary.			5.0 Clearance Released: Equipment ready to be operated or WCC notified as to why not.		
Signature	Date/Time	Grounds Required	Signature	Date/Time	Grounds Removed
1		Y/N			Y/N
2		Y/N			Y/N
3		Y/N			Y/N
4		Y/N			Y/N
5		Y/N			Y/N
6		Y/N			Y/N
7		Y/N			Y/N

6.0 Authorization to Release: The individuals signing Step 4.0 must sign Step 5.0 before clearance is removed.

6.1 All work completed. Ground removal authorized.

______________________ ______/______
Signature Date / Time

Restored Position and Order to be Restored sections prepared.

______________________ ______/______
Signature Date / Time

6.2 Authorized to lift. Equipment may be restored to service per Checklist.

______________________________ ______/______
Distributed by SRO Date / Time

6.3 Checklist completed. (Clearance Checklist completed as requested)

______________________________ ______/______
Signature Date / Time

7 Review – Equipment Realigned as Required? Yes / NA

Clearance Removed from required documents? Yes / NA OP V/E L/U Updated? Yes / NA

______________________________ ______/______
SRO Date / Time

Special Instructions/References______________________________

____

____

____

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 *

Continued Y / N

ATTACHMENT 5
Sheet 1 of 1
Operations Clearance Principal Equipment

1.

C/R:	W/O:	Task:
Equipment/Component:		

2

C/R:	W/O:	Task:
Equipment/Component:		

3

C/R:	W/O:	Task:
Equipment/Component:		

4

C/R:	W/O:	Task:
Equipment/Component:		

5

C/R:	W/O:	Task:
Equipment/Component:		

6

C/R:	W/O:	Task:
Equipment/Component:		

7

C/R:	W/O:	Task:
Equipment/Component:		

8

C/R:	W/O:	Task:
Equipment/Component:		

9

C/R:	W/O:	Task:
Equipment/Component:		

10

C/R:	W/O:	Task:
Equipment/Component:		

11

C/R:	W/O:	Task:
Equipment/Component:		

Boundary Change Form

Clearance and Checklist Number ______________

1.0 TYPE OF BOUNDARY CHANGE REQUEST (Select one)
____ Addition ____ Removal ____ Combination

2.0 REASON FOR BOUNDARY CHANGE AND BOUNDARY CHANGE DETAILS (Step 9.5.2.1):

____
____
____
____

Requestor: ______________ Phone #: ______________ Date/Time: ______________

3.0 PREPARE BOUNDARY CHANGE (Steps 9.5.2.2, 9.5.2.3)
[ ] Completed via computer entry
<u>OR</u>

______________	____/____	______________	____/____
Prepared By	Date / Time	Verified By	Date / Time

4.0 Notifications (Select One) [ ] Holder lock applied, if applicable (Step 9.5.2.4)
____ None Required – Addition to Clearance unless the boundary could be affected by adding tags (Go to 5.0)
____ Not Applicable – No Holders (Go to 5.0)
____ Notify All Holders (N/A Section 4.1)
____ Notify Only Affected Employees (Section 4.1 Required)

4.1 DETERMINE AFFECTED EMPLOYEES: [ ] Not Applicable if notifying all Holders
(Steps 9.5.2.5, 9.5.2.6) (One must be an SRO, CNO for CR3 only)

______________	____/____	______________	____/____
Determined By	Date / Time	Verified By	Date / Time

4.2 NOTIFY EMPLOYEES: Appropriate employees must agree with the proposed boundary change, are ready for the implementation of the boundary change, and work has been stopped or suspended, as necessary.
(Steps 9.5.2.7 – 9.5.2.9)

Clearance Holder Agreement Obtained [ ] Not Applicable if "None Required" or "No Holders"

______________	____/____
Requestor's Signature	Date / Time

5.0 AUTHORIZATION (Step 9.5.2.10): Boundary Change may be implemented and any required compensatory actions and notifications have been made.
[ ] Completed via computer entry
<u>OR</u>

______________	____/____
SRO	Date / Time

6.0 BOUNDARY CHANGE COMPLETE (Steps 9.5.2.13, 9.5.2.14): Tags hung/lifted and Checklist completed as requested.
[ ] Completed via computer entry [ ] Notify Requestor to Accept Boundary Change
<u>OR</u> [ ] Holder Lock removed, if applicable

______________	____/____
Completed By	Date / Time

7.0 ACCEPT BOUNDARY CHANGE (Steps 9.5.2.15, 9.5.2.16): Appropriate employees notified as necessary.
[ ] Not Applicable if No Holders

______________	____/____	[ ] Accepted per telecom with WCC
Requestor <u>OR</u> WCC Notified	Date / Time	

ATTACHMENT 7
Sheet 1 of 1
Personal Clearance Form

Clearance Number ______________________ Page ____ of ____

Equipment to be Cleared: ______________________

Work Item or Procedure Number: ______________________

Clearance Prepared By: ______________________ Date/Time: ________/________

Supervisor Authorization: ______________________ Date/Time: ________/________

WCC Notified: ______________________ Date/Time: ________/________

Tags Hung By: ______________________ Date/Time: ________/________

Tags Verified By: ______________________ Date/Time: ________/________

Clearance Accepted: ______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

Clearance Released: ______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

Restoration Prepared By: ______________________ Date/Time: ________/________

Restoration Authorized: ______________________ Date/Time: ________/________

WCC Notified: ______________________ Date/Time: ________/________

Tags Removed: ______________________ Date/Time: ________/________

Tags Verified: ______________________ Date/Time: ________/________

Review Complete: ______________________ Date/Time: ________/________

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

** N/A if Order is not important

TAG TYPE AND #	** ORDER TO BE HUNG	COMPONENT ID/ LOCATION	CLR POSITION	ATTACHED BY (INITIALS)		RESTORED POSITION	** ORDER TO BE RESTORED	REMOVED BY (INITIALS) *	
					Verif By				Verif By

Initials/Print Name ______/__________ ______/__________ ______/__________

Special Instructions: ______________________

ATTACHMENT 8
Sheet 1 of 1
Special Instruction Continuation Sheet

Clearance Number ______________________________ Page ____ of ____

ATTACHMENT 9
Sheet 1 of 2
Operations Clearance Audit Form

Page ____ of ____

1. The quarterly audit of the Operations Clearances was completed this date ________________ with the following discrepancies noted.

Discrepancy	**Action**

Continued Yes/No

ATTACHMENT 9
Sheet 2 of 2
Operations Clearance Audit Form

Audit Form Continuation Sheet　　　　Page ____ of ____

2. The following clearances have been in place for longer than three months:

Number	Reason	Status

3. Resolution of Items in Block 2

Number	Resolution

WCC-SRO　　Date

Superintendent – Shift Operations　　Date

ATTACHMENT 10
Sheet 1 of 1
Personal Clearance Audit Form

Page ____ of ____

1. The Monthly audit of the Personal Clearance tags was completed this date __________ with the following discrepancies noted.

Discrepancy	Action

2. The following Personal Clearances have been in place for longer than three months:

Number	Reason	Status

3. Resolution of Items in Block 2

Number	Resolution

Continued Yes/No

______________________________ ____________
Supervisor Date

Boundary Device Tagging Guidelines

NOTE: This attachment should be used as a guideline for the typical restrictions and Tagout methods for the types of components listed. It is not all inclusive. Deviations from the Tagout Method is allowed when component design and application allow for other methods that also provide adequate isolation.

Boundary Device	Restrictions	Tagout Method
Manually Operated Valve	- Butterfly valves are prone to leak by seat. Monitor for seat leakage. - Plug valves are prone to leak. Monitor for leakage.	- Place tag on handwheel - If the valve has a remote operator such as a reach rod, it should be tagged
Manual Throttle Valve	- Normally not used as a boundary device - If a test (flow balance) is required to restore valve position, evaluate if the test can be performed during anticipated plant conditions prior to using valve as a boundary - Documentation of original valve position should be as accurate as indications or positioning will allow	- Record valve position, angle, percent open or number of turns in the restored position in Step Instructions and/or Special Instructions - Place tag on handwheel
Check Valve	- Should not be used as a boundary device	- If used, place a tag on the check valve to prevent inadvertent removal from the system - If possible, establish a vent path between the check valve and work location - Tag the vent path if possible
Solenoid Operated Valve	- Target Rock Solenoid Operated valves should not be used (NUREG-1275 Vol. 6) - Use only if valve fails closed - Evaluate for other components that are powered from same circuit	- Place tag on power supply - A tag should be placed on the valve to prevent inadvertent violation of the boundary

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

ATTACHMENT 11
Sheet 3 of 5
Boundary Device Tagging Guidelines

Boundary Device	Restrictions	Tagout Method
Hydraulic Operated Valve (Fails As Is)	- Normally not used as a boundary device - Either a manual positioning device or a mechanical gag is required - 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
R 2.2.1 Pneumatic Operated Valve (Fails Open)	- Normally not be used as a boundary device - Either a manual positioning device or a mechanical gag is required (SOER 85-5) - If a valve fails open on loss of air, isolation of the air supply will cause the valve actuator to work against the gag (gagged closed). If possible, do not isolate air to the valve.	- Position valve from control switch - Place a CIT or clearance tag on control switch as required - If work is to be performed on valve pneumatic system, place tag on pneumatic supply - If work is to be performed on valve pneumatic system, ensure that the pneumatics are vented from the operator and leave vent path open - If work is to be performed on valve pneumatic system, if a solenoid can be de-energized to vent the pneumatics from the operator, the solenoid may be de-energized and tagged - 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

Boundary Device Tagging Guidelines

Boundary Device	Restrictions	Tagout Method
Pneumatic Operated Valve (Fails Closed)	- If primary use of valve is flow control, monitor for seat leakage	- Position valve from control switch - Place a CIT or clearance tag on control switch as required - Place tag on pneumatic supply to valve - Ensure that the pneumatics are vented from the operator and leave vent path open - If a solenoid can be de-energized to vent the pneumatics from the operator, the solenoid may be de-energized and tagged - 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
Pneumatic Operated Valve (Fails As Is or Pressure Balanced)	- Normally not used as a boundary device - Either a manual positioning device or a mechanical gag is required	- Position valve from control switch - Place a CIT or clearance tag on control switch as required - Place tag on pneumatic supply to valve - Ensure that the pneumatics are vented from the operator and leave vent path open - If a solenoid can be de-energized to vent the pneumatics from the operator, the solenoid may be de-energized and tagged - 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

ATTACHMENT 11
Sheet 5 of 5
Boundary Device Tagging Guidelines

Boundary Device	Restrictions	Tagout Method
Rack IN/OUT Breaker (6.9 kV, 4160 volt or 480 volt)	- "Racked Out" is interpreted as either at the Racked Out position or removed from the cubicle. - "Not Racked In" is interpreted as any position other than "Racked In". - If the breaker is placed in the "Test" position, concurrent verification is required to ensure the breaker is not placed past the "Test" position - Control Power may be left on when the need is identified and evaluated as safe.	- Secure component/Open breaker - Place a CIT or clearance tag on control switch as required - Tag control power if required - Tag breaker as "Racked Out" - Tag breaker as "Not Racked In" when it is known that the breaker will be required to be positioned to the "Test" position.
MCC Breaker	- Not required unless work is performed on the load - If the breaker has been removed from the cubicle and work is in progress on the load, concurrent verification is required to ensure the breaker is open prior to reinstallation	- Secure component/Open breaker - Place a CIT or clearance tag on control switch as required - Place tag on breaker at the lockout device, if equipped - If the breaker door must be opened or the breaker removed, it is permissible to place the tag at another location on the breaker
Distribution Panel Breaker	- If a permanent lockout device does not exist use of a portable or removable lockout device is recommended	- Place tag on breaker
Lighting Panel Breaker	- If a permanent lockout device does not exist use of a portable or removable lockout device is recommended - Use of other tag attachment may be used per Step 9.3.1.6.	- Place tag on breaker
Lifted Lead/Sliding Link	- Use breakers and fuses when possible - Adhere to site and corporate safety requirements. - Evaluate other circuits that may be affected during the lead lift	- If lifted/opened at component, document with NGGC/Site configuration control methods - If lifted/opened at a location other than the component, hang a tag on each lifted lead/sliding link - If component is a boundary device, tag each lifted lead/sliding link

R 2.1.11

ATTACHMENT 12
Sheet 1 of 2
Clearance Checklist

NOTE: This checklist is intended to be an aid for the clearance process. It is not required but may be used in conjunction with the procedure as necessary.

<table>
<tr><td colspan="4">CLEARANCE PREPARATION CHECKLIST</td></tr>
<tr><td>YES</td><td>NO</td><td>N/A</td><td>Clearance #</td></tr>
<tr><td></td><td></td><td></td><td>CLEARANCE PREPARATION</td></tr>
<tr><td></td><td></td><td></td><td>System prints reviewed</td></tr>
<tr><td></td><td></td><td></td><td>System OPs reviewed</td></tr>
<tr><td></td><td></td><td></td><td>Electrical Load List reviewed</td></tr>
<tr><td></td><td></td><td></td><td>Two isolation valve criteria required, >200°F or >500 psig, Caustic/Acid Sys.</td></tr>
<tr><td></td><td></td><td></td><td>Tag hanging sequence correct (high energy to low energy sequence)</td></tr>
<tr><td></td><td></td><td></td><td>Ground straps identified and applicable marked up drawings included</td></tr>
<tr><td></td><td></td><td></td><td>Other unit effects identified (BNP Only)</td></tr>
<tr><td></td><td></td><td></td><td>Special Instructions include the pertinent information
• Energized Circuits • Significant loss of function
• WO on Checklist X-Ref • Valve handwheels not tagged
• Double valve iso. not met • Not completely drained/depressurized
• Approval for waiving IV • Relying on Valve L/U for restoration</td></tr>
<tr><td></td><td></td><td></td><td>Tagging sequence depressurizes system</td></tr>
<tr><td></td><td></td><td></td><td>Vent and drain path administratively controlled</td></tr>
<tr><td></td><td></td><td></td><td>CLEARANCE VERIFICATION</td></tr>
<tr><td></td><td></td><td></td><td>Second verification complete on Checklist
Clearance package complete (Check Included Documents)
☐ Clearance request ☐ Checklist Cross Reference and/or Principal Equipment Screen
☐ Clearance form ☐ Required prints
☐ Checklist(s) ☐ OP valve and electrical lineup</td></tr>
<tr><td></td><td></td><td></td><td>CLEARANCE AUTHORIZATION</td></tr>
<tr><td></td><td></td><td></td><td>LCOs activated</td></tr>
<tr><td></td><td></td><td></td><td>Control Room Notified</td></tr>
<tr><td></td><td></td><td></td><td>CLEARANCE INSTALLATION</td></tr>
<tr><td></td><td></td><td></td><td>Pre-Job Brief held prior to clearance hanging</td></tr>
<tr><td></td><td></td><td></td><td>Tags hung</td></tr>
<tr><td></td><td></td><td></td><td>Tags independently verified</td></tr>
<tr><td></td><td></td><td></td><td>Plant responded as expected</td></tr>
<tr><td></td><td></td><td></td><td>SRO notified that tags are hung</td></tr>
</table>

R
2.1.11

ATTACHMENT 12
Sheet 2 of 2
Clearance Checklist

CLEARANCE RESTORATION CHECKLIST			
YES	NO	N/A	Clearance #
			CLEARANCE RESTORATION
			Clearance Restored Order correct
			Clearance Restored Position correct
			Independent Verification requirements specified
			Special Instructions reviewed
			Partial valve and electrical lineup marked up and attached
			REMOVAL AUTHORIZATION
			Cleared equipment condition supports return to service (intact)
			Current plant conditions support clearance release and restoration
			Grounds removed, if used
			Clearance release Pre-Job brief held
			CLEARANCE REMOVAL
			Pre-job Brief held prior to clearance removal
			Tags removed
			Tag Accountability performed
			Tags Independently Verified, as required
			Plant responded as expected
			SRO notified that tags are removed
			CLEARANCE REVIEW
			Clearance removed from LCOs, EIRs, OWPs as necessary
			Independent Verification performed (if required)
			Components/Systems returned to service

ATTACHMENT 13
Sheet 1 of 1
Operations Clearance Acceptance/Release Form

Clearance Number: ______________________________

Principal Clearance Holder: ______________________________

Work Order Number(s) and Task(s): ______________________________

____

Principal Clearance Holder and WO Number(s)/Task(s) listed on Contacts Panel ☐

Work Order Number and Task	Clearance Worker Name (Print)	Accepted		Released	
		Signature	Date	Signature	Date

Check if continued on next page. ☐ This is Page _____

NOTE: This form should be included in the work order package or delivered to Operations for inclusion in the clearance package for record retention.

NOTE: Signing onto this form signifies understanding and acceptance of the work boundary.

REVISION SUMMARY

SECTION	CHANGE
3.2	Modified the definition for Checklist Cross Reference since PassPort has been modified to allow the writing of Clearance Requests for work items. Thus, all Work Orders should be able to be placed on the Principal Equipment List. The option to use the Checklist Cross Reference for WO Tasks will be maintained available until some later time.
3.14	Modified when Personal Clearances can be used. Clarified that Personal Clearances can be used for work on LCO equipment if the equipment is not required to be Operable in the current plant mode. Also clarified that the intent of the Maintenance Rule step is that Personal Clearances may not be utilized if Maintenance Rule unavailability time is incurred.
9.2.2.4	Removed the requirement to put Work Orders not associated with plant equipment in the EDB on the Checklist Cross Reference. PassPort has been modified to allow the writing of Clearance Requests for work items. Thus, all Work Orders should be able to be placed on the Principal Equipment List. The option to use the Checklist Cross Reference for WO Tasks will be maintained available until some later time.
10.0	NCR 85342 / PRR 111804 / Operations Sub-Peer Group – Added a requirement to maintain Attachment 7, Personal Clearance Form, Attachment 9, Operations Clearance Audit Form, and Attachment 10, Personal Clearance Audit Form, as QA Records.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMIN

ADM4ROEP

LESSON TITLE: Estimate Source Term for a Release from the Main Stack per PEP-03.6.1.

REVISION NO: 0

RECOMMENDED BY: Curt Robert ______________________________
Instructor/Developer DATE

CONCURRENCE BY: ______________________________
Line Superintendent/Supervisor DATE

APPROVED BY: ______________________________
Superintendent/Supervisor Training DATE

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee.
2. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
3. This JPM may be administered in the simulator, control room, or classroom setting.

Read the following to trainee.

TASK CONDITIONS:

1. A Loss of Coolant Accident on Unit Two has required declaration of a General Emergency due to entry into Severe Accident Management Guidelines.
2. Off-Site Dose Projection is required. ERFIS is not available in the EOF, and the Radiological Control Manager has requested the Control Room to determine the Source Term for the Main Stack Release.
3. The Main Stack flow transmitter (2-VA-FT-3359) is **NOT** operational. Main Stack flow indication is not available.
4. Unit Two (2) is performing Containment Venting per SAMG procedures.
5. Unit One (1) has been placed in Hot Shutdown.

INITIATING CUE:

You are directed by the Shift Superintendent to estimate the Source Term release from the Main Stack per PEP-03.6.1, and inform him of the Source Term estimation.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain current revision of PEP-03.6.1.

Current Revision of 0PEP03.6.1 obtained and verified, if applicable.

SAT/UNSAT*

Step 2 - Refer to Attachment 1 for source term calculation from the plant stack and determine calculation per Attachment 1 is required.

Determined that calculation of main stack source term is required by PEP-03.6.1 Attachment 1.

SAT/UNSAT*

Step 3 - Enter time on Attachment 1.

Time is entered on Attachment 1.

SAT/UNSAT*

PROMPT: Indicate on recorder 2-D12-RR-4599, Main Stack Radiation Monitor, a reading of 7.0×10^{-3} μCi/cc so that the examinee demonstrates ability to read the radiation monitor.

Step 4 - Obtain monitor readings from 2-D12-RR-4599.

Record 2-D12-RR-4599 reading as 7.0 E-3 on Attachment 1.

SAT/UNSAT*

NOTE: Examinee will verify which Unit One, Unit Two, and Common Systems are exhausting to the Main Stack. These systems can be checked in any order and the examiner should prompt the examinee when asked about system status.

PROMPT: When asked about system status to Estimate Stack Flow per Attachment 6 of PEP-03.6.1 reply as follows:

	Unit 1	Unit 2
SJAE A	Shutdown	Shutdown
SJAE B	Shutdown	Shutdown
Seal Stm Exh. A	**In service**	Shutdown
Seal Stm Exh. B	Shutdown	Shutdown
Mech. Vac. Pmp A	**In service**	Shutdown
Mech. Vac. Pmp B	Shutdown	Shutdown
Purge Fan A	Shutdown	**In service**
Purge Fan B	Shutdown	**In service**
SBGT A	**In service**	**In service**
SBGT B	**In service**	**In service**

	Common Systems
Radwaste Exhaust Fan A	**In service**
Radwaste Exhaust Fan B	Shutdown
AOG Building Ventilation	**In service**

Step 5 - Estimate Stack Flow using Attachment 6 as follows:

a. Unit 2 flow determined to be (DW Purge A + DW Purge B + SBGT A + SBGT B) 21,400 CFM.

Unit 2 flow calculated and recorded as 21,400 cfm on attachment 6.

SAT/UNSAT*

b. Unit 1 flow determined to be 9460 cfm (MVP A + SPE A + SBGT A + SBGT B).

Unit 1 flow determined to be 9460 cfm and recorded on attachment 6.

SAT/UNSAT*

c. Common flow determined to be 41,200 cfm (RW Fan A + AOG Vent).

Common flow determined and recorded as 41,200 cfm on attachment 6.

SAT/UNSAT*

d. Total Stack flow estimated at (Unit 1 + Unit 2 + Common) 72,060 cfm.

Total Stack flow estimate recorded as 72,060 cfm on attachment 6.

SAT/UNSAT*

Step 6 - Determine Release Rate (7.0 E-3 X 72,060 X 472 = 2.38 E5 μC/sec).

Release Rate from Main Stack determined to be 2.3-2.5 E5 μC/sec.

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

Step 7 - Inform Shift Superintendent of results.

SS notified.

SAT/UNSAT*

TERMINATING CUE: When the Main Stack Source Term has been estimated, this JPM is complete.

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

LIST OF REFERENCES

RELATED TASKS:

283 005 B1 01

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.4.39 3.3/3.1
Knowledge of the RO's responsibilities in emergency plan implementation

REFERENCES:

0PEP-03.6.1 Rev. 11
Release Estimation Based Upon Stack/Vent Readings.

TOOLS AND EQUIPMENT:

Calculator.

SAFETY FUNCTION (from NUREG 1123, Rev 2):

Administrative A.4 (Emergency Plan)

REASON FOR REVISION:

Revised JPM created for HLC 2004 NRC exam, LOT-OJT-JP-301-A14.

Time Required for Completion: 10 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ___ Actual ✓ Unit: 0

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)

Comments: ____

____

____

____

____

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. A Loss of Coolant Accident on Unit Two has required declaration of a General Emergency due to entry into Severe Accident Management Guidelines.

2. Off-Site Dose Projection is required. ERFIS is not available in the EOF, and the Radiological Control Manager has requested the Control Room to determine the Source Term for the Main Stack Release.

3. The Main Stack flow transmitter (2-VA-FT-3359) is **NOT** operational. Main Stack flow indication is not available.

4. Unit Two (2) is performing Containment Venting per SAMG procedures.

5. Unit One (1) has been placed in Hot Shutdown.

INITIATING CUE:

You are directed by the Shift Superintendent to estimate the Source Term release from the Main Stack per PEP-03.6.1, and inform him of the Source Term estimation.

PLANT OPERATING MANUAL

VOLUME XIII

PLANT EMERGENCY PROCEDURE

UNIT
0

0PEP-03.6.1

RELEASE ESTIMATES BASED UPON STACK/VENT READINGS

REVISION 11

EFFECTIVE DATE

10/30/97

Sponsor Signature and Date on File ______________
Date

Approval Signature and Date on File ______________
Supervisor - Emergency Preparedness Date

REVISION SUMMARY

Revision 11 of 0PEP-03.6.1 consists of the following changes:

-Step 6.0 - deleted "...by the RCM/RCD,..."

-Conversion of procedure from WordPerfect 5.1 DOS to Microsoft Word 7.0.

LIST OF EFFECTIVE PAGES

Page(s)	Revision
1-12	11

TABLE OF CONTENTS

1.0 PURPOSE

This procedure defines a methodology for determining if a radiation release has occurred or is occurring.

2.0 REFERENCES

2.1 0PEP-03.4.7, Automation of Offsite Dose Projection Procedures

2.2 0PEP-02.6.26, Activation and Operation of the Technical Support Center (TSC)

2.3 0PEP-02.6.27, Activation and Operation of the Emergency Operations Facility (EOF)

2.4 0PEP-02.6.20, Dose Projection Coordinator

3.0 DEFINITIONS

3.1 RCM - Radiological Control Manager

3.2 RCD - Radiological Control Director

3.3 ERM - Emergency Response Manager

4.0 RESPONSIBILITIES

4.1 The Radiological Control Manager (RCM) is responsible to the Emergency Response Manager (ERM) for determining the magnitude and rate of radioactive release to the environment. The Dose Projection function shall report to the Radiological Control Manager.

4.2 If the EOF is not activated, the Radiological Control Director (RCD) will direct the Dose Projection Team.

4.3 The Radiological Control Manager/Director may delegate the calculational aspects of this procedure to the Dose Projection Coordinator.

4.4 This procedure may be used by the Control Room personnel until the Dose Projection Team is activated in the EOF.

5.0 GENERAL

None

6.0 INITIATING CONDITION(S)

This procedure shall be implemented whenever an abnormal radiological release through an identifiable release point is suspected, including any Site Area or General Emergency.

7.0 PRECAUTIONS AND LIMITATIONS

None

8.0 SPECIAL TOOLS AND EQUIPMENT

Scientific Calculator

9.0 INSTRUCTIONS

NOTE: The detector response will depend on the specific isotopic mixture being released at various times. Grab samples must be taken, analyzed and evaluated to provide an exact relationship; however, the predetermined relationship used in this procedure should be sufficiently accurate to guide initial emergency response actions and assessments.

9.1 Depending upon alarming channel(s), use appropriate Attachment (Attachment 1 through Attachment 5) to calculate the release source term.

9.2 If only one channel is alarming or reading abnormally high, the source term determined on the appropriate Attachment is the total.

9.3 If multiple building vent radiation monitors are alarming (and are not monitoring the same point), calculate the individual source terms and sum them to obtain the total source term.

NOTE: Source terms calculated for the stack should not be added to source terms calculated for alarming vent monitors since stack source terms represent elevated rather than ground level releases. If the stack and vent monitors are alarming, then separate elevated and ground level source terms. These should be calculated and applied separately to dose calculations. The resultant off-site dose projections can then be summed to assess the total impact of the releases off site.

9.4 Report the source term to the RCM (RCD if the EOF is not activated) for use with PEP-03.4.7.

9.0 INSTRUCTIONS

9.5 If the Hardened Wetwell Vent (HWV) is initiated, the Operator should go to the releasing plant's panel XU-54. A reading may be observed. The Operator can obtain the proper release rate by pushing the "EFL" button on the HWV panel (XU-54) and taking the reading which is displayed in microcuries per second.

ATTACHMENT 1
Page 1 of 1
Source Term Calculation From Plant Stack Monitors

Release rate is read in μCi/sec directly from 2-D12-RR-4600 (effluent channel) when the 2-VA-FT-3359 flow instrument loop is operational. The following calculations are necessary when this loop is not operational.

TIME	MONITOR[1] READING (μCi/cc)	FLOW[2] (cfm)	CONVERSION FACTOR $\frac{cc/sec}{cfm}$	RELEASE RATE[3] (μCi/sec)
			472	

[1] The monitor automatically selects the most accurate operational channel, either low, mid, or high range. Read the μCi/cc from the appropriate channel (low, mid, or high) of 2-D12-RR-4599.

[2] If not available, use the sum of design flows for systems exhausting to the stack per Attachment 6.

[3] Release rate (μCi/sec) = (μCi/cc) x (cfm) x (472)

Source Term Calculation From #1 RX Gas (1-CAC-AQH-1264-3)

TIME	METER READING (cpm)	FLOW[1] (cfm)	EFFICIENCY[(2)] FACTOR	RELEASE[(3)] RATE (µCi/sec)

(1) If not available use 43,200 cfm per discharge fan times the number of fans operating.

(2) The efficiency factors posted on the front panel of the stack, reactor buildings monitors. If not posted, these values can be obtained from the latest E&RC 2020 performance (contact E&RC counting room).

(3) Release Rate = (cpm) x (cfm) x (Efficiency Factor)

Source Term Calculation From #1 Turbine Vent

Release rate is read in µCi/sec directly from 1-D12-RR-4549 (effluent channel) when the 1-VA-FT-3358 flow instrument loop is operational. The following calculations are necessary when this loop is not operational.

TIME	MONITOR READING(1) (µCi/cc)	FLOW(2) (cfm)	CONVERSION FACTOR $\frac{cc/sec}{cfm}$	RELEASE RATE(3) (µCi/sec)
			472	

(1) The monitor automatically selects the most accurate operational channel, either low, mid, or high range. Read the µCi/cc from the appropriate channel (low, mid, or high) of 1-D12-RR-4548.

(2) If not available, use 15,500 cfm.

(3) Release Rate (µCi/sec) = (µCi/cc) x (cfm) x (472)

ATTACHMENT 4
Page 1 of 1
Source Term Calculation From #2 RX Gas (2-CAC-AQR-1264-3)

TIME	METER READING (cpm)	FLOW[1] (cfm)	EFFICIENCY[2] FACTOR	RELEASE[3] RATE (µCi/sec)

(1) If not available use 43,200 cfm per discharge fan times the number of fans operating.

(2) The efficiency factors posted on the front panel of the stack, reactor buildings monitors. If not posted, these values can be obtained from the latest E&RC 2020 performance (contact E&RC counting room).

(3) Release Rate = (cpm) x (cfm) x (Efficiency Factor)

Source Term Calculation From #2 Turbine Vent

Release rate is read in μCi/sec directly from 2-D12-RR-4549 (effluent channel) when the 2-VA-FT-3358 flow instrument loop is operational. The following calculations are necessary when this loop is not operational.

TIME	MONITOR READING[1] (μCi/cc)	FLOW[2] (cfm)	CONVERSION FACTOR $\frac{cc/sec}{cfm}$	RELEASE RATE[3] (μCi/sec)
			472	

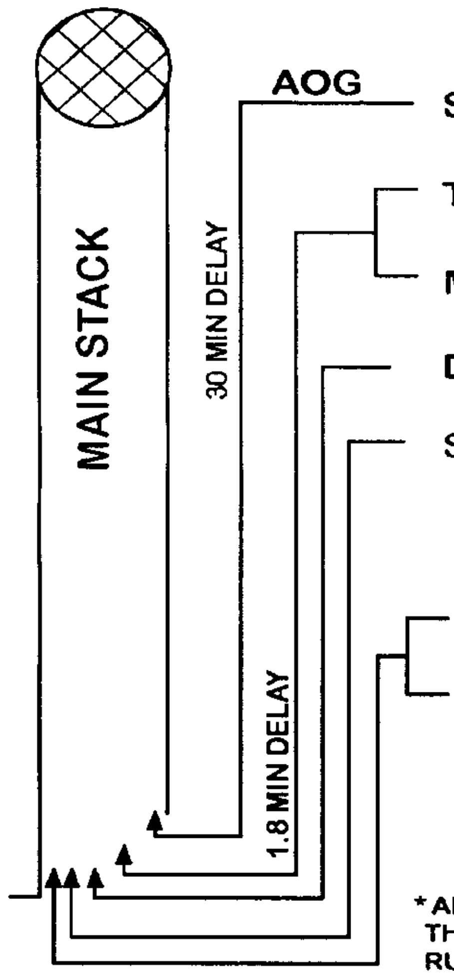
(1) The monitor automatically selects the most accurate operational channel, either low, mid, or high range. Read the μCi/cc from the appropriate channel (low, mid, or high) of 2-D12-RR-4548.

(2) If not available, use 15,500 cfm.

(3) Release Rate (μCi/sec) = (μCi/cc) x (cfm) x (472)

ATTACHMENT 6
Page 1 of 1
Estimating Stack Flow

SUM OF THE DESIGN FLOWS FOR SYSTEMS EXHAUSTING TO THE MAIN STACK



System		CFM	UNIT 1	UNIT 2
SJAE	A	300		
	B	300		
TURB GLAND SEAL	A	650		
	B	650		
MECH VAC PUMP	A	1810		
	B	1810		
DW PURGE	A	7200		
	B	7200		
STANDBY GAS TRAIN	A	3500		
	B	3500		
SUB TOTAL				

System		CFM	COMMON SYSTEMS
RAD BLDG FAN	A	23200	
	B	23200	
* AOG BLDG VENT EXH		18000	
TOTAL STACK EFFLUENT FLOW			

* ALTHOUGH THERE ARE 2 SUPPLY AND EXHAUST FANS, THIS FLOW IS BASED ON 1 SUPPLY AND 1 EXHAUST FAN RUNNING BY PROCEDURE.

KEY

Source Term Calculation From Plant Stack Monitors

Release rate is read in µCi/sec directly from 2-D12-RR-4600 (effluent channel) when the 2-VA-FT-3359 flow instrument loop is operational. The following calculations are necessary when this loop is not operational.

TIME	MONITOR[1] READING (µCi/cc)	FLOW[2] (cfm)	CONVERSION FACTOR cc/sec / cfm	RELEASE RATE[3] (µCi/sec)
	7.0×10^{-3}	72,060	472	2.38×10^{5}

1 The monitor automatically selects the most accurate operational channel, either low, mid, or high range. Read the µCi/cc from the appropriate channel (low, mid, or high) of 2-D12-RR-4599.

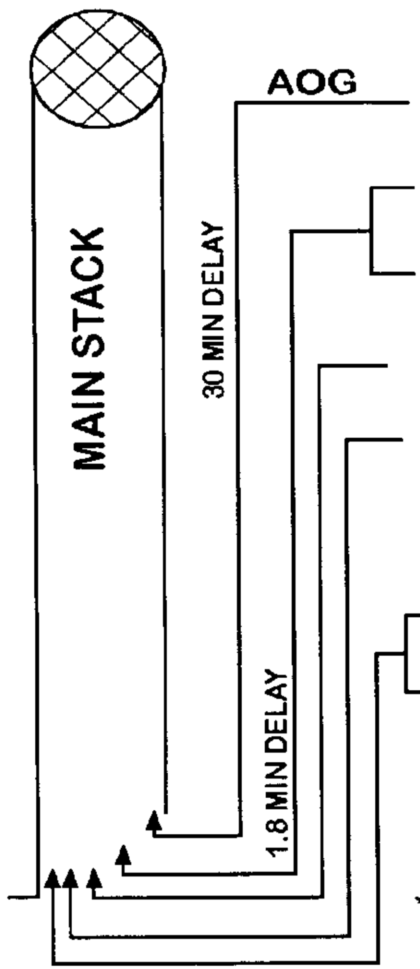
2 If not available, use the sum of design flows for systems exhausting to the stack per Attachment 6.

3 Release rate (µCi/sec) = (µCi/cc) x (cfm) x (472)

KEY

ATTACHMENT 6
Page 1 of 1
Estimating Stack Flow

SUM OF THE DESIGN FLOWS FOR SYSTEMS EXHAUSTING TO THE MAIN STACK



System	CFM	UNIT 1	UNIT 2
SJAE	A 300	0	0
	B 300	0	0
TURB GLAND SEAL	A 650	650	0
	B 650	0	0
MECH VAC PUMP	A 1810	1810	0
	B 1810	0	0
DW PURGE	A 7200	0	7200
	B 7200	0	7200
STANDBY GAS TRAIN	A 3500	3500	3500
	B 3500	3500	3500
SUB TOTAL		9460	21400

System	CFM	COMMON SYSTEMS
RAD BLDG FAN	A 23200	23200
	B 23200	0
* AOG BLDG VENT EXH	18000	18000
TOTAL STACK EFFLUENT FLOW		72060

* ALTHOUGH THERE ARE 2 SUPPLY AND EXHAUST FANS, THIS FLOW IS BASED ON 1 SUPPLY AND 1 EXHAUST FAN RUNNING BY PROCEDURE.