Draft Submittal
(Pink Paper)

1. ADMINISTRATIVE TOPICS OUTLINE (ES-301-1)
2. CONTROL ROOM SYSTEMS & FACILITY WALK-THROUGH TEST OUTLINE (ES-301-2)
3. ADMINISTRATIVE JPMS
4. IN-PLANT JPMS
5. CONTROL ROOM JPMS (SIMULATOR JPMS)

<u>PROGRESS ENERGY CAROLINAS</u>
<u>BRUNSWICK TRAINING SECTION</u>

JOB PERFORMANCE MEASURE
SIMULATOR

S-8

LESSON TITLE: Bypass a Control Rod from the RWM Sequence

LESSON NUMBER: LOT-SIM-JP-007-A01

REVISION NO: 2

SIMULATOR SETUP

IC-32 (suggested)

Triggers

None

Malfunctions

None

Overrides

None

Remote

None

Special Instructions

Ensure rod 30-07 is full in.

Control Rod 30-07 will have to be unbypassed in the RWM ***PRIOR TO*** subsequent JPM administration.

Resetting the simulator to the established IC for the JPM setup ***DOES NOT*** clear the bypassed rod in the RWM.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee after finding the appropriate section of the procedrue.

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.

Read the following to trainee.

TASK CONDITIONS:

1. Control Rod 30-07 has been fully inserted to suppress a fuel leak.

2. Control Rod 30-07 has not been bypassed in the Rod Worth Minimizer.

3. The RWM does not have a critical self test failure.

4. 2OP-07, Section 4.0 Prerequisites are met.

5. The Reactor Engineer has been notified and Technical Specifications have been reviewed.

INITIATING CUE:

The Unit SCO directs you to bypass Control Rod 30-07 in the Rod Worth Minimizer and inform him when the rod has been bypassed.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a copy of 2OP-07, Section 8.15.
Current Revision of 2OP-07, Section 8.15 obtained.

SAT/UNSAT*

Time Start:___________

NOTE: The key cabinet has the appropriate key (#37) which can be identified by using the list of keys in the key cabinet.

Step 2 – Obtain key to RWM Computer Display (P607 – Key #37).
Key for RWM Computer display obtained.

SAT/UNSAT*

NOTE: When placed in INOP the following alarm will annunciate - *ROD BLOCK RWM/RMCS SYS TROUBLE* (A-05 5-2).

Step 3 – Place RWM Computer Display keylock switch in the INOP position.
RWM Computer Display keylock switch is in INOP.

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

Step 4 – Press the ETC softkey until Rod Bypass Options appears.
Rod Bypass Options is displayed.

SAT/UNSAT*

Step 5 – Press the Rod Bypass Options softkey.
Rod Bypass Options softkey is pressed.

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

Step 6 – Use Up/Down cursor to ensure correct ID of rod to bypass.
Rod 30-07 identified for bypassing.

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

Step 7 – Press Bypass Rod softkey
Bypass Rod softkey is pressed.

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

Step 8 – Confirm the selected rod is added to the display of bypassed rods
Bypassed Rod is displayed.

SAT/UNSAT*

Step 9 – Place RWM Computer Display to OPER (Operate).
RWM Computer Display is in OPER

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

Step 10 – Press the Display Off softkey to extinguish the screen.
Display Off pressed.

SAT/UNSAT*

Step 11 – Ensure annunciator Rod Block RWM/RMCS Sys Trouble (A-05 5-2) is clear.
Rod Block RWM/RMCS Sys Trouble alarm verified clear.

SAT/UNSAT*

PROMPT: Inform examinee as Unit SCO that you will contact the Reactor Engineer.

PROMPT: Inform examinee that another operator will ensure a Caution Tag is generated identifying the bypassed control rod(s) in the RWM and posted at the RWM ODA (P603) and computer display (P607).

Step 12 – Inform the Unit SCO that Control Rod 30-07 is bypassed

Unit SCO informed Rod 30-07 is bypassed.

SAT/UNSAT*

TERMINATING CUE: When control rod 30-07 is bypassed in the RWM and the Unit SCO informed, this JPM is complete.

Time completed:___________

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

RELATED TASKS:

214201B401 Bypass/unbypass a control rod from the Rod Worth Minimizer Computer Display

K/A REFERENCE AND IMPORTANCE RATING:

201006 A2.05 3.1/3.5
Ability to use procedures to correct or control out of sequence rod movement.

REFERENCES:

2OP-07 Rev. 87

TOOLS AND EQUIPMENT:

Key for RWM Computer Display.

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

7 - Instrumentation

REASON FOR REVISION:

Formatting.

Validation Time: _5_ 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: ____________________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure?: Yes _____ No _____

Comments: ____

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Comments reviewed with Student

Evaluator Signature: ________________________________ Date: _______________

TASK CONDITIONS:

1. Control Rod 30-07 has been fully inserted to suppress a fuel leak.
2. Control Rod 30-07 has not been bypassed in the Rod Worth Minimizer.
3. The RWM does not have a critical self test failure.
4. 2OP-07, Section 4.0 Prerequisites are met.
5. The Reactor Engineer has been notified and Technical Specifications have been reviewed.

INITIATING CUE:

The Unit SCO directs you to bypass Control Rod 30-07 in the Rod Worth Minimizer and inform him when the rod has been bypassed.

8.13 Bypassing a Control Rod in the Rod Worth Minimizer

C
Continuous
Use

8.13.1 Initial Conditions

Date/Time Started_______________

Initials

1. There is a need to bypass a control rod in the *RWM*. _____
2. *RWM* does **NOT** have a critical self test failure. _____
3. All applicable prerequisites listed in Section 4.0 are met. _____
4. Reactor Engineer has been contacted. _____
5. The Unit SCO has reviewed Technical Specification Sections 3.1.3, 3.1.6, and 3.3.2.1 for applicability and has given permission to perform this procedure. _____

8.13.2 Procedural Steps

NOTE:	'Rod Bypass' operations are only allowed in *INOP* mode at *RWM COMPUTER DISPLAY (P607).*

1. **BYPASS** selected control rod as follows:

   a. **OBTAIN** key to *RWM COMPUTER DISPLAY (P607)*. _____

NOTE:	*RWM* will only allow a maximum of eight control rods to be bypassed.
NOTE:	The following step will annunciate *ROD BLOCK RWM/RMCS SYS TROUBLE* (A-05 5-2).

   b. **PLACE** *RWM COMPUTER DISPLAY (P607)* keylock switch in *INOP*. _____

   c. **PRESS** *ETC* softkey until *ROD BYPASS OPTIONS* appears. _____

8.13.2 Procedural Steps Initials

d. **PRESS** *ROD BYPASS OPTIONS* softkey. _____

e. **ENSURE** correct *ID* of rod to bypass (use *UP/DOWN* cursor to change). _____

f. **PRESS** *BYPASS ROD* softkey. _____

g. **CONFIRM** selected rod is added to the display of bypassed control rods. ___/___ Ind.Ver.

h. **PLACE** *RWM COMPUTER DISPLAY (P607)* keylock switch in *OPER* (OPERATE). ___/___ Ind.Ver.

i. **PRESS** *DISPLAY OFF* softkey to extinguish screen. _____

j. **ENSURE** annunciator *ROD BLOCK RWM/RMCS SYS TROUBLE* (A-05 5-2) is clear. _____

k. **CONTACT** Reactor Engineer to annotate appropriate GP Rod Sequence Checkoff Sheet to reflect bypassed rod condition. _____

l. **IF** bypassed control rod is inoperable, **THEN ENSURE** control rod is fully inserted. _____

m. **ENSURE** a Caution Tag is generate identifying the bypassed control rod(s) in the RWM and posted at the RWM ODA (P603) and computer display (P607) _____

Date/Time Completed ____________________

Performed By (Print)	Initials
____________________	_____
____________________	_____
____________________	_____
____________________	_____

Reviewed By: ____________________
Unit SCO

PROGRESS ENERGY – CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SIMULATOR

S-7

little discriminatory value

LESSON TITLE: Restore Nitrogen Backup System after an Isolation

LESSON NUMBER: LOT-SIM-JP-046-001

REVISION NO: 0

SIMULATOR SETUP

Recommended Initial Conditions

IC-11

Rx Pwr 100%

BOC

Required Plant Conditions:

Triggers:

Malfunctions:

Insert an inadvertent CS initiation and then remove the malfunction.

Overrides:

Remotes

None

Special Instructions:

Verify auto actions occurred for the inadvertent CS initiation signal.

Turn both Core Spray pumps off.

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL NOT** 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.

Read the following to trainee.

TASK CONDITIONS:

1. Core Spray instrumentation was bumped causing an inadvertent initiation signal.
2. Auto actions have been verified.
3. Core Spray Pumps have been secured.
4. Prerequisites of 0OP-46 are all met.

INITIATING CUE:

You are directed to:

1. Complete the actions to shutdown Core Spray.
2. Restore the Nitrogen Backup System in accordance with 0OP-46.

Inform the Unit SCO when the Nitrogen Backup System is restored to normal.

PERFORMANCE CHECKLIST

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

NOTE:	Examinee should determine that the only steps in the Core Spray Shutdown procedure that are left to complete are the steps to reset the logic. (Step 7.1.5). Examinee may sign off these steps as Condition Met (CM) or perform them. These steps are not critical. 1. Verify the initiation signal is not valid. 2. Verify Inboard Injection Valve, E21-F005A/B, are closed. 3. Verify Min Flow Bypass Valve, E21-F031A/B, are open. 4. Verify Core Spray Pumps are secured.

Step 1 – Evaluates 2OP-18 Section 7 and determines actions are complete with the exception of Core Spray logic being reset (Step 7.1.5).

Determines Core Spray Logic needs to be reset.

SAT/UNSAT*

NOTE:	The only critical step is to reset the Core Spray Initiation, since LPCI does not have an initiation signal at this time. The 10 second time limit does not apply under these conditions.

Step 2 –Perform the following two steps within 10 seconds of each other:

a. Depress both Initiation Signal/Reset pushbuttons, E21-CS-15A and E21-CS-15B and verify both white Initiation Signal Sealed-In lights go out

Verifies white initiation lights are not lit.

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

b. Depress both Loop A and B LPCI Injection Signal/Reset pushbuttons, E11-CS-S26A and E11-CS-S26B, and verify both white Initiation Signal Sealed-In lights are out

Verifies white initiation lights are not lit.

SAT/UNSAT*

PROMPT: Inform the examinee that another operator will perform step 7.1.6 of 2OP-18 to return Core Spray to Standby.

Step 3 – Obtain copy of 0OP-46 Section 8.10 to restore Nitrogen Backup System to normal.
Section 8.10 of 0OP-46 is obtained.

SAT/UNSAT*

Step 4 – Verifies instrument air header pressure(IA-PI-724-1) is greater than 98 psig.
Verifies air header pressure is normal.

SAT/UNSAT*

Step 5 –Verifies that the following alarms are clear:
Alarms are clear.

Alarm	SAT	UNSAT
UA-01 1-1 RB Instr Air Receiver 2A Press Low		
UA-01 1-2 RB Instr Air Receiver 2B Press Low		

SAT/UNSAT*

Step 6 – Momentarily place Div I Non-Intrpt RNA, RNA-SV-5262, control switch to the Override/Reset position, then to OPEN.
Control switch placed to override/reset then back to open.

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

Step 7 – Ensures the following valve positions:
Valves in their appropriate position.

Valve	Position	SAT	UNSAT
Div I Non-Intrpt RNA, RNA-SV-5262	open		
Div I Backup N2 Rack Isol Vlv, RNA-SV-5482	closed		

SAT/UNSAT*

Step 8 – Momentarily place Div II Non-Intrpt RNA, RNA-SV-5261, control switch to the Override/Reset position, then to OPEN.

Control switch placed to override/reset then back to open.

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

Step 9 – Ensures the following valve positions:

Valves in their appropriate position.

Valve	Position	SAT	UNSAT
Div II Non-Intrpt RNA, RNA-SV-5261	open		
Div II Backup N2 Rack Isol Vlv, RNA-SV-5481	closed		

SAT/UNSAT*

PROMPT: Inform the examinee that another operator will perform Attachment 11.

Step 10 – Inform Unit SCO that Core Spray has been shutdown and Nitrogen Backup System is in normal alignment.

Unit SCO informed.

SAT/UNSAT*

TERMINATING CUE: When the Nitrogen Backup System has been placed back into normal alignment this JPM is complete.

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

RELATED TASKS:

278203B101, Restore the Backup Nitrogen System following an Auto Initiation Per OP-46.

K/A REFERENCE AND IMPORTANCE RATING:

232002 A4.03 3.6/3.5

Ability to manually operate and/or monitor in the control room: Reset system isolations.

REFERENCES:

OP-46, Section 8.10

Op-18, Section 7.

TOOLS AND EQUIPMENT:

None.

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

5 – Containment Integrity

REASON FOR REVISION:

New JPM.

Validation Time: 14 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:________________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments ____

Comments reviewed with Student

Evaluator Signature: ________________________________ Date:____________

7.0 SHUTDOWN

7.1 Core Spray Shutdown

R
Reference Use

7.1.1 Initial Conditions

1. **EITHER** of the following exist:

   a. Core Spray has automatically initiated **AND** either of the following exist: ☐

      – Core Spray is no longer required to maintain water level,

      OR

      – The automatic initiation signal is **NOT** a valid signal.

   OR

   b. Core spray was manually started and is no longer required to maintain water level. ☐

7.1.2 Procedural Steps

Loop A(B)________

1. **IF** core spray auto initiated, **THEN VERIFY** from at least two independent indications that one of the following conditions exist:

   - adequate core cooling is ensured ☐
   - the initiation signal was **NOT** valid ☐
   - core spray is **NOT** functioning properly in the automatic mode ☐

2. **CLOSE** *INBOARD INJECTION VLV, E21-F005A(B).* ☐

7.1.2 Procedural Steps

NOTE:	Actual minimum flow bypass switch setpoint is 603 gpm which, due to limited gage increments, can be verified on Control Room indication at or below 500 gpm.

R14

CAUTION

Failure to minimize core spray pump operation in the minimum flow mode may cause pump damage.

3. **WHEN** flow drops below 603 gpm, **THEN ENSURE** *MIN FLOW BYPASS VLV, E21-F031A(B),* opens. ☐

CAUTION

A core spray pump stopped manually with an initiation signal present will **NOT** automatically restart unless the initiation signal has cleared and been reset.

4. **STOP** *CORE SPRAY PUMP 2A(2B), E21-C001A(B).* ☐

5. **WHEN** auto initiation conditions are no longer present, **THEN PERFORM** the following two steps within 10 seconds of each other:

   a. **DEPRESS** BOTH *INITIATION SIGNAL/RESET* push buttons, *E21-CS-15A* **AND** *E21-CS-15B,* **AND VERIFY** BOTH white *INITIATION SIGNAL SEALED-IN* lights go out. ☐

   b. **DEPRESS** BOTH *LOOP A* and *B LPCI INJECTION SIGNAL/RESET* push buttons, *E11-CS-S62A* **AND** *E11-CS-S62B*, **AND VERIFY** BOTH white *INITIATION SIGNAL SEALED-IN* lights go out. ☐

6. **GO TO** Section 5.1 **AND RETURN** core spray to Standby. ☐

8.10 Restoring the Nitrogen Backup System After A Core Spray/LOCA Logic Auto Initiation

8.10.1 Initial Conditions

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

2. *DIV I BACKUP N2 RACK ISOL VLV, SV-5482* **OR** *DIV II BACKUP N2 RACK ISOL, SV-5481*, is open due to Core Spray/LOCA Logic actuation. ☐

3. *DIV I NON-INTRPT RNA, SV-5262* **OR** *DIV II NON-INRPT RNA, SV-5261*, is closed due to Core Spray/LOCA Logic actuation. ☐

8.10.2 Procedural Steps

1. **ENSURE** the Core Spray/LOCA Logic has been reset. ☐

2. **OBSERVE** *INSTRUMENT AIR HEADER PRESSURE, IA-PI-724-1*, is greater than 98 psig. ☐

3. **OBSERVE** the following annunciators are clear:

   a. *RB INSTR AIR RECEIVER 1A(2A) PRESS LOW* (UA-01 1-1). ☐

   b. *RB INSTR AIR RECEIVER 1B(2B) PRESS LOW* (UA-01 1-2) ☐

4. **MOMENTARILY PLACE** *DIV I NON-INTRPT RNA, RNA-SV-5262* control switch to *OVERRIDE/RESET* position, **THEN** to the *OPEN* position. ☐

   a. **ENSURE** *DIV I NON-INTRPT RNA, RNA-SV-5262* is open. ☐

   b. **ENSURE** *DIV I BACKUP N2 RACK ISOL VLV, RNA-SV-5482* is closed. ☐

8.10.2 Procedural Steps

5. **MOMENTARILY PLACE** *DIV II NON-INTRPT RNA, RNA-SV-5261* control switch to *OVERRIDE/RESET* position, **THEN** to the *OPEN* position. ☐

   a. **ENSURE** *DIV II NON-INTRPT RNA, RNA-SV-5261* is open. ☐

   b. **ENSURE** *DIV II BACKUP N2 RACK ISOL VLV, RNA-SV-5481* is closed. ☐

6. **COMPLETE** Attachment 11. ☐

PROGRESS ENERGY – CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SIMULATOR

S-6

LESSON TITLE: Manual Transfer Of E Bus From DG To Normal Feeder.

LESSON NUMBER: LOT-SIM-JP-050-A02

REVISION NO: 2

Recommended Simulator Setup

Initial Conditions

IC-11

Triggers

None

Malfunctions/Overrides

None

Special instructions

1. Start DG3 and tie to E3, pick up E3 load on DG3 and open the master/slave from 2D to E3.

2. Ensure all motors fed from E3 are not running (i.e. CRD, CSW, NSW).

3. Place DG3 in Auto Mode of operation (output breaker will remain closed).

4. Start loads on DG3 to pick up approximately 3200 – 3500 KW. (CRD A, CSW A, NSW A, RHR Loop A in suppression pool cooling)

5. Return DG3 frequency to approximately 60 hertz.

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to examinee)

1. The applicable procedure section **WILL** provided to the examinee after the appropriate procedure section is identified.
2. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the examinee.

Read the following to examinee.

TASK CONDITIONS:

1. Diesel Generator #3 is supplying power to 4160 VAC Bus E3.
2. Bus 2D is energized.
3. The dispatcher has been notified that the E Bus power is being shifted to the normal feeder.

INITIATING CUE:

You are directed by the Unit SCO to perform the actions of 0OP-50.1 for control room manual transfer of Bus E3 from the Diesel Generator to the normal feeder and inform the Unit SCO when actions are complete.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a current revision of 0OP-50.1, Section 8.6.
Current Revision of 0OP-50.1, Section 8.6 obtained.

SAT/UNSAT*

Step 2 – Reduce diesel generator load or raise diesel generator frequency as necessary to prevent RPS EPA breaker trip.
DG3 load is lowered or frequency is raised.

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

NOTE: RPS MG Set A EPA breakers will trip on under frequency at 57.5.

DG frequency cannot be raised above approximately 61 hertz due to the mechanical governor (raising frequency to 61 hertz will prevent EPA breaker trip).

Step 3 – Place DG3 in control room manual.
DG3 is verified to be in control room manual.

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

Step 4 – Place the synchroscope to ON for Bus 2D to E3
Bus 2D to E3 synchroscope switch is in ON.

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

Step 5 – Ensure incoming and running voltages are matched.
Incoming and running voltages are matched as indicated on the incoming and running voltmeters on XU-1.

SAT/UNSAT*

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a current revision of 0OP-50.1, Section 8.6.

Current Revision of 0OP-50.1, Section 8.6 obtained.

SAT/UNSAT*

Step 2 – Reduce diesel generator load or raise diesel generator frequency as necessary to prevent RPS EPA breaker trip.

DG3 load is lowered or frequency is raised.

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

NOTE: RPS MG Set A EPA breakers will trip on under frequency at 57.5 hertz if no action is taken to lower load or raise frequency.

DG frequency cannot be raised above approximately 61 hertz due to the mechanical governor (raising frequency to 61 hertz will prevent EPA breaker trip).

Step 3 – Place DG3 in control room manual.

DG3 is placed in control room manual without tripping RPS EPA breakers.

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

Step 4 – Place the synchroscope to ON for Bus 2D to E3

Bus 2D to E3 synchroscope switch is in ON.

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

Step 5 – Ensure incoming and running voltages are matched.

Incoming and running voltages are matched as indicated on the incoming and running voltmeters on XU-1.

SAT/UNSAT*

NOTE: DG3 is the running source, Bus 2D (the grid) is incoming.

Step 6 – Adjust the DG3 governor control switch as necessary so the synchroscope is rotating slowly in the SLOW direction.

Synchroscope is rotating slowly in the SLOW direction.

SAT/UNSAT*

Step 7 – When the synchroscope is at 12 o'clock position, Then place and hold the control switch for Bus 2D to E3 in CLOSE until both MSTR and SLAVE breakers indicate closed.

Bus 2D to E3 Master and Slave breakers are both closed.

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

Step 8 – Confirm synchroscope remains at 12 o'clock.

Synchroscope remains at 12 o'clock.

SAT/UNSAT*

Step 9 - Place synchroscope for Bus 2D to E3 in OFF.

Synchroscope for Bus 2D to E3 is in OFF.

SAT/UNSAT*

Step 10 – Lower DG3 load to between 450 and 550 KW by placing the governor switch in LOWER.

DG3 load is between 450 and 550 KW.

SAT/UNSAT*

Step 11 – Open DG3 to E3 output breaker.

DG3 to E3 breaker is open.

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

NOTE: DG3 is the running source, Bus 2D (the grid) is incoming.

Step 6 – Adjust the DG3 governor control switch as necessary so the synchroscope is rotating slowly in the SLOW direction.

Synchroscope is rotating slowly in the SLOW direction.

SAT/UNSAT*

Step 7 – When the synchroscope is at 12 o'clock position, Then place and hold the control switch for Bus 2D to E3 in CLOSE until both MSTR and SLAVE breakers indicate closed.

Bus 2D to E3 Master and Slave breakers are both closed.

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

Step 8 – Confirm synchroscope remains at 12 o'clock.

Synchroscope remains at 12 o'clock.

SAT/UNSAT*

Step 9 - Place synchroscope for Bus 2D to E3 in OFF.

Synchroscope for Bus 2D to E3 is in OFF.

SAT/UNSAT*

Step 10 – Lower DG3 load to between 450 and 550 KW by placing the governor switch in LOWER.

DG3 load is between 450 and 550 KW.

SAT/UNSAT*

Step 11 – Open DG3 to E3 output breaker.

DG3 to E3 breaker is open.

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

Step 12 – Observe the following indications:

a. Breaker open in accordance with indicating lights.
Breaker open indication observed.

SAT/UNSAT*

b. Emergency Bus voltage remains constant.
Emergency Bus voltage observed to remain constant.

SAT/UNSAT*

c. Diesel generator load and amps are zero.
DG load and amps observed to be zero.

SAT/UNSAT*

d. NO LOAD and AVAIL lights are illuminated.
No Load and Avail lights observed to be on

SAT/UNSAT*

PROMPT: Inform examinee that another operator has been assigned to shut down DG3 in accordance with OP-39.

Step 13 – Unit SCO informed actions complete to transfer Bus E3 from DG to normal.
SCO informed actions to transfer E3 from DG to normal are complete.

SAT/UNSAT*

TERMINATING CUE: When E3 is being supplied from Bus 2D and DG3 output breaker is open, this JPM is complete.

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

RELATED TASKS:

262017B101, Complete A Control Room Manual Transfer Of Emergency Bus Supply From Diesel Generator To Normal Feeder Per OP-50.1

K/A REFERENCE AND IMPORTANCE RATING:

264000 A4.05 3.6/3.7
Ability to manually operate and/or monitor in the control room: Transfer of emergency generator (with load) to grid.

REFERENCES:

0OP-50.1, Section 8.6

TOOLS AND EQUIPMENT:

None.

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

6 - Electrical (Emergency Generators)

REASON FOR REVISION:

Formatting

Validation Time: 15 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

Examinee: ______________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date: ______________

TASK CONDITIONS:

1. Diesel Generator #3 is supplying power to 4160 VAC Bus E3.
2. Bus 2D is energized.
3. The dispatcher has been notified that the E Bus power is being shifted to the normal feeder.

INITIATING CUE:

You are directed by the Unit SCO to perform the actions of 0OP-50.1 for control room manual transfer of Bus E3 from the Diesel Generator to the normal feeder and inform the Unit SCO when actions are complete.

R36 **8.6 Control Room Manual Transfer of 4160V Emergency Bus Supply from Diesel Generator to Normal Feeder**

C
Continuous
Use

8.6.1 Initial Conditions

R38

NOTE:	**IF** this procedure is being used to recover from a loss of grid event (such as 0AOP-36.1 or 0AOP-36.2), **THEN** the Shift Superintendent and Operations Manager should be included during consultation with the Load Dispatcher to obtain assurance that Off-site power is reliable enough to support reconnection of the Emergency Buses.

1. Diesel generator is supplying the associated emergency bus. ☐

2. Normal feeder bus for emergency bus is energized. ☐

3. Notify the Load Dispatcher that the 4160V E Bus power supply is being shifted to the Normal Feeder. ☐

8.6.2 Procedural Steps

R35

NOTE:	**WHEN** transferring the diesel generator from Auto Mode to Control Room Manual, diesel generator frequency is expected to drop approximately 3 Hz at rated load. Since the range of frequency drop to diesel generator load is linear (e.g., transfer to Control Room Manual at half load results in a frequency drop of 1.5 Hz), adjustments to lower diesel generator load or raise diesel frequency can be made to compensate for frequency drop prior to the transfer. See Figure 1.

R35

CAUTION

Failure to reduce load or raise frequency on the diesel generator as necessary, prior to transferring to Control Room Manual may result in trip of the RPS EPA breakers on underfrequency (57.7 Hz decreasing).

8.6.2 Procedural Steps

R35

1. **PERFORM** one or more of the following as necessary to prevent RPS EPA breaker trip. (See Figure 1.)

   – **RAISE** diesel generator frequency (limiter set at 61 Hz) ☐

   – **REDUCE** diesel generator load ☐

2. **PLACE** the appropriate diesel generator control in control room manual mode by depressing applicable push button on Panel XU-2. ☐

3. **PLACE** appropriate synchroscope switch in *ON* for normal feed to emergency bus:

	Emergency Bus	Synchroscope	
a.	E1	*BUS 1D TO BUS E1 (1AD1).*	☐
b.	E2	*BUS 1C TO BUS E2 (1AC8).*	☐
c.	E3	*BUS 2D TO BUS E3 (2AD1).*	☐
d.	E4	*BUS 2C TO BUS E4 (2AC8).*	☐

CAUTION

Incoming voltage is from the grid and running voltage is from the diesel generator.

4. **ENSURE** incoming and running voltages are matched. ☐

CAUTION

WHEN the synchroscope is rotating slowly in the fast direction during this method of transfer, it will be necessary to raise DG frequency to obtain rotation in the slow direction. Failure to follow this guidance could result in an RPS MG set trip on low frequency at 57.7 Hz decreasing.

5. **ADJUST** diesel generator *GOVERNOR* motor control switch as necessary so the synchroscope is rotating slowly in the SLOW direction (counterclockwise). ☐

8.6.2 Procedural Steps

6. **WHEN** synchroscope is at "12 o'clock", **THEN PLACE AND HOLD** control switch for appropriate normal feed to emergency bus in *CLOSE* until both *MSTR* and *SLAVE* breakers indicate closed: ☐

	Breaker Feed	Master Breaker	Slave Breaker	
a.	*BUS 1D TO BUS E1*	1AD1	AE6.	☐
b.	*BUS 1C TO BUS E2*	1AC8	AG4.	☐
c.	*BUS 2D TO BUS E3*	2AD1	AI2.	☐
d.	*BUS 2C TO BUS E4*	2AC8	AJ9.	☐

7. **CONFIRM** synchroscope remains at "12 o'clock". ☐

8. **PLACE** synchroscope used in Step 8.6.2.3 in *OFF*. ☐

CAUTION

To prevent a diesel generator from tripping on reverse power, do **NOT** reduce DG load below 450KW.

9. **MAINTAIN** generator vars with voltage adjusting rheostat while lowering diesel generator load. ☐

10. **LOWER** diesel generator load to between 450 and 550 KW by momentarily placing the *GOVERNOR* motor control switch in *LOWER*. ☐

8.6.2 Procedural Steps

11. **OPEN** the appropriate diesel generator output breaker: ☐

Diesel Generator	Breaker	
No. 1	*DIESEL GEN 1 TO BUS E1 (AE9)*	☐
No. 2	*DIESEL GEN 2 TO BUS E2 (AG7)*	☐
No. 3	*DIESEL GEN 3 TO BUS E3 (AI5)*	☐
No. 4	*DIESEL GEN 4 TO BUS E4 (AK2)*	☐

12. **OBSERVE** the following indications: ☐

    a. Breaker open in accordance with indicating lights. ☐

    b. Emergency bus voltage remains constant. ☐

    c. Diesel generator load and amps are zero. ☐

    d. *NO LOAD* and *AVAIL* lights are illuminated on the diesel generator control module. ☐

13. **SHUT DOWN** the diesel in accordance with 0OP-39. ☐

NOTE:	The emergency bus is now energized from normal feeder and the diesel generator is returned to standby automatic upon completion of shutdown section.

PROGRESS ENERGY – CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SIMULATOR

S-5

little
discriminatory
value

LESSON TITLE: RCIC Start Using the Hard Card – Flow Controller Failure

LESSON NUMBER: LOT-SIM-JP-016-A02

REVISION NO: 3

SIMULATOR SETUP

Recommended Initial Conditions

IC-11

Rx Pwr 100%

BOC

Required Plant Conditions:

RPV level <105 inches"

RFPTs tripped and HPCI not available

Triggers:

1 – RCIC Flow Control Failure

Malfunctions:

Active, ES041F (RCIC Auto Start Fail)

Overrides:

Trigger 1, Switch, P601, K1H12E, RCIC FC Setpoint Decrease, PUSH

Remotes

None

Special Instructions:

Place HPCI Aux Oil Pump in PTL. Trip RFPTs to reduce RPV level below +105 inches.

Complete scram immediate actions. Start SBGT.

When RPV level is <105 inches (LL2), place simulator in Freeze.

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL NOT** 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.

Read the following to trainee.

TASK CONDITIONS:

1. Both Reactor Feed Pumps have tripped.
2. HPCI is not available
3. Reactor Vessel Level has decreased to less than LL2.
4. SBGT is running.
5. RCIC has failed to auto start.

INITIATING CUE:

You are directed to manually start RCIC per the Hard Card, raise RCIC flow to 500 gpm and inform the Unit SCO when actions to start RCIC per the Hard Card are complete.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain Hard Card RCIC Operations For EOPs.
Hard Card RCIC Operations For EOPs obtained at P601.

SAT/UNSAT*

Time Started:___________

Step 2 - Ensure E51-V8 (valve position), E51-V8 (actuator position), and E51-V9 indicate OPEN.
E51-V8 (valve position), E51-V8 (actuator position), and E51-V9 verified open.

SAT/UNSAT*

Step 3 - OPEN E51-F046.
E51-F046 is full OPEN.

SAT/UNSAT*

Step 4 - Start Vacuum Pump and leave switch in START.
Vacuum Pump running with switch in START.

SAT/UNSAT*

Step 5 - OPEN E51-F045.
E51-F045 is full OPEN.

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

Step 6 – OPEN E51-F013.
E51-F013 is full OPEN.

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

SIM OP: Monitor RCIC controller on panel mimics. When injection valve has been opened ensure Trigger 1 activated RCIC controller failure.

Step 7 – Ensure RCIC turbine starts and comes up to speed as directed by RCIC flow control.
RCIC Turbine speed observed to come up to speed.

SAT/UNSAT*

Step 8 – Adjust RCIC flow controller to obtain desired flow rate.
RCIC controller adjusted to achieve flow rate 500 gpm.

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

NOTE: Sequence of steps not critical concerning recognizing the flow controller failure and taking manual control.

NOTE: The flow controller must be placed in Manual to remove the failure. To adjust the flow in Manual the examinee will use the slide bar. It is desirable, but not critical, to maintain the RCIC controller yellow alarm indication off (flow <106%)

Step 9 – Recognize failure of RCIC, Flow Controller, E51-FIC-R601, and place E51-FIC-R601, in Manual and raise output to re-establish RCIC flow.
E51-FIC-R601, flow controller, in Manual and output raised to achieve 500 gpm.

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

Step 10 – Ensure E51-F019 CLOSED with flow >80 gpm.
E51-F019 verified CLOSED.

SAT/UNSAT*

Step 11 – Ensure E51-F025, E51-F026, E51-F004, and E51-F005 are CLOSED.
E51-F025, E51-F026, E51-F004, and E51-F005 verified CLOSED.

SAT/UNSAT*

Step 12 – START SBGT (OP-10)
SBGT fans verified to be running.

SAT/UNSAT*

Step 13 – ENSURE SGT-V8 and SGT-V9.
SGT-V8 and SGT-V9 verified to be OPEN.

SAT/UNSAT*

Step 14 – Ensure barometric condenser condensate pump operates.
Barometric condenser condensate pump operation verified.

SAT/UNSAT*

Step 15 – Inform Unit SCO RCIC is injecting to the RPV with the flow controller in Manual due to failure of automatic flow control.
Unit SCO informed RCIC injecting in Manual with auto flow controller failed.

SAT/UNSAT*

TERMINATING CUE: RCIC is injecting ~500 gpm to the reactor with the Flow Controller in Manual and Hard Card actions complete.

Time Completed:___________

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

RELATED TASKS:

217003B101, Manually Startup The RCIC System Per OP-16

K/A REFERENCE AND IMPORTANCE RATING:

295031 EA1.05 4.3/4.3

Ability to operate and/or monitor the following as they apply to Reactor Low Water Level: Reactor Core Isolation System (plant specific)

REFERENCES:

S/969 (RCIC Hard Card)

OP-16, Section 5.3

TOOLS AND EQUIPMENT:

None.

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

2 - Inventory Control

REASON FOR REVISION:

Formatting.

Validation Time: 10 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ___ Actual ✓ Unit: 2

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

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

Alternate Path: Yes ✓ No ___

EVALUATION

Trainee:___________________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments ___________________________________

Comments reviewed with Student

Evaluator Signature: ___________________________________ Date:_____________

TASK CONDITIONS:

1. Both Reactor Feed Pumps have tripped.
2. HPCI is not available
3. Reactor Vessel Level has decreased to less than LL2.
4. SBGT is running.
5. RCIC has failed to auto start.

INITIATING CUE:

You are directed to manually start RCIC per the Hard Card, raise RCIC flow to 500 gpm and inform the Unit SCO when actions to start RCIC per the Hard Card are complete.

RCIC Instructional Aids

RCIC OPERATIONS FOR EOPs

MANUAL RCIC INJECTION
(OP-16 Section 5.3)

______ 1. **ENSURE** THE FOLLOWING VALVES ARE OPEN: E51-V8 (VALVE POSITION), E51-V8 (ACTUATOR POSITION), AND E51-V9.
______ 2. **OPEN** E51-F046
______ 3. **START** VACUUM PUMP AND LEAVE SWITCH IN START.
______ 4. **OPEN** E51-F045
______ 5. **OPEN** E51-F013
______ 6. **ENSURE** RCIC TURBINE STARTS AND COMES UP TO SPEED AS DIRECTED BY RCIC FLOW CONTROL
______ 7. **ADJUST** RCIC FLOW CONTROLLER TO OBTAIN DESIRED FLOW RATE.
______ 8. **ENSURE** E51-F019 IS CLOSED WITH FLOW ABOVE 80 GPM.
______ 9. **ENSURE** THE FOLLOWING VALVES ARE CLOSED: E51-F025, E51-F026, E51-F004, AND E51-F005
______ 10. **START** SBGT (OP-10)
______ 11. **OPEN** THE SGT-V8 AND SGT-V9
______ 12. **ENSURE** BAROMETRIC CNDSR CONDENSATE PUMP OPERATES

RCIC PRESSURE CONTROL
(OP-16 SECTION 8.2)

______ 1. **ENSURE** THE FOLLOWING VALVES ARE OPEN: E51-V8 (VALVE POSITION), E51-V8 (ACTUATOR POSITION), AND E51-V9.
______ 2. **OPEN** E51-F046
______ 3. **START** VACUUM PUMP AND LEAVE SWITCH IN START.
______ 4. **ENSURE** E51-F013 IS CLOSED
______ 5. **ENSURE** E41-F011 IS OPEN
______ 6. **THROTTLE OPEN** E51-F022 UNTIL DUAL INCATION IS OBTAINED
______ 7. **OPEN** E51-F045
______ 8. **THROTTLE OPEN** E51-F022 OR **ADJUST** RCIC FLOW CONTROL, E51-FIC-R600, TO OBTAIN DESIRED SYSEM PARAMETERS AND REACTOR PRESSURE.
______ 9. **ENSURE** E51-F019 IS CLOSED WITH FLOW ABOVE 80 GPM.
______ 10. **ENSURE** THE FOLLOWING VALVES ARE CLOSED: E51-F025, E51-F026, E51-F004, AND E51-F005.
______ 11. **START** SBGT (OP-10)
______ 12. **OPEN** THE SGT-V8 AND SGT-V9
______ 13. **ENSURE** BAROMETRIC CNDSR CONDENSATE PUMP OPERATES

FOR SHUTDOWN REFER TO OP-16
FOR TRANSFER BETWEEN PRESSURE AND LEVEL CONTROL REFER TO OP-16

2/968
S/969

PROGRESS ENERGY - CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

SIMULATOR

S-4

LESSON TITLE:	HPCI Start in Pressure Control Per The Hard Card - Exhaust Diaphragm Failure.
LESSON NUMBER:	LOT-SIM-JP-019-14
REVISION NO:	0

SIMULATOR SETUP

Recommended Initial Conditions

IC-11 100%, BOC

Event Triggers

E1 - Activates all malfunctions/overrides when the F008 is opened

Malfunctions

A, ES040F, HPCI Fail To Auto Start
A, ES053F - E41-F002 Fail To Auto Close
A, ES054F - E41-F003 Fail To Auto Close
E1, ES047F - HPCI Stm Brk HPCI Room, 1%, 0 SEC

Overrides

Lamps

E1, P601, Q1112SWL, Auto Isol Sig A White, ON
E1, P601, Q1111SWL, Auto Isol Sig B White, ON

Alarms

E1, P601, ZA135, HPCI Isol Trip Sig A, ON
E1, P601, ZA145, HPCI Isol Trip Sig B , ON
E1, P601, ZA152, HPCI Turb Exh Diaph Press Hi, On

Special Instructions

1. Scram the Reactor and close MSIV's
2. Perform scram immediate actions
3. Ensure RPV level is stable and >LL2

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL NOT** 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.

Read the following to trainee.

TASK CONDITIONS:

1. The reactor has scrammed due to MSIV closure.
2. RPV water level is stable.
3. HPCI is not required for RPV level control.

INITIATING CUE:

You are directed by the Unit SCO to start HPCI for pressure control per the Hard Card and inform the Unit SCO when the Hard Card actions are complete.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain Hard Card for HPCI Injection In EOPs.
Hard Card for HPCI Injection obtained.

SAT/UNSAT*

Time Started:___________

> **NOTE:** Auto Initiation signal can be verified to be reset by observing the white light is not illuminated or by pushing the reset pushbutton.

Step 2 - Ensure HPCI auto initiation is reset.
HPCI auto initiation is reset.

SAT/UNSAT*

Step 3 - Ensure Auxiliary Oil Pump is not running.
Auxiliary Oil Pump verified not running.

SAT/UNSAT*

Step 4 - Ensure E41-V9 and E41-V8 are closed.
E41-V9 and E41-V8 indicate closed.

SAT/UNSAT*

Step 5 - Open E41-F011.
E41-F011 indicates full open.

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

Step 6 - Open E41-F059.
E41-F059 indicates full open.

SAT/UNSAT*

Step 7 – Start Vacuum Pump and leave in start
Vacuum Pump is running

SAT/UNSAT*

Step 8 - Open E41-F001.
E41-F001 indicates full open.

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

Step 9 - Start Auxiliary Oil Pump and Leave in START.
Auxiliary Oil Pump control switch in the START position.

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

SIM OP: When E41-F008 is open and HPCI starts, verify trigger E1 to activate HPCI malfunction/overrides.

Step 10 – Throttle open E41-F008 to maintain desired reactor pressure.
E41-F008 indicates dual indication.

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

Step 11 - Diagnose indications of a HPCI Exhaust Diaphragm rupture.
Determined the exhaust diaphragm has ruptured.

SAT/UNSAT*

Step 12 - Determine HPCI has failed to auto isolate and manually isolate HPCI by closing E41-F002 and F003.

E41-F002 or E41-F003 indicate full closed.

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

Step 13 - Inform Unit SCO HPCI is isolated and unavailable for pressure control.

SCO informed HPCI is unavailable for injection.

SAT/UNSAT*

TERMINATING CUE: When HPCI is isolated, this JPM is complete.

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

RELATED TASKS:

206200B401, Place HPCI in Reactor Pressure control from the standby lineup per OP-19

K/A REFERENCE AND IMPORTANCE RATING:

295025 EA1.04 3.8/3.9
Ability to operate and/or monitor the following as they apply to High Reactor Pressure:
HPCI (plant specific)

REFERENCES:

2OP-19, Section 8.2
Hard Card S/1019, HPCI Pressure Control In EOPs

TOOLS AND EQUIPMENT:

None.

SAFETY FUNCTION (from NUREG 1123, Rev 2.)

3 - Pressure Control (HPCI)

REASON FOR REVISION:

Modified JPM to have exhaust diaphragm failure.

Vailidation Time: 10 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ___ Actual ✓ Unit: 2

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

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

Alternate Path: Yes ✓ No ____

EVALUATION

Trainee:________________________________

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. The reactor has scrammed due to MSIV closure.
2. RPV water level is stable.
3. HPCI is not required for RPV level control.

INITIATING CUE:

You are directed by the Unit SCO to start HPCI for pressure control per the Hard Card and inform the Unit SCO when the Hard Card actions are complete.

HPCI Instructional Aids

HPCI PRESSURE CONTROL IN EOPs
(OP-19 Section 8.2)

_______ 1. **ENSURE** HPCI AUTO INITIATION IS RESET

_______ 2. **ENSURE** AUXILIARY OIL PUMP IS NOT RUNNING AND E41-V8 AND E41-V9 ARE CLOSED

_______ 3. **OPEN** E41-F011

_______ 4. **OPEN** E41-F059

_______ 5. **START** VACUUM PUMP AND **LEAVE** IN START

_______ 6. **OPEN** E41-F001

_______ 7. **START** AUXILIARY OIL PUMP AND **LEAVE** IN START

_______ 8. **THROTTLE OPEN** E41-F008 TO MAINTAIN DESIRED REACTOR PRESSURE

_______ 9. **ENSURE** E41-V8 AND E41-V9 ARE OPEN

_______ 10. **ENSURE** E41-F012 IS CLOSED WHEN FLOW HAS INCREASED ABOVE 800 GPM

_______ 11. **ENSURE** THE FOLLOWING E41 VALVES ARE CLOSED: F025 AND F026

_______ 12. **START** SBGT (OP-10) AND **OPEN** SGT-V8 AND SGT-V9

_______ 13. **ENSURE** BAROMETRIC CNDSR CONDENSATE PUMP IS OPERATING

_______ 14. **ADJUST** HPCI PARAMETERS BY THROTTLING E41-F008 OR VARYING HPCI FLOW WITH THE FLOW CONTROLLER TO CONTROL REACTOR PRESSURE

2/1020
S/1019

PROGRESS ENERGY – CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SIMULATOR

S-3

- Missing Page 4
- Little discriminatory value

LESSON TITLE: Reset Scoop tube lockout – Speed failure

LESSON NUMBER: LOT-SIM-JP-002-009

REVISION NO: 0

SIMULATOR SETUP

Recommended Initial Conditions

IC-10

Rx Pwr 70%

BOC

Required Plant Conditions:

Scoop tube locked out on the A Recirc Pump.

Triggers:

1 – When Scoop tube lockout is reset (K2712JS8) activates the speed failure on the A RR Pump

Malfunctions:

Overrides:

Recirc A Flow Controller (P2739A1L) To 1 over 15 seconds when scoop tube is reset.

Remotes

None

Special Instructions:

Lock the scoop tube on the A Recirc Pump.

Adjust the 2A Recirc Pump Speed Controller counterclockwise to zero in order to provide a deviation signal for the actual speed to controller speed signals.

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee after he/she has determined the appropriate procedure section.
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.

Read the following to trainee.

TASK CONDITIONS:

1. The A Recirc Pump Scoop tube was locked out for maintenance on the speed controller.
2. Maintenance is now complete.
3. An I&C Technician is standing by at the 2A MG Set.

INITIATING CUE:

You are directed to reset the scoop tube lockout on the 2A Recirculation Pump in accordance with 2OP-02 and inform the Unit SCO when the scoop tube is reset.

Step 6 – Observes pump speed, loop flow and core flow for changes.
Identifies instrumentation to allow monitoring of pump speed and flow.

SAT/UNSAT*

NOTE: When the Lockout Switch is placed to reset, Trigger 1 will activate to cause the Recirc pump to increase in speed demand, the examinee should note this condition and re-lock the scoop tube.

SIM Operator: Monitor lockout switch on panel mimics. When lockout has been reset ensure Trigger 1 activated, Recirc Pump A controller failure.

Step 7 – Place Scoop Tube A Lock switch to Reset.
Switch is in reset and released.

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

Step 8 – Recognizes failure and places Scoop Tube A Lock switch to Trip.
Scoop tube is re-locked.

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

Step 9 – Inform Unit SCO 2A Recirc Pump Speed increased when the scoop tube was reset and has been re-locked.
Unit SCO informed.

SAT/UNSAT*

TERMINATING CUE: Scoop tube has been unlocked and then re-locked based on pump speed failure and Unit SCO notified.

Time Completed:___________

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

RELATED TASKS:

202203B401, Recover from a Reactor Recirculation Pump Scoop Tube lockout Per OP-02

K/A REFERENCE AND IMPORTANCE RATING:

202002	A4.07	3.3/3.2

Ability to manually operate and/or monitor in the control room: Recirc Pump Speed.

REFERENCES:

OP-02, Section 8.4

TOOLS AND EQUIPMENT:

None.

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

1 - Reactivity Control

REASON FOR REVISION:

New JPM.

Validation Time: _10_ Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ___ Actual _✓_ Unit: _2_

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

Time Critical: Yes ___ No _✓_ Time Limit _N/A_

Alternate Path: Yes _✓_ No ____

EVALUATION

Trainee:__________________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments ____

Comments reviewed with Student

Evaluator Signature: __________________________________ Date:_____________

TASK CONDITIONS:

1. The A Recirc Pump Scoop tube was locked out for maintenance on the speed controller.
2. Maintenance is now complete.
3. An I&C Technician is standing by at the 2A MG Set.

INITIATING CUE:

You are directed to reset the scoop tube lockout on the 2A Recirculation Pump in accordance with 2OP-02 and inform the Unit SCO when the scoop tube is reset.

8.4 Recovery from Scoop Tube Lockout

C
Continuous
Use

8.4.1 Initial Conditions

1. Annunciator *FLUID DRIVE A(B) SCOOP TUBE LOCK*, A-6 2-4 (A-7 1-6), is actuated. ☐
2. Lockout bus power is available. ☐
3. The cause of the scoop tube lockout has been corrected. ☐
4. Plant conditions have stabilized. ☐

8.4.2 Procedural Steps

1. **CHECK** *RECIRC RUNBACK* A(B) light is off. ☐

CAUTION

A flow transient will occur if there is a difference in actual Recirculation Pump speed and the speed demand signal from the flow controller **OR** if a runback signal is present when the scoop tube lockout is reset.

CAUTION

The lockout condition should be cleared and the lockout reset as soon as possible due to loss of runback capabilities on the affected Recirculation Pump. **IF** a recirculation runback occurs and causes an excessive speed mismatch between pumps, **THEN** the Recirculation Pump with a scoop tube lock should be tripped.

2. **ADJUST** the potentiometer on the affected *RECIRC PUMP 2A(B) SPEED CONTROL* until the speed demand signal has settled out and is nulled with the actual pump speed as required by the following guide-lines.

   a. **IF** the lockout was **MANUALLY** initiated for a **SHORT** duration with **STABLE** plant conditions then no adjustment is required. ☐

   b. **IF** step 8.4.2.2.a is **NOT** applicable **THEN** **REQUEST** assistance from I&C in adjusting the controller to a nulled condition. ☐

PERFORMANCE CHECKLIST

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

Step 1 - Obtain copy of 2OP-02 Section 8.4.
Section 8.4 of 2OP-02 is obtained.

SAT/UNSAT*

TIME START:__________

Step 2 – Verifies Annunciator Fluid Drive A Scoop Tube Lock is actuated.
Verifies A-6 2-4 is lit.

SAT/UNSAT*

Step 3 – Verifies Recirc Runback A light is off.
Verifies that there is no runback signal.

SAT/UNSAT*

Step 4 –Contacts I&C to verify that the speed signals are nulled.
I&C, confirms speed signals are nulled..

SAT/UNSAT*

SIM Operator:	Monitor Recirc MG Set Bailey Positioner Error from Instructor Panels.
PROMPT:	Provide feedback to the examinee to raise/lower speed demand until the error signal is nulled. The examinee will have to initially increase the speed demand to null the signals.

Step 5 – Adjusts the speed demand signal until actual pump speed is nulled.
Actual speed signal is nulled with speed demand signal.

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

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
SIMULATOR

S-2

LESSON TITLE: Vent the Drywell per OP-10 w/ Stack Rad Monitor Increase >50%

LESSON NUMBER: LOT-SIM-JP-010-A02

REVISION NO: 3

SIMULATOR SETUP:

A. Initial Conditions:

1. Recommended Initial Conditions

IC	11
Rx. Pwr.	100%
Core Age	BOC

2. Required Plant Conditions

Drywell Pressure above 0.5 psig SLOWLY rising or stable, AND below 1.7 psig.

B. Malfunctions

None required

C. Overrides

Meters

Event	Panel	Tag	Title	Value (ramp rate)	Activate Time (sec)	Deactivate Time (sec)
E1	XU-3	G5B02G15	Main Stack Radiation	13 / 5 min	0 SEC	N/A

Trigger 1 Q6225LGT CAC-V23 Green Lamp = False

D. Special Instructions

Secure Drywell Coolers 2C and 2D Fans 1 and 2 and allow drywell pressure to rise to ≥0.6 psig as indicated on CAC-PI-2685-1 on XU-51, then restart Drywell Coolers 2D Fan 2 and allow Drywell pressure to stabilize. Override Drywell Cooler 2C Fans 1 and 2 and Drywell Cooler 2D Fan 1 control switches OFF.

SAFETY CONSIDERATIONS:

NONE

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee, once it is demonstrated he/she knows the correct procedure.

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

Read the following to trainee.

TASK CONDITIONS:

1. Drywell pressure is above normal due to a partial loss of Drywell Cooling.
2. AOP-14.0 has been entered.
3. Standby Gas Treatment System is in the Standby Alignment.
4. The plant stack radiation monitor is in service and CAC-CS-5519, CAC Purge Vent Isolation Override is in OFF.
5. Temporary suppression chamber to drywell vacuum breaker monitoring is in service.

INITIATING CUE:

The Unit SCO directs you to vent the Drywell via Standby Gas Treatment, and to inform him when drywell pressure has been reduced below 0.5 psig.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain current revision of OP-10, Section 8.2.

Current revision of OP-10, Section 8.2 is obtained.

SAT/UNSAT*

Time Started: __________

Step 2 - Record D12-RR-R600B, STACK RAD MONITOR, digital point display.

Value for D12-RR-R600B recorded in OP-10.

. **SAT/UNSAT***

Step 3 - Add 0.17 to the value to obtain the logarithmic equivalent of a 50% increase in stack radiation monitor reading and record result.

Value recorded in OP-10 of initial reading + 0.17.

SAT/UNSAT*

NOTE:	The value will be greater than 1 so step 8.2.2.3 can be N/A'd.

Step 4 - Monitor Stack Rad Monitor, D12-RM-R600B, for increase in activity during venting.

D12-RM-R600B periodically monitored.

SAT/UNSAT*

PROMPT:	If asked the condition of the monitoring equipment inform the examinee that all Torus Vacuum breaker green indicating lights are lit.
NOTE:	Examinee should note that if radiation increases above the value determined then they need to proceed to step 8.2.2.14., notify E&RC to sample primary containment, and refer to 0E&RC-2020.

Step 5 - CLOSE REACTOR BUILDING SBGT TRAIN 2A INLET VALVE, VA-2D-BFV-RB.

VA-2D-BFV-RB indicates fully closed.

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

Step 6 - CLOSE REACTOR BUILDING SBGT 2B INLET VALVE, VA-2H-BFV-RB.

VA-2H-BFV-RB indicates fully closed.

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

Step 7 - OPEN SBGT DW SUCT DAMPER, VA-2F-BFV-RB.

VA-2F-BFV-RB, indicates open.

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

NOTE:	Examinee should recognize that steps 8.2.2.11 and 8.2.2.12 can be N/A'd.

Step 8 - OPEN DW PURGE EXH VALVE, CAC-V9.

CAC-V9 indicates full open.

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

Step 9 - OPEN DW PURGE EXH VALVE, CAC-V23.

CAC-V23 indicates full open.

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

SIM OP:	When CAC-V23 is opened, verify Event Trigger E1 initiates to ramp Main Stack Rad Monitor value.
PROMPT:	If requested, inform examinee as Unit SCO that it is desired to vent from the drywell head.

Step 10 - OPEN DW HEAD PURGE EXH VLV, CAC-V49.

CAC-V49 indicates full open.

SAT/UNSAT*

Step 11 - OPEN DW HEAD PURGE EXH VLV, CAC-V50.

CAC-V50 indicates full open.

SAT/UNSAT*

Step 12 - Monitor Main Stack Rad Monitor and determine reading has risen by >50%.

Determines Main Stack Rad Monitor reading has risen by >.17 (50%).

SAT/UNSAT*

NOTE:	It is critical for at least one valve to be closed in each vent path that is open, i.e., CAC-V23 or CAC-V9, **AND**, CAC-V49 or CAC-V50, or that the primary containment suction valve VA-2F-BFV-RB is closed to isolate the release path.
CUE:	When the vent path has been isolated, delete the meter override on the Main Stack Rad Monitor.
PROMPT:	If the examinee informs the Unit SCO that the Main Stack has risen by >50%, direct examinee as Unit SCO to perform required actions for the increase.

Step 13 - CLOSE DW PURGE EXH VLV, CAC-V23.

CAC-V23 indicates full closed.

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

Step 14 - CLOSE DRYWELL PURGE EXH VALVE, CAC-V9.

CAC-V9 indicates full closed.

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

Step 15 - ENSURE DW HEAD PURGE EXH VLV, CAC-V49, IS CLOSED.
CAC-V49 indicates full closed.

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

Step 16 - ENSURE DW HEAD PURGE EXH VLV, CAC-V50, IS CLOSED.
CAC-V50 indicates full closed.

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

NOTE:	Step 17 is not critical if either step 13 or 14 **AND** either 15 or 16 was completed SAT. Release path may be isolated by closing 1 valve in each vent path OR by closing the common isolation in Step 17.

Step 17 - CLOSE SBGT DW SUCT DAMPER, VA-2F-BFV-RB.
VA-2F-BFV-RB indicates full closed.

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

NOTE:	The following valves would auto open on SBGT Initiation therefore Steps 18 and 19 are NOT critical.

Step 18 - OPEN SBGT TRAIN 2B REACTOR BUILDING SUCTION VALVE, VA-2H-BFV-RB.
VA-2H-BFV-RB indicates full open.

. **SAT/UNSAT***

Step 19 - OPEN SBGT TRAIN 2A REACTOR BUILDING SUCTION VALVE, VA-2D-BFV-RB.
VA-2D-BFV-RB indicates full open.

. **SAT/UNSAT***

PROMPT:	If asked the condition of the monitoring equipment inform the examinee that all Torus Vacuum breaker green indicating lights are lit.

Step 20 - CONFIRM ALL SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS are closed.

All Suppression Chamber to Drywell vacuum breakers verified closed.

. **SAT/UNSAT***

PROMPT:	If asked, inform examinee as Unit SCO that E&RC has been notified to sample containment and perform E&RC 2020, Noble Gas Instantaneous Release Rate Determination.

Step 21 - Inform Unit SCO venting is secured due to increase of 50% in Main Stack Rad Monitor reading.

Unit SCO is informed venting is secured due to increase of 50% in Main Stack Rad Monitor reading.

. **SAT/UNSAT***

TERMINATING CUE: Primary containment Venting has been isolated due to the high radiation reading and the Unit SCO has been notified this JPM is complete.

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

Time completed: __________

LIST OF REFERENCES

RELATED TASKS:

261 008 B1 01, Perform Normal Primary Containment Venting.

K/A REFERENCE AND IMPORTANCE RATING:

261000 A4.04 3.3/3.4,
Ability to manually operate and monitor Primary Containment Pressure.

REFERENCES:

2OP-10, Sect. 8.2 Rev 65

TOOLS AND EQUIPMENT:

None

SAFETY FUNCTION (from NUREG 1123, Rev 2):

Safety Function 9, Radioactivity Release

REASON FOR REVISION:

Formatting.

Time Required for Completion: 12 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?: Yes _____ No ______
(Each Student should verify one JPM per evaluation set)

Comments: ____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:______________

TASK CONDITIONS:

1. Drywell pressure is above normal due to a partial loss of Drywell Cooling.
2. AOP-14.0 has been entered.
3. Standby Gas Treatment System is in the Standby Alignment.
4. The plant stack radiation monitor is in service and CAC-CS-5519, CAC Purge Vent Isolation Override is in OFF.
5. Temporary suppression chamber to drywell vacuum breaker monitoring is in service.

INITIATING CUE:

The Unit SCO directs you to vent the Drywell via Standby Gas Treatment, and to inform him when drywell pressure has been reduced below 0.5 psig.

8.2 Venting Containment Via the SBGT

C
Continuous
Use

8.2.1 Initial Conditions

Date/Time Started _______________

Initials

1. Drywell pressure has increased to greater than 0.15 psig. _____

2. SBGT System is in standby in accordance with Section 5.1. _____

3. Plant stack radiation monitor is in service **AND** *CAC-CS-5519, CAC PURGE VENT ISOL OVRD*, is in *OFF* _____

   OR

   E&RC has sampled the drywell atmosphere and has determined that it is suitable for release. _____

4. Unit SCO's approval is obtained prior to venting. _____

8.2.2 Procedural Steps

> **NOTE:** **IF** the plant stack radiation monitor is out of service, **THEN** Steps 1 through 6 are **NOT** applicable.
>
> **NOTE:** Backwashing an RWCU filter may cause stack radiation to increase. Venting primary containment and RWCU backwashing should not be done concurrently.

1. **RECORD** *D12-RR-R600B, STACK RAD MONITOR*, digital point display. _____

   D12-RR-R600B: __________

2. **IF** the value obtained in Step 8.2.2.1 is ≥ 1 **ADD** 0.17 to obtain the logarithmic equivalent of a 50% increase in stack radiation monitor reading. _____

   0.17 + ___________ = ______
   Step 8.2.2.1 Result

8.2.2 Procedural Steps

NOTE:	A *D12-RR-R600B, STACK RAD MONITOR* indication of ≤ 1 and downscale denotes an effluent release value of < 10 µCi/sec as indicated on the Stack RM-23 panel.

3. **IF** the value obtained in Step 8.2.2.1 is < 1 and downscale, **SUBSTITUTE** 1.17 to obtain the logarithmic equivalent as a conservative value to monitor for an increase in the stack radiation monitor reading. _____

4. **RECORD** the logarithmic equivalent **OR** substitute value for a stack radiation monitor increase as determined in Step 8.2.2.2 or 8.2.2.3. _____

   Value: ______________________

5. **MONITOR** *STACK RAD MONITOR, D12-RR-R600B*, on Panel XU-3 for an increase in activity during the performance of this procedure. _____

NOTE:	Technical Specifications 3.6.1.6.2 (Modes 1, 2, or 3) requires completion of 0PT-02.3.1, Suppression Chamber To Drywell Vacuum Breakers Operability Test, within 12 hours following an operation that causes any of the vacuum breakers to open. The test is **NOT** required if vacuum breakers are monitored and determined to remain closed during performance of this procedure section.

6. **IF** desired, **THEN ESTABLISH MONITORING** of the suppression chamber to drywell vacuum breakers. _____

7. **IF**, during performance of this procedure, stack radiation increases above the value determined in Step 8.2.2.4, **THEN PERFORM** the following:

   a. **GO TO** Step 8.2.2.12 to secure venting the suppression pool. _____

   OR

   GO TO Step 8.2.2.14 to secure venting the drywell. _____

8.2.2 Procedural Steps

b. **NOTIFY** E&RC to sample primary containment. _____

c. **REFER** to 0E&RC-2020 Setpoint Determinations for Gaseous Radiation Monitors (Noble Gas Instantaneous Release Rate Determination). _____

8. **CLOSE** *REACTOR BUILDING SBGT TRAIN 2A INLET VALVE, VA-2D-BFV-RB.* _____

9. **CLOSE** *REACTOR BUILDING SBGT TRAIN 2B INLET VALVE, VA-2H-BFV-RB.* _____

10. **OPEN** *SBGT DW SUCT DAMPER, VA-2F-BFV-RB.* _____

NOTE:	The suppression pool should normally be vented for at least 6 hours prior to venting the drywell. **IF** drywell pressure requires immediate drywell venting then Step 8.2.2.11 and 8.2.2.12 may be omitted **OR** the 6 hours reduced as necessary.

R15

CAUTION

Simultaneous venting of the Drywell and the Suppression Pool shall **NOT** be performed when the plant is in Mode 1, 2, or 3.

11. **OPEN** the following valves to lower suppression pool pressure:

    a. *SUPP POOL PURGE EXH VLV, CAC-V172.* _____

    b. *TORUS PURGE EXHAUST VLV, CAC-V22.* _____

12. **WHEN** the suppression pool has been vented for 6 hours **OR** the desired pressure is reached as indicated on Computer Point L128, **THEN CLOSE** the following valves:

    a. *SUPP POOL PURGE EXH VLV, CAC-V172.* ___/___ Ind.Ver.

    b. *TORUS PURGE EXHAUST VLV, CAC-V22.* ___/___ Ind.Ver.

8.2.2 Procedural Steps

NOTE:	Technical Specification 3.6.1.6.2 (Modes 1, 2, or 3) requires the suppression chamber to drywell vacuum breakers to remain closed **OR** completion of 0PT-02.3.1, Suppression Chamber to Drywell Vacuum Breakers Operability Test, within 12 hours following an operation that caused any of the vacuum breakers to open.

18. **IF** in Modes 1, 2, or 3, **THEN PERFORM** one of the following:

    a. **CONFIRM** suppression chamber to drywell vacuum breakers remained closed. _____

    OR

    b. 0PT-02.3.1, Suppression Chamber to Drywell Vacuum Breakers Operability Test, within 12 hours following an operation that caused any of the vacuum breakers to open. _____

Date/Time Completed _______________

Performed By (Print)	Initials
______________________	_____
______________________	_____
______________________	_____
______________________	_____

Reviewed By: ______________________
Unit SCO

SIMULATOR SETUP:

Recommended Initial Conditions
IC-11, 100% Power, BOC

Required Plant Conditions
Perform a MANUAL Scram carry out EOP-01-RSP initial operator actions. Close the MSIVs, Trip the SJAEs, RFPs and OPEN the condenser vacuum breakers to reduce vacuum to <10". After this is done place the MSIV control switches to OPEN.

Triggers

Malfunctions

Overrides

Remotes
MS_VMS5005D MVD-V5005 MN STM DRN HDR Isolation Open
MS_IAGP1BYP LO COND VACUUM GP1 TRIP BYP

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to performer)

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

Read the following to the JPM performer.

TASK CONDITIONS:

1. A scram and Group 1 Isolation have occurred.
2. No fuel failure or steam line breaks have occurred.
3. The Main Condenser is available as a heat sink.
4. The Unit SCO has anticipated that Emergency Depressurization may be required.

INITIATING CUE:

You are directed to perform the control operator actions associated with emergency equalization around the MSIVs, and open MSIVs when pressure is <200 psid, using the Hard Card.
You are to inform the Unit SCO when the actions to equalize and open the MSIVs per the Hard Card are complete.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain "Hard Card" for MSIV equalization.
"Hard Card" obtained for MSIV equalization.

SAT/UNSAT*

TIME START ___________

SIM OP:	When requested, place the low condenser vacuum bypass switches to Bypass using Remote Function **MS_IAGP1BYP**

Step 2 – Ensure the condenser vacuum bypass switches in bypass position.
Vacuum bypass switches placed in bypass.

SAT/UNSAT*

Step 3 – Place all MSIV control switches in the CLOSE position.
All MSIV control switches, B21-F022A, B, C & D, B21-F028A, B, C & D, placed in CLOSE position.

SAT/UNSAT*

Step 4 – Reset Group 1 Isolation.
Group 1 Isolation reset switches, A72-S32 and S33, on P601, are depressed and White lights are ON.

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

Step 5 – Open Outboard MSIVs.
Outboard MSIV control switches, B21-F028A, B21-F028B, B21-F028C, B21-F028D, placed in OPEN and MSIVs are OPEN.

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

Step 6 – Open MS-F020.
MSL Drain Isolation Valve, MS-F020, is open.

SAT/UNSAT*

Step 7 – Open B21-F019.
MSL Outboard Drain Isolation Valve, B21-F019, is open.

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

Step 8 – Close MS-V28.
Steam Supply to MSR's, SJAE's, RFP's, MS-V28, indicates full closed.

SAT/UNSAT*

Step 9 – Close MVD-F021.
Common drain line orifice Bypass Valve to Condenser, MVD-F021, closed.

SAT/UNSAT*

Step 10 – Open B21-F016.
MSL Inboard Drain Isolation Valve, B21-F016, open.

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

Step 11 – Open MS-F038 A, B, C, D.
MSL Orifice Bypass Valve, MS-F038A, B, C, and D, open to increase steam line pressure.

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

Step 12 – Ensure steam line pressure is increasing downstream of Outboard MSIVs.
Steam line pressure rising as indicated on Main Steam Pressure A/B indications on XU-1.

SAT/UNSAT*

Step 13 – Close MS-V46, V47, V48, V49 and V35.
MSL drain valves, MS-V46, MS-V47, MS-V48, & MS-V49 and V35, are closed.

SAT/UNSAT*

Step 14 – When < 200 psid across the valves, open Inboard MSIVs.
Inboard MSIVs B21-F022A, B, C & D are open.

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

Step 15 – Open MVD-F021.
MVD-F021 indicates open.

SAT/UNSAT*

SIM OP: When directed as the AO, open MVD-V5005 using Remote Function **MS_VMS5005D**

Step 16 – Direct AO to open MVD-V5005.
MVD-V5005 is open.

SAT/UNSAT*

Step 17 – Open MS-V46, V47, V48, V49 and V35.
MS-V46, V47, V48, V49 and V35 are opened.

SAT/UNSAT*

Step 18 – Ensure Open MS-V43, MS-V44, MS-V45, MS-V37/39, MS-V41/V42, MS-V36.
MS-V43, MS-V44, MS-V45, MS-V37/39, MS-V41/V42, MS-V36 verified open.

SAT/UNSAT*

Step 19 – Open MS-V28.
MS-V28 is open.

SAT/UNSAT*

Step 20 – Notify Unit SCO that MSIVs are open and to continue with pressure control as directed by the EOPs.

Unit SCO notified MSIVs have been opened per the Hard Card.

SAT/UNSAT*

TERMINATING CUE: When the actions to equalize around and open MSIVs have been performed per the hard card, this JPM is complete.

Time completed:____________

LIST OF REFERENCES

RELATED TASKS:

239 201 B4 01
Equalize Around And Open Main Steam Isolation Valves Per Hot Startup OP-25.

K/A REFERENCE AND IMPORTANCE RATING:

239001 A4.01 4.2/4.0
Ability to manually operate and or monitor in the Control Room: MSIVs

REFERENCES:

EOP-01-RVCP, Reactor Vessel Control Procedure
Hard Card for Emergency MSIV equalization and reopening (S/1032)

TOOLS AND EQUIPMENT:

None

SAFETY FUNCTION (from NUREG 1123, Rev .2)

4 – Heat Removal from the Reactor Core (Main and Reheat Steam System)

REASON FOR REVISION:

Formatting.

Validation Time: 12 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate	___	Actual	X	Unit:	2
Setting:	Control Room	___	Simulator	X	In-Plant:	___
Time Critical:	Yes	___	No	X	Time Limit	___
Alternate Path:	Yes	___	No	X		

EVALUATION

Performer:________________________________

JPM: Pass _____ Fail _____

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. A scram and Group 1 Isolation have occurred.
2. No fuel failure or steam line breaks have occurred.
3. The Main Condenser is available as a heat sink.
4. The Unit SCO has anticipated that Emergency Depressurization may be required.

INITIATING CUE:

You are directed to perform the control operator actions associated with emergency equalization around the MSIVs, and open MSIVs when pressure is <200 psid, using the Hard Card.
You are to inform the Unit SCO when the actions to equalize and open the MSIVs per the Hard Card are complete.

ATTACHMENT 4
Page 1 of 1

Equalization Around and Opening of MSIVs For Anticipation of Emergency Depressurization or Reactor Pressure Control During an ATWS

_______: IF IN MODE 3 AND CONDENSER VACUUM IS LOW, THEN ENSURE VACUUM BYPASS SWITCHES ARE IN BYPASS

_______: PLACE MSIV CONTROL SWITCHES TO CLOSE

_______: RESET GROUP 1 ISOLATION

_______: OPEN OUTBOARD MISVs

_______: OPEN MS-F020

_______: OPEN B21-F019

_______: CLOSE MS-V28

_______: CLOSE MVD-F021

_______: OPEN B21-F016

_______: OPEN MS-F038A, B, C, AND D

_______: ENSURE STEAM LINE PRESSURE IS INCREASING DOWN STREAM OF OUTBOARD MSIVs

_______: CLOSE MS-V46, V47, V48, V49, AND V35.

_______: WHEN LESS THAN 50 PSID OR 200 PSID ACROSS THE VALVE FOR A RAPID RECOVERY, OPEN INBOARD MSIVs

_______: OPEN MVD-F021

_______: OPEN MVD-V5005

_______: OPEN MS-V46, V47, V48, V49, AND V35.

_______: ENSURE OPEN MS-V43, MS-V44, MS-V45, MS-V37/V39, MS-V41/ V42, MS-V36

_______: OPEN MS-V28

_______: CONTINUE WITH PRESSURE CONTROL STEPS AS DIRECTED BY THE EOPs

2/1031
S/1032

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL NOT** 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. The evaluator may provide the examinee with a copy of PEP-02.1 (including flowchart) if desired.
4. Criteria for passing are declaration of a General Emergency, and satisfactory evaluation on 3 of 4 steps from steps 2-5.

Read the following to trainee.

TASK CONDITIONS:

1. Unit Two was operating at 100% power with DG4 under clearance. SJAE monitors were slowly rising and E&RC was notified to obtain a reactor coolant sample.

2. The following sequence of events occurs (ASSUME all automatic actions that should occur have occurred unless otherwise specified):

   @ 1200 E&RC reports results of the Reactor Coolant sample at 5.2 μCi/gm I-131 dose equivalent.

   @ 1230 a seismic event occurs and is verified to be at a magnitude of 0.12g on seismic instrumentation.

   @ 1245 off-site power is lost. DG4 remains under clearance, DG3 fails to start automatically or manually.

   @ 1255 DG3 is successfully started and tied to E3.

   @ 1305 a HPCI steam line break occurs in the HPCI Room as indicated by high room temperature and radiation levels, and high HPCI steam line flow. Attempts to isolate the HPCI steam line are unsuccessful (E41-F002 lost power, E41-F003 trips on overload – Assume any E Bus cross-tie actions are unsuccessful).

   @ 1315 ADS is manually initiated due to two areas above Maximum Safe Operating Temperature with a Primary System discharging.

   @ 1320 E&RC reports results of the Reactor Coolant sample at 330 μCi/gm I-131 dose equivalent

INITIATING CUE:

You are directed to classify the event per PEP-02.1. Provide the highest classification exceeded, including EAL number, and for each time listed, state any classification that was exceeded, and the EAL number exceeded.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a current revision of PEP-02.1.
Current Revision of PEP-02.1 obtained.

SAT/UNSAT*

Step 2 - Determine initial Reactor Coolant sample requires declaration of Unusual Event per 03.01.01-A (Time 1200).
Determine initial Reactor Coolant sample requires declaration of Unusual Event

C **SAT/UNSAT***

Step 3 - Determine seismic event required declaration of Alert per 14.02.01 (Time 1230).
Determined seismic event required declaration of Alert

C **SAT/UNSAT***

Step 4 - Determine loss of off-site power with failure of DGs to start and synchronize for <15 minutes requires Alert per 06.02.02 (Time 1245).
Determined loss of off-site power with failure of DGs to start and synchronize for <15 minutes requires Alert

C **SAT/UNSAT***

Step 5 - Determine HPCI steam line break requires declaration of a Site Area Emergency per 02.03.01 or 12.03.01 (it is acceptable to declare a General Emergency at this time per 12.04.01 since earlier E&RC sample indicates potential for fuel failure) (Time 1305).

Determined HPCI Steam Line break requires declaration a Site Area Emergency (or General Emergency)

C **SAT/UNSAT***

Step 6 - Determine that a loss of 3 of 3 fission product barriers exist and a general Emergency must be declared per 12.04.01 (also the EAL for Alert has been exceeded per 03.01.01).

Determine that loss of 3 out of 3 fission product barriers requires declaration of General Emergency.

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

NOTE: Criteria for passing are declaration of a General Emergency, and satisfactory evaluation of 3 of 4 steps from steps 2-5.

TERMINATING CUE: When it is determined a General Emergency should be declared based on Abnormal Core Conditions and Core Damage, this JPM is complete.

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

RELATED TASKS:

Perform actions of Site Emergency Coordinator following declaration of a General Emergency

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.4.29 3.1/4.4

Knowledge of the Emergency Plan

REFERENCES:

0PEP-02.1, Rev 50

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2., Supp.1):

Admin – Emergency Procedures / Plan

Time Required for Completion: _15_ Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate _ŏ_ Actual ___ Unit: ____

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

Time Critical: Yes ___ No _ŏ_ Time Limit _N/A_

Alternate Path: Yes ___ No _ŏ_

EVALUATION

Trainee:______________________________ SSN: ____________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure Current?: Yes _____ No ______

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Unit Two was operating at 100% power with DG4 under clearance. SJAE monitors were slowly rising and E&RC was notified to obtain a reactor coolant sample.

2. The following sequence of events occurs (ASSUME all automatic actions that should occur have occurred unless otherwise specified):

   @ 1200 E&RC reports results of the Reactor Coolant sample at 5.2 μCi/gm I-131 dose equivalent.

   @ 1230 a seismic event occurs and is verified to be at a magnitude of 0.12g on seismic instrumentation.

   @ 1245 off-site power is lost. DG4 remains under clearance, DG3 fails to start automatically or manually.

   @ 1255 DG3 is successfully started and tied to E3.

   @ 1305 a HPCI steam line break occurs in the HPCI Room as indicated by high room temperature and radiation levels, and high HPCI steam line flow. Attempts to isolate the HPCI steam line are unsuccessful (E41-F002 lost power, E41-F003 trips on overload – Assume any E Bus cross-tie actions are unsuccessful).

   @ 1315 ADS is manually initiated due to two areas above Maximum Safe Operating Temperature with a Primary System discharging.

   @ 1320 E&RC reports results of the Reactor Coolant sample at 330 μCi/gm I-131 dose equivalent

INITIATING CUE:

You are directed to classify the event per PEP-02.1. Provide the highest classification exceeded, including EAL number, and for each time listed, state any classification that was exceeded, and the EAL number exceeded.

Emergency Action Levels

Section	Event Category	Page No.

Emergency Action Levels

1.0 Abnormal Primary Leak Rate

1.1 Notification of Unusual Event

01.01.01 Reactor Coolant System total leakage greater than 25 gpm averaged over the previous 24-hour period using the sum of drywell equipment drain integrator (G16-FQ-K603) and drywell floor drain integrator (G16-FQ-K601), and the leakage rate has not been reduced to less than 25 gpm within eight hours, or plant shutdown is not achieved within required time period.

OR

01.01.02 Unidentified Reactor Coolant System leakage greater than 5 gpm averaged over the previous 24-hour period using the drywell floor drain integrator (G16-FQ-K601), and the leakage rate has not been reduced to less than 5 gpm within eight hours, or plant shutdown is not achieved within required time period.

1.2 Alert

01.02.01 Small break LOCA with primary system leakage greater than 50 gpm. A LOCA is indicated by a significant loss of reactor inventory to the drywell resulting in increased drywell pressure, temperature, and/or sump pump usage indicated by:

- Low or falling Reactor Coolant System pressure with rising drywell pressure and temperature (C32-R608, CAC-PI-2685-1, CAC-TR-4426-1A, CAC-TR-4426-1B, CAC-TR-4426-2A and CAC-TR-4426-2B).

1.3 Site Area Emergency

01.03.01 Loss of coolant accident requiring the initiation of Low Pressure Coolant Injection, Core Spray, or the Automatic Depressurization System, **AND REQUIRED FOR ADEQUATE CORE COOLING**.

Emergency Action Levels

1.0 Abnormal Primary Leak Rate (Continued)

1.4 General Emergency

01.04.01 Loss of coolant accident requiring the initiation of Low Pressure Coolant Injection, Core Spray, or Automatic Depressurization System, **AND REQUIRED FOR ADEQUATE CORE COOLING**;

AND

Inability to provide makeup water to the Reactor Coolant System (i.e, failure of HPCI, Core Spray A and B, RHR Loops A and B, RCIC, condensate, and feedwater) as indicated by falling or low reactor vessel level with attempts to inject water not successful.

Emergency Action Levels

2.0 Steam Line Break or Safety/Relief Valve Failure

2.1 Notification of Unusual Event

02.01.01 Reactor Coolant System pressure ≥ 1250 psig.

OR

02.01.02 Inability to close an SRV with Reactor Coolant System pressure ≤ 900 psig.

2.2 Alert

02.02.01 Main Steam, HPCI or RCIC steam line break inside the primary containment without (full) line isolation valve closure.

2.3 Site Area Emergency

02.03.01 Main Steam, HPCI or RCIC steam line break outside primary containment and line isolation valve(s) fail to close indicated by valid area radiation and/or temperature alarms.

2.4 General Emergency

02.04.01 N/A

3.0 Abnormal Core Conditions and Core Damage

3.1 Notification of Unusual Event

03.01.01 Liquid

A. Reactor Coolant System (RCS) activity greater than 4.0 μCi/gm I-131 dose equivalent.

B. RCS activity greater than 0.2 μCi/gm I-131 dose equivalent but less than limit above for more than 48 hours.

03.01.02 Gaseous

A. Steam jet air ejector off-gas radiation monitor (D12-RM-K601A and B) reading of greater than 1.2×10^4 mR/hr.

B. Steam jet air ejector off-gas radiation monitor (D12-RM-K601A and B) increase of greater than 2.4×10^3 mR/hr in 30 minutes.

3.2 Alert

03.02.01 Liquid

Reactor coolant activity greater than 300 μCi/gm I-131 dose equivalent.

03.02.02 Gaseous

Steam jet air ejector off-gas radiation monitor (D12-RM-K601A and B) reading of greater than 1.2×10^5 mR/hr.

3.3 Site Area Emergency

03.03.01 Reactor Coolant System activity is greater than 4000 μCi/gm I-131 dose equivalent.

3.0 Abnormal Core Conditions and Core Damage (Continued)

3.4 General Emergency

03.04.01 Any two functional high range drywell radiation monitors (D22-RI-4195, 4196, 4197, and 4198) reading greater than 5000 R/hr.

4.0 Abnormal Radiological Effluent or Radiation Levels

4.1 Notification of Unusual Event

04.01.01 Liquid Release

Any unplanned release from the liquid waste system resulting in activity levels in the discharge canal greater than those in 10CFR20, Appendix B, Table II, Column 2.

04.01.02 Gaseous Release

Any gaseous release which exceeds the dose limit specified in ODCM 7.3.7 (i.e., exceeding the noble gas instantaneous dose rate limit as evaluated by 0E&RC-2020).

04.01.03 Any building evacuation based on confirmed radiological conditions (i.e., greater than 10 dac airborne [except precautionary evacuations]).

4.2 Alert

04.02.01 Liquid Release

Any liquid release resulting in activity concentration levels in the discharge canal that are greater than 10 times those given in 10CFR20, Appendix B, Table II, Column 2 (10 times the concentration listed in Unusual Event).

04.02.02 Gaseous Release

Any gaseous release which exceeds 10 times the dose rate limit specified in ODCM 7.3.7 (i.e., exceeding 10 times the noble gas instantaneous dose rate limit as evaluated by 0E&RC-2020).

04.02.03 In-Plant Leak or Spill

Unplanned, valid direct area radiation (gamma and/or neutron) reading(s) increase by a factor of 1000 over normal levels.

4.0 Abnormal Radiological Effluent or Radiation Levels (Continued)

4.3 Site Area Emergency

04.03.01 Projected dose exceeding 50 mRem Whole body (TEDE) **OR** exceeding 250 mRem Thyroid (CDE) at site boundary.

04.03.02 Measured dose rate exceeding 100 mR/hr at site boundary.

04.03.03 Measured I-131 dose equivalent concentration exceeds 3.9E-7 μCi/cc at the site boundary.

4.4 General Emergency

04.04.01 Offsite release resulting in a dose exceeding one (1) Rem Whole Body (TEDE) **OR** five (5) Rem Thyroid (CDE) at the Site Boundary as indicated by dose projection or field data.

04.04.02 Measured I-131 Dose Equivalent concentration exceeding 3.9E-6 μCi/cc at the site boundary.

5.0 Loss of Shutdown Functions: Decay Heat and Reactivity

5.1 Notification of Unusual Event

05.01.01 N/A

Alert

05.02.01 Complete loss of ability to maintain plant in cold shutdown:

1. Loss of essential service water loops, or Loss of RHR Loops A and B.

AND

2. Loss of Condenser Condensate System.

AND

3. Either:

    a. Coolant temperature exceeds 212°F,

    OR

    b. Uncontrolled temperature rise approaching 212°F.

05.02.02 Failure of the Reactor Protection System to initiate and complete a scram, indicated on Panel A-5, which brings the reactor to a subcritical condition as indicated by full core display panel P603 and neutron monitoring instruments (APRM and IRM).

5.0 Loss of Shutdown Functions: Decay Heat and Reactivity (Continued)

5.3 Site Area Emergency

05.03.01 Failure of the Reactor Protection System to initiate and complete a scram as indicated by Section 05.02.02 above.

AND

Failure of standby liquid control to bring the reactor to a subcritical condition.

05.03.02 Complete loss of reactor heat removal capability indicated by inability to maintain Suppression Pool below Heat Capacity Temperature Limit curve.

5.4 General Emergency

05.04.01 Site Area Emergency as indicated in Section 05.03.01 above lasting greater than 30 minutes.

AND

Loss of main condenser heat removal capability indicated by MSIVs shut or loss of vacuum on condenser vacuum indicator.

AND EITHER

1. Failure of all low pressure coolant injection trains indicated on panel P601.

OR

2. Failure of all service water trains necessary for decay heat removal indicated on panel P601 (RHR Service Water) and Panel XU2 (Nuclear and Conventional Service Water).

05.04.02 Containment pressure approaching Primary Containment Pressure Limit (PCPL), and containment venting will be required within the next six (6) hours.

Emergency Action Levels

6.0 Electrical or Power Failures

6.1 Notification of Unusual Event

06.01.01 Inability to power either 4 kV E Bus from off-site power.

OR

06.01.02 Loss of all on-site AC power capability indicated by failure of diesel generators to start or synchronize.

6.2 Alert

06.02.01 Loss of all vital DC power.

OR

06.02.02 Inability to power either 4 kV E Bus from off-site power.

AND

Loss of all on-site AC power capability indicated by failure of diesel generators to start or synchronize.

6.3 Site Area Emergency

06.03.01 Either Alert condition in Section 06.02.01 or 06.02.02 listed above **AND** lasting longer than 15 minutes.

6.4 General Emergency

06.04.01 N/A

7.0 Fire

7.1 Notification of Unusual Event

07.01.01 Fire located in or adjacent to the areas listed below **NOT** extinguished within 15 minutes of alarm verification or Control Room notification.

Areas:

Emergency Diesel Generator Building
Control Building
Central Alarm Station/Secondary Alarm Station
Reactor Building
Turbine Building
Unit Intake Structures
Service Water Building

7.2 Alert

07.02.01 Fire which could potentially affect vital safety-related equipment.

7.3 Site Area Emergency

07.03.01 Any fire that impairs the operability of any vital equipment which, in the opinion of the Site Emergency Coordinator, is essential to maintain the plant in a safe condition.

7.4 General Emergency

07.04.01 Any fire which in the opinion of the Site Emergency Coordinator could cause massive common damage to plant systems.

8.0 Control Room Evacuation

8.1 Notification of Unusual Event

08.01.01 N/A

8.2 Alert

08.02.01 Evacuation of Control Room anticipated or required with control of shutdown established from local stations.

8.3 Site Area Emergency

08.03.01 Evacuation of Control Room **AND** local control of shutdown is not established in 15 minutes.

8.4 General Emergency

08.04.01 N/A

9.0 Loss of Monitors or Alarms or Communication Capability

9.1 Notification of Unusual Event

09.01.01 Site communications capability impaired as determined by loss of all of the following:

1. Both site Private Branch Exchanges (PBX's)
2. All private phone lines (not routed through Plant Branch Exchange; Control Room, Security, Site Vice President Office)
3. Selective Signaling
4. Decision Line
5. State and Local emergency management radio system
6. Cellular phone system access
7. Satellite telephone

09.01.02 Unplanned loss of most or all annunciators on Panels P601, P603, XU-1, XU-2, XU-3, XU-51, and XU-80 for > 15 minutes with the affected unit in Mode 1, 2, or 3;

AND

Compensatory (non-alarming) indications are available.

9.2 Alert

09.02.01 Unplanned loss of most or all annunciators on Panels P601, P603, XU-1, XU-2, XU-3, XU-51, and XU-80 for > 15 minutes with the affected unit in Mode 1, 2, or 3;

AND

Either;

- Compensatory (non-alarming) indications are **NOT** available.

OR

- A plant transient is in progress.

9.0 Loss of Monitors or Alarms or Communication Capability (Continued)

9.3 Site Area Emergency

09.03.01 Unplanned loss of most or all annunciators on Panels P601, P603, XU-1, XU-2, XU-3, XU-51, and XU-80 with the affected unit in Operational Condition 1, 2, or 3;

AND

- Compensatory (non-alarming) indications are NOT available.

AND

- A plant transient is in progress.

AND

- Plant safety function indications (reactor power, reactor level, reactor pressure, containment parameters) are **NOT** available.

9.4 General Emergency

09.04.01 N/A

10.0 Fuel Handling Accident

10.1 Notification of Unusual Event

10.01.01 N/A

10.2 Alert

10.02.01 Fuel handling accident involving damage to new or spent fuel indicated by:

A. Observation/report **AND** alarm on:

1. Process Reactor Building ventilation RAD monitor D12-K609A, B or D12-RR-R605.

OR

2. Reactor Building roof ventilation monitor CAC-AIQ-1264-3.

OR

3. Refuel floor area monitor ARM channel 1-28 or 2-28.

10.3 Site Area Emergency

10.03.01 Major damage to spent fuel indicated by:

1. Observation of substantial damage to multiple fuel assemblies, or observation that water level has dropped below the top of the fuel.

AND

2. Indications or alarms listed in Attachment 1, Section 10.02.01.A above.

10.4 General Emergency

10.04.01 N/A

11.0 Security Threats

11.1 Notification of Unusual Event

11.01.01 Security threat or attempted entry (PA) or attempted sabotage.

11.01.02 A credible site specific security threat notification.

11.01.03 A validated notification from NRC providing information of an aircraft threat.

11.2 Alert

11.02.01 Ongoing security compromise (as determined by security).

11.02.02 A validated notification from NRC of an airliner attack threat less than 30 minutes away.

11.02.03 A notification from the site security force of an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION within the OCA.

11.3 Site Area Emergency

11.03.01 Imminent loss of physical control of the plant.

11.03.02 A notification from the site security force that an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION is occurring or has occurred within the protected area.

11.4 General Emergency

11.04.01 A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions.

12.0 Fission Product Barriers and Specific LCOs

12.1 Notification of Unusual Event

12.01.01 Loss of containment operability requiring shutdown by Technical Specifications and shutdown is not achieved within required time period.

12.01.02 Loss of engineered safety feature requiring shutdown by Technical Specifications and shutdown is not achieved within required time period.

12.2 Alert

12.02.01 Loss of either Fuel Clad or the Reactor Coolant Boundary.

12.3 Site Area Emergency

12.03.01 Loss of two-out-of-three fission product barriers.

12.4 General Emergency

12.04.01 Loss of any two-out-of-three fission product barriers with a potential loss of the third barrier.

13.0 Hazards to Plant Operations

13.1 Notification of Unusual Event

13.01.01 Non-hostile Aircraft crash within site boundaries with the potential to endanger safety-related equipment.

13.01.02 Unplanned non-hostile explosion within the site boundaries with the potential to endanger safety-related equipment.

13.01.03 Release of toxic or flammable gas that could endanger personnel.

13.01.04 Turbine rotating component failure causing rapid plant shutdown.

13.2 Alert

13.02.01 Non-hostile explosion, aircraft crash, or missile resulting in major damage to structures housing safety-related systems.

13.02.02 Unplanned and uncontrolled entry of toxic or flammable gases into vital areas in sufficient quantities to endanger personnel or the operability of safety-related equipment.

13.02.03 Turbine failure causing penetration of its outer casing.

13.3 Site Area Emergency

13.03.01 Non-hostile explosion, aircraft crash, or missile resulting in major damage to safe shutdown equipment with plant not in cold shutdown.

13.03.02 Uncontrolled entry of flammable or toxic gases into vital areas where lack of access constitutes a safety problem with plant not in cold shutdown.

13.4 General Emergency

13.04.01 Any major internal or external event substantially beyond design basis which could cause massive common damage to plant systems.

Emergency Action Levels

14.0 Natural Events

14.1 Notification of Unusual Event

14.01.01 Alarm on seismic monitor AND confirmation of earthquake.

14.01.02 Hurricane warning issued.

14.01.03 Tornado on site.

14.2 Alert

14.02.01 Earthquake registering greater than 0.08g on seismic instrumentation.

14.02.02 Any adverse weather conditions that causes a loss of function of two or more safety trains.

14.02.03 Tornado striking inside protected area resulting in major damage to structures housing safety-related systems.

14.02.04 Hurricane winds on site estimated:

1. ≥ 130 mph at 30 ft above ground level
2. ≥ 180 mph at 300 ft above ground level

14.3 Site Area Emergency

14.03.01 Earthquake registering greater than 0.16g on seismic instrumentation with plant not in cold shutdown.

14.03.02 Flood, low water, or hurricane surge greater than design levels or failure to protect vital equipment at lower levels and plant not in cold shutdown.

14.03.03 Plant not in cold shutdown with hurricane winds on site estimated:

1. ≥ 130 mph at 30 ft above ground level
2. ≥ 180 mph at 300 ft above ground level

14.0 Natural Events (Continued)

14.4 General Emergency

14.04.01 Any major natural event substantially beyond design basis which could cause massive common damage to plant systems.

Emergency Action Levels

15.0 Shift Superintendent/Site Emergency Coordinator Judgments

When any condition exists which indicates a necessity for an increased level of awareness or readiness above previous plant conditions, the Shift Superintendent/Site Emergency Coordinator should use his judgment to declare the appropriate emergency status for the plant.

15.1 Notification of Unusual Event

15.01.01 Plant conditions exist that warrant increased awareness by plant staff such as exceeding any Technical Specification safety limit.

15.2 Alert

15.02.01 Plant conditions exist that reflect a significant degradation in the safety of the reactor, but releases from this event would be small.

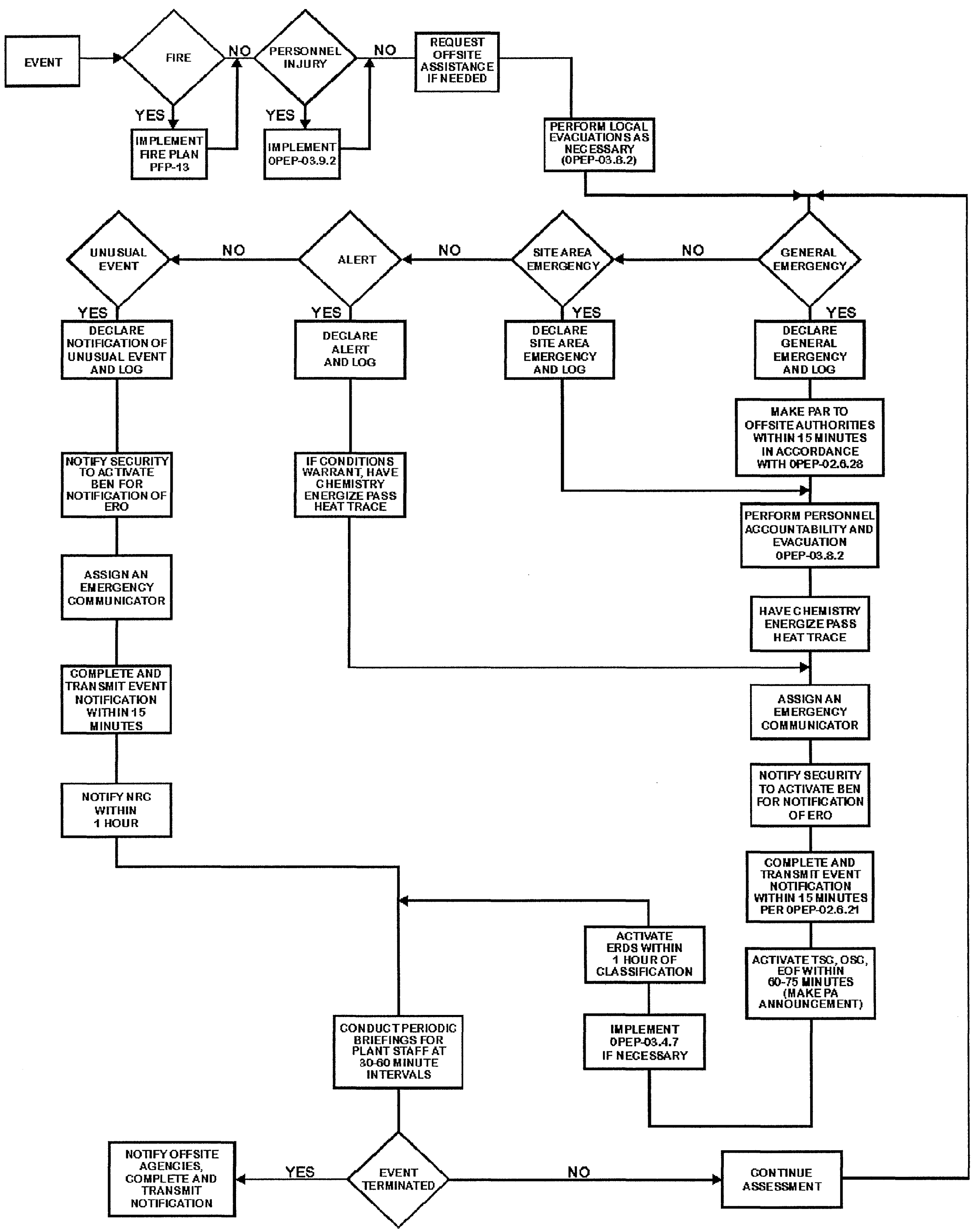
15.3 Site Area Emergency

15.03.01 Plant conditions exist that involve major failures of equipment and that will lead to core damage. Unless corrective action is taken, significant radiation releases may occur.

15.4 General Emergency

15.04.01 Plant conditions exist that make a release of a large amount of radioactivity in a short time possible; any core melt situation.

ATTACHMENT 2
Page 1 of 1
Site Emergency Coordinator Actions Flow Chart



PROGRESS ENERGY – CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
IN-PLANT

P-1

LESSON TITLE: Alternate Coolant Injection - EOP-LEP-01 - Coolant Injection with SLC Pumps Aligned To Demineralized Water

LESSON NUMBER: AOT-OJT-JP-300-J10

REVISION NO: 04

SAFETY CONSIDERATIONS:

1. Radiological hazards.
2. Operating equipment hazards.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be supplied to the trainee.
2. If this is the first JPM of the JPM set, read the JPM briefing contained in NUREG 1021, Appendix E, or similar to the trainee.
3. This JPM may be performed on either Unit, as selected by the evaluator.

Read the following to the trainee

TASK CONDITIONS:

1. This JPM will be performed on Unit ____. (Designated by the evaluator)
2. The SLC system and the Demineralized Water system are operable and accessible.
3. Reactor pressure is below the upper range of the SLC pump discharge pressure (0-1380 psig).
4. EOP-01 has directed control operators to enter LEP-01 to restore and/or maintain RPV level above TAF.
5. All control rods are fully inserted.

INITIATING CUE:

You are directed by the Control Operator (with SCO approval) to perform the Auxiliary Operator actions associated with aligning Unit ____ SLC using Demineralized Water for Alternate Coolant Injection and inform the control room when you have completed the actions.

PERFORMANCE CHECKLIST

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

Step 1 - Determines that EOP-01-LEP-01, Section 1, Step 4 is the starting point and proceed to the Reactor Building 80' elevation.

Procedure is obtained.

SAT/UNSAT*

Start Time: __________

NOTE: All actions are performed locally in the reactor building on the 80'.

Step 2 - Unlock and close SLC storage tank outlet isolation valve, C41-F001.

C41-F001 unlocked and manually closed.

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

NOTE: The student should not remove items from or open the LEP Toolbox, but they should state where the equipment is located.

Step 3 – Obtain pipe wrench and Demin water to SLC Jumper hose from 80' LEP Toolbox.

Jumper and pipe wrench is obtained.

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

Step 4 – Connect one end of the demin water to SLC jumper hose to the threaded connection at the SLC Demineralized Water Supply Isolation Valve, C41-V5000.

Jumper is connected to threaded connection at V5000.

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

Step 5 – Connect the other end of the demin water to SLC jumper hose to the threaded connection upstream of the SLC Test Tank Outlet Demineralized Water Supply Isolation Valve, C41-F014.

Jumper is connected to threaded connection at F014.

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

Step 6 – Open the SLC Demin Water Supply Isolation Valve, C41-V5000.

C41-V5000 manually opened, at 80' Rx Bldg.

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

Step 7 - Unlock and open SLC Test Tank Outlet Demineralized Water Supply Isolation Valve, C41-F014.

C41-F014 unlocked and manually opened, at 80' Rx Bldg above SLC test tank.

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

CUE:	If asked, as the Reactor Operator, report that air sparging of the SLC tank is not in progress.

Step 8 - Contact the control room to start the SLC pumps.

Control room informed that SLC is aligned to demineralized water and that the pumps can be started.

SAT/UNSAT*

TERMINATING CUE: All Auxiliary Operator actions necessary for Alternate Coolant Injection with the SLC system are complete.

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

RELATED TASKS:

200 071 B5 04
Perform Alternate Coolant Injection With SLC Pumps Per EOP-LEP-01.

K/A REFERENCE AND IMPORTANCE RATING:

295031 EA1.08 3.8/3.9
Ability to operate alternate injection systems.

REFERENCES:

1. EOP-01-LEP-01, Alternate Coolant Injection, Section 1.

TOOLS AND EQUIPMENT:

1. 1 LEP Toolbox Key
2. Pipe wrench
3. Demineralized water to SLC jumper hose

SAFETY FUNCTION (from NUREG 1123, Rev. 2)

Safety Function 2, Reactor Water Inventory Control

REASON FOR REVISION:

SLC modification is now common to both Units.

Validation Time: ___8___ Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance:	Simulate ✓	Actual ____		Unit: ____	
Setting:	Control Room ____	Simulator ____		In-Plant ✓	
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?: Yes _____ No ______
(Each Student should verify one JPM per evaluation set)

Comments: ____

____

____

____

____

____

____

____

____

Comments Reviewed With Trainee

Evaluator Signature: ___________________________________ Date:_______________

TASK CONDITIONS:

1. This JPM will be performed on Unit ____. (Designated by the evaluator)
2. The SLC system and the Demineralized Water system are operable and accessible.
3. Reactor pressure is below the upper range of the SLC pump discharge pressure (0-1380 psig).
4. EOP-01 has directed control operators to enter LEP-01 to restore and/or maintain RPV level above TAF.
5. All control rods are fully inserted.

INITIATING CUE:

You are directed by the Control Operator (with SCO approval) to perform the Auxiliary Operator actions associated with aligning Unit ____ SLC using Demineralized Water for Alternate Coolant Injection and inform the control room when you have completed the actions.

Section 1 Coolant Injection with SLC Pumps

NOTE: Manpower:		1 Control Operator 2 Auxiliary Operators
	Special equipment:	1 LEP toolbox key locking tabs <u>80' Rx Bldg LEP Toolbox</u> 1 pipewrench 1 Demineralized water to SLC jumper hose

CO:	1.	**INFORM** the Unit SCO of the performance of this section.	☐
CO:	2.	**IF** directed by the Unit SCO to inject with SLC pumps while aligned to the SLC storage tank, **THEN GO TO** Step 6, on page 6.	☐
CO:	3.	**IF** it has been determined the reactor will remain shutdown under all conditions without boron, **THEN CONTINUE** in this procedure.	☐
	4.	**IF** directed to inject demineralized water, **THEN PERFORM** the following steps:	
AO:	a.	**UNLOCK AND CLOSE** *SLC STORAGE TANK OUTLET ISOLATION VALVE, C41-F001*.	☐
AO:	b.	**CONNECT** one end of the demineralized water to SLC jumper hose to the threaded connection at *SLC DEMINERALIZED WATER SUPPLY ISOLATION VALVE, C41-V5000*.	☐
AO:	c.	**CONNECT** the other end of the demineralized water to SLC jumper hose to the threaded connection upstream of *SLC TEST TANK OUTLET DEMINERALIZED WATER SUPPLY ISOLATION VALVE, C41-F014.*	☐

Section 1 (Continued)

AO:		d.	**OPEN** *SLC DEMINERALIZED WATER SUPPLY ISOLATION VALVE, C41-V5000.*	☐
AO:		e.	**UNLOCK AND OPEN** *SLC TEST TANK OUTLET DEMINERALIZED WATER SUPPLY ISOLATION VALVE, C41-F014.*	☐
	5.	**IF** demineralized water is **NOT** available **AND** fire protection water is available, **THEN PERFORM** the following:		

NOTE:	Use of fire protection water may result in the injection of borated water from the SLC test tank.

AO:	a.	**UNLOCK AND CLOSE** *SLC STORAGE TANK OUTLET ISOLATION VALVE, C41-F001.*	☐
AO:	b.	**UNLOCK AND OPEN** *SLC TEST TANK OUTLET ISOLATION VALVE, C41-F031.*	☐

NOTE:	Fire hose stations are located on the north wall of the CRD rebuild room and the south wall of the 80' elevation.

AO:	c.	**DISCONNECT** the nozzle from the fire hose selected for make up to the SLC test tank.	☐

NOTE:	One auxiliary operator will be required to hold the fire hose in the SLC test tank during the filling process while the other operator adjusts the fill flow rate.

AO:	d.	**PLACE AND HOLD** the discharge end of fire hose in the SLC test tank.	☐
AO:	e.	**MAKEUP** to SLC test tank with fire protection water, throttling flow with the hose reel angle valve as required.	☐
AO:	6.	**IF** sparging of the SLC tank is in progress, **THEN CLOSE AND LOCK** *SLC STORAGE TANK SERVICE AIR STOP VALVE, C41-F012.*	☐

Section 1 (Continued) Initials

CO:	7.	**START** SLC Pumps A and B from the RTGB.		☐
	8.	**WHEN** SLC pumps are **NOT** required for coolant injection, **THEN PERFORM** the following:		
CO:		a.	**PLACE** *SLC PUMPS A & B, C41-CS-S1*, to *STOP*.	_____
AO:		b.	**SECURE** fire protection water makeup to the SLC test tank, if necessary.	_____
AO:		c.	**IF** removed, **THEN INSTALL** the fire hose nozzle removed in Step 5.c on the fire hose used for makeup to the SLC test tank.	___/___ Ind.Ver.
AO:		d.	**IF** Step 5.c was performed, **THEN COORDINATE** with Fire Protection personnel to perform an inspection of the fire hose station used for makeup to the SLC test tank.	_____
		e.	**PERFORM** the following for all valves that were operated.	
AO:			(1) **CLOSE AND LOCK** *SLC TEST TANK OUTLET DEMINERALIZED WATER SUPPLY ISOLATION VALVE, C41-F014.*	___/___ Ind.Ver.
AO:			(2) **CLOSE** *SLC DEMINERALIZED WATER SUPPLY ISOLATION VALVE, C41-V5000*.	___/___ Ind.Ver.
AO:			(3) **CLOSE AND LOCK** *SLC TEST TANK OUTLET ISOLATION VALVE, C41-F031*.	___/___ Ind.Ver.
AO:			(4) **OPEN AND LOCK** *SLC STORAGE TANK OUTLET ISOLATION VALVE, C41-F001*.	___/___ Ind.Ver.
AO:		f.	**IF** installed, **THEN REMOVE** the demineralized water to SLC jumper hose and connections, and reinstall the pipe caps.	___/___ Ind.Ver.

Section 1 (Continued) Initials

AO:	g.	**RETURN** any LEP tool box equipment to storage **AND PERFORM** inventory of LEP tool boxes.	_____
CO:	h.	**COORDINATE** with E&RC to sample the SLC tank for proper concentration **OR** to refill the SLC tank in accordance with 1(2)OP-05.	_____
AO:	i.	**INITIATE** a WO to replace both squib valves.	_____
CO:	j.	**EXIT** this section **AND CONTINUE** in this procedure at Step 2.1 on page 3.	_____

Date/Time Completed ______________________

Performed By (Print)	Initials
______________	____
______________	____
______________	____
______________	____

Reviewed By: ______________ ____
Unit SCO

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
IN PLANT

P-2A

LESSON TITLE:	PREPARE DG4 FOR START PER 0ASSD-02 with failed breaker (DG OPERATOR ACTIONS)
LESSON NUMBER:	AOT-OJT-JP-304-24
REVISION NO:	0

SAFETY CONSIDERATIONS:

1. Hearing protection, hardhat, and safety glasses.
2. Simulate all actions including communications.
3. Practice ALARA at all times while simulating actions.
4. Standard electrical precautions when working around energized electrical equipment.

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:** Begin this JPM at the DG4 Control Panel H57. Access/Egress is NOT evaluated because this JPM starts at and is performed at the DG4 Control Panel H57.
3. **PROVIDE A COPY:** 0ASSD-02, Section E, is to be provided to the student (marked up to the starting location).
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is a time critical JPM. The critical time is a fraction of the analysis time to establish Suppression Pool Cooling within 1.5 hours. Based on all the other actions that are required to be performed within this time frame, the critical time established for this JPM is 10 minutes.

Read the following to the JPM performer.

TASK CONDITIONS:

1. A Control Room fire has resulted in Control Room Evacuation.
2. 0ASSD-02 has been entered and is being performed.
3. You are the Diesel Generator Operator.
4. ASSD equipment is distributed and ASSD communications are established.
5. You have your ASSD equipment bag and the following keys:
   Fifteen (15) T112 keys, one (1) CO key, thirty-four (34) GE-75 keys
6. You have completed the actions to remove DG2 and DG4 from service. what steps of the procedure have been completed?
7. You have communicated the completion of these actions using the ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT, at the DG4 Control Panel.

INITIATING CUE:

You are directed to prepare DG4 for start per 0ASSD-02, Section E, step 1.16.

PERFORMANCE CHECKLIST

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

START TIME: ___________

PROMPT: When key inserted (T112) and NORMAL/LOCAL switch is rotated to the LOCAL position, indicate the switch in LOCAL.

Step 1 – At MCC DGD Compt D59 (Row G3), place NORMAL/LOCAL switch in LOCAL.
MCC DGD Compt D59: *Inserts key into NORMAL/LOCAL switch and rotates switch to LOCAL position*

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

PROMPT: When the START/STOP control switch is rotated to START, indicate switch in START. Indicate green light off, red light on.

Step 2 – At MCC DGD Compt D59 (Row G3), place START/STOP control switch in START for DG CELL 4 EXHAUST FAN 2-VA-H-EF-DG.
MCC DGD Compt D59: *Rotates START/LOCAL switch to START.*

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

Step 3 – At MCC DGD Compt EF7 (Row G2), place SW TO JKT WTR CLR SPLY ISOL VLV, 1-SW-V682 in OFF.
MCC DGD Compt EF7: *Placed in OFF.*

SAT/UNSAT*

PROMPT: When each breaker is tripped; indicate to the examinee that there is a green open indicating flag.

Step 4 – At 480V Substation E8 trip the following breakers:

Row	Compt	Breaker	Open
B3	AZ6	MCC 2XH	
D2	AO3	MCC 1XK	
E2	AO7	MCC 2XM	
E4	AO9	MCC 2CB	
F3	A12	Emerg. 120/208V AC Distr Pnl 2E8-HG3	

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

PROMPT: When key is inserted and NORMAL/LOCAL switch is rotated to the LOCAL position, indicate the switch in LOCAL.

Step 5 - At 480V Substation E8 Compt FN2 (Row A1): Places NORMAL/LOCAL keylock switch to LOCAL.

E8 Compt FN2 (Row A1): *NORMAL/LOCAL switch in LOCAL.*

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

PROMPT: Indicate breaker is OPEN by indicating that there is a green open indicating flag.

Step 6 - At 480V Substation E8 Compt AZ5 (Row B2): Verifies E8 480V SUB MAIN BREAKER.

E8 Compt AZ5 (Row B2): *E8 480V SUB MAIN BREAKER open flag verified.*

SAT/UNSAT*

Step 7 - At 480V Substation E8 Compt FN2 (Row A1): Places local ASSD control switch to close.

E8 Compt FN2 (Row A1): *local ASSD control switch is closed.*

SAT/UNSAT*

PROMPT: Indicate breaker OPEN; green open indicating flag.

Step 8 - At 480V Substation E8 Compt AZ5 (Row B2): Verifies E8 480V SUB MAIN BREAKER.

E8 Compt AZ5 (Row B2): *E8 480V SUB MAIN BREAKER open flag verified.*

SAT/UNSAT*

PROMPT: Indicate breaker closed after pulling down the manual close lever; red closed indicating flag.

Step 9 - At 480V Substation E8 Compt AZ5 (Row B2): Close the breaker by pulling down the manual close lever.

E8 Compt FN2 (Row B2): *Breaker closed.*

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

PROMPT: Role play communications as Emergency Switchgear Operator DG Bldg.

Step 10 - Inform Emergency Switchgear Operator DG Bldg that DG4 is ready to be started.

Emergency Switchgear operator DG Bldg Operator informed DG4 is ready to be started.

SAT/UNSAT*

TERMINATING CUE: When DG4 is ready to be started and the Emergency Switchgear Operator DG Bldg is informed this JPM is complete.

STOP TIME: ___________

RELATED TASKS:

200611B504, Perform actions associated with Alternate Safe Shutdown as the Unit 1(2) DG Operator per 0ASSD-02.

K/A REFERENCE AND IMPORTANCE RATING:

295003 AA1.02 Ability to operate and/or monitor the following as they apply to Partial or Complete Loss of AC Power: Emergency Generators (4.2/4.3)

REFERENCES:

0ASSD-02, Section E.

TOOLS AND EQUIPMENT:

None

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

6 (Electrical)

REASON FOR REVISION:

Modified JPM to add alternate path.

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

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate x Actual __ Unit: 2

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

Time Critical: Yes x No __ Time Limit **10 Minutes**

Alternate Path: Yes x No __

EVALUATION

Performer:________________________________

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. A Control Room fire has resulted in Control Room Evacuation.
2. 0ASSD-02 has been entered and is being performed.
3. You are the Diesel Generator Operator.
4. ASSD equipment is distributed and ASSD communications are established.
5. You have your ASSD equipment bag and the following keys:
   Fifteen (15) T112 keys, one (1) CO key, thirty-four (34) GE-75 keys
6. You have completed the actions to remove DG2 and DG4 from service.
7. You have communicated the completion of these actions using the ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT, at the DG4 Control Panel.

INITIATING CUE:

You are directed to prepare DG4 for start per 0ASSD-02, Section E, steps 1.16.

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	Critical tasks for the Diesel Generator Operator include tripping Unit 1 condensate pumps, condensate booster pumps, and reactor recirculation MG set breakers, shutdown and restart of Diesel Generators 2 and 4 to re-energize E2 and E4, shutdown of Diesel Generators 1 and 3, and alignment of Diesel Generator Building ventilation. Close coordination and communication is essential between the Diesel Generator Operator and the Emergency Switchgear Operator. Restoration of Div II emergency bus power is vital for DC battery chargers and to supply power for RHR and Service Water Systems in various modes.

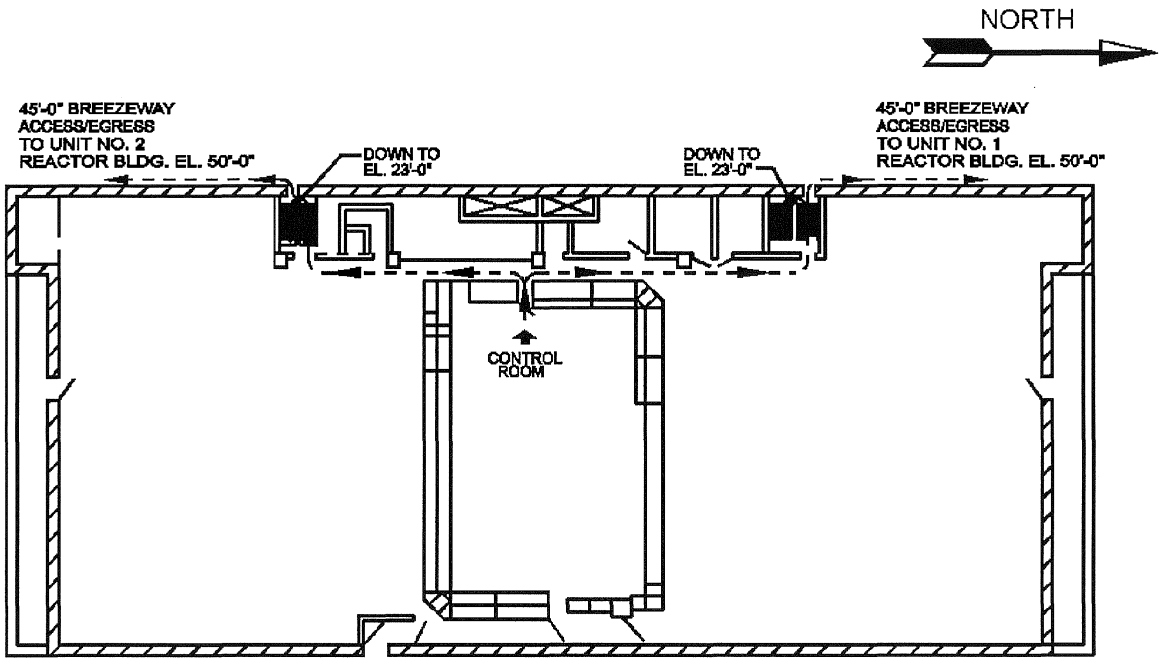
1.0 OPERATOR ACTIONS

1.1 **OBTAIN** a security access key from the ASSD equipment cabinet. ☑

1.2 **USE** appropriate figures in this section for access/egress routes and equipment and communication locations. ☑

NOTE:	The following two pages contain Control Building and Turbine Building access/egress routes and BOP bus breaker arrangement drawings.

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS
Control Building Access/Egress Pathways



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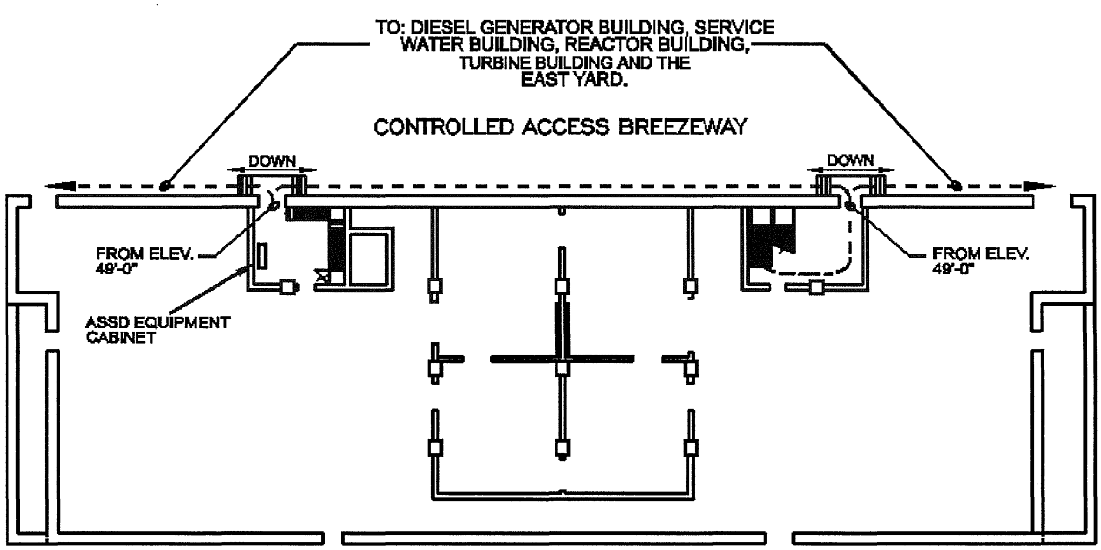
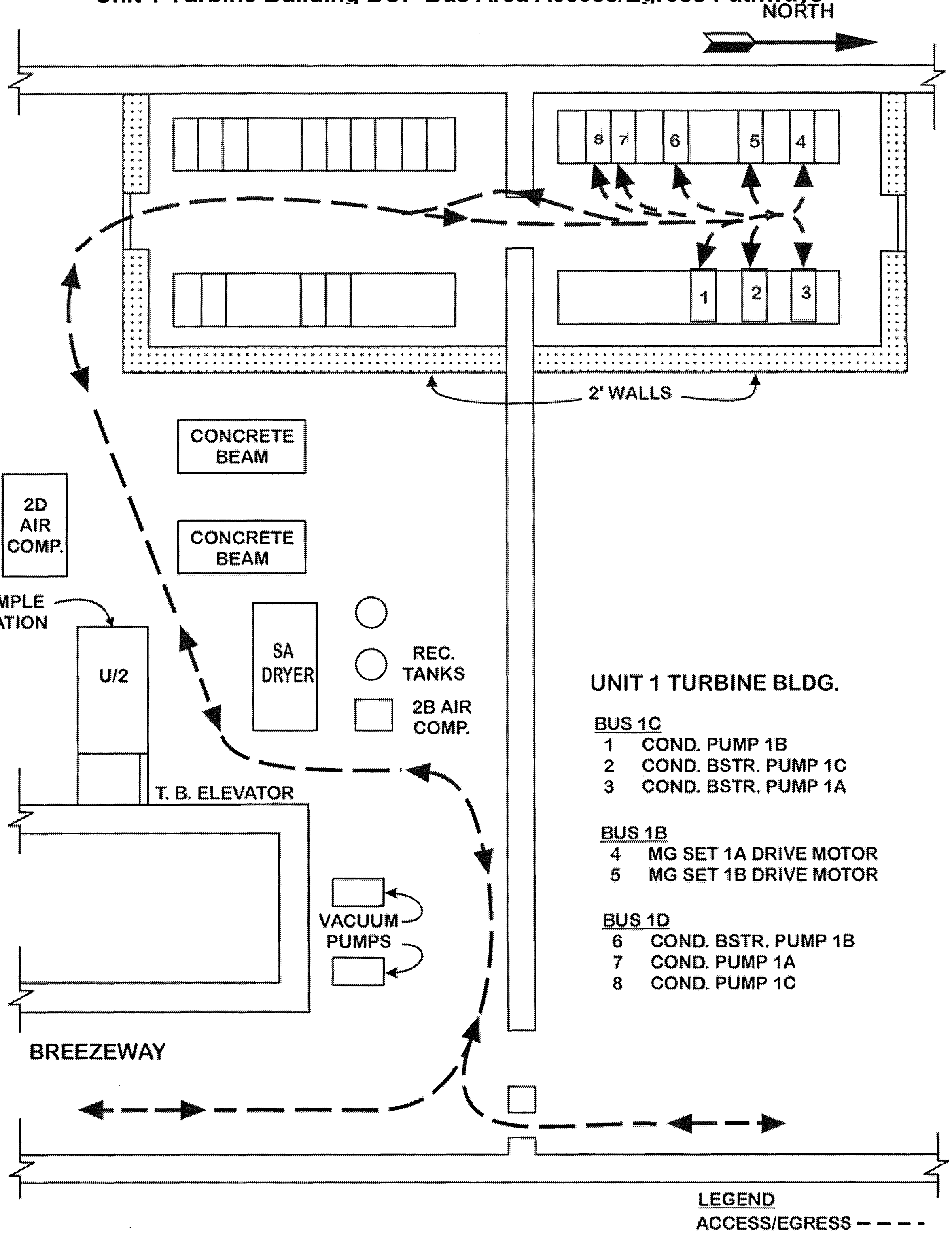


EL.23'-0"

LEGEND
- - - - ACCESS/EGRESS

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS
Unit 1 Turbine Building BOP Bus Area Access/Egress Pathways



SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	The drawing on the preceding page depicts access/egress pathways to the Turbine Building BOP bus area and BOP bus breaker arrangement to be used in the following step.

1.3 **PERFORM** the following in Unit 1 Turbine Building:

1.3.1 **REMOVE** control power fuses **AND MANUALLY TRIP** the following breakers at Unit 1 Turbine Building BOP bus area, using the mechanical trip push button: ☑

At 4160V SWGR 1C:

1. *COND PUMP 1B*, Compt AC4 (**Row JJ**) ☑
2. *COND BSTR PUMP 1C,* Compt AC2 (**Row HH**) ☑
3. *COND BSTR PUMP 1A,* Compt AC1 (**Row GG**) ☑

At 4160V SWGR 1B:

4. *RX RECIRC PUMP MG SET 1A MOTOR,* Compt AB3 (**Row R**) ☑
5. *RX RECIRC PUMP MG SET 1B MOTOR,* Compt AA9 (**Row N**) ☑

At 4160V SWGR 1D:

6. *COND BSTR PUMP 1B,* Compt AD9 (**Row I**) ☑
7. *COND PUMP 1A,* Compt AD3 (**Row C**) ☑
8. *COND PUMP 1C,* Compt AD2 (**Row B**) ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	The following steps to trip MCC feeder breakers on E5, E6, E7, and E8 satisfies the requirement of NRC Generic Letter 96-06 to prevent uncontrolled restart of RBCCW pumps.

In the Diesel Generator Building:

1.4 **TRIP** breaker *MCC 2XE,* Compt. AY4, at Substation E7 (**Row C3**) ☑

1.5 **BLOCK OPEN** Door 125 between Substations E7 and E8. ☑

1.6 **TRIP** breaker *MCC 2XF*, Compt. AO4, Substation E8 (**Row D3**) ☑

1.7 **BLOCK OPEN** the following doors:

1.7.1 Door 105 between Substation E7 and Diesel Generator 4 ☑

1.7.2 Door 110 and Door 111 between Diesel Generators 1 and 2 ☑

1.7.3 Door 112 between Diesel Generator 1 and Substation E6. ☑

1.8 **TRIP** breaker *MCC 1XF,* Compt. AW2, Substation E6 (**Row D3**) ☑

1.9 **BLOCK OPEN** Door 115 between Substations E5 and E6. ☑

1.10 **TRIP** breaker *MCC 1XE,* Compt. AU2, Substation E5 (**Row C3**) ☑

1.11 **ESTABLISH** communications with Emergency Switchgear Operator, using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT,* at Diesel Generator 2 control panel. ☑

NOTE:	**IF** the Unit 1 SCO is **NOT** yet on the line, **THEN** performance of the succeeding steps should **NOT** be delayed.

1.12 **WHEN** communication with the Unit 1 RSDP is established, **THEN INFORM** the Unit SCO that Unit 1 condensate pumps, condensate booster pumps, and reactor recirculation MG set drive breakers are tripped. ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.13 **WHEN** directed to remove Diesel Generator 2 from service, **THEN PERFORM** the following:

1.13.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER*. ☑

1.13.2 **IF** operating, **THEN STOP** Diesel Generator 2 using the *EMERGENCY STOP* push button. ☑

> **CAUTION**
>
> There are seven keylock *NORMAL/LOCAL* switches located on Diesel Generator 2 control panel. Six of these are located in a row. The seventh switch is located in the row above the six switches. The six switches in a row must be placed in *LOCAL* before placing the seventh switch in *LOCAL*.

1.13.3 **PLACE** the six keylock *NORMAL/LOCAL* switches in *LOCAL*. ☑

1.13.4 **PLACE** the seventh keylock *NORMAL/LOCAL* switch in *LOCAL,* located in the row above the six keylock *NORMAL/LOCAL* switches. ☑

1.13.5 **INFORM** Emergency Switchgear Operator that Diesel Generator 2 has been removed from service. ☑

> **NOTE:** **WHEN** necessary to go off the sound-powered phones to relocate, **THEN** all parties on the circuit should be notified.

1.14 **ESTABLISH** communications using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT* at Diesel Generator 4 control panel. ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.15 **WHEN** directed to remove Diesel Generator 4 from service, **THEN PERFORM** the following:

1.15.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER*. ☑

1.15.2 **IF** operating, **THEN STOP** Diesel Generator 4 using the *EMERGENCY STOP* push button. ☑

CAUTION
There are seven keylock *NORMAL/LOCAL* switches located on Diesel Generator 4 control panel. Six of these are located in a row. The seventh switch is located in the row above the six switches. The six switches in a row must be placed in *LOCAL* before placing the seventh switch in *LOCAL*.

1.15.3 **PLACE** the six keylock *NORMAL/LOCAL* switches in *LOCAL.* ☑

1.15.4 **PLACE** the seventh keylock *NORMAL/LOCAL* switch in *LOCAL,* located in the row above the six keylock *NORMAL/LOCAL* switches. ☑

1.15.5 **INFORM** Emergency Switchgear Operator that Diesel Generator 4 has been removed from service. ☑

NOTE:	**IF** the ASSD sound-powered phone system is being used, **THEN** the headset may need to be removed to complete the following steps. All parties on the circuit should be informed.

1.16 **PERFORM** the following lineups:

1.16.1 **PERFORM** the following at MCC DGD:

1. **PLACE** *NORMAL/LOCAL* switch for *DG CELL 4 EXHAUST FAN 2-VA-H-EF-DG,* at Compt D59 (**Row G3**) in *LOCAL*. ☐

2. **PLACE** *START/STOP* control switch in *START* for *DG CELL 4 EXHAUST FAN 2-VA-H-EF-DG,* at Compt D59 (**Row G3**). ☐

3. **PLACE** *SW TO JKT WTR CLR SPLY ISOL VLV, 1-SW-V682*, at Compt. EF7 **(Row G2)**, in *OFF*. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.16.2 **TRIP** the following breakers at 480V Substation E8:

- *MCC 2XH* breaker, at Compt AZ6 (**Row B3**) ☐
- *MCC 1XK* breaker, at Compt AO3 (**Row D2**) ☐
- *MCC 2XM* breaker, at Compt AO7 (**Row E2**) ☐
- *MCC 2CB* breaker, at Compt AO9 (**Row E4**) ☐
- *EMERGENCY 120/208V AC DISTR PNL 2E8-HG3* breaker, at Compt A12 (**Row F3**) ☐

1.16.3 **PERFORM** the following at 480V Substation E8:

1. **PLACE** *NORM/LOCAL* switch in *LOCAL* at Compt FN2 (**Row A1**). ☐
2. **IF** *E8 480V SUB MAIN BREAKER* at Compt AZ5 (**Row B2**) is open, **THEN CLOSE** *E8 480V SUB MAIN BREAKER* using the local ASSD control switch on Compt FN2. ☐
3. **IF** *E8 480V SUB MAIN BREAKER* was open and failed to close using the local ASSD control switch on Compt FN2, **THEN PULL DOWN** the *E8 480V SUB MAIN BREAKER* Manual Close Lever at Compt AZ5 to close the breaker. (SOER 98-02) ☐

1.17 **INFORM** Emergency Switchgear Operator that Diesel Generator 4 is ready to be started. ☐

1.18 **WHEN** directed, **THEN START** Diesel Generator 4 using the *EMERGENCY START* push button. ☐

1.19 **WHEN** the *UNIT AVAILABLE RUNNING* light illuminates, **THEN INFORM** the Emergency Switchgear Operator that Diesel Generator 4 is running. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.20 **WHEN** directed to close Diesel Generator 4 circuit breaker, **THEN PERFORM** the following:

1.20.1 **PLACE** *SYNCHRONIZING GENERATOR* switch in *ON*. ☐

1.20.2 **CLOSE** *GENERATOR CIRCUIT BREAKER* for Diesel Generator 4. ☐

1.20.3 **PLACE** *SYNCHRONIZING GENERATOR* switch in *OFF*. ☐

1.20.4 **INFORM** Emergency Switchgear Operator that *GENERATOR CIRCUIT BREAKER* for DG 4 is closed. ☐

1.21 **WHEN** 2B NSW Pump starts **AND** the discharge valve opens, **THEN CONFIRM** service water pressure is greater than 25 psig on *SW-PI-153-4* at Diesel Generator 4 control panel. ☐

1.22 **ESTABLISH** communications using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT* at Diesel Generator 2 control panel. ☐

NOTE:	**IF** required to go off the headset, **THEN** all parties on the line should be informed.

1.23 **REMOVE** the sound-powered phone system headset **AND PERFORM** the following: ☐

1.23.1 **PERFORM** the following at MCC DGB:

1. **PLACE** *NORMAL/LOCAL* switch for *DG CELL 2 EXHAUST FAN, 2-VA-F-EF-DG,* at Compt D99 (**Row G3**) in *LOCAL.* ☐

2. **PLACE** *START/STOP* switch in *START* for *DG CELL 2 EXHAUST FAN, 2-VA-F-EF-DG,* at Compt D99 (**Row G3**). ☐

3. **PLACE** *SW TO JKT WTR CLR SPLY ISOL VLV, 2-SW-V680*, at Compt. EC3, **(Row H2)**, in *OFF*. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.23.2 **TRIP** the following breakers at 480V Substation E6:

- *MCC 1XH* breaker, at Compt AV5 (**Row B3**) ☐
- *MCC 2XK* breaker, at Compt AW1 (**Row D2**) ☐
- *MCC 2OG* breaker, at Compt AW4 (**Row E1**) ☐
- *MCC 1XM* breaker, at Compt AW5 (**Row E2**) ☐
- *MCC 1CB* breaker, at Compt AW7 (**Row E4**) ☐
- *EMERGENCY 120/208V AC DISTR PNL 1E6-HG3* breaker, at Compt AX3 (**Row F3**) ☐

1.23.3 **PERFORM** the following at 480V Substation E6:

1. **PLACE** *NORM/LOCAL* switch in *LOCAL* at Compt FNO (**Row A1**). ☐
2. **IF** *E6 480V SUB MAIN BREAKER* at Compt AV4 (**Row B2**) is open, **THEN CLOSE** *E6 480V SUB MAIN BREAKER* using the local ASSD control switch on Compt FN0. ☐
3. **IF** *E6 480V SUB MAIN BREAKER* was open and failed to close using the local ASSD control switch on Compt FNO, **THEN PULL DOWN** the *E6 480V MAIN BREAKER* Manual Close Lever at Compt AV4 to close the breaker. (SOER 98-02) ☐

1.24 **INFORM** Emergency Switchgear Operator that Diesel Generator 2 is ready to be started. ☐

1.25 **WHEN** directed, **THEN START** Diesel Generator 2 using the *EMERGENCY START* push button. ☐

1.26 **WHEN** the *UNIT AVAILABLE RUNNING* light illuminates, **THEN INFORM** Emergency Switchgear Operator Diesel Generator 2 is running. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.27 **WHEN** directed to close Diesel Generator 2 circuit breaker, **THEN PERFORM** the following:

1.27.1 **PLACE** *SYNCHRONIZING GENERATOR* switch in *ON*. ☐

1.27.2 **CLOSE** *GENERATOR CIRCUIT BREAKER*. ☐

1.27.3 **PLACE** *SYNCHRONIZING GENERATOR* switch in *OFF*. ☐

1.27.4 **INFORM** Emergency Switchgear Operator that Diesel Generator 2 *GENERATOR CIRCUIT BREAKER* is closed. ☐

1.28 **IF NOT** already performed, **THEN INFORM** the Unit SCO that Unit 1 condensate pumps, condensate booster pumps, and reactor recirculation MG set drive breakers are tripped. ☐

1.29 **WHEN** 1B NSW Pump starts **AND** the discharge valve opens, **THEN CONFIRM** service water pressure on *SW-PI-153-2,* at Diesel Generator 2 control panel, is greater than 25 psig. ☐

NOTE:	Service water pressure should be periodically monitored on *SW-PI-153-2* and *SW-PI-153-4* at Diesel Generator 2 and Diesel Generator 4 control panels while these diesels are operating.

1.30 **REESTABLISH** communications using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT,* located on Diesel Generator 2 control panel. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	Train B sound-powered phone communication is **NOT** available for operations at Diesel Generator 3 and Diesel Generator 1 control panels. The following steps will require removing the headset, performing the function, and returning to Diesel Generator 2 control panel for communication. **IF** required to go off the headset, **THEN** all parties on the line should be informed.

1.31 **WHEN** directed to remove Diesel Generator 3 from service, **THEN PERFORM** the following at Diesel Generator 3 control panel:

1.31.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER*. ☐

1.31.2 **IF** operating, **THEN STOP** Diesel Generator 3 using *EMERGENCY STOP* push button. ☐

1.31.3 **PLACE** the six *NORMAL/LOCAL* keylock switches in *LOCAL*. ☐

1.31.4 **INFORM** Emergency Switchgear Operator that Diesel Generator 3 is removed from service. ☐

1.32 **WHEN** directed to remove Diesel Generator 1 from service, **THEN PERFORM** the following at Diesel Generator 1 control panel:

1.32.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER*. ☐

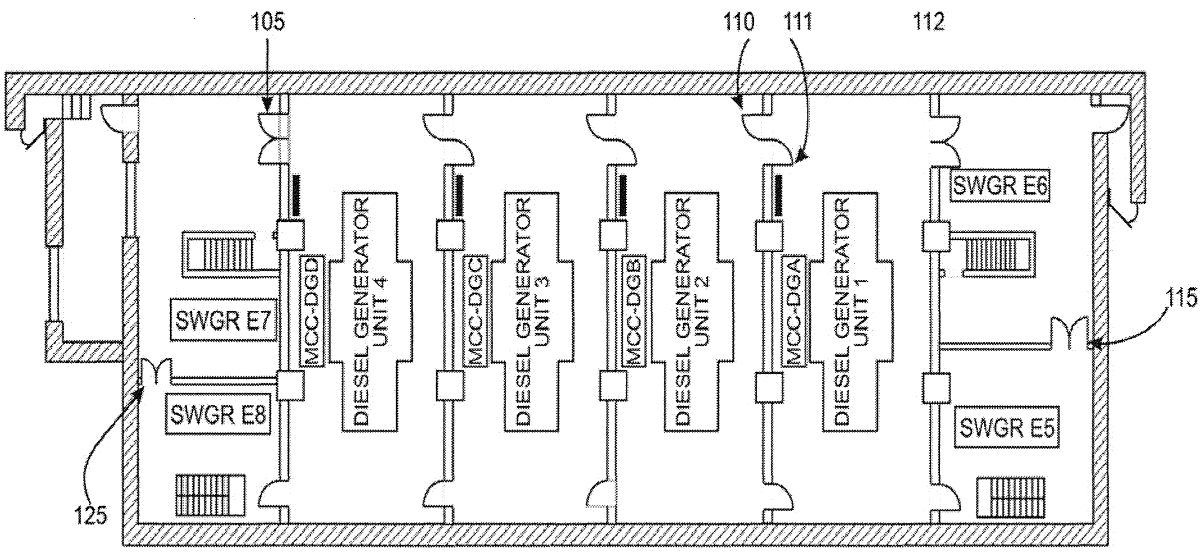
1.32.2 **IF** operating, **THEN STOP** Diesel Generator 1 using *EMERGENCY STOP* push button. ☐

1.32.3 **PLACE** the six *NORMAL/LOCAL* keylock switches in *LOCAL*. ☐

1.32.4 **INFORM** Emergency Switchgear Operator that Diesel Generator 1 is removed from service. ☐

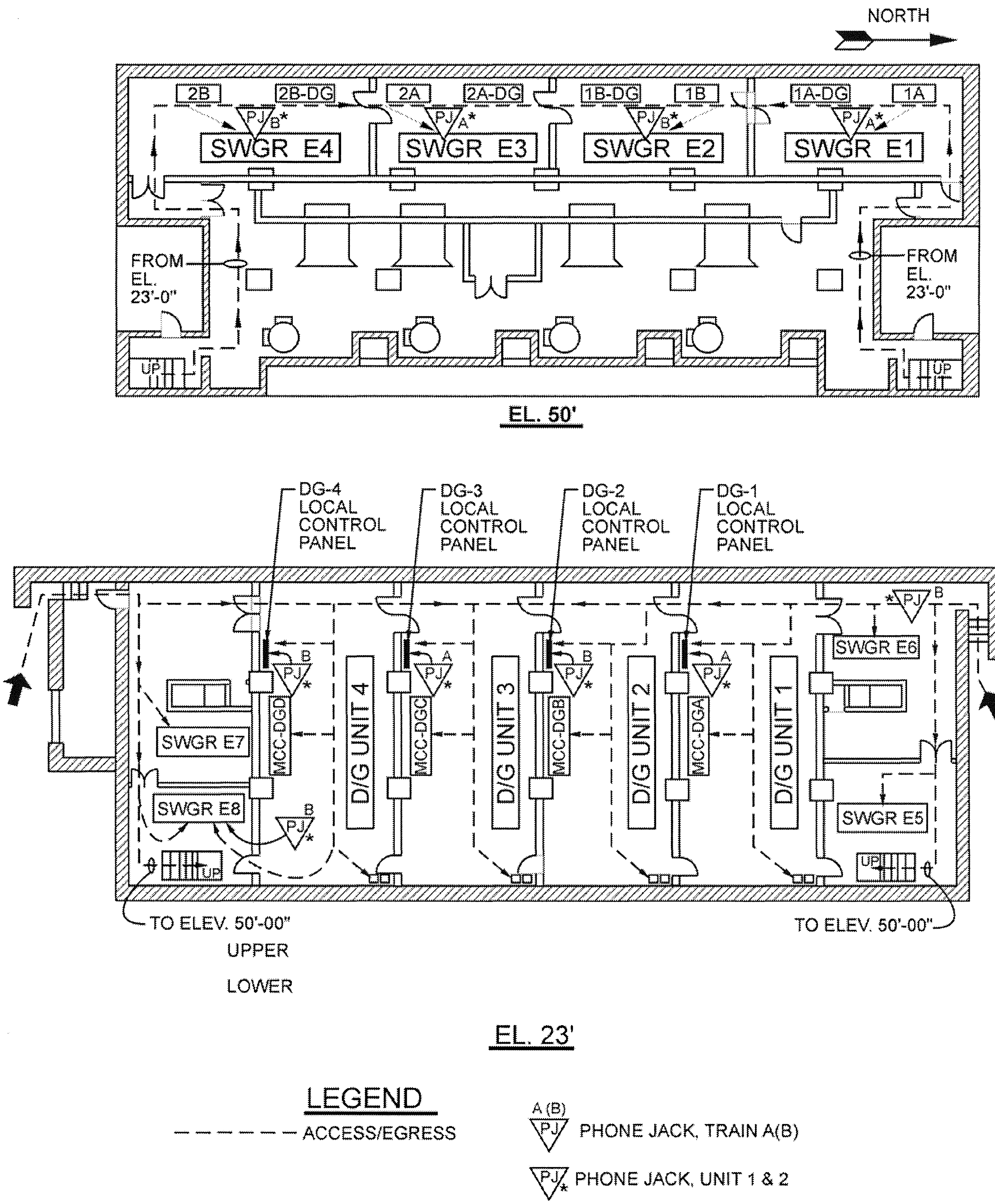
1.33 **MONITOR** diesel generator operation. ☐

SECTION E
FIGURE 1
Diesel Generator Building Door Position For
Diesel Cell Ventilation



EL. 23' 0"

SECTION E
FIGURE 2
Diesel Generator Building Access/Egress Routes and Sound-Powered Phone Communications



PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
IN PLANT

P-2B

LESSON TITLE:	PREPARE DG2 FOR START PER 0ASSD-02 with breaker failure (DG OPERATOR ACTIONS)
LESSON NUMBER:	AOT-OJT-JP-304-25
REVISION NO:	0

SAFETY CONSIDERATIONS:

1. Hearing protection, hardhat, and safety glasses.
2. Simulate all actions including communications.
3. Practice ALARA at all times while simulating actions.
4. Standard electrical precautions when working around energized electrical equipment.

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:** Begin this JPM at the DG2 Control Panel. Access/Egress is NOT evaluated because this JPM starts at and is performed at the DG2 Control Panel.
3. **PROVIDE A COPY:** 0ASSD-02, Section E, is to be provided to the student marked up to the starting point.
4. **TIME CRITICAL – BASIS FOR TIME:** This JPM is a time critical JPM. The critical time is a fraction of the analysis time to establish Suppression Pool Cooling within 1.5 hours. Based on all the other actions that are required to be performed within this time frame, the critical time established for this JPM is 10 minutes.

Read the following to the JPM performer.

TASK CONDITIONS:

1. A Control Room fire has resulted in Control Room Evacuation.
2. 0ASSD-02 has been entered and is being performed.
3. You are the Diesel Generator Operator.
4. ASSD equipment is distributed and ASSD communications are established.
5. You have your ASSD equipment bag and the following keys:
   Fifteen (15) T112 keys, one (1) CO key, thirty-four (34) GE-75 keys
6. You have completed the actions for starting DG4 and for closing DG4 circuit breaker.
7. You have communicated the completion of these actions using the ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT, at DG2 Control Panel.

INITIATING CUE:

You are directed to prepare DG2 for start per 0ASSD-02, Section E, step 1.23.

PERFORMANCE CHECKLIST

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

START TIME: ___________

PROMPT: When key inserted (T112) and NORMAL/LOCAL switch is rotated to the LOCAL position, indicate the switch in LOCAL.

Step 1 – At MCC DGB Compt D99 (Row G3), place NORMAL/LOCAL switch in LOCAL.
MCC DGB Compt D99: *Inserts key into NORMAL/LOCAL switch and rotates switch to LOCAL position*

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

PROMPT: When the START/STOP control switch is rotated to START, indicate switch in START. Indicate green light off, red light on.

Step 2 – At MCC DGB Compt D99 (Row G3), place START/STOP control switch in START for DG CELL 2 EXHAUST FAN 2-VA-F-EF-DG.
MCC DGB Compt D99: *Rotates START/LOCAL switch to START.*

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

Step 3 – At MCC DGB Compt EC3 (Row H2), place SW TO JKT WTR CLR SPLY ISOL VLV, 2-SW-V680 in OFF.
MCC DGB Compt EC3: *Places in OFF.*

SAT/UNSAT*

PROMPT: When each breaker is tripped; indicate to the examinee that there is a green open indicating flag.

Step 4 – At 480V Substation E6 trip the following breakers:

Row	Compt	Breaker	Open
B3	AV5	MCC 1XH	
D2	AW1	MCC 2XK	
E1	AW4	MCC 2OG	
E2	AW5	MCC 1XM	
E4	AW7	MCC 1CB	
F3	AX3	Emerg. 120/208V AC Distr Pnl 1E6-HG3	

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

PROMPT: When key is inserted and NORMAL/LOCAL switch is rotated to the LOCAL position, indicate the switch in LOCAL.

Step 5 - At 480V Substation E6 Compt FN0 (Row A1): Places NORMAL/LOCAL keylock switch to LOCAL.

E6 Compt FN0 (Row A1): *NORMAL/LOCAL switch in LOCAL.*

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

PROMPT: Indicate breaker is OPEN by indicating that there is a green open indicating flag.

Step 6 - At 480V Substation E6 Compt AV4 (Row B2): Verifies E6 480V SUB MAIN BREAKER.

E6 Compt AV4 (Row B2): *E6 480V SUB MAIN BREAKER open flag verified.*

SAT/UNSAT*

Step 7 - At 480V Substation E6 Compt FN0 (Row A1): Places local ASSD control switch to close.

E6 Compt FN0 (Row A1): *local ASSD control switch is closed.*

SAT/UNSAT*

PROMPT: Indicate breaker OPEN; green open indicating flag.

Step 8 - At 480V Substation E6 Compt AV4 (Row B2): Verifies E6 480V SUB MAIN BREAKER.
E6 Compt AV4 (Row B2): *E6 480V SUB MAIN BREAKER open flag verified.*

SAT/UNSAT*

PROMPT: Indicate breaker closed after pulling down the manual close lever; red closed indicating flag.

Step 9 - At 480V Substation E6 Compt AV4 (Row B2): Close the breaker by pulling down the manual close lever.
E6 Compt AV4 (Row B2): *Breaker closed.*

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

PROMPT: Role play communications as Emergency Switchgear Operator DG Bldg.

Step 10 - Inform Emergency Switchgear Operator DG Bldg that DG2 is ready to be started.
Emergency Switchgear operator DG Bldg Operator informed DG2 is ready to be started.

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

TERMINATING CUE: When DG2 is ready to be started and the Emergency Switchgear Operator DG Bldg is informed this JPM is complete.

STOP TIME: ___________

RELATED TASKS:

200611B504, Perform actions associated with Alternate Safe Shutdown as the Unit 1(2) DG Operator per 0ASSD-02.

K/A REFERENCE AND IMPORTANCE RATING:

295003 AA1.02 Ability to operate and/or monitor the following as they apply to Partial or Complete Loss of AC Power: Emergency Generators (4.2/4.3)

REFERENCES:

0ASSD-02, Section E.

TOOLS AND EQUIPMENT:

None

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

6 (Electrical)

REASON FOR REVISION:

Modified JPM to add alternate path.

PREPARE DG2 FOR START PER 0ASSD-02 with breaker failure

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

Time Taken: ____ Minutes

APPLICABLE METHOD OF TESTING

Performance: Simulate x Actual __ Unit: 1

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

Time Critical: Yes x No __ Time Limit **10 Minutes**

Alternate Path: Yes x No __

EVALUATION

Performer:______________________________

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. A Control Room fire has resulted in Control Room Evacuation.
2. 0ASSD-02 has been entered and is being performed.
3. You are the Diesel Generator Operator.
4. ASSD equipment is distributed and ASSD communications are established.
5. You have your ASSD equipment bag and the following keys:
   Fifteen (15) T112 keys, one (1) CO key, thirty-four (34) GE-75 keys
6. You have completed the actions for starting DG4 and for closing DG4 circuit breaker.
7. You have communicated the completion of these actions using the ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT, at DG2 Control Panel.

INITIATING CUE:

You are directed to prepare DG2 for start per 0ASSD-02, Section E, step 1.23.

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	Critical tasks for the Diesel Generator Operator include tripping Unit 1 condensate pumps, condensate booster pumps, and reactor recirculation MG set breakers, shutdown and restart of Diesel Generators 2 and 4 to re-energize E2 and E4, shutdown of Diesel Generators 1 and 3, and alignment of Diesel Generator Building ventilation. Close coordination and communication is essential between the Diesel Generator Operator and the Emergency Switchgear Operator. Restoration of Div II emergency bus power is vital for DC battery chargers and to supply power for RHR and Service Water Systems in various modes.

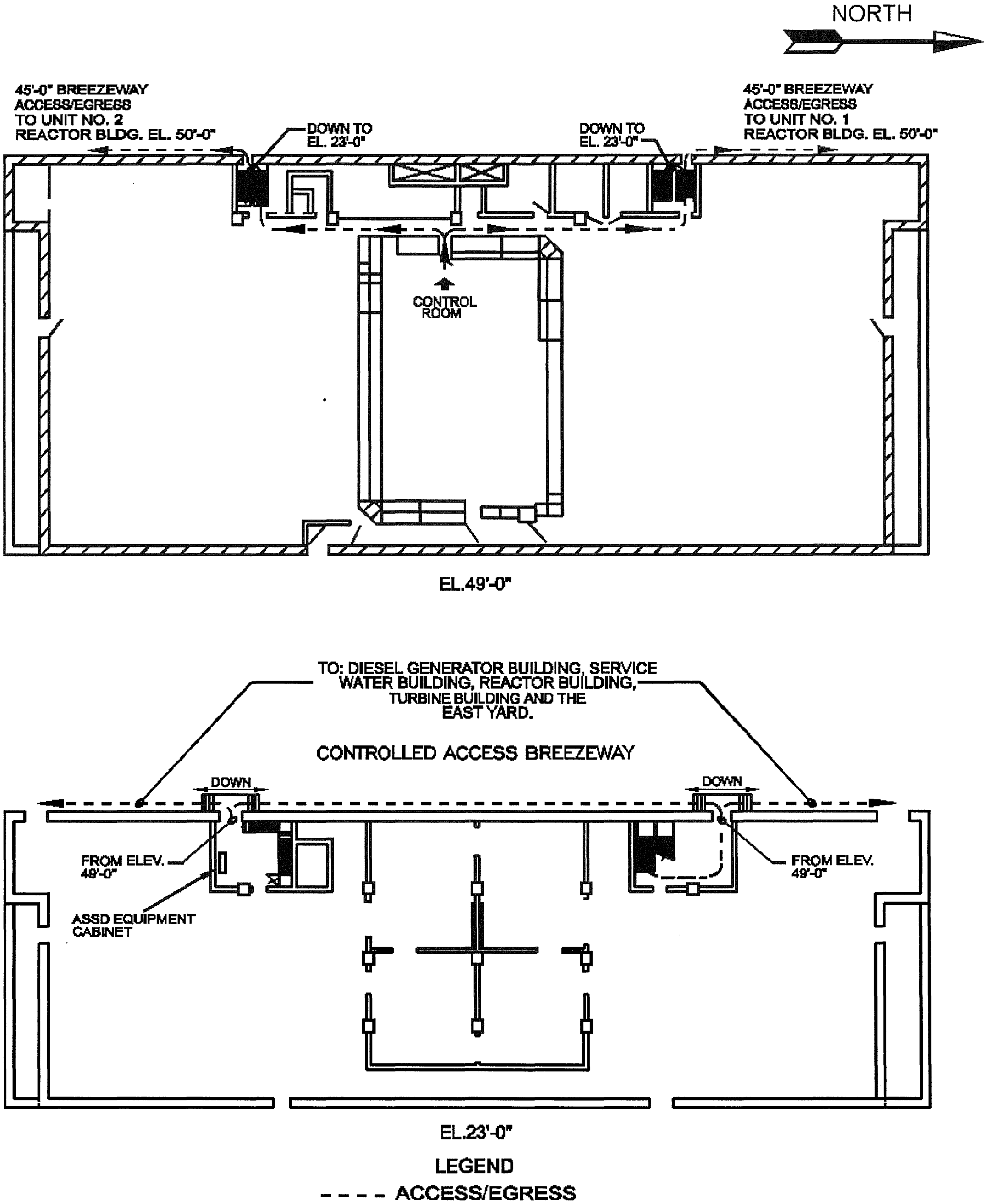
1.0 OPERATOR ACTIONS

1.1 **OBTAIN** a security access key from the ASSD equipment cabinet. ☑

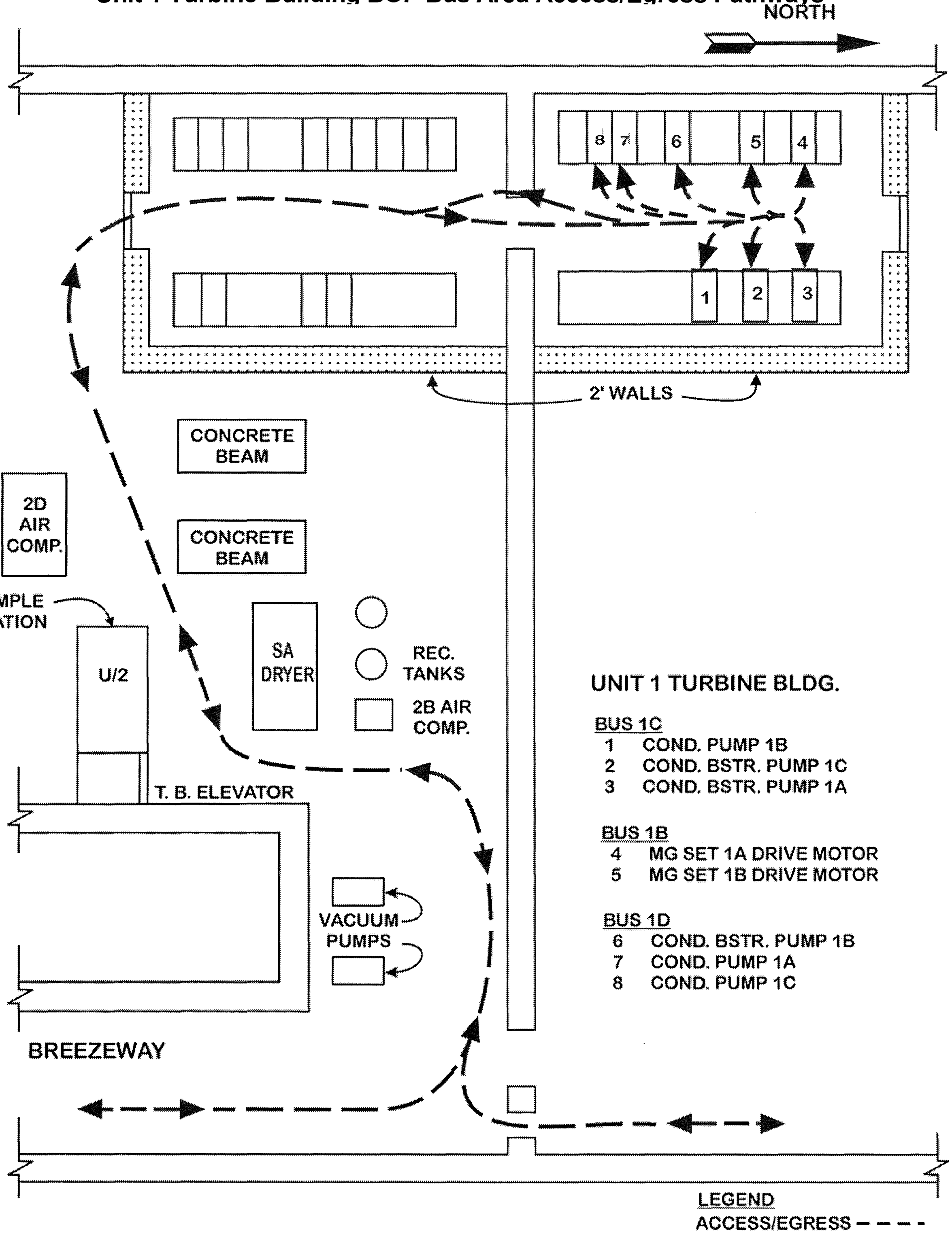
1.2 **USE** appropriate figures in this section for access/egress routes and equipment and communication locations. ☑

NOTE:	The following two pages contain Control Building and Turbine Building access/egress routes and BOP bus breaker arrangement drawings.

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS
Control Building Access/Egress Pathways



SECTION E
DIESEL GENERATOR OPERATOR ACTIONS
Unit 1 Turbine Building BOP Bus Area Access/Egress Pathways



SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	The drawing on the preceding page depicts access/egress pathways to the Turbine Building BOP bus area and BOP bus breaker arrangement to be used in the following step.

1.3 **PERFORM** the following in Unit 1 Turbine Building:

1.3.1 **REMOVE** control power fuses **AND MANUALLY TRIP** the following breakers at Unit 1 Turbine Building BOP bus area, using the mechanical trip push button: ☑

At 4160V SWGR 1C:

1. *COND PUMP 1B*, Compt AC4 (**Row JJ**) ☑
2. *COND BSTR PUMP 1C,* Compt AC2 (**Row HH**) ☑
3. *COND BSTR PUMP 1A,* Compt AC1 (**Row GG**) ☑

At 4160V SWGR 1B:

4. *RX RECIRC PUMP MG SET 1A MOTOR,* Compt AB3 (**Row R**) ☑
5. *RX RECIRC PUMP MG SET 1B MOTOR,* Compt AA9 (**Row N**) ☑

At 4160V SWGR 1D:

6. *COND BSTR PUMP 1B,* Compt AD9 (**Row I**) ☑
7. *COND PUMP 1A,* Compt AD3 (**Row C**) ☑
8. *COND PUMP 1C,* Compt AD2 (**Row B**) ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	The following steps to trip MCC feeder breakers on E5, E6, E7, and E8 satisfies the requirement of NRC Generic Letter 96-06 to prevent uncontrolled restart of RBCCW pumps.

In the Diesel Generator Building:

1.4 **TRIP** breaker *MCC 2XE,* Compt. AY4, at Substation E7 (**Row C3**) ☑

1.5 **BLOCK OPEN** Door 125 between Substations E7 and E8. ☑

1.6 **TRIP** breaker *MCC 2XF,* Compt. AO4, Substation E8 (**Row D3**) ☑

1.7 **BLOCK OPEN** the following doors:

1.7.1 Door 105 between Substation E7 and Diesel Generator 4 ☑

1.7.2 Door 110 and Door 111 between Diesel Generators 1 and 2 ☑

1.7.3 Door 112 between Diesel Generator 1 and Substation E6. ☑

1.8 **TRIP** breaker *MCC 1XF,* Compt. AW2, Substation E6 (**Row D3**) ☑

1.9 **BLOCK OPEN** Door 115 between Substations E5 and E6. ☑

1.10 **TRIP** breaker *MCC 1XE,* Compt. AU2, Substation E5 (**Row C3**) ☑

1.11 **ESTABLISH** communications with Emergency Switchgear Operator, using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT,* at Diesel Generator 2 control panel. ☑

NOTE:	**IF** the Unit 1 SCO is **NOT** yet on the line, **THEN** performance of the succeeding steps should **NOT** be delayed.

1.12 **WHEN** communication with the Unit 1 RSDP is established, **THEN INFORM** the Unit SCO that Unit 1 condensate pumps, condensate booster pumps, and reactor recirculation MG set drive breakers are tripped. ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.13 **WHEN** directed to remove Diesel Generator 2 from service, **THEN PERFORM** the following:

1.13.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER*. ☑

1.13.2 **IF** operating, **THEN STOP** Diesel Generator 2 using the *EMERGENCY STOP* push button. ☑

> **CAUTION**
>
> There are seven keylock *NORMAL/LOCAL* switches located on Diesel Generator 2 control panel. Six of these are located in a row. The seventh switch is located in the row above the six switches. The six switches in a row must be placed in *LOCAL* before placing the seventh switch in *LOCAL*.

1.13.3 **PLACE** the six keylock *NORMAL/LOCAL* switches in *LOCAL*. ☑

1.13.4 **PLACE** the seventh keylock *NORMAL/LOCAL* switch in *LOCAL,* located in the row above the six keylock *NORMAL/LOCAL* switches. ☑

1.13.5 **INFORM** Emergency Switchgear Operator that Diesel Generator 2 has been removed from service. ☑

> **NOTE:** **WHEN** necessary to go off the sound-powered phones to relocate, **THEN** all parties on the circuit should be notified.

1.14 **ESTABLISH** communications using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT* at Diesel Generator 4 control panel. ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.15 **WHEN** directed to remove Diesel Generator 4 from service, **THEN PERFORM** the following:

1.15.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER.* ☑

1.15.2 **IF** operating, **THEN STOP** Diesel Generator 4 using the *EMERGENCY STOP* push button. ☑

> **CAUTION**
>
> There are seven keylock *NORMAL/LOCAL* switches located on Diesel Generator 4 control panel. Six of these are located in a row. The seventh switch is located in the row above the six switches. The six switches in a row must be placed in *LOCAL* before placing the seventh switch in *LOCAL.*

1.15.3 **PLACE** the six keylock *NORMAL/LOCAL* switches in *LOCAL.* ☑

1.15.4 **PLACE** the seventh keylock *NORMAL/LOCAL* switch in *LOCAL,* located in the row above the six keylock *NORMAL/LOCAL* switches. ☑

1.15.5 **INFORM** Emergency Switchgear Operator that Diesel Generator 4 has been removed from service. ☑

> **NOTE:** **IF** the ASSD sound-powered phone system is being used, **THEN** the headset may need to be removed to complete the following steps. All parties on the circuit should be informed.

1.16 **PERFORM** the following lineups:

1.16.1 **PERFORM** the following at MCC DGD:

1. **PLACE** *NORMAL/LOCAL* switch for *DG CELL 4 EXHAUST FAN 2-VA-H-EF-DG,* at Compt D59 (**Row G3**) in *LOCAL.* ☑
2. **PLACE** *START/STOP* control switch in *START* for *DG CELL 4 EXHAUST FAN 2-VA-H-EF-DG,* at Compt D59 (**Row G3**). ☑
3. **PLACE** *SW TO JKT WTR CLR SPLY ISOL VLV, 1-SW-V682*, at Compt. EF7 **(Row G2)**, in *OFF.* ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.16.2 **TRIP** the following breakers at 480V Substation E8:

- *MCC 2XH* breaker, at Compt AZ6 (**Row B3**) ☑
- *MCC 1XK* breaker, at Compt AO3 (**Row D2**) ☑
- *MCC 2XM* breaker, at Compt AO7 (**Row E2**) ☑
- *MCC 2CB* breaker, at Compt AO9 (**Row E4**) ☑
- *EMERGENCY 120/208V AC DISTR PNL 2E8-HG3* breaker, at Compt A12 (**Row F3**) ☑

1.16.3 **PERFORM** the following at 480V Substation E8:

1. **PLACE** *NORM/LOCAL* switch in *LOCAL* at Compt FN2 (**Row A1**). ☑
2. **IF** *E8 480V SUB MAIN BREAKER* at Compt AZ5 (**Row B2**) is open, **THEN CLOSE** *E8 480V SUB MAIN BREAKER* using the local ASSD control switch on Compt FN2. ☑
3. **IF** *E8 480V SUB MAIN BREAKER* was open and failed to close using the local ASSD control switch on Compt FN2, **THEN PULL DOWN** the *E8 480V SUB MAIN BREAKER* Manual Close Lever at Compt AZ5 to close the breaker. (SOER 98-02) NA

1.17 **INFORM** Emergency Switchgear Operator that Diesel Generator 4 is ready to be started. ☑

1.18 **WHEN** directed, **THEN START** Diesel Generator 4 using the *EMERGENCY START* push button. ☑

1.19 **WHEN** the *UNIT AVAILABLE RUNNING* light illuminates, **THEN INFORM** the Emergency Switchgear Operator that Diesel Generator 4 is running. ☑

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.20 **WHEN** directed to close Diesel Generator 4 circuit breaker, **THEN PERFORM** the following:

1.20.1 **PLACE** *SYNCHRONIZING GENERATOR* switch in *ON*. ☑

1.20.2 **CLOSE** *GENERATOR CIRCUIT BREAKER* for Diesel Generator 4. ☑

1.20.3 **PLACE** *SYNCHRONIZING GENERATOR* switch in *OFF*. ☑

1.20.4 **INFORM** Emergency Switchgear Operator that *GENERATOR CIRCUIT BREAKER* for DG 4 is closed. ☑

1.21 **WHEN** 2B NSW Pump starts **AND** the discharge valve opens, **THEN CONFIRM** service water pressure is greater than 25 psig on *SW-PI-153-4* at Diesel Generator 4 control panel. ☑

1.22 **ESTABLISH** communications using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT* at Diesel Generator 2 control panel. ☑

NOTE:	**IF** required to go off the headset, **THEN** all parties on the line should be informed.

1.23 **REMOVE** the sound-powered phone system headset **AND PERFORM** the following: ☐

1.23.1 **PERFORM** the following at MCC DGB:

1. **PLACE** *NORMAL/LOCAL* switch for *DG CELL 2 EXHAUST FAN, 2-VA-F-EF-DG,* at Compt D99 (**Row G3**) in *LOCAL.* ☐

2. **PLACE** *START/STOP* switch in *START* for *DG CELL 2 EXHAUST FAN, 2-VA-F-EF-DG,* at Compt D99 (**Row G3**). ☐

3. **PLACE** *SW TO JKT WTR CLR SPLY ISOL VLV, 2-SW-V680*, at Compt. EC3, **(Row H2)**, in *OFF*. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.23.2 **TRIP** the following breakers at 480V Substation E6:

- *MCC 1XH* breaker, at Compt AV5 (**Row B3**) ☐
- *MCC 2XK* breaker, at Compt AW1 (**Row D2**) ☐
- *MCC 2OG* breaker, at Compt AW4 (**Row E1**) ☐
- *MCC 1XM* breaker, at Compt AW5 (**Row E2**) ☐
- *MCC 1CB* breaker, at Compt AW7 (**Row E4**) ☐
- *EMERGENCY 120/208V AC DISTR PNL 1E6-HG3* breaker, at Compt AX3 (**Row F3**) ☐

1.23.3 **PERFORM** the following at 480V Substation E6:

1. **PLACE** *NORM/LOCAL* switch in *LOCAL* at Compt FNO (**Row A1**). ☐
2. **IF** *E6 480V SUB MAIN BREAKER* at Compt AV4 (**Row B2**) is open, **THEN CLOSE** *E6 480V SUB MAIN BREAKER* using the local ASSD control switch on Compt FN0. ☐
3. **IF** *E6 480V SUB MAIN BREAKER* was open and failed to close using the local ASSD control switch on Compt FNO, **THEN PULL DOWN** the *E6 480V MAIN BREAKER* Manual Close Lever at Compt AV4 to close the breaker. (SOER 98-02) ☐

1.24 **INFORM** Emergency Switchgear Operator that Diesel Generator 2 is ready to be started. ☐

1.25 **WHEN** directed, **THEN START** Diesel Generator 2 using the *EMERGENCY START* push button. ☐

1.26 **WHEN** the *UNIT AVAILABLE RUNNING* light illuminates, **THEN INFORM** Emergency Switchgear Operator Diesel Generator 2 is running. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

1.27 **WHEN** directed to close Diesel Generator 2 circuit breaker, **THEN PERFORM** the following:

- 1.27.1 **PLACE** *SYNCHRONIZING GENERATOR* switch in *ON*. ☐
- 1.27.2 **CLOSE** *GENERATOR CIRCUIT BREAKER*. ☐
- 1.27.3 **PLACE** *SYNCHRONIZING GENERATOR* switch in *OFF*. ☐
- 1.27.4 **INFORM** Emergency Switchgear Operator that Diesel Generator 2 *GENERATOR CIRCUIT BREAKER* is closed. ☐

1.28 **IF NOT** already performed, **THEN INFORM** the Unit SCO that Unit 1 condensate pumps, condensate booster pumps, and reactor recirculation MG set drive breakers are tripped. ☐

1.29 **WHEN** 1B NSW Pump starts **AND** the discharge valve opens, **THEN CONFIRM** service water pressure on *SW-PI-153-2,* at Diesel Generator 2 control panel, is greater than 25 psig. ☐

NOTE:	Service water pressure should be periodically monitored on *SW-PI-153-2* and *SW-PI-153-4* at Diesel Generator 2 and Diesel Generator 4 control panels while these diesels are operating.

1.30 **REESTABLISH** communications using *ASSD UNIT 2 TRAIN B SOUND POWERED PHONE CKT,* located on Diesel Generator 2 control panel. ☐

SECTION E
DIESEL GENERATOR OPERATOR ACTIONS

NOTE:	Train B sound-powered phone communication is **NOT** available for operations at Diesel Generator 3 and Diesel Generator 1 control panels. The following steps will require removing the headset, performing the function, and returning to Diesel Generator 2 control panel for communication. **IF** required to go off the headset, **THEN** all parties on the line should be informed.

1.31 **WHEN** directed to remove Diesel Generator 3 from service, **THEN PERFORM** the following at Diesel Generator 3 control panel:

1.31.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER*. ☐

1.31.2 **IF** operating, **THEN STOP** Diesel Generator 3 using *EMERGENCY STOP* push button. ☐

1.31.3 **PLACE** the six *NORMAL/LOCAL* keylock switches in *LOCAL*. ☐

1.31.4 **INFORM** Emergency Switchgear Operator that Diesel Generator 3 is removed from service. ☐

1.32 **WHEN** directed to remove Diesel Generator 1 from service, **THEN PERFORM** the following at Diesel Generator 1 control panel:

1.32.1 **IF** closed, **THEN TRIP** *GENERATOR CIRCUIT BREAKER*. ☐

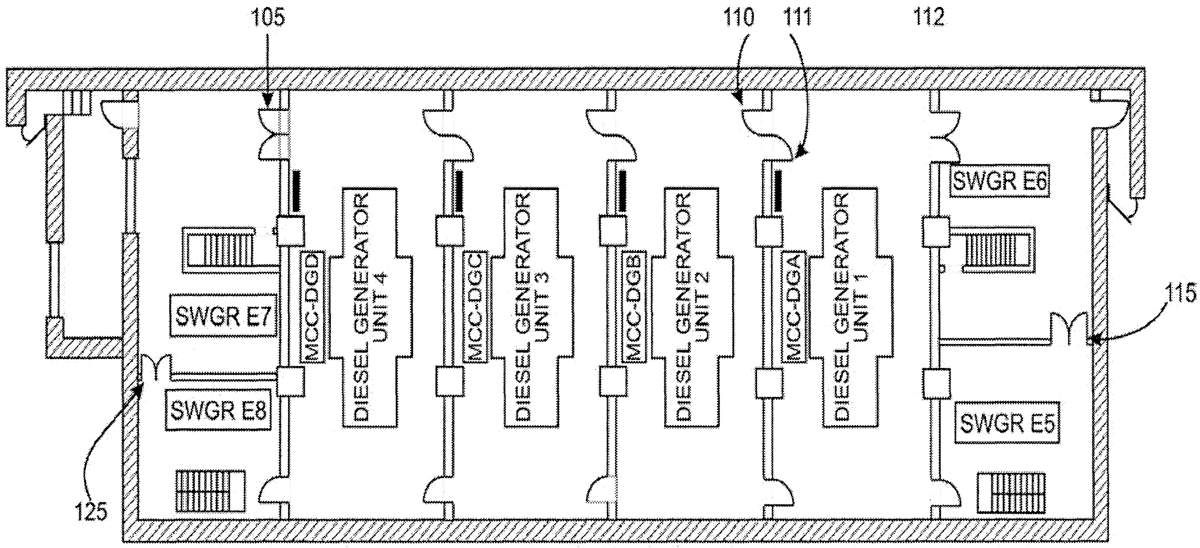
1.32.2 **IF** operating, **THEN STOP** Diesel Generator 1 using *EMERGENCY STOP* push button. ☐

1.32.3 **PLACE** the six *NORMAL/LOCAL* keylock switches in *LOCAL*. ☐

1.32.4 **INFORM** Emergency Switchgear Operator that Diesel Generator 1 is removed from service. ☐

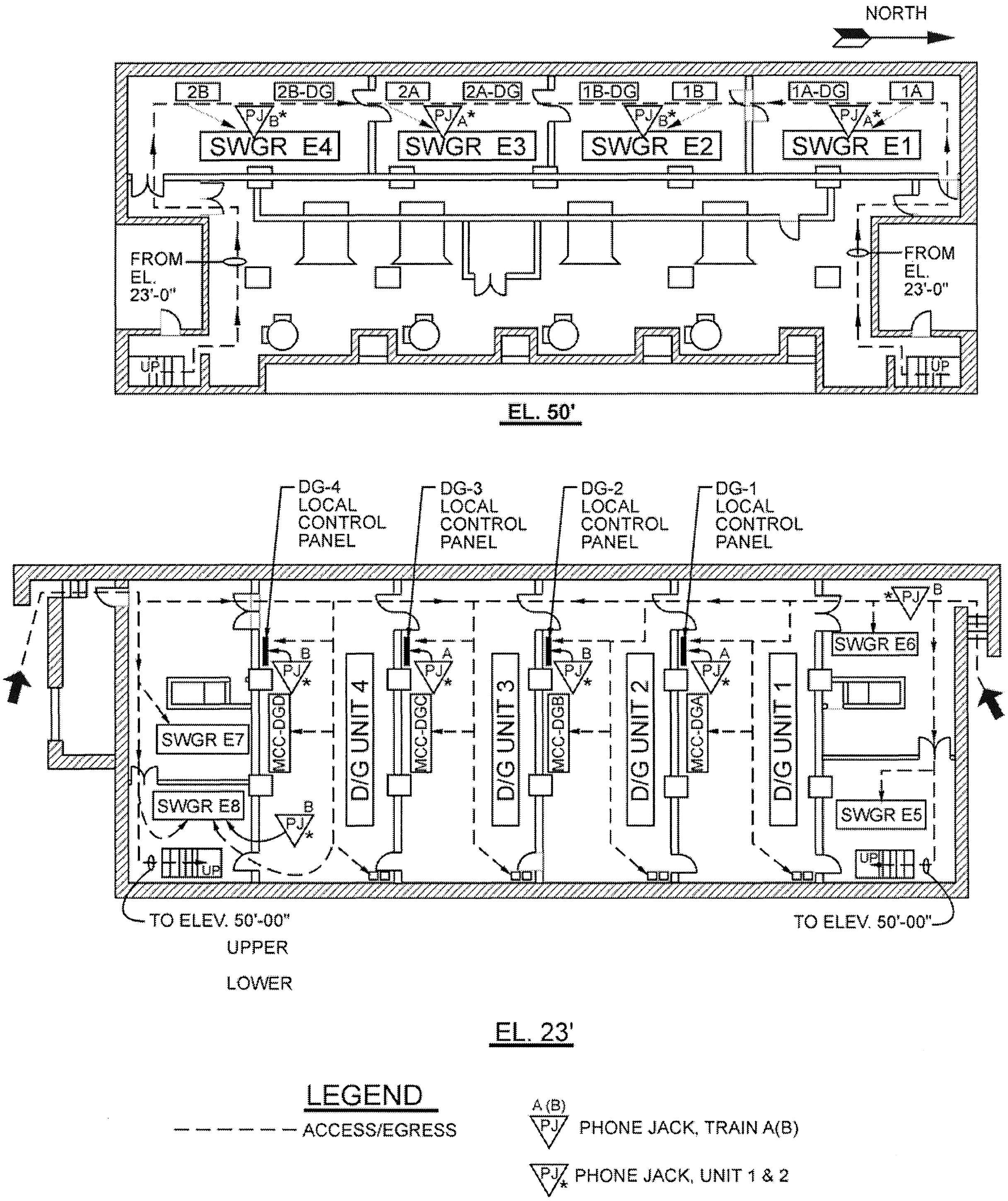
1.33 **MONITOR** diesel generator operation. ☐

SECTION E
FIGURE 1
Diesel Generator Building Door Position For
Diesel Cell Ventilation



EL. 23' 0"

SECTION E
FIGURE 2
Diesel Generator Building Access/Egress Routes and Sound-Powered Phone Communications



PROGRESS ENERGY – CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
IN-PLANT

P-3

LESSON TITLE: Control Room Evacuation IAW AOP-32, Placing the RHR Service Water System in Operation

LESSON NUMBER: LOT-OJT-JP-302-E07

REVISION NO: 04

SAFETY CONSIDERATIONS:

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

EVALUATOR NOTES: (Do not read to performer)

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

Read the following to the JPM performer.

TASK CONDITIONS:

1. The Shift Superintendent has made the determination that Control Room evacuation is required.
2. All immediate actions associated with AOP-32, Plant Shutdown from Outside Control Room, are complete.
3. Remote shutdown equipment has been distributed and communication between the Remote Shutdown Stations is established.
4. All NORMAL/LOCAL switches have been placed in LOCAL in accordance with Attachments 1 through 4, Remote Shutdown Panel Initial Switch Alignment.
5. The RHRSW System is accessible and in standby IAW OP-43.
6. Station 4 (Diesel Building Operator) is available for actions required by this procedure.
7. This JPM will be performed on Unit ______.

INITIATING CUE:

You are directed by the Unit SCO to perform Station 2 (Reactor Building Operator) actions, including Remote Shutdown Panel (Station 1) actions, associated with placing the 'B' Loop RHRSW System in operation per 0AOP-32, Step 3.2.11.2.
Inform the Unit SCO when all required actions have been completed.

PERFORMANCE CHECKLIST

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

Step 1 – Obtains copy of AOP-32 and determines starting point of Step 3.2.11.2
Obtains copy of AOP-32.

SAT/UNSAT*

TIME START ___________

PROMPT: Provide MCC Valve light indications commensurate with Performer actions.

PROMPT: SW-V105 is normally closed. After placing local control switch to open inform examinee, Green light is off, red light is on.

Step 2 – OPEN SW-V105, NUCLEAR SERVICE WATER SUPPLY VALVE, at MCC 1(2) XB Compartment DM1, Row H3.
SW-V105 is opened.

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

PROMPT: SW-V143 will be closed during the panel lineup. Inform examinee, Green light is on, red light is off.

Step 3 – CLOSE SW-V141, WELL WATER SUPPLY VALVE, at the Remote Shutdown Panel.
SW-V141 is verified closed.

SAT/UNSAT*

PROMPT: SW-V141 will be closed during the panel lineup. Inform examinee, Green light is on, red light is off.

Step 4 – CLOSE SW-V143, WELL WATER SUPPLY VALVE, at the Remote Shutdown Panel.
SW-V143 is verified closed.

SAT/UNSAT*

PROMPT: E11-F002B is normally open. Inform examinee, Red light is on, green light is off.

Step 5 – OPEN or VERIFY OPEN E11-F002B, RHR HEAT EXCHANGER 'B' SERVICE WATER DISCHARGE VALVE, at MCC 1(2) XB Compartment DN9, Row G4.
E11-F002B is verified opened.

SAT/UNSAT*

PROMPT: Respond as the Station 4 (Diesel Generator Operator) in the following step to report that both unit NSW Pumps have been started.

Step 6 – Contact Station 4 (Diesel Generator Operator) and direct starting both unit NSW pumps.
Both affected unit NSW pumps are started.

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

PROMPT: Respond as the Station 4 (Diesel Generator Operator) in the following step to report that the B or D RHR Service Water Booster Pump has been started.

Step 7 – Contact the Station 4 (Diesel Generator Operator) and direct starting the 'B' or 'D' RHR Service Water Booster Pump.
The B or D RHR SW Booster Pump is started.

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

PROMPT: If directed, respond as the Station 4 Operator that you are monitoring RHR Service Water Booster Pump amperage.

PROMPT: The next step will require the Performer to throttle open E11-F068B until amperage on the running Service Water Booster Pump reaches 80 amps. As the Station 4 Operator, provide cues of rising pump current as the valve is throttled open. Data from the simulator is that the amps for the pump after it is started should be around 60 amps and raise 1 amp per second the valve is open. The Performer should secure throttling the valve when pump amperage reaches 80 amps.

PROMPT: E11-F068B is normally closed. Initially inform examinee that the Green light is on, Red light is off (as shown). After the valve is throttled, inform examinee that the Green light is on, Red light is on.

Step 8 – THROTTLE OPEN E11-F068B, RHR HEAT EXCHANGER 'B' SERVICE WATER DISCHARGE VALVE, at MCC 1(2) XB Compartment DN1, Row K4, until amperage on the running RHR Service Water Booster Pump reaches 80 amps.
E11-F068B is throttled open until pump amperage reaches 80 amps.

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

PROMPT: SW-V117 is normally closed. After placing local control switch to open, inform examinee Green light is off, red light is on.

Step 9 – OPEN SW-V117, NUCLEAR SERVICE WATER TO VITAL HEADER VALVE, at MCC 1(2) XB Compartment DP2, Row G2.
SW-V117 is opened.

SAT/UNSAT*

PROMPT: If contacted, report as the Station 3 Operator that the supply of Service Water to running equipment is adequate.

Step 10 –Notify the Unit SCO that the RHR Service Water System is in operation.
The Unit SCO is notified.

SAT/UNSAT*

TERMINATING CUE: When the RHR Service Water System is in operation and the Unit SCO is notified, this JPM is complete.

TIME COMPLETED ____________

LIST OF REFERENCES

RELATED TASKS:

200604B504

Perform MCC Operator Actions For Placing Suppression Pool Cooling In Service Per ASSD-02 or AOP-32.

K/A REFERENCE AND IMPORTANCE RATING:

295026 EA1.01 4.1/4.1
Ability to operate and/or monitor the following as they apply to Suppression Pool High Water Temperature: Suppression Pool Cooling

REFERENCES:

AOP-32, Plant Shutdown from Outside Control Room - Rev 45

TOOLS AND EQUIPMENT:

Equipment from the Remote Shutdown Equipment Locker.

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

Safety Function 5 – Containment Integrity

REASON FOR REVISION:
Procedure changes.

Validated Time: 20 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate √ Actual __ Unit: ____

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

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

Alternate Path: Yes ___ No √

EVALUATION

Performer:________________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

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Comments reviewed with Student

Evaluator Signature: ________________________________ Date:_____________

TASK CONDITIONS:

1. The Shift Superintendent has made the determination that Control Room evacuation is required.
2. All immediate actions associated with AOP-32, Plant Shutdown from Outside Control Room, are complete.
3. Remote shutdown equipment has been distributed and communication between the Remote Shutdown Stations is established.
4. All NORMAL/LOCAL switches have been placed in LOCAL in accordance with Attachments 1 through 4, Remote Shutdown Panel Initial Switch Alignment.
5. The RHRSW System is accessible and in standby IAW OP-43.
6. Station 4 (Diesel Building Operator) is available for actions required by this procedure.
7. This JPM will be performed on Unit ______.

INITIATING CUE:

You are directed by the Unit SCO to perform Station 2 (Reactor Building Operator) actions, including Remote Shutdown Panel (Station 1) actions, associated with placing the 'B' Loop RHRSW System in operation per 0AOP-32, Step 3.2.11.2.
Inform the Unit SCO when all required actions have been completed.

3.0 OPERATOR ACTIONS

3.2.11 **PERFORM** the following to place RHR loop B in Suppression Pool Cooling:

1. **PERFORM** the following to fill and vent RHR Loop B:

   a. Station 2, **ENSURE** *RHR PUMP B AND D SUPPRESSION POOL SUCTION VALVE, E11-F020B,* is open at MCC 1(2)XB. Compt DN6, Row G1. ☑

   b. Station 2, **ENSURE** *RHR PUMP B SUPPRESSION POOL SUCTION VALVE, E11-F004B*, is open at MCC 1(2)XB Compt DK9, Row M1. ☑

   c. Station 2, **ENSURE** *RHR PUMP D SUPPRESSION POOL SUCTION VALVE, E11-F004D*, is open at MCC 1(2)XB Compt DL0, Row M3. ☑

   d. Station 3, **ENSURE** RHR loop B keep fill station is in service (located 50 foot El.West). ☑

   e. Station 3, **OPEN** *REACTOR VESSEL HEAD SPRAY VENT VALVE, E11-V85* (located at vessel head spray station 66' El., West), until a solid stream of water is observed flowing from the vent line, **THEN CLOSE** the vent valve. ☑

   f. Station 3, **OPEN** *LOOP B RHR SYSTEM HIGH POINT VENT VALVES, E11-V79* and *E11-V80* (located RHR Hx B room El. 20', South), until a solid stream of water is flowing from the vent line, **THEN CLOSE** the vent valves. ☑

2. **PERFORM** the following to place the RHR Service Water System in operation:

   a. Station 2, **OPEN** *NUCLEAR SERVICE WATER SUPPLY VALVE, SW-V105*, at MCC 1(2)XB Compt DM1, Row H3. ☐

b. Station 1, **CLOSE** the following valves:

- *RHR VITAL SERVICE WATER HEADER WELL WATER SUPPLY VALVE, SW-V141* ☐
- *SERVICE WATER HEADER WELL WATER SUPPLY VALVE, SW-V143.* ☐

c. Station 2, **ENSURE** *RHR HEAT EXCHANGER B SERVICE WATER DISCHARGE VALVE, E11-F002B*, is open at MCC 1(2)XB Compt DN9, Row G4. ☐

d. Station 4, **ENSURE** both Nuclear Service Water Pumps to the affected unit are operating:

NSW Pump	Location	
1A	4160 Bus E1, AF9	☐
1B	4160 Bus E2, AH6	☐
2A	4160 Bus E3, AJ3	☐
2B	4160 Bus E4, AL1	☐

e. Station 4, **START** *RHR SERVICE WATER BOOSTER PUMP B* or *D:*

RHR SW Pump	Location	
1B	4160 Bus E4, AK9	☐
1D	4160 Bus E2, AH4	☐
2B	4160 Bus E4, AK4	☐
2D	4160 Bus E2, AG8	☐

f. Station 4, **MONITOR** the amperage on the Service Water Booster Pump that was started. ☐

g. Station 2, **THROTTLE OPEN** *RHR HEAT EXCHANGER B SERVICE WATER DISCHARGE VALVE, E11-F068B*, at MCC 1(2)XB Compt DN1, Row K4, until the amperage on the running RHR service water pump reaches 80 amps. ☐

3.0 OPERATOR ACTIONS

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

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

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

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

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

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

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

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

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

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE

A-1B-R

Little Discriminatory
Value

LESSON TITLE: Verification of Procedure Working Copy

LESSON NUMBER:

REVISION: 0

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
2. Obtain the most recent revision of 0GP-02 for use during this JPM.
3. Prior to use, verify 0GP-02 status as follows:
   - Hard copy procedure revision # matches Controlled Document List revision #.
   - Controlled Document Global Status indicates “ACTIVE”.
   - Controlled Document Revision Status indicates “ISSUED”.
4. Give student copy of verified 0GP-02 for use during JPM.

Read the following to trainee.

TASK CONDITIONS:

1. Preparations for a reactor startup are in progress in accordance with 0GP-01, “Pre-startup Checklist”.
2. A working copy of 0GP-02 has been issued for use during the startup.

INITIATING CUE:

Per the guidance of RDC-NGGC-0002 Document Control Program, log into PASSPORT and verify the working copy of 0GP-02 meets the requirements for use.

Notify the Unit SRO of the status of the working copy of 0GP-02.

PERFORMANCE CHECKLIST

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

Step 1 - Log into passport.
Examinee logs into PASSPORT

SAT/UNSAT*

Step 2 – Access controlled document screen for 0GP-02.
Examinee accesses controlled document screen for GP-02.

SAT/UNSAT*

Step 3 – Check 0GP-02 revision number documented in PASSPORT.
Verify revision number on hard copy of 0GP-02 matches the controlled document revision number documented in PASSPORT.

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

Step 4 – Check Controlled Document Global Status.
Verify Controlled Document Global Status field in PASSPORT indicates ACTIVE.

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

Step 5 - Check Controlled Document Revision Status.
Verify Controlled Document Revision Status in PASSPORT indicates ISSUED.

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

TERMINATING CUE: When student has verified status of procedure this JPM may be terminated.

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

RELATED TASKS:

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.21 3.5/3.6

Verify controlled copy of procedure

REFERENCES:

RDC-NGGC-0002 Document Control Program

PRO-NGGC-0200 Procedure Use and Adherence

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2, Supp. 1.):

Admin – Conduct of Operations

Time Required for Completion: _10_ Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate _ŏ_ Actual ___ Unit: ____

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

Time Critical: Yes ___ No _ŏ_ Time Limit _N/A_

Alternate Path: Yes ___ No _ŏ_

EVALUATION

Trainee:______________________________ SSN: ___________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

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Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Preparations for a reactor startup are in progress in accordance with 0GP-01, “Pre-startup Checklist”.

2. A working copy of 0GP-02 has been issued for use during the startup.

INITIATING CUE:

Per the guidance of RDC-NGGC-0002 Document Control Program, log into PASSPORT and verify the working copy of 0GP-02 meets the requirements for use.

Notify the Unit SRO of the status of the working copy of 0GP-02.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE

A-1B-R

LESSON TITLE: Verification of Procedure Working Copy

LESSON NUMBER:

REVISION: 0

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
2. Obtain the most recent revision of 0GP-02 for use during this JPM.
3. Prior to use, verify 0GP-02 status as follows:
    - Hard copy procedure revision # matches Controlled Document List revision #.
    - Controlled Document Global Status indicates "ACTIVE".
    - Controlled Document Revision Status indicates "ISSUED".
4. Give student copy of verified 0GP-02 for use during JPM.

Read the following to trainee.

TASK CONDITIONS:

1. Preparations for a reactor startup are in progress in accordance with 0GP-01, “Pre-startup Checklist”.
2. A working copy of 0GP-02 has been issued for use during the startup.

INITIATING CUE:

Per the guidance of RDC-NGGC-0002 Document Control Program, log into PASSPORT and verify the working copy of 0GP-02 meets the requirements for use.

Notify the Unit SRO of the status of the working copy of 0GP-02.

PERFORMANCE CHECKLIST

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

Step 1 - Log into passport.
Examinee logs into PASSPORT

SAT/UNSAT*

Step 2 – Access controlled document screen for 0GP-02.
Examinee accesses controlled document screen for GP-02.

SAT/UNSAT*

Step 3 – Check 0GP-02 revision number documented in PASSPORT.
Verify revision number on hard copy of 0GP-02 matches the controlled document revision number documented in PASSPORT.

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

Step 4 – Check Controlled Document Global Status.
Verify Controlled Document Global Status field in PASSPORT indicates ACTIVE.

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

Step 5 - Check Controlled Document Revision Status.
Verify Controlled Document Revision Status in PASSPORT indicates ISSUED.

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

TERMINATING CUE: When student has verified status of procedure this JPM may be terminated.

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

RELATED TASKS:

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.21 3.5/3.6

Verify controlled copy of procedure

REFERENCES:

RDC-NGGC-0002 Document Control Program

PRO-NGGC-0200 Procedure Use and Adherence

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2, Supp. 1.):

Admin – Conduct of Operations

Time Required for Completion: 10 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ŏ Actual ___ Unit: ____

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

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

Alternate Path: Yes ___ No ŏ

EVALUATION

Trainee:________________________________ SSN: ____________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

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Comments reviewed with Student

Evaluator Signature: ________________________________ Date:__________

TASK CONDITIONS:

1. Preparations for a reactor startup are in progress in accordance with 0GP-01, “Pre-startup Checklist”.

2. A working copy of 0GP-02 has been issued for use during the startup.

INITIATING CUE:

Per the guidance of RDC-NGGC-0002 Document Control Program, log into PASSPORT and verify the working copy of 0GP-02 meets the requirements for use.

Notify the Unit SRO of the status of the working copy of 0GP-02.

Progress Energy	**I** **Information** **Use**

NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

RDC-NGGC-0002
Document Control Program

REVISION 17

NGG Nuclear Generation Group

3.0 DEFINITIONS

3.6 Controlled Document List

A web based application within PassPort Web Tools that allows users to obtain a list of active PassPort controlled documents and pertinent PassPort document information to support the Verify Working Document program.

3.7 Controlled Document Revision Status Codes

A status indicator within the Document Management module that applies to each revision of the parent Controlled Document and utilized by site personnel as the bases, in conjunction with the parent Controlled Document Global Status Codes, for determining document use limitations as stipulated in Section 9.8.

3.8 Copyholder/Sender Identification Record

The facility-specific name, notification ID (valid PassPort Identification), and optional information such as job title, location, telephone number, for each individual who will be sending or receiving information related to Controlled Documents via the Document Management System.

3.9 Document Management Administrator

Site-specific personnel responsible for providing overall Document Management program administration and troubleshooting of the PassPort Document Management module.

3.10 Document Management System

A module within the PassPort System that provides for the distribution and control of Controlled Documents and indexing and dissemination of controlled document information.

3.11 Document Owner Organization

The entity responsible for preparing, revising, reviewing, approving, and completing a Master Controlled Document and submitting it to Document Services for processing.

3.12 "Electronic Controlled" Copy

A Controlled Document in an electronic format within the Document Management system.

3.13 Engineering Change System

A module within the Passport System that provides revision tracking of Engineering Changes specifically related to each facility.

9.0 INSTRUCTIONS

9.9 Verifying Working Copies

The following requirements are established to ensure individuals are aware of and use current, up-to-date, and appropriate Controlled Document information in the performance of Activities Affecting Quality.

9.9.1 Site personnel shall perform Activities Affecting Quality using "Working Copies." Authorized exceptions are:

1. "Working Copies" are not required for emergency activities.
2. During site emergencies, emergency drills, or emergency conditions which could affect safe plant operations, "Controlled" Distribution Copies may be used by Emergency Response personnel and do not require verification. After the emergency, emergency drill, or emergency condition is terminated; copyholders shall replenish "Controlled" Distribution Copies as required.

9.9.2 The Document Management System and/or the Controlled Document List shall be used to verify current revision, Controlled Document Global Status, and Pending Changes prior to use. Authorized exceptions are:

1. Verification of Pending Changes is not required when the Controlled Document Global Status in the Document Management module or the Controlled Document list is "ACTIVE" **AND** the Controlled Document Revision Status is "ISSUED."
2. Documents defined in Step 9.8.4.
3. Documents used in activities defined as exceptions in Step 9.9.1 by Emergency Response Organization Personnel.
4. Interim approved Temporary Changes to procedures prior to processing by Document Services on the next working day.

9.9.3 The Engineering Change module shall be used to verify pending change statuses.

9.9.4 If the Document Management System is not available, "Controlled" distribution copies shall be used from Vital File Locations, and verification of Pending Changes shall be accomplished utilizing a list distributed weekly by Document Services to applicable locations. Those documents defined in Step 9.8.4 do not require verification.

9.0 INSTRUCTIONS

9.9.5 Pending Changes that impact the activity may be attached to the "Working Copy." Pending Changes with statuses as defined below shall be reviewed to determine the impact on performance of Activities Affecting quality:

1. "ACTIVE" indicates that implementation activities for an EC have started, implementation activities required for turnover to Operations may be complete, but plant equipment has not been returned to service.

2. "ACTIVE-R" indicates implementation activities for a temporary EC have started, removal activities required for turnover to Operations may be complete, but plant equipment has not been returned to service.

3. "CLOSED" indicates that an EC has been fully implemented, turnover to Operations is complete, plant equipment has been returned to service, and administrative requirements are complete.

4. "INSTALLD" indicates a temporary EC where installation activities required for turnover are complete, turnover to Operations is complete, and plant equipment has been returned to service.

5. "MODIFIED" indicates that EC installation activities required for turnover are complete, turnover to Operations is complete, and plant equipment has been returned to service.

9.9.6 "Working Copies" are valid for seven calendar days. However, "Working Copies" may be re-verified at anytime and re-verification is recommended on a daily basis. Evidence of verification may be documented with signature (or initials) and current date.

9.9.7 During verification, if any discrepancy is noted, immediately contact Document Services for resolution.

PLANT OPERATING MANUAL

VOLUME IV

GENERAL PLANT OPERATING PROCEDURE

UNIT
0

0GP-02

APPROACH TO CRITICALITY AND PRESSURIZATION OF THE REACTOR

REVISION 89

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE

A-3-RS

LESSON TITLE: **Response to Dosimeter Alarms**

LESSON NUMBER:

REVISION NO: **0**

Low Discriminatory
Value

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
2. This JPM is written to be administered with the examinee already logged on to an RWP and inside the RCA.
3. Prior to administering this JPM, the evaluator must document the following information from the candidates RWP
   - Dose rate alarm setting ____________ mr/hr
   - Total dose alarm setting ____________ mrem
4. If this JPM is being administered with a set of JPMs within the RCA, administer it as the last JPM of the set.

Read the following to trainee.

TASK CONDITIONS:

Unit Two is operating at rated power.

The following annunciator is received in the control room:

CRD ACCUM LO PRESS/HI LEVEL A-07(6-1)

INITIATING CUE:

As the RB operator, you are directed by the Unit RO to investigate the cause of the alarm at the local CRD HCU Panel.

PERFORMANCE CHECKLIST

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

Step 1 – Respond to request and commence transit to Unit Two RB 20ft. elevation.
Operator responds to request and heads towards U/2 RB 20 ft.

SAT/UNSAT*

Evaluator Cue – Shortly after entering RB 20ft. and before reaching the local CRD HCU Panel, inform the examinee that their dosimeter is ALARMING.

If examinee checks their dosimeter for alarm conditions, inform the examinee that the "**dose rate**" and "**total dose**" alarms are alarming.

Step 2 – Check dosimeter for alarm status.
Operator checks dosimeter for alarm conditions.

SAT/UNSAT*

Step 3 – Commence transit to immediately exit the RCA.
Operator immediately commences exit of the RCA.

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

Step 4 – Contact Health Physics.
Examinee exits the RCA and contacts Health Physics.

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

Evaluator Cue – Once the examinee exits the RCA and contacts HP, move to an area suitable for asking the examinee questions.

Step 5 – Ask the examinee what the "**dose rate**" alarm setpoint is for the applicable RWP?
Without referring to the RWP, examinee states that the dose rate alarm setpoint is ______ mrem/hr.

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

Step 6 – Ask the examinee what the "**total dose**" alarm setpoint is for the applicable RWP?
*Without referring to the RWP, examinee states that the "**total dose**" alarm setpoint is ______ mrem.*

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

TERMINATING CUE:	When the examinee has responded to the above questions, the JPM can be terminated.

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

RELATED TASKS:

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.3.7 3.5/3.6

Ability to comply with radiation work permit requirements during normal and abnormal conditions.

REFERENCES:

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev. 2, Supp.1):

Admin – Radiation Control

Time Required for Completion: _10_ Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate _ŏ_ Actual ___ Unit: ____

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

Time Critical: Yes ___ No _ŏ_ Time Limit _N/A_

Alternate Path: Yes ___ No _ŏ_

EVALUATION

Trainee:________________________________ SSN: ____________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure Current?: Yes _____ No ______

Comments: ____

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Comments reviewed with Student

Evaluator Signature: ________________________________ Date:__________

TASK CONDITIONS:

Unit Two is operating at rated power.

The following annunciator is received in the control room:

CRD ACCUM LO PRESS/HI LEVEL A-07(6-1)

INITIATING CUE:

As the RB operator, you are directed by the Unit RO to investigate the cause of the alarm at the local CRD HCU Panel.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE

A-3-RS

LESSON TITLE: Response to Dosimeter Alarms

LESSON NUMBER:

REVISION NO: 0

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
2. This JPM is written to be administered with the examinee already logged on to an RWP and inside the RCA.
3. Prior to administering this JPM, the evaluator must document the following information from the candidates RWP
   - Dose rate alarm setting _____________ mr/hr
   - Total dose alarm setting _____________ mrem
4. If this JPM is being administered with a set of JPMs within the RCA, administer it as the last JPM of the set.

Read the following to trainee.

TASK CONDITIONS:

Unit Two is operating at rated power.

The following annunciator is received in the control room:

CRD ACCUM LO PRESS/HI LEVEL A-07(6-1)

INITIATING CUE:

As the RB operator, you are directed by the Unit RO to investigate the cause of the alarm at the local CRD HCU Panel.

PERFORMANCE CHECKLIST

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

Step 1 – Respond to request and commence transit to Unit Two RB 20ft. elevation.
Operator responds to request and heads towards U/2 RB 20 ft.

SAT/UNSAT*

Evaluator Cue – Shortly after entering RB 20ft. and before reaching the local CRD HCU Panel, inform the examinee that their dosimeter is ALARMING.

If examinee checks their dosimeter for alarm conditions,
inform the examinee that the "**dose rate**" and "**total dose**" alarms are alarming.

Step 2 – Check dosimeter for alarm status.
Operator checks dosimeter for alarm conditions.

SAT/UNSAT*

Step 3 – Commence transit to immediately exit the RCA.
Operator immediately commences exit of the RCA.

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

Step 4 – Contact Health Physics.
Examinee exits the RCA and contacts Health Physics.

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

Evaluator Cue – Once the examinee exits the RCA and contacts HP, move to an area suitable for asking the examinee questions.

Step 5 – Ask the examinee what the "**dose rate**" alarm setpoint is for the applicable RWP?
Without referring to the RWP, examinee states that the dose rate alarm setpoint is ______ mrem/hr.

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

Step 6 – Ask the examinee what the "**total dose**" alarm setpoint is for the applicable RWP?
*Without referring to the RWP, examinee states that the "**total dose**" alarm setpoint is ______ mrem.*

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

TERMINATING CUE: When the examinee has responded to the above questions, the JPM can be terminated.

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

RELATED TASKS:

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.3.7 3.5/3.6

Ability to comply with radiation work permit requirements during normal and abnormal conditions.

REFERENCES:

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev. 2, Supp.1):

Admin – Radiation Control

Time Required for Completion: _10_ Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate _ŏ_ Actual ___ Unit: ____

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

Time Critical: Yes ___ No _ŏ_ Time Limit _N/A_

Alternate Path: Yes ___ No _ŏ_

EVALUATION

Trainee:________________________________ SSN: ____________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure Current?: Yes _____ No ______

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ________________________________ Date:___________

TASK CONDITIONS:

Unit Two is operating at rated power.

The following annunciator is received in the control room:

CRD ACCUM LO PRESS/HI LEVEL A-07(6-1)

INITIATING CUE:

As the RB operator, you are directed by the Unit RO to investigate the cause of the alarm at the local CRD HCU Panel.

Objectives

ED-01 State the purpose of dosimetry.

ED-02 List the types of radiation detected by thermoluminescent dosimeters (TLDs) and electronic dosimeters (EDs).

ED-03 Identify how to wear dosimetry devices properly including placement and orientation.

ED-04 Identify the modes, methods, and frequency for operating and reading EDs.

ED-05 Identify how dosimetry is issued and returned.

ED-06 State the action(s) to be taken if a dosimeter is lost, damaged, or alarming.

Purpose and Characteristics (ED-01, 02)

Dosimeters are used as a tool to monitor and control personnel radiation exposures during work inside Radiation Control Areas. There are two basic types of dosimeters issued, the thermoluminescent dosimeter (TLD) and the Electronic Dosimeter (ED). EDs provide you with an approximation of dose received, while TLDs are used to record your permanent occupational external dose record.

Characteristics of the TLD and ED

TLD	ED
Passive Monitoring	Active Monitoring
Requires Processing	Direct Reading of Dose Estimate
Measure Dose Only	Measures Dose and Dose Rate
Detects Beta, Gamma, Neutron	Detects Gamma Only
No Alarms	Dose and Dose Rate Alarms

ED accumulated dose and area dose rate alarm set-points will be established by RC personnel for each Radiation Work Permit/ALARA Task. Alarm set-points are determined during RWP development, and will be based on anticipated radiological conditions, average time of RCA entry, maximum expected dose per RCA entry, and ALARA considerations.

The goal in establishing the ED accumulated dose alarm is to alert personnel and prevent them from exceeding an Administrative Dose Limit. You should pre-plan your work activities; allowing yourself enough time to exit the area before the ED alarms. If your ED alarms for DOSE, you should immediately place the work area in a safe condition, promptly exit the work area, and contact RC. RC supervision is notified of all accumulated dose alarms. RC supervisor concurrence is required prior to continuing work.

The ED dose rate alarm set-point is typically set at, or near, the maximum anticipated work area dose rates. High dose rates that may be encountered during transit to the work area, or for short periods of time during the work activity, may be excluded if these alarm conditions are discussed with workers during the RC briefing. If the ED alarms for DOSE RATE, the response should be based on the type of dose rate alarm:

Unanticipated Dose Rate Alarm – Place the work in a safe condition, promptly exit the work area, and contact RC.

Anticipated Dose Rate Alarm – If the alarm is outside RC briefing conditions, immediately place the work in a safe condition, promptly exit the work area, and contact RC. If the cause of the dose rate alarm is known and has been addressed; RC may authorize the work to continue. If the cause of the dose rate alarm is unknown, or has not been addressed, RC supervisor concurrence is required prior to continuing work.

Wearing Dosimetry (ED-03)

THE TLD AND ED SHOULD BE WORN IN CLOSE PROXIMITY TO EACH OTHER, ON THE UPPER FRONT PORTION OF THE BODY (BETWEEN THE NECK AND WAIST). The ED should be worn with the clip toward the body (this ensures the ED detector faces away from the body) and the TLD Beta window should be facing away from the body. Additional or special dosimetry may be required for certain jobs where dose rates to areas of the body are higher than those to the chest region. Typical placements for additional whole-body dose include the head, back, and thigh. For extremity dose considerations, the wrists or ankles may have special dosimetry attached. If you are required to wear any special dosimetry, RC will provide you with instructions.

USE OF DOSIMETRY (ED-04)

Electronic Dosimeters operate in two modes; dose and dose rate

- The DOSE mode provides a read-out of estimated dose in units of mrem.
- The DOSE RATE mode provides a read-out of the current dose rate in units of mrem/hr.
- The ED should never be removed from the body and should never be used as a survey meter. It should be kept near the body at all times.
- EDs will alarm if a preset dose or dose rate is exceeded. The LED on the dosimeter will remain illuminated when the dosimeter is alarming. It is still important, however, to track on-the-job dose by periodically checking your dosimeter readings (once or twice per hour in a radiation area and every 15 minutes in a posted high radiation area). The ED has a continuous display for Dose; however, you can toggle between dose and dose rate readings by depressing the button located on the front of the dosimeter. Use the alarms as a backup only.
- There is also an alarm that will sound on your ED if the battery requires recharging/ replacement. This alarm is not associated with your dose or dose rate requirements for your RWP; however, it is still important that you exit the area when this alarm sounds.

OE12441
07/03/01
During a refueling outage, a worker was performing in-service inspections when his ED alarmed for dose rate (conditions in the area changed based on work being performed). The worker, not suspecting that the work conditions had changed, misinterpreted the alarm as a low battery alarm. The worker made a cognitive decision that the alarm was battery related based upon past experiences at other facilities. The dose rate alarm and battery alarm sound similar, as do many of the other audio signals associated with the ED. This event is not significant because the radiation dose received by the worker was very small. This event is noteworthy because the exposed worker misinterpreted the dose rate alarm and apparently did not check the dose rate reading when the alarm sounded.

It is your responsibility to monitor your own radiation exposure while performing a task in a radiation area. The ED provides the best method to perform this responsibility. Workers should never tamper with their dosimeters. Failure to comply with the dosimetry requirements may result in disciplinary action up to and including termination.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE

A-2-R

LESSON TITLE: Determination of Drywell Volumetric Average Temperature Per 0PT-16.2

LESSON NUMBER: LOT-OJT-JP-201-D09

REVISION NO: 2

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
2. The trainee will need a calculator to perform this JPM.
3. The trainee will be given a copy of 0PT-16.2 with the first column of FIGURE 1 readings complete, as documented in the JPM, and the cover page initial information complete.

Read the following to trainee.

TASK CONDITIONS:

1. Drywell air RTDs CAC-TE-1258-8, CAC-TE-1258-18 and CAC-TE-1258-23 are inoperable due to erratic indication.
2. An LCO has been established that requires the performance of 0PT-16.2, Drywell Volumetric Average Temperature, once per 24 hours.
3. 0PT-16.2 FIGURE 1 readings have been recorded on FIGURE 1.
4. The CAC-TY-4426-1 and 2 Microprocessors could not be physically accessed to work in the back panel area.
5. The Process Computer is not available due to maintenance activities.
6. ERFIS is temporarily off-line.
7. This is the 15^{th} day of the month.

INITIATING CUE:

You have been directed by the Unit SCO to complete the performance of 0PT-16.2, Drywell Volumetric Average Temperature, using the readings documented in Figure 1.

Report the results of the surveillance to him upon completion of the test.

You have been granted permission by the Unit SCO to perform this test.

PERFORMANCE CHECKLIST

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

Step 1 – Transfer appropriate FIGURE 1 readings into step 7.2.1
FIGURE 1 readings transferred into step 7.2.1. No reading transferred for 4426-2A Channel 3 due to inoperability.

SAT/UNSAT*

Step 2 – Add step 7.2.1 readings and record in step 7.2.2
198 and 215 added totaling 413 and documented in step 7.2.2

SAT/UNSAT*

Step 3 – Divide total obtained in step 7.2.2 by the number of temperatures used
413 divided by 2 equaling 206.5 and documented in step 7.2.3

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

Step 4 – Transfer appropriate FIGURE 1 readings into step 7.3.1
FIGURE 1 readings transferred into step 7.3.1.

SAT/UNSAT*

Step 5 – Add step 7.3.1 readings and record in step 7.3.2
168, 157 and 154 added totaling 479 and documented in step 7.3.2

SAT/UNSAT*

Step 6 – Divide total obtained in step 7.3.2 by the number of temperatures used
479 divided by 3 equaling 159.7 and documented in step 7.3.3

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

Step 7 – Transfer appropriate FIGURE 1 readings into step 7.4.1
FIGURE 1 readings transferred into step 7.4.1. No reading transferred for 4426-2B Channel 4 due to inoperability.

SAT/UNSAT*

Step 8 – Add step 7.4.1 readings and record in step 7.4.2
133,128 and 130 added totaling 391 and documented in step 7.4.2

SAT/UNSAT*

Step 9 – Divide total obtained in step 7.4.2 by the number of temperatures used
391 divided by 3 equaling 130.3 and documented in step 7.4.3

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

Step 10 – Transfer appropriate FIGURE 1 readings into step 7.5.1
FIGURE 1 readings transferred into step 7.5.1.

SAT/UNSAT*

Step 11 – Add step 7.5.1 readings and record in step 7.5.2
125, 120 and 117 added totaling 362 and documented in step 7.5.2

SAT/UNSAT*

Step 12 – Divide total obtained in step 7.5.2 by the number of temperatures used
362 divided by 3 equaling 120.7 and documented in step 7.5.3

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

Step 13 – Transfer appropriate FIGURE 1 readings into step 7.6.1
FIGURE 1 readings transferred into step 7.6.1. No reading transferred for 4426-1A Channel 6 due to inoperability.

SAT/UNSAT*

Step 14 – Add step 7.6.1 readings and record in step 7.6.2
103, 97 and 98 added totaling 298 and documented in step 7.6.2

SAT/UNSAT*

Step 15 – Divide total obtained in step 7.6.2 by the number of temperatures used
298 divided by 3 equaling 99.3 and documented in step 7.6.3

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

Step 16 – Transfer average readings documented in steps 7.2.3, 7.3.3, 7.4.3, 7.5.3 and 7.6.3 into step 7.7.1

206.5, 159.7, 130.3, 120.7 and 99.3 transferred into step 7.7.1

SAT/UNSAT*

Step 17 – Multiply each reading in 7.7.1 by the designated factor and document in step 7.7.1

10.3, 14.4, 52.1, 45.9, and 7.9 documented in step 7.7.1

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

Step 18 – Add weighted averages in step 7.7.1 and document as TOTAL in step 7.7.1.6

10.3, 14.4, 52.1, 45.9 and 7.9 added totaling 130.6 and documented in step 7.7.1

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

PROMPT: If asked the status of computer point C074, report it is unavailable.

Step 19 – Record computer point C074 value in step 7.7.2

Step 7.7.2 marked N/A due to unavailability

SAT/UNSAT*

Step 20 – Perform steps 7.7.3 and 7.7.4

Step 7.7.3 and 7.7.4 marked N/A (not required)

SAT/UNSAT*

Step 21 – Perform step 7.7.5

Cover page information verified complete

SAT/UNSAT*

Step 22 – Perform step 7.7.6

Unit SCO notified test is complete and SAT

SAT/UNSAT*

TERMINATING CUE: When SCO is informed of test results, this JPM can be terminated.

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

LIST OF REFERENCES

RELATED TASKS:

223*206*B1*01

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.2.12 3.7 / 4.1

Knowledge of Surveillance Procedures

REFERENCES:

0PT-16.2 Drywell Volumetric Average Temperature

TOOLS AND EQUIPMENT:

Calculator

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2. Supplement 1):

Admin – Equipment Control

Time Required for Completion: 20 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ŏ Actual ___ Unit: 2

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

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

Alternate Path: Yes ___ No ŏ

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. Drywell air RTDs CAC-TE-1258-8, CAC-TE-1258-18 and CAC-TE-1258-23 are inoperable due to erratic indication.
2. An LCO has been established that requires the performance of 0PT-16.2, Drywell Volumetric Average Temperature, once per 24 hours.
3. 0PT-16.2 FIGURE 1 readings have been recorded on FIGURE 1.
4. The CAC-TY-4426-1 and 2 Microprocessors could not be physically accessed to work in the back panel area.
5. The Process Computer is not available due to maintenance activities.
6. ERFIS is temporarily off-line.
7. This is the 15th day of the month.

INITIATING CUE:

You have been directed by the Unit SCO to complete the performance of 0PT-16.2, Drywell Volumetric Average Temperature, using the readings documented in Figure 1.

Report the results of the surveillance to him upon completion of the test.

You have been granted permission by the Unit SCO to perform this test.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE

A-2-R

LESSON TITLE: Determination of Drywell Volumetric Average Temperature Per 0PT-16.2

LESSON NUMBER: LOT-OJT-JP-201-D09

REVISION NO: 2

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

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

2. The trainee will need a calculator to perform this JPM.

3. The trainee will be given a copy of 0PT-16.2 with the first column of FIGURE 1 readings complete, as documented in the JPM, and the cover page initial information complete.

Read the following to trainee.

TASK CONDITIONS:

1. Drywell air RTDs CAC-TE-1258-8, CAC-TE-1258-18 and CAC-TE-1258-23 are inoperable due to erratic indication.
2. An LCO has been established that requires the performance of 0PT-16.2, Drywell Volumetric Average Temperature, once per 24 hours.
3. 0PT-16.2 FIGURE 1 readings have been recorded on FIGURE 1.
4. The CAC-TY-4426-1 and 2 Microprocessors could not be physically accessed to work in the back panel area.
5. The Process Computer is not available due to maintenance activities.
6. ERFIS is temporarily off-line.
7. This is the 15th day of the month.

INITIATING CUE:

You have been directed by the Unit SCO to complete the performance of 0PT-16.2, Drywell Volumetric Average Temperature, using the readings documented in Figure 1.

Report the results of the surveillance to him upon completion of the test.

You have been granted permission by the Unit SCO to perform this test.

PERFORMANCE CHECKLIST

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

Step 1 – Transfer appropriate FIGURE 1 readings into step 7.2.1
FIGURE 1 readings transferred into step 7.2.1. No reading transferred for 4426-2A Channel 3 due to inoperability.

SAT/UNSAT*

Step 2 – Add step 7.2.1 readings and record in step 7.2.2
198 and 215 added totaling 413 and documented in step 7.2.2

SAT/UNSAT*

Step 3 – Divide total obtained in step 7.2.2 by the number of temperatures used
413 divided by 2 equaling 206.5 and documented in step 7.2.3

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

Step 4 – Transfer appropriate FIGURE 1 readings into step 7.3.1
FIGURE 1 readings transferred into step 7.3.1.

SAT/UNSAT*

Step 5 – Add step 7.3.1 readings and record in step 7.3.2
168, 157 and 154 added totaling 479 and documented in step 7.3.2

SAT/UNSAT*

Step 6 – Divide total obtained in step 7.3.2 by the number of temperatures used
479 divided by 3 equaling 159.7 and documented in step 7.3.3

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

Step 7 – Transfer appropriate FIGURE 1 readings into step 7.4.1
FIGURE 1 readings transferred into step 7.4.1. No reading transferred for 4426-2B Channel 4 due to inoperability.

SAT/UNSAT*

Step 8 – Add step 7.4.1 readings and record in step 7.4.2
133,128 and 130 added totaling 391 and documented in step 7.4.2

SAT/UNSAT*

Step 9 – Divide total obtained in step 7.4.2 by the number of temperatures used
391 divided by 3 equaling 130.3 and documented in step 7.4.3

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

Step 10 – Transfer appropriate FIGURE 1 readings into step 7.5.1
FIGURE 1 readings transferred into step 7.5.1.

SAT/UNSAT*

Step 11 – Add step 7.5.1 readings and record in step 7.5.2
125, 120 and 117 added totaling 362 and documented in step 7.5.2

SAT/UNSAT*

Step 12 – Divide total obtained in step 7.5.2 by the number of temperatures used
362 divided by 3 equaling 120.7 and documented in step 7.5.3

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

Step 13 – Transfer appropriate FIGURE 1 readings into step 7.6.1
FIGURE 1 readings transferred into step 7.6.1. No reading transferred for 4426-1A Channel 6 due to inoperability.

SAT/UNSAT*

Step 14 – Add step 7.6.1 readings and record in step 7.6.2
103, 97 and 98 added totaling 298 and documented in step 7.6.2

SAT/UNSAT*

Step 15 – Divide total obtained in step 7.6.2 by the number of temperatures used
298 divided by 3 equaling 99.3 and documented in step 7.6.3

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

Step 16 – Transfer average readings documented in steps 7.2.3, 7.3.3, 7.4.3, 7.5.3 and 7.6.3 into step 7.7.1

206.5, 159.7, 130.3, 120.7 and 99.3 transferred into step 7.7.1

SAT/UNSAT*

Step 17 – Multiply each reading in 7.7.1 by the designated factor and document in step 7.7.1

10.3, 14.4, 52.1, 45.9, and 7.9 documented in step 7.7.1

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

Step 18 – Add weighted averages in step 7.7.1 and document as TOTAL in step 7.7.1.6

10.3, 14.4, 52.1, 45.9 and 7.9 added totaling 130.6 and documented in step 7.7.1

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

PROMPT: If asked the status of computer point C074, report it is unavailable.

Step 19 – Record computer point C074 value in step 7.7.2

Step 7.7.2 marked N/A due to unavailability

SAT/UNSAT*

Step 20 – Perform steps 7.7.3 and 7.7.4

Step 7.7.3 and 7.7.4 marked N/A (not required)

SAT/UNSAT*

Step 21 – Perform step 7.7.5

Cover page information verified complete

SAT/UNSAT*

Step 22 – Perform step 7.7.6

Unit SCO notified test is complete and SAT

SAT/UNSAT*

TERMINATING CUE: When SCO is informed of test results, this JPM can be terminated.

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

LIST OF REFERENCES

RELATED TASKS:

223*206*B1*01

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.2.12 3.7 / 4.1

Knowledge of Surveillance Procedures

REFERENCES:

0PT-16.2 Drywell Volumetric Average Temperature

TOOLS AND EQUIPMENT:

Calculator

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2. Supplement 1):

Admin – Equipment Control

Time Required for Completion: 20 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ŏ Actual ___ Unit: 2

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

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

Alternate Path: Yes ___ No ŏ

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. Drywell air RTDs CAC-TE-1258-8, CAC-TE-1258-18 and CAC-TE-1258-23 are inoperable due to erratic indication.
2. An LCO has been established that requires the performance of 0PT-16.2, Drywell Volumetric Average Temperature, once per 24 hours.
3. 0PT-16.2 FIGURE 1 readings have been recorded on FIGURE 1.
4. The CAC-TY-4426-1 and 2 Microprocessors could not be physically accessed to work in the back panel area.
5. The Process Computer is not available due to maintenance activities.
6. ERFIS is temporarily off-line.
7. This is the 15th day of the month.

INITIATING CUE:

You have been directed by the Unit SCO to complete the performance of 0PT-16.2, Drywell Volumetric Average Temperature, using the readings documented in Figure 1.

Report the results of the surveillance to him upon completion of the test.

You have been granted permission by the Unit SCO to perform this test.

Progress Energy

BRUNSWICK NUCLEAR PLANT

C
Continuous Use

DATE COMPLETED ____________
UNIT 2 % PWR 100 GMWE 958
SUPERVISOR IM ABLE
REASON FOR TEST (check one or more):
____ Routine surveillance
____ WO # ____________
✓ Other (explain) LCO Requirement

FREQUENCY:

Once every 24 hours when at least one SPTMS air RTD is inoperable in each division of SPTMS and the unit is in Mode 1, 2, or 3.

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
0

0PT-16.2

DRYWELL VOLUMETRIC AVERAGE TEMPERATURE

REVISION 34

1.0 PURPOSE

1.1 This test is performed to determine the operability of the drywell in conformance with the requirements specified in Technical Specification SR 3.6.1.4.1.

1.2 This test involves averaging air temperatures within the drywell.

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR, Section 6.2

2.3 System Description SD-24, Containment Atmosphere Control System

2.4 EER 93-578 (SPTMS Air RTD Divisions/Channels Defined)

2.5 2SP-95-208, Temperature Measurement for SPTMS RTD

2.6 ESR 98-00387, Rev. 0, TS Change to Containment/Drywell Air Temperature Requirements

3.0 PREREQUISITES

None Applicable

4.0 PRECAUTIONS AND LIMITATIONS

None Applicable

5.0 SPECIAL TOOLS AND EQUIPMENT

Calculator

6.0 ACCEPTANCE CRITERIA

This test may be considered satisfactory when the drywell volumetric average temperature is less than or equal to 150°F.

7.0 PROCEDURAL STEPS

Initials

7.1 **OBTAIN** permission from Unit Senior Control Operator (SCO) to perform this test. _____

NOTE:	Figure 1 may be used as a worksheet but is **NOT** required to be retained with this PT.
NOTE:	All temperatures used in this procedure should be rounded off to the nearest tenth of a degree.
NOTE:	Primary containment temperatures may be obtained from the CAC-TY-4426-1(2) microprocessor per OP-24, Operator Interface With The SPTMS Microprocessors, from the recorders in the Control Room, from ERFIS display screens 740 and 745 of the Validation Menu; or as a backup method, the designated process computer points may be used. Microprocessor point values may also be obtained by I&C manually taking temperature measurements of SPTMS RTDs.
NOTE:	Technical Specifications requires at least one operable temperature detector in each channel for each location.

7.0 PROCEDURAL STEPS

Initials

7.2 90' Elevation And Above

7.2.1 **OBTAIN** drywell temperature for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display		SPTMS		CHAN	PPC
4426-2A Channel 3	______	(5823)	_____	II	N/A
4426-2A Channel 4	______	(5824)	198	II	N/A
4426-1A Channel 4	______	(5822)	215	I	N/A

7.2.2 **ADD** the recorded temperatures **AND RECORD** the total in the following space: _____

________________________ - Recorder/ERFIS display total

413 - SPTMS total

7.2.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 90' elevation and above in the following space: _____

total		no. of temperatures		average
413	÷	2	=	206.5

7.0 PROCEDURAL STEPS

Initials

7.3 Between 70' And 80' Elevation

7.3.1 **OBTAIN** drywell temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-2B Channel 1 ______	(5802) 168	II	W109 ____________
4426-1B Channel 2 ______	(5803) 157	I	F148 ____________
4426-2B Channel 2 ______	(5804) 154	II	W110 ____________

NOTE: Notify BESS duty manager if any temperatures between 70' and 80' elevation exceed 240°F.

7.3.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

____________________ - Recorder/ERFIS display total
479 - SPTMS total
____________________ - PPC total

7.3.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 70' - 80' elevation in the following space: _____

____________	÷	3	=	159.66
total		no. of temperatures		average

7.0 PROCEDURAL STEPS

Initials

7.4 Between 28' And 45' Elevation

7.4.1 **OBTAIN** drywell temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-1B Channel 3 ______	(5805) 133	I	F149 ____________
4426-2B Channel 3 ______	(5806) 128	II	W085 ____________
4426-1B Channel 4 ______	(5807) 130	I	F150 ____________
4426-2B Channel 4 ______	(5808) _____	II	W086 ____________

7.4.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

____________________ - Recorder/ERFIS display total
391 - SPTMS total
____________________ - PPC total

7.4.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 28' - 45' elevation in the following space: _____

391 ÷ 3 = 130.33
total ÷ no. of temperatures = average

7.5 Between 10' And 23' Elevation

7.5.1 **OBTAIN** drywell temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-1B Channel 5 ______	(5809) 125	I	F151 ____________
4426-1A Channel 3 ______	(5812) 120	I	W105 ____________
4426-2B Channel 6 ______	(5813) 117	II	W088 ____________

7.0 PROCEDURAL STEPS

Initials

7.5.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

_______________ - Recorder/ERFIS display total
362 - SPTMS total
_______________ - PPC total

7.5.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 10' - 23' elevation in the following space: _____

362 ÷ _______________ = 120.66
total no. of temperatures average

7.6 Below 5' Elevation

7.6.1 **OBTAIN** primary containment temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display		SPTMS		CHAN	PPC	
4426-1A Channel 5	______	(5817)	103	I	W106	______
4426-1A Channel 6	______	(5818)	______	I	W107	______
4426-2A Channel 5	______	(5819)	97	II	W115	______
4426-2A Channel 6	______	(5820)	98	II	W116	______

CAUTION

If microprocessor is used to obtain data, failure to restore mode selector switch to the ERFIS (NORMAL) position will cause loss of SPTMS indications on the ERFIS Control Room displays.

7.6.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

_______________ - Recorder/ERFIS display total
298 - SPTMS total
_______________ - PPC total

7.0 PROCEDURAL STEPS

Initials

7.6.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the below 5' elevation in the following space: _____

298 ÷ 3 = 99.33

total ÷ no. of temperatures = average

NOTE:	The total in Step 7.7.1.6 is the volumetric average temperature for the drywell. If this temperature is greater than 150°F, actions should be taken as required by Technical Specification SR 3.6.1.4.1.

7.7 Volumetric Average

7.7.1 **DETERMINE** the volumetric average temperature by performing the following calculations: _____

1. Average above 90' elevation 206.5 (Step 7.2.3) x 0.05 = 10.325
2. Average 70' - 80' elevation 159.66 (Step 7.3.3) x 0.09 = 14.3694
3. Average 28' - 45' elevation 130.33 (Step 7.4.3) x 0.40 = 52.132
4. Average 10' - 23' elevation 120.66 (Step 7.5.3) x 0.38 = 45.8508
5. Average below 5' elevation 99.33 (Step 7.6.3) x 0.08 = 7.9464
6. Total 130.6236 (Steps 7.7.1.1 through 7.7.1.5)

7.0 PROCEDURAL STEPS

Initials

NOTE:	Computer point C074 may only be used to satisfy EOP concerns and may **NOT** be used to satisfy Technical Specifications.

7.7.2 **RECORD** computer point C074 value (for information). _____

C074 ___________

NOTE:	Performance of Steps 7.7.3 and 7.7.4 is only required once a month (perform on the first day of the month).

7.7.3 **SUBTRACT** the value obtained in Step 7.7.2 from the value obtained in Step 7.7.1.6. _____

_____________ -	___________ =	__________
Step 7.7.1.6	Step 7.7.2	Difference

7.7.4 **IF** the absolute value of the difference obtained in Step 7.7.3 is greater than 10°F, **THEN ENSURE** that Unit SCO is informed of the discrepancies in the computer point reading (EOP concern). _____

7.7.5 **ENSURE** required information has been recorded on the cover page. _____

7.7.6 **NOTIFY** Unit SCO when this test is complete or found to be unsatisfactory. _____

ATTACHMENT 1
Page 1 of 1
Certification and Review Form

General Comments and Recommendations ______________________________

____

____

	Initials	Name (Print)
Performed by:	________	______________________
	________	______________________
	________	______________________
	________	______________________

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

REVISION SUMMARY

Revision 34 restores 2CAC-TE-1258-20 (4426-2A [channel 6]-5820) that was temporarily removed IAW EC 63061.

Revision 33 incorporates temporary change EC 63061 which temporarily disables temperature indication 2CAC-TE-1258-20 (4426-2A [channel 6]-5820).

Revision 32- Removes the Unit Specific items and associated notes that were added per Temporary Plant Modification ESR 99-00485. Temperature Sensor 2-CAC-TE-1258-22 has been repaired during the refuel outage. This revision also revises terminology for PassPort Implementation.

Revision 31 - This revision removes the notes that specified equivalencies during implementation of ESRs 97-00125 and 97-00051, and changed points A, B, C, D, E, & F to channel 1, 2, 3, 4, 5, & 6.

FIGURE 1
Page 1 of 1
Containment Temperature Worksheet

TIME								
4426-2A (Channel 3)-5823								0.05
4426-2A (Channel 4)-5824	198							
4426-1A (Channel 4)-5822	215							
4426-2B (Channel 1)-5802	168							
4426-1B (Channel 2)-5803	157							0.09
4426-2B (Channel 2)-5804	154							
4426-1B (Channel 3)-5805	133							
4426-2B (Channel 3)-5806	128							
4426-1B (Channel 4)-5807	130							0.40
4426-2B (Channel 4)-5808								
4426-1B (Channel 5)-5809	125							
4426-1A (Channel 3)-5812	120							0.38
4426-2B (Channel 6)-5813	117							
4426-1A (Channel 5)-5817	103							
4426-1A (Channel 6)-5818								0.08
4426-2A (Channel 5)-5819	97							
4426-2A (Channel 6)-5820	98							
AVERAGE TEMPERATURE								

Progress Energy | BRUNSWICK NUCLEAR PLANT | **C** **Continuous Use**

DATE COMPLETED ______________________________
UNIT ______ % PWR__________ GMWE__________
SUPERVISOR____________________________________
REASON FOR TEST (check one or more):
____ Routine surveillance
____ WO # ______________________________
____ Other (explain)______________________________
____
____
____

FREQUENCY:

Once every 24 hours when at least one SPTMS air RTD is inoperable in each division of SPTMS and the unit is in Mode 1, 2, or 3.

PLANT OPERATING MANUAL

VOLUME X

PERIODIC TEST

UNIT
0

0PT-16.2

DRYWELL VOLUMETRIC AVERAGE TEMPERATURE

REVISION 34

1.0 PURPOSE

1.1 This test is performed to determine the operability of the drywell in conformance with the requirements specified in Technical Specification SR 3.6.1.4.1.

1.2 This test involves averaging air temperatures within the drywell.

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR, Section 6.2

2.3 System Description SD-24, Containment Atmosphere Control System

2.4 EER 93-578 (SPTMS Air RTD Divisions/Channels Defined)

2.5 2SP-95-208, Temperature Measurement for SPTMS RTD

2.6 ESR 98-00387, Rev. 0, TS Change to Containment/Drywell Air Temperature Requirements

3.0 PREREQUISITES

None Applicable

4.0 PRECAUTIONS AND LIMITATIONS

None Applicable

5.0 SPECIAL TOOLS AND EQUIPMENT

Calculator

6.0 ACCEPTANCE CRITERIA

This test may be considered satisfactory when the drywell volumetric average temperature is less than or equal to 150°F.

7.0 PROCEDURAL STEPS

Initials

7.1 **OBTAIN** permission from Unit Senior Control Operator (SCO) to perform this test. _____

NOTE:	Figure 1 may be used as a worksheet but is **NOT** required to be retained with this PT.
NOTE:	All temperatures used in this procedure should be rounded off to the nearest tenth of a degree.
NOTE:	Primary containment temperatures may be obtained from the CAC-TY-4426-1(2) microprocessor per OP-24, Operator Interface With The SPTMS Microprocessors, from the recorders in the Control Room, from ERFIS display screens 740 and 745 of the Validation Menu; or as a backup method, the designated process computer points may be used. Microprocessor point values may also be obtained by I&C manually taking temperature measurements of SPTMS RTDs.
NOTE:	Technical Specifications requires at least one operable temperature detector in each channel for each location.

7.0 PROCEDURAL STEPS

Initials

7.2 90' Elevation And Above

7.2.1 **OBTAIN** drywell temperature for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-2A Channel 3 ______	(5823) _____	II	N/A
4426-2A Channel 4 ______	(5824) _____	II	N/A
4426-1A Channel 4 ______	(5822) _____	I	N/A

7.2.2 **ADD** the recorded temperatures **AND RECORD** the total in the following space: _____

_______________________ - Recorder/ERFIS display total

_______________________ - SPTMS total

7.2.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 90' elevation and above in the following space: _____

_____________ ÷ _________________ = _____________

total no. of temperatures average

7.0 PROCEDURAL STEPS

Initials

7.3 Between 70' And 80' Elevation

7.3.1 **OBTAIN** drywell temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-2B Channel 1 ______	(5802)_____	II	W109 ___________
4426-1B Channel 2 ______	(5803) _____	I	F148 ___________
4426-2B Channel 2 ______	(5804) _____	II	W110 ___________

NOTE: Notify BESS duty manager if any temperatures between 70' and 80' elevation exceed 240°F.

7.3.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

____________________ - Recorder/ERFIS display total
____________________ - SPTMS total
____________________ - PPC total

7.3.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 70' - 80' elevation in the following space: _____

____________ ÷ _______________ = _____________
total no. of temperatures average

7.0 PROCEDURAL STEPS

Initials

7.4 Between 28' And 45' Elevation

7.4.1 **OBTAIN** drywell temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-1B Channel 3 ______	(5805)_____	I	F149 ____________
4426-2B Channel 3 ______	(5806) _____	II	W085 ____________
4426-1B Channel 4 ______	(5807) _____	I	F150 ____________
4426-2B Channel 4 ______	(5808) _____	II	W086 ____________

7.4.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

____________________ - Recorder/ERFIS display total
____________________ - SPTMS total
____________________ - PPC total

7.4.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 28' - 45' elevation in the following space: _____

___________ ÷ ________________ = ___________
total no. of temperatures average

7.5 Between 10' And 23' Elevation

7.5.1 **OBTAIN** drywell temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-1B Channel 5 ______	(5809) _____	I	F151 ____________
4426-1A Channel 3 ______	(5812) _____	I	W105 ____________
4426-2B Channel 6 ______	(5813) _____	II	W088 ____________

7.0 PROCEDURAL STEPS

Initials

7.5.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

______________________ - Recorder/ERFIS display total
______________________ - SPTMS total
______________________ - PPC total

7.5.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the 10' - 23' elevation in the following space: _____

________________ ÷ __________________ = ___________
total no. of temperatures average

7.6 Below 5' Elevation

7.6.1 **OBTAIN** primary containment temperatures for the locations listed below **AND RECORD** in the spaces provided. _____

Recorder/ERFIS Display	SPTMS	CHAN	PPC
4426-1A Channel 5 ______	(5817)_____	I	W106 ____________
4426-1A Channel 6 ______	(5818) _____	I	W107 ____________
4426-2A Channel 5 ______	(5819) _____	II	W115 ____________
4426-2A Channel 6 ______	(5820) _____	II	W116 ____________

CAUTION

If microprocessor is used to obtain data, failure to restore mode selector switch to the ERFIS (NORMAL) position will cause loss of SPTMS indications on the ERFIS Control Room displays.

7.6.2 **ADD** the recorded temperatures **AND RECORD** the total in the following spaces: _____

______________________ - Recorder/ERFIS display total
______________________ - SPTMS total
______________________ - PPC total

7.0 PROCEDURAL STEPS

Initials

7.6.3 **DIVIDE** the total by the number of temperatures used to obtain the average temperature for the below 5' elevation in the following space: _____

____________ ÷ ________________ = ___________

total no. of temperatures average

NOTE:	The total in Step 7.7.1.6 is the volumetric average temperature for the drywell. If this temperature is greater than 150°F, actions should be taken as required by Technical Specification SR 3.6.1.4.1.

7.7 Volumetric Average

7.7.1 **DETERMINE** the volumetric average temperature by performing the following calculations: _____

1. Average above 90' elevation ________ x 0.05 =_________
   Step 7.2.3

2. Average 70' - 80' elevation _________ x 0.09 =_________
   Step 7.3.3

3. Average 28' - 45' elevation _________ x 0.40 =_________
   Step 7.4.3

4. Average 10' - 23' elevation _________ x 0.38 =_________
   Step 7.5.3

5. Average below 5' elevation _________ x 0.08 =_________
   Step 7.6.3

6. Total_____________________________
   Steps 7.7.1.1 through 7.7.1.5

7.0 PROCEDURAL STEPS

Initials

NOTE:	Computer point C074 may only be used to satisfy EOP concerns and may **NOT** be used to satisfy Technical Specifications.

7.7.2 **RECORD** computer point C074 value (for information). _____

C074 ___________

NOTE:	Performance of Steps 7.7.3 and 7.7.4 is only required once a month (perform on the first day of the month).

7.7.3 **SUBTRACT** the value obtained in Step 7.7.2 from the value obtained in Step 7.7.1.6. _____

_____________ - ___________ = __________

Step 7.7.1.6 Step 7.7.2 Difference

7.7.4 **IF** the absolute value of the difference obtained in Step 7.7.3 is greater than 10°F, **THEN ENSURE** that Unit SCO is informed of the discrepancies in the computer point reading (EOP concern). _____

7.7.5 **ENSURE** required information has been recorded on the cover page. _____

7.7.6 **NOTIFY** Unit SCO when this test is complete or found to be unsatisfactory. _____

Certification and Review Form

General Comments and Recommendations ____________________

____

____

	Initials	Name (Print)
Performed by:	________	____________________
	________	____________________
	________	____________________
	________	____________________

Exceptions to satisfactory performance ____________________

____

Corrective action required ____________________

____

Test procedure has been satisfactorily completed:

Unit SCO: ____________________ ________
Signature Date

Test procedure has **NOT** been satisfactorily completed:

Unit SCO: ____________________ ________
Signature Date

Test has been reviewed by:

Shift Superintendent: ____________________ ________
Signature Date

FIGURE 1

Page 1 of 1

Containment Temperature Worksheet

TIME	TODAY NOW							
4426-2A (Channel 3)-5823	198							0.05
4426-2A (Channel 4)-5824	215							
4426-1A (Channel 4)-5822 INOP	255							
4426-2B (Channel 1)-5802	168							
4426-1B (Channel 2)-5803	157							0.09
4426-2B (Channel 2)-5804	154							
4426-1B (Channel 3)-5805	133							
4426-2B (Channel 3)-5806	128							
4426-1B (Channel 4)-5807	130							0.40
4426-2B (Channel 4)-5808 INOP	165							
4426-1B (Channel 5)-5809	125							
4426-1A (Channel 3)-5812	120							0.38
4426-2B (Channel 6)-5813	117							
4426-1A (Channel 5)-5817	103							
4426-1A (Channel 6)-5818 INOP	113							0.08
4426-2A (Channel 5)-5819	97							
4426-2A (Channel 6)-5820	98							
AVERAGE TEMPERATURE								

REVISION SUMMARY

Revision 34 restores 2CAC-TE-1258-20 (4426-2A [channel 6]-5820) that was temporarily removed IAW EC 63061.

Revision 33 incorporates temporary change EC 63061 which temporarily disables temperature indication 2CAC-TE-1258-20 (4426-2A [channel 6]-5820).

Revision 32- Removes the Unit Specific items and associated notes that were added per Temporary Plant Modification ESR 99-00485. Temperature Sensor 2-CAC-TE-1258-22 has been repaired during the refuel outage. This revision also revises terminology for PassPort Implementation.

Revision 31 - This revision removes the notes that specified equivalencies during implementation of ESRs 97-00125 and 97-00051, and changed points A, B, C, D, E, & F to channel 1, 2, 3, 4, 5, & 6.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE
A-1A-R

LESSON TITLE: Determine SRM/IRM Overlap Per GP-02.

LESSON NUMBER: LOT-OJT-JP-307-A03

REVISION NO: 0

SAFETY CONSIDERATIONS:

None.

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL NOT** 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.

Read the following to trainee.

TASK CONDITIONS:

1. Unit One (1) startup is being performed per 0GP-02.
2. Initial (pre-startup) SRM and IRM readings were recorded as follows:

SRM Channel	Reading	IRM Channel	Reading*
A	100 CPS	A	3%
B	150 CPS	B	2%
C	150 CPS	C	4%
D	100 CPS	D	5%
		E	8%
		F	6%
		G	3%
		H	5%

3. Current SRM and IRM readings are as follows:

SRM Channel	Reading	IRM Channel	Reading*
A	2×10^5 CPS	A	11%
B	9×10^4 CPS	B	14%
C	4×10^5 CPS	C	16%
D	3×10^5 CPS	D	10%
		E	15%
		F	18%
		G	14%
		H	17%

*** All IRM Readings taken on Range One From the Bar Graph Recorder (0-125%)**

INITIATING CUE:

You are directed to determine if proper SRM/IRM overlap exists in accordance with GP-02.

It is NOT desired to use the highest reading IRM (pre-startup) for overlap criteria for all IRMs.

For each IRM channel, state if overlap is met.

State required GP actions, if any, based on your results.

PERFORMANCE CHECKLIST

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

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 not met for IRM A and D based on not reading 10% of scale.

Determined that SRM/IRM overlap criteria is not met for IRM A and D based on not reading 10% of scale.

X **SAT/UNSAT***

Step 3 – Determine SRM/IRM overlap criteria is not met for IRM E based on not reading double the initial reading.

Determined that SRM/IRM overlap criteria is not met for IRM E based on not reading double the initial reading.

X **SAT/UNSAT***

Step 4 – Determine GP-02 requires the Reactor Engineer be notified and Technical Specification LCO 3.3.1.1 be referenced.

Determined that GP-02 requires the Reactor Engineer be notified and Technical Specification 3.3.1.1 be referenced.

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

<u>TERMINATING CUE:</u> When SRM/IRM overlap determination has been made, this JPM is complete.

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

RELATED TASKS:

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

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.7 4.4 / 4.7

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.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2. Supplement 1):

Admin – Conduct of Operations

Time Required for Completion: 10 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ŏ Actual ___ Unit: ____

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

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

Alternate Path: Yes ___ No ŏ

EVALUATION

Trainee:______________________________ SSN: ___________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. Unit One startup is being performed per 0GP-02.
2. Initial (pre-startup) SRM and IRM readings were recorded as follows:

SRM Channel	Reading	IRM Channel	Reading*
A	100 CPS	A	3%
B	150 CPS	B	2%
C	150 CPS	C	4%
D	100 CPS	D	5%
		E	8%
		F	6%
		G	3%
		H	5%

3. Current SRM and IRM readings are as follows:

SRM Channel	Reading	IRM Channel	Reading*
A	2×10^5 CPS	A	11%
B	9×10^4 CPS	B	14%
C	4×10^5 CPS	C	16%
D	3×10^5 CPS	D	10%
		E	15%
		F	18%
		G	14%
		H	17%

*** All IRM Readings taken on Range One From the Bar Graph Recorder (0-125%)**

A X　　B
C　　D X
E X　　F
G　　H

INITIATING CUE:

You are directed to ~~determine if~~ verify proper SRM/IRM overlap exists in accordance with GP-02.

It is NOT desired to use the highest reading IRM (pre-startup) for overlap criteria for all IRMs.

~~For each IRM channel, state if overlap is met.~~

~~State required GP actions, if any, based on your results.~~

PLANT OPERATING MANUAL

VOLUME IV

GENERAL PLANT OPERATING PROCEDURE

UNIT
0

0GP-02

APPROACH TO CRITICALITY AND PRESSURIZATION OF THE REACTOR

REVISION 89

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)

2.38 OPS-NGGC-1306, Reactivity Management Program

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 1500-3000 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 airborne radioactive contamination and a possible moisture excursion in the Turbine-Generator Lube Oil System.

3.13 Pressure /temperature relationship during operation shall be in accordance with Technical Specifications Figure 3.4.9-2.

4.0 PREREQUISITES

Unit___ Date/Time Started________/_____

Initials

4.1 Preparations for a reactor startup are in progress in accordance with 0GP-01. ______

4.2 Reactor water level is between 182 and 192 inches. ______

5.0 PROCEDURAL STEPS

5.1 Administrative

R37 5.1.1 **ENSURE** review and implementation of 0GP-02, Attachment 1 is complete. ______

5.1.2 **ANNOUNCE** on the PA System primary and secondary containment are in effect **AND** reactor startup is commencing. ______

5.1.3 **NOTIFY** Load Dispatcher of impending startup. ______

5.1.4 **OBTAIN** guidance from the Reactor Engineer for single notch or continuous rod withdrawal. ______

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. _____

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. _____

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

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

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* ___/___ Ind.Ver.

   b. *OPERATOR'S DISPLAY KEYLOCK SWITCH* ___/___ 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). _____

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: **IF** greater than one SRM is determined to be inoperable prior to establishing overlap with the IRM s, **THEN NOTIFY** the Shift Operations Manager or Manager Operations to determine if reactor startup should continue.

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.

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

5.0 PROCEDURAL STEPS

Initials

NOTE:	**WHEN** performing 'doubling' calculations, start with the values indicated on the SRM s. Example: If the indicated SRM value is 100 cpm then (2 X 100 =200) 200 cpm is the FIRST 'doubling', then 800 cpm is the third 'doubling' recorded in Step 5.2.6.1, and 3200 cpm is the fifth 'doubling' value to be recorded in Step 5.2.6.2.

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

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

5.2.7 **RECORD** the IRM channel indications in the Reactor Operator's Log for use in determining SRM/IRM overlap in Step 5.2.19. _____

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). _____

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

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

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 GP-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.

CAUTION

Operations management, a Senior Technical Advisor (STA) and a Reactor Engineer should be present in the Control Room during approaches to criticality in accordance with OPS-NGGC-1306, Reactivity Management Program.

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

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

5.0 PROCEDURAL STEPS

Initials

> **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 5.2.12 **MONITOR** the following for indications of criticality **AND CONFIRM** SRM levels are increasing as control rods are being withdrawn: _____

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

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

R37 5.2.14 **OBSERVE** the SRM channels for the following indications of criticality: _____

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

5.2.15 **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. _____

5.0 PROCEDURAL STEPS

Initials

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

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

5.2.17 **ANNOUNCE** the reactor is critical on the PA system. _____

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

5.0 PROCEDURAL STEPS

Initials

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 x 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.

5.2.19 **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 2 x 10^5 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.

5.2.20 **WHEN** SRM/IRM overlap has been verified, **THEN WITHDRAW** SRM detectors as required to maintain an indicated SRM count rate between 10^2 cps and 2 x 10^5 cps. _____

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.

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

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

5.2.23 **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 **IF** unit startup is from a shutdown greater than three days with the Off-Gas Trains out of service, **THEN REQUEST** I&C fill SJAE Level Instrument Reference Legs in preparation for placing SJAEs in service. _____

5.3.9 **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. **CLOSE** *SPE 1(2)A RECIRCULATION LINE ISOLATION VALVE, OG-V122.* _____

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

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

e. **CLOSE** *SPE 1(2)B RECIRCULATION LINE ISOLATION VALVE, OG-V123.* _____

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

5.3.10 **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)*. _____

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

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) _____

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). _____

5.0 PROCEDURAL STEPS

Initials

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

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

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

1. *RESERVOIR DRAIN VALVE, 1(2)OG-V71.* _____
2. *RESERVOIR DRAIN VALVE, 1(2)OG-V81.* _____

5.3.15 **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.* _____

NOTE:	Attempting to start a SPE Fan with water in the shell side of the cooler may result in tripping the fan motor breaker. Sufficient draining is indicated by a stream of water less than the size of a pencil at the drain pipe discharge.

5.3.16 **PRIOR** to reaching 50 psig reactor pressure, **ENSURE** both SPE inlet pipes and SPE condenser shell sides are drained by performing the following:

1. **OBSERVE** the drains for *1(2)A SHELL DRAIN VALVE, 1(2)MVD-V39*, and *SPE 1(2)A SHELL DRAIN VALVE, 1(2)MVD-V40* **AND ENSURE** the shell side of 1(2)A SPE is drained sufficiently to allow starting the 1(2)A SPE FAN. _____
2. **OBSERVE** the drains for *SPE 1(2)B SHELL DRAIN VALVE, 1(2)MVD-V42*, and *SPE 1(2)B SHELL DRAIN VALVE, 1(2)MVD-V43* **AND ENSURE** the shell side of 1(2)B SPE is drained sufficiently to allow starting the 1(2)B SPE FAN. _____

5.0 PROCEDURAL STEPS

Initials

CAUTION

The amount of time sealing steam is applied without the Steam Packing Exhauster (SPE) in operation should be minimized to prevent airborne radioactive contamination in the Turbine Building and a possible moisture excursion in the Turbine-Generator Lube Oil System.

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

1. **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 _____

2. **THROTTLE OPEN** *STEAM SEAL SPE 1(2)A MO DISCH VLV, OG-MOV-D1,* **OR** *STEAM SEAL SPE 1(2)B MO DISCH VLV, OG-MOV-D2* for 5 seconds. _____

NOTE: The time delay between opening OG-MOV-D1(2) and starting the SPE Fan is to allow the SPE fan housing to drain prior to placing in service.

3. **WHEN** approximately 3-5 minutes after Step 5.3.17.2 have elapsed**, THEN START** *STEAM PACKING EXHAUSTER SPE A* **OR** *STEAM PACKING EXHAUSTER SPE B.* _____

4. **ENSURE** *STEAM SEAL SPE 1(2)A MO INLET VLV, 1(2)OG-MOV-E1* **OR** *STEAM SEAL SPE 1(2)B MO INLET VLV, 1(2)OG-MOV-E2* is open. _____

5. **ENSURE** *STEAM SEAL BYPASS UNLOADING VALVE, MVD-B*, is closed. _____

6. **OPEN** *MN STEAM TO SEALS VLV, MVD-S1.* _____

5.0 PROCEDURAL STEPS

Initials

NOTE:	Steps 5.3.17.7 and 5.3.17.8 should be performed in parallel until stable system operation is established.

7. **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. _____

8. **THROTTLE OPEN** *STEAM SEAL SPE 1(2)A MO DISCH VLV, OG-MOV-D1,* **OR** *STEAM SEAL SPE 1(2)B MO DISCH VLV, OG-MOV-D2* as necessary, to maintain *GLAND EXHAUST HEADER, OG-PI-EPT-9*, located on Panel XU-2, between 10 to 20 inches of water vacuum. _____

9. **WHEN** Steps 5.3.17.7 and 5.3.17.8 are complete, **THEN OPEN** *SPE 1(2)A RECIRCULATION LINE ISOLATION VALVE, OG-V122,* **AND** *SPE 1(2)B RECIRCULATION LINE ISOLATION VALVE, OG-V123.* _____

10. **THROTTLE OPEN** *STEAM SEAL SPE 1(2)A MO DISCH VLV, OG-MOV-D1,* **OR** *STEAM SEAL SPE 1(2)B MO DISCH VLV, OG-MOV-D2* as necessary, to maintain *GLAND EXHAUST HEADER, OG-PI-EPT-9*, located on Panel XU-2, between 10 to 20 inches of water vacuum. _____

11. **ENSURE** the inlet valve for the non operating Steam Packing Exhauster is closed.

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

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

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 5.3.18 **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.

5.3.19 **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. _____

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

5.0 PROCEDURAL STEPS

Initials

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

5.3.20 **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.

5.3.21 **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.

5.3.22 **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. _____

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

5.0 PROCEDURAL STEPS

Initials

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, **OBTAIN** Unit SCO concurrence to open the affected valve until dual indication is achieved, **THEN PLACE AND HOLD** the control switch in *CLOSE* for at least 20 seconds after full closed indication is received (green lamp lit and red lamp extinguished).

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

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

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

5.3.27 **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 1500-3000 gpm.

NOTE: **WHEN** opening valves *B21-F032A* and *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

Valves *B21-F032A* and *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.

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

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

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

5.3.31 **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

5.3.32 **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.

5.3.33 **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%. _____

5.3.34 **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*. _____

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

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

5.0 PROCEDURAL STEPS

Initials

> **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.

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

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5.3.37 **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 approximately one week. _____

5.3.38 **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 $\leq$ 138 psig.

5.3.39 **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. _____

5.0 PROCEDURAL STEPS

Initials

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.

5.3.40 **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

5.3.41 **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

5.3.42 **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. ______

5.0 PROCEDURAL STEPS

Initials

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

5.3.43 **CONTINUE** heatup and pressurization of the unit as follows:

1. Preferred Method: **ALLOW** one Bypass Valve to open at least 25%, **THEN JOG** the pressure regulator setpoint to establish a reactor heatup (do **NOT** exceed 100°F per hour heatup rate). _____

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

5.3.44 **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. _____

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

5.0 PROCEDURAL STEPS

Initials

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.

5.3.46 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. _____

5.0 PROCEDURAL STEPS

Initials

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> **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 5.3.47 **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*. _____

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.

5.3.48 **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*. _____

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

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

5.3.51 **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)*. _____

5.3.52 **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. _____

5.0 PROCEDURAL STEPS

Initials

5.3.53 **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.

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

5.3.55 **WHEN** Condensate Booster Pump discharge pressure decreases to approximately 380 psig, **THEN PLACE** a second Condensate Booster Pump in service in accordance with 1(2)OP-32. _____

NOTE: The nominal setpoint of the pressure regulator is 928 psig, 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.

5.3.56 **WHEN** one Reactor Feed Pump is in operation, **THEN INCREASE** the setpoint of the pressure regulator to 928 psig, while maintaining a heatup rate of less than 100°F an hour. _____

5.0 PROCEDURAL STEPS

Initials

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

5.3.58 **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. _____

5.3.59 **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.
6. *MAIN STEAM LINE DRAIN INBD ISOL VLV, B21-F016.* ___/___ Ind.Ver.

5.3.60 **WHEN** Reactor Feed Pump 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. _____

5.0 PROCEDURAL STEPS Initials

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. _____

5.0 PROCEDURAL STEPS

Initials

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.
**Complete within 48 hours after reactor pressure reaches 928 psig.
***Complete within 12 hours after reactor pressure reaches 928 psig.

5.3.61 **IF** 0PT-11.1.2 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig to document the start of the 12-hour interval allowed to perform 0PT-11.1.2. _____

_______________ Date _______________ Time

5.3.62 **IF** 0PT-10.1.1 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig to document the start of the 24-hour interval allowed to perform 0PT-10.1.1. _____

_______________ Date _______________ Time

5.3.63 **IF** 0PT-09.2 is **NOT** current, **THEN RECORD** when reactor pressure reaches 928 psig to document the start of the 48-hour interval allowed to perform 0PT-09.2. _____

_______________ Date _______________ Time

5.0 PROCEDURAL STEPS

Initials

Date/Time Completed ____________________

Performed By (Print)	Initials
______________________________	______
______________________________	______
______________________________	______
______________________________	______

Reviewed By: ______________________________
Unit SCO

COMMENTS

____

____

____

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 89: Added steps to close the SPE recirculation line isolation valve (5.3.9.2.b/e) and open (5.3.17.9). Also added Step 5.3.17.10 to adjust vacuum if required. Also added a 3-5 minute delay between opening OG-MOV-D1(2) in step 5.3.17.2 and starting the SPE in 5.3.17.3 and associated note explaining the reason for the delay. This change is required to match the guidance in 1(2)OP-26.1. (PRR00276678).

Revision 88: Step added to provide instruction to request I&C fill the SJAE Level Instrument reference legs to prevent delays in startup when placing the SJAEs in service (PRR 229647). Revised step for heatup of the unit to allow opening a Bypass valve and jogging the pressure regulator (PRR 228680).

Revision 87 is an editorial correction to correct Step 5.3.36 to be consistent with the wording in the referenced LER. The requirement in the LER is for the RCIC System Operability Test to be scheduled within approximately one week.

Revision 86 incorporates new SRM Rod Block setpoint to 2 x 10^5 cps for Unit 1 in accordance with EC 59816.

Revision 85 incorporates new SRM Rod Block setpoint to 2 x 10^5 cps for Unit 2 in accordance with EC 59816.

Revision 84: Revision to Precaution and Limitation 3.8 and note prior to 5.3.27 to change the minimum flow through CDD s when feeding the RPV to 1500 gpm from 2000 gpm as in 0OP-32.1 (PRR 187718). Revision to caution to provide additional information on how to fully close throttle valves in the Feedwater System prior to opening the Feedwater Line Stops to prevent a possible cold water injection (PRR 180408). Revision to add Caution for to ensure Control Room Staffing meets the requirements in OPS-NGGC-1306 during approach to criticality (NCR 172379). A note has added to notify Operations Management if greater then one SRM is determined to be inoperable prior to achieving SRM/IRM overlap (NCR 204216, PRR 204527).

Revision 83: Editorial change to delete note before 5.3.16.2.

Revision 82 incorporates a change to the start up sequence for the Steam Packing Exhauster and Gland Sealing Steam due to trips on the SPE causing delays in establishing vacuum allowing steam to leak past the Main Turbine Seals causing a possible moisture excursion in the Turbine-Generator Lube Oil System. Included in the revision is a note providing guidance on how to perform the SRM 'doubling' calculation.

Revision 81 incorporates NCR 156480 to ensure the correct Power-Flow Map is selected prior to Control Rod withdrawal.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

ADMINISTRATIVE

A-2-S

LESSON TITLE: Evaluate a Clearance Request - CRD Pump 2A.

LESSON NUMBER: LOT-OJT-JP-201-E01

REVISION NO: 01

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable prints D-02516 SH1A & 1B, D-02538 SH2, LL-09113 SH32, and Attachments 2 & 4 of OPS-NGGC-1301 **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. The attached forms from OPS-NGGC-1301 are intended to provide a guide to the evaluator and are **NOT** to be given to the examinee. Attachments 2 & 4 of OPS-NGGC-1301 should be filled out using actual copies of forms from OPS-NGGC-1301 and given to the examinee.
4. The evaluator should have available copies of valve lineups from 2OP-08 & 21 to support performance of JPM if the examinee asks for them.

Read the following to trainee.

TASK CONDITIONS:

1. You are an operator in the Work Control Center. Passport is not available for use.
2. Maintenance has prepared a Clearance Request to place CRD Pump 2A under clearance for scheduled work. CRD Pump 2B will be running.
3. This clearance is to allow maintenance to perform two WOs.
   a. The first WO is to allow maintenance to sample lube oil on CRD Pump 2A motor bearings and speed changer, and to inspect the seal cooling water lines (requires breaking flanges on cooling water lines at the pump).
   b. The second WO is to lift the pump so the pump feet can be honed due to high vibration (requires breaking flanges at the pump).

INITIATING CUE:

The WCC SRO directs you to evaluate the attached proposed Clearance Checklist (Attachment 4 of OPS-NGGC-1301) and determine the adequacy of the clearance boundary, and inform him if the proposed clearance is adequate.

ATTACHMENT 2
Sheet 1 of 1
Clearance Request Form

To be completed by the Requestor. (Please print.)

A. Name Mechanic Supervisor Ext. No. 0000

Work Group Z73 (Mechanical Maintenance) Date: Yesterday

B. (1) Unit # 2

(2) System # 2-C12

(3) Equipment to be cleared 2-C12-C001A, CRD Pump 2A

C. Clearance Specifications

- Fluid Boundary
- System Depressurized and Drained
- Power Supply breaker racked out/off
-
-
-
-

D. Reference drawings and procedures (attach list if necessary)

- D-02516 SH1A & 1B, D-02538 SH2, LL-09113 SH32, 2OP-08, 2OP-21

E. Special requests, precautions, and prerequisites

Need SS Waiver of 2 isolation valve requirement

F. Date/Time Needed Today / ASAP or Event

ATTACHMENT 4
Sheet 1 of 1
Operations Clearance Checklist

Clearance No. Admin JPM

Page 1 of 1

Checklist Type: Hang

INT	NAME (PRINT)	INT	NAME (PRINT)

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

Seq	Action	Type	Tag Id	Position	Equipment/Component	Completed. By	Verified By *
1	Hang	CIT	1	INFTAH	RTGB Control Switch 2-C12-CS-Z4A		
2	Hang	Red	2	RACOR	Motor Feeder 2-E3-AI2		
3	Hang	Red	3	CLOLOC	Discharge Valve 2-C12-F014A		
4	Hang	Red	4	CLOLOC	Recirc Valve 2-C12-F015A		
5	Hang	Red	5	CLOLOC	Suction Valve 2-C12-F013A		
6	Hang	Red	6	Closed	Cooling Inlet Valve 2-RCC-V295		
7	Hang	Red	7	Closed	Cooling Outlet Valve 2-RCC-V7		
8	Hang	Red	8	Open	Pump Drain Valve 2-C12-V45		
9	Hang	Red	9	Open	Casing Vent Valve 2-C12-F109A		

Continued N

PERFORMANCE CHECKLIST

NOTE: Steps are listed in a logical order, but may be performed in any order.

Step 1 – May obtain a current revision of OPS-NGGC-1301.
Current Revision of OPS-NGGC-1301 obtained.

SAT/UNSAT*

Step 2 – Evaluates CIT INFTAH Tag for the RTGB Control Switch 2-C12-CS-Z4A.
Determines no deficiencies for the info tag.

SAT/UNSAT*

Step 3 – Evaluates Red RACOR Tag for the Motor Feeder 2-E3-AI2.
Identifies deficiency for the breaker number, which should be 2-E3-AJ2.

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

Step 4 – Evaluates Red CLOLOC Tag for the Discharge Valve 2-C12-F014A.
Determines no deficiencies for the locked closed tag.

SAT/UNSAT*

Step 5 – Evaluates Red CLOLOC Tag for the Recirc Valve 2-C12-F015A.
Determines no deficiencies for the locked closed tag.

SAT/UNSAT*

Step 6 – Evaluates Red CLOLOC Tag for the Suction Valve 2-C12-F013A.
Determines no deficiencies for the locked closed tag.

SAT/UNSAT*

Step 7 – Evaluates Red Closed Tag for the Cooling Inlet Valve 2-RCC-V295.
Identifies wrong valve listed, Valve should be 2.RCC-V294.

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

Step 8 – Evaluates Red Closed Tag for the Cooling Outlet Valve 2-RCC-V7.
Identifies wrong valve listed, Valve should be 2.RCC-V8.

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

Step 9 – Evaluates Red Open Tag for the Pump Drain Valve 2-C12-V45.
Determines no deficiencies for the open tag.

SAT/UNSAT*

Step 10 – Evaluates Red Open Tag for the Casing Vent Valve 2-C12-F109A.
Determines no deficiencies for the open tag.

SAT/UNSAT*

Step 11 – Identify the positive seal line isolation valve not included in boundary request.
Determine positive seal pressure valve (2-C12-F017) should be added.
(Red Closed Tag sequenced anywhere after the breaker but before the Drain Valve).

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

Step 12 – Evaluates Sequence of the steps of the clearance.
Determines no deficiencies for the sequence.

SAT/UNSAT*

Step 13 - Inform WCC SRO of results._
WCC SRO informed of results

SAT/UNSAT*

TERMINATING CUE:	When the clearance request has been evaluated for adequacy of the proposed boundary, 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:

Generic 2.2.13 4.1/4.3

Knowledge of tagging and clearance procedures

REFERENCES:

OPS-NGGC-1301

TOOLS AND EQUIPMENT:

Referenced prints and OP lineups.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2. Supp. 1):

Admin - Equipment Control

Time Required for Completion: 35 Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate ŏ Actual ___ Unit: 2

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

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

Alternate Path: Yes ___ No ŏ

EVALUATION

Trainee:_______________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure Revision?: 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 is not available for use.

2) Maintenance has prepared a Clearance Request to place CRD Pump 2A under clearance for scheduled work. CRD Pump 2B will be running.

3) This clearance is to allow maintenance to perform two WOs.

   a) The first WO is to allow maintenance to sample lube oil on CRD Pump 2A motor bearings and speed changer, and to inspect the seal cooling water lines (requires breaking flanges on cooling water lines at the pump).

   b) The second WO is to lift the pump so the pump feet can be honed due to high vibration (requires breaking flanges at the pump).

INITIATING CUE:

The WCC SRO directs you to evaluate the attached proposed Clearance Checklist (Attachment 4 of OPS-NGGC-1301) and determine the adequacy of the clearance boundary, and inform him if the proposed clearance is adequate.

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 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)

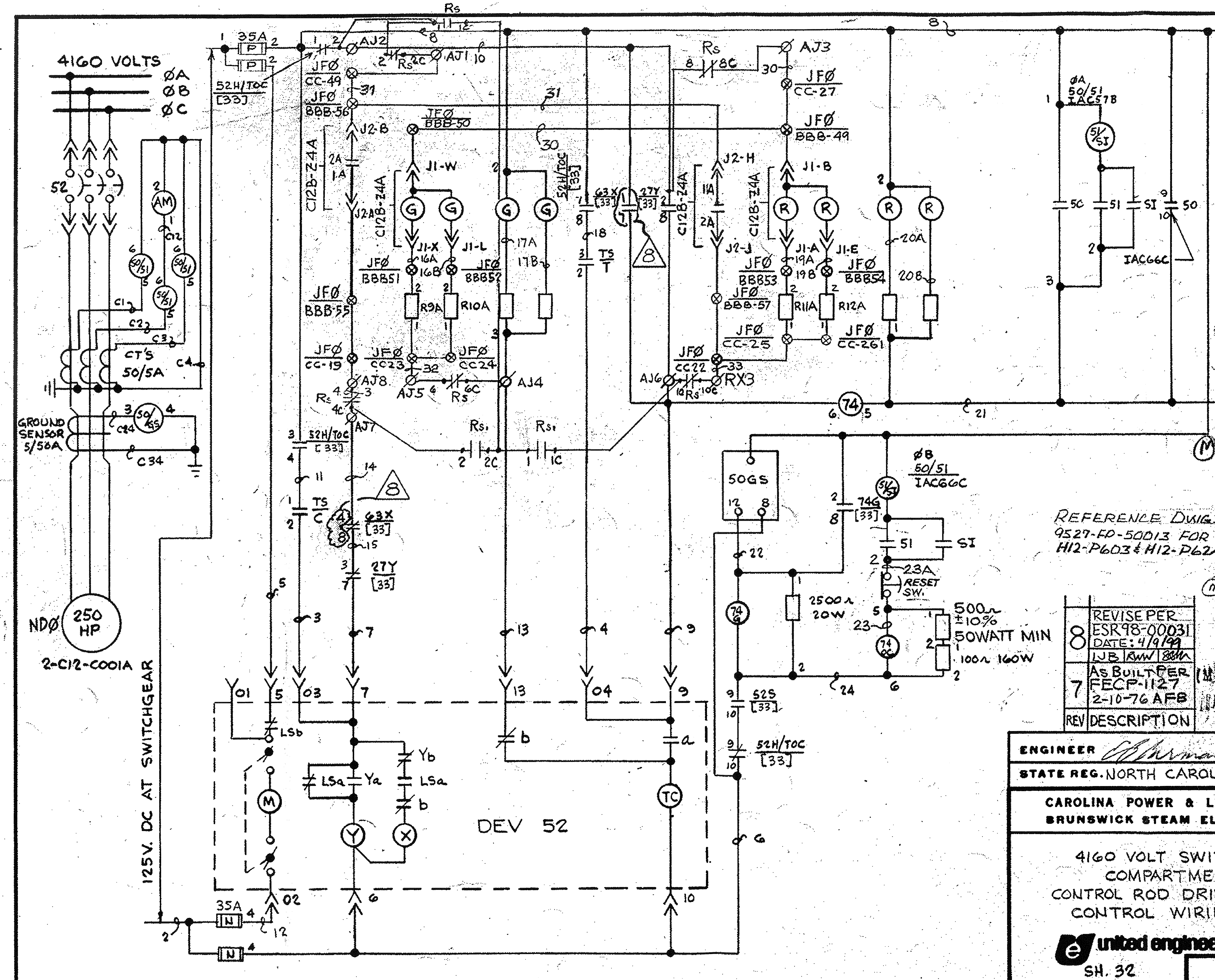
* Independent Verification Required? YES/NO If NO, N/A the Blocks

Seq	Action	Type	Tag Id	Position	Equipment/Component	Completed. By	Verified By *

Continued Y / N

QA RECORD

DRAWING TRANSFERRED TO
THE CUSTODY OF CP&L
REV 7 UC 33762



REV	DESCRIPTION
8	REVISE PER ESR98-00031 DATE: 4/9/99 LJB RWW
7	As Built Per FECP-1127 2-10-76 AFB

REV	DESCRIPTION
6	REV. PER. UBX-7439 3-18-75
5	REV'D PER CPU-0355 JEF
4	REV PER UBX 36A1 7/26/74
3	ADDED TERM. & R6, REV'D WIRING CHG'D PER FDDR-KB1-AW 6-1874
2	CHNG'D CONT. WIRING DIAG. 1/28/74
1	ADDED TERM. NO'S
0	FIRST ISSUE

ENGINEER DATE 10-13-72

STATE REG. NORTH CAROLINA No. 6037

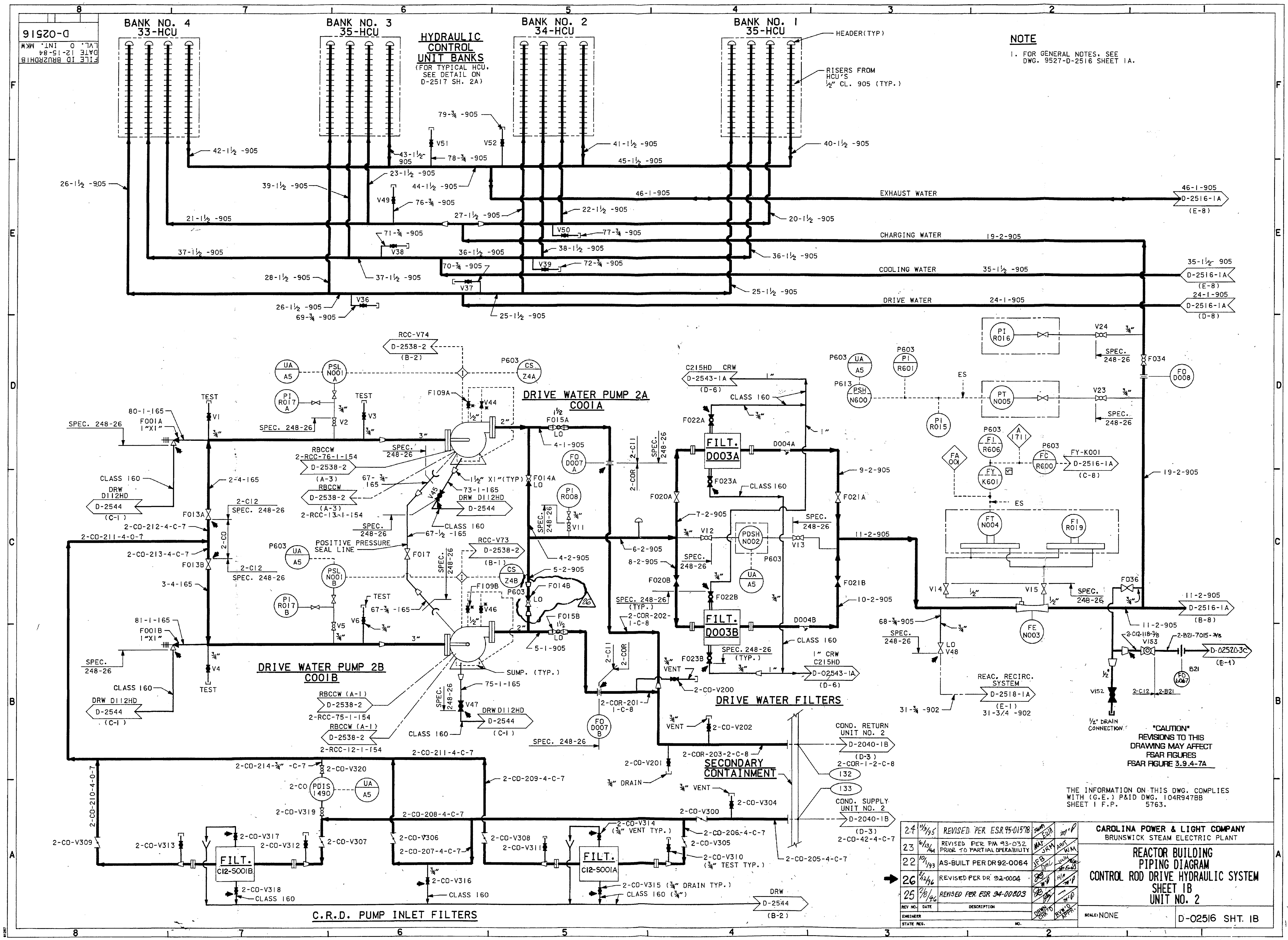
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

4160 VOLT SWITCHGEAR "E3"
COMPARTMENT "AJ2"
CONTROL ROD DRIVE PUMP 2A
CONTROL WIRING DIAGRAM

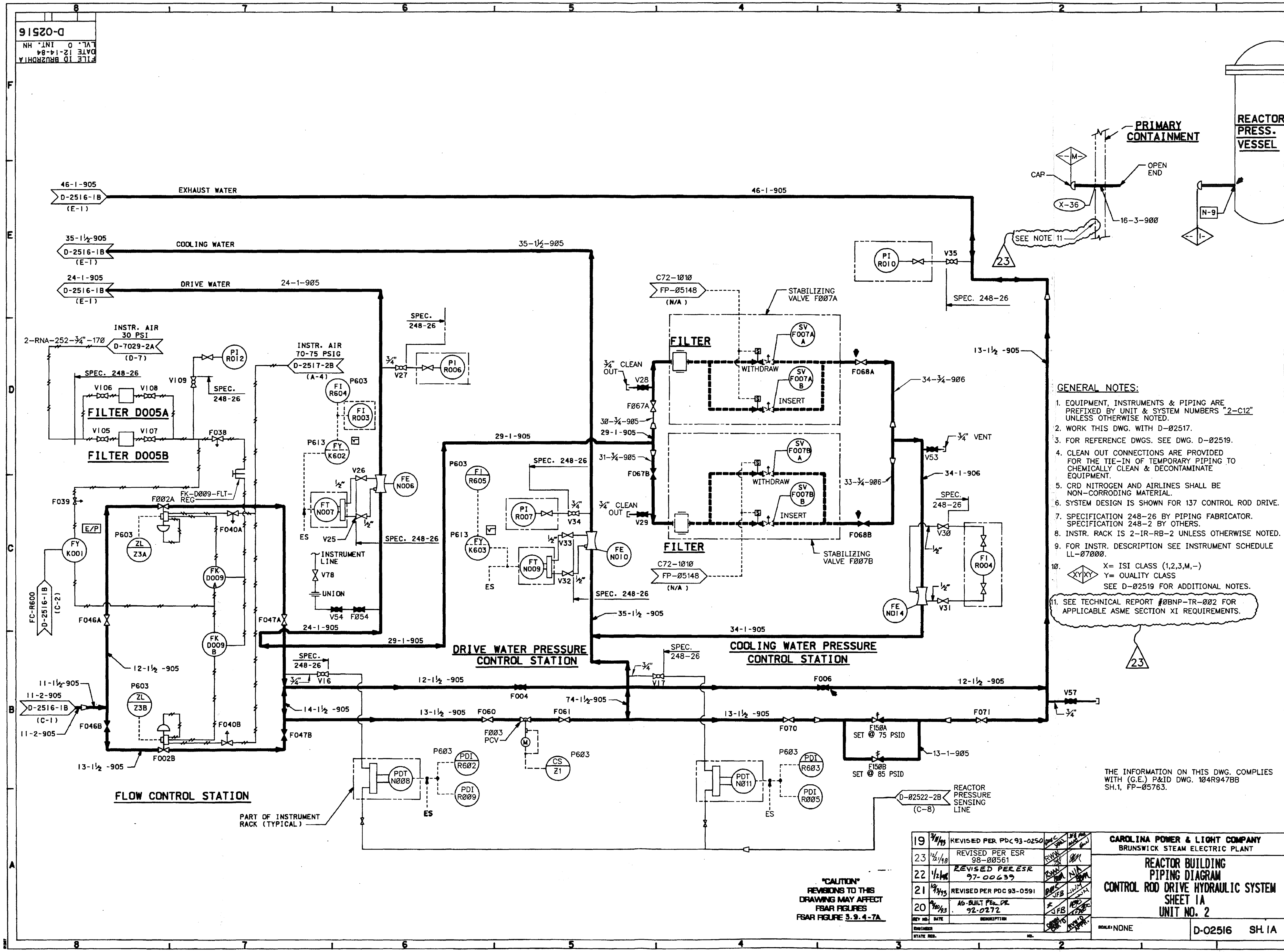
united engineers & constructors inc.

SH. 32

LL-09113



D-02516
FILE ID BRU2DH1B
DATE 12-15-84
LVL. 0 INT. MKW
BANK NO. 4
33-HCU
BANK NO. 3
35-HCU
BANK NO. 2
34-HCU
BANK NO. 1
35-HCU
HYDRAULIC CONTROL UNIT BANKS
(FOR TYPICAL HCU, SEE DETAIL ON D-2517 SH. 2A)
HEADER(TYP)
RISERS FROM HCU'S
1/2" CL. 905 (TYP.)
NOTE
1. FOR GENERAL NOTES, SEE DWG. 9527-D-2516 SHEET 1A.
EXHAUST WATER
CHARGING WATER
COOLING WATER
DRIVE WATER
46-1-905
D-2516-1A
(E-8)
19-2-905
35-1 1/2-905
24-1-905
(D-8)
DRIVE WATER PUMP 2A
C001A
DRIVE WATER PUMP 2B
C001B
POSITIVE PRESSURE SEAL LINE
DRIVE WATER FILTERS
FILT. D003A
FILT. D003B
SECONDARY CONTAINMENT
REAC. RECIRC. SYSTEM
D-2518-1A
COND. RETURN UNIT NO. 2
D-2040-1B
COND. SUPPLY UNIT NO. 2
FILT. C12-S001B
FILT. C12-S001A
C.R.D. PUMP INLET FILTERS
1/2" DRAIN CONNECTION
"CAUTION"
REVISIONS TO THIS DRAWING MAY AFFECT FSAR FIGURES
FSAR FIGURE 3.9.4-7A
THE INFORMATION ON THIS DWG. COMPLIES WITH (G.E.) P&ID DWG. 104R947BB SHEET 1 F.P. 5763.
24 11/3/95 REVISED PER ESR 95-01578
23 6/13/94 REVISED PER PM 93-032 PRIOR TO PARTIAL OPERABILITY
22 10/1/93 AS-BUILT PER DR 92-0064
26 2/12/96 REVISED PER DR 92-0004
25 2/8/96 REVISED PER ESR 94-00603
REV. NO. DATE DESCRIPTION
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
REACTOR BUILDING
PIPING DIAGRAM
CONTROL ROD DRIVE HYDRAULIC SYSTEM
SHEET 1B
UNIT NO. 2
SCALE: NONE
D-02516 SHT. 1B



GENERAL NOTES:

1. EQUIPMENT, INSTRUMENTS & PIPING ARE PREFIXED BY UNIT & SYSTEM NUMBERS "2-C12" UNLESS OTHERWISE NOTED.
2. WORK THIS DWG. WITH D-02517.
3. FOR REFERENCE DWGS. SEE DWG. D-02519.
4. CLEAN OUT CONNECTIONS ARE PROVIDED FOR THE TIE-IN OF TEMPORARY PIPING TO CHEMICALLY CLEAN & DECONTAMINATE EQUIPMENT.
5. CRD NITROGEN AND AIRLINES SHALL BE NON-CORRODING MATERIAL.
6. SYSTEM DESIGN IS SHOWN FOR 137 CONTROL ROD DRIVE.
7. SPECIFICATION 248-26 BY PIPING FABRICATOR. SPECIFICATION 248-2 BY OTHERS.
8. INSTR. RACK IS 2-IR-RB-2 UNLESS OTHERWISE NOTED.
9. FOR INSTR. DESCRIPTION SEE INSTRUMENT SCHEDULE LL-07000.
10. XY: X= ISI CLASS (1,2,3,M,-) Y= QUALITY CLASS SEE D-02519 FOR ADDITIONAL NOTES.
11. SEE TECHNICAL REPORT #0BNP-TR-002 FOR APPLICABLE ASME SECTION XI REQUIREMENTS.

THE INFORMATION ON THIS DWG. COMPLIES WITH (G.E.) P&ID DWG. 104R947BB SH.1, FP-05763.

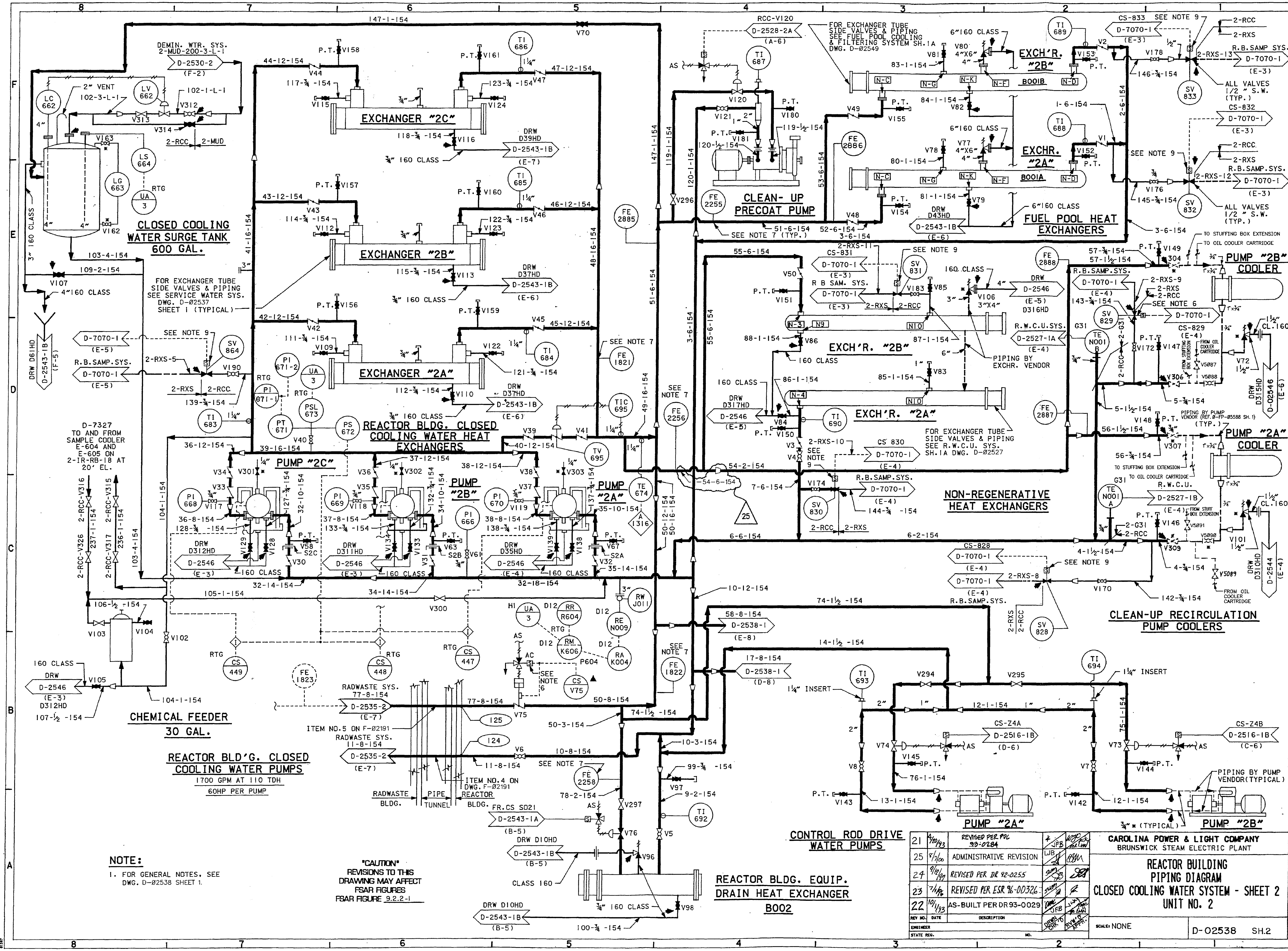
"CAUTION" REVISIONS TO THIS DRAWING MAY AFFECT FSAR FIGURES FSAR FIGURE 3.9.4-7A

REV NO.	DATE	DESCRIPTION
19	3/11/93	REVISED PER PDC 93-0250
23	12/21/10	REVISED PER ESR 98-00561
22	1/12/98	REVISED PER ESR 97-00639
21	12/3/93	REVISED PER PDC 93-0591
20	4/20/93	AS-BUILT PER DR 92-0272

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

REACTOR BUILDING
PIPING DIAGRAM
CONTROL ROD DRIVE HYDRAULIC SYSTEM
SHEET 1A
UNIT NO. 2

SCALE: NONE | D-02516 SH. 1A



CLOSED COOLING WATER SURGE TANK 600 GAL.
EXCHANGER "2C"
EXCHANGER "2B"
EXCHANGER "2A"
REACTOR BLDG. CLOSED COOLING WATER HEAT EXCHANGERS
PUMP "2C"
PUMP "2B"
PUMP "2A"
CHEMICAL FEEDER 30 GAL.
REACTOR BLD'G. CLOSED COOLING WATER PUMPS
1700 GPM AT 110 TDH
60HP PER PUMP
CLEAN- UP PRECOAT PUMP
EXCH'R. "2B" B001B
EXCHR. "2A" B001A
FUEL POOL HEAT EXCHANGERS
EXCH'R. "2B"
EXCH'R. "2A"
NON-REGENERATIVE HEAT EXCHANGERS
PUMP "2B" COOLER
PUMP "2A" COOLER
CLEAN-UP RECIRCULATION PUMP COOLERS
CONTROL ROD DRIVE WATER PUMPS
REACTOR BLDG. EQUIP. DRAIN HEAT EXCHANGER B002
RADWASTE BLDG.
PIPE TUNNEL
REACTOR BLDG.
NOTE:
1. FOR GENERAL NOTES, SEE DWG. D-02538 SHEET 1.
"CAUTION" REVISIONS TO THIS DRAWING MAY AFFECT FSAR FIGURES FSAR FIGURE 9.2.2-1
21 4/20/93 REVISED PER PCL 93-0284
25 9/7/00 ADMINISTRATIVE REVISION
24 9/10/97 REVISED PER DR 92-0255
23 7/4/96 REVISED PER ESR 96-00326
22 10/1/93 AS-BUILT PER DR 93-0029
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
REACTOR BUILDING PIPING DIAGRAM CLOSED COOLING WATER SYSTEM - SHEET 2 UNIT NO. 2
SCALE: NONE
D-02538 SH.2

(See reference disk for all 157 pages of Att. 3.)

Control Rod Drive Hydraulic System Valve Lineup

C
Continuous
Use

PERSON(S) PERFORMING OR VERIFYING LINEUP AND INITIALS
(PRINT)

________________ _____ ________________ _____ ________________ _____

________________ _____ ________________ _____ ________________ _____

________________ _____ ________________ _____ ________________ _____

REMARKS:

DOCUMENT any components **NOT** in required position and reason below.
(Duplicates of this page may be used for additional space, if necessary.)

Started: Date ________________ Time ________________

Completed: Date ________________ Time ________________

Approved by: ________________ ____________ / ________
Unit SCO Date Time

(see reference disk for all 22 pages of Att. 3)

C
Continuous
Use

Reactor Building Closed Cooling Water System Valve Lineup

PERSON(S) PERFORMING OR VERIFYING LINEUP AND INITIALS
(PRINT)

REMARKS: **DOCUMENT** any components **NOT** in required position and reason below. Page may be duplicated as necessary.

Started: Date ____________________ Time ____________________

Completed: Date ____________________ Time ____________________

Approved by: ____________________ ____________ / ____________

Unit SCO Date Time

Progress Energy	**R** **Reference Use**

NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

OPS-NGGC-1301

EQUIPMENT CLEARANCE

REVISION 17

NGG Nuclear Generation Group

TABLE OF CONTENTS

R 2.1.11

1.0 PURPOSE

R 2.5.6

R 2.5.11

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.

R 2.5.12

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 on to 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-SUBS-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 (BNP, HNP, RNP)

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

2.1.9 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

2.3.6 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

2.3.17 NCR 102355, Individuals Not Signing On to Attachment 13s

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 MMM-003, Maintenance Work Requests and Work Request Planning

2.4.8 SCR 90-005, Men At Work Red Tags

2.4.9 ACR 91-061, Insufficient Clearance for PM

2.4.10 ACR 91-237, Sequence for Hanging and Removing Tags

2.4.11 ACR 92-352, Insufficient Understanding of Clearance Process

2.4.12 ACR 94-00127, EDG "A" Starting during Local Clearance Removal

2.4.13 ACR 94-00459, Valve Positioned within Local Clearance Boundary

2.4.14 ACR 94-00686, Removal of Clearance Boundary Valve

2.4.15 ACR 94-01421, Vent/Drain Caps Removed for Clearances

2.4.16 CR 95-0143, Potential Containment Isolation Valve Misposition

2.4.17 CR 95-0011, Incorrect Clearance Restoration Position

2.4.18 CR 95-01090, Improper Use of Sleeving for System Venting/Draining

2.4.19 CR 95-01352, Contaminated Local Clearance Tag Accountability

2.4.20 CR 95-01354, HVH Unit Damper Maintenance

2.4.21 CR 95-02114, IST Evaluation of Maintenance Activities

2.4.22 CR 95-02144, Verifying Personnel on QCHL

2.4.23 CR 95-02373, QCHL Maintenance

2.4.24 CR 96-03104, Clearance Preparation Without Controlled Documents

2.4.25 RAIL 94-R0645, Control of Equipment Inoperable Records

2.4.26 PGM 94-036, Plant General Manager Memo Addressing Review of OSHA Regulations for Electric Utilities

R 2.4.27

2.4.27 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 NGGM-IA-0031, Transmission Florida Interface Agreement for Operation, Maintenance, and Engineering Activities at Crystal River 3 Nuclear Plant

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 NCR 90037, FWP-2B Boundary Change Not Controlled IAW OPS-NGGC-1301

2.5.15 NCR 133321, Valves Restored Improperly Following Maintenance

3.0 DEFINITIONS

3.1 Affected Employee

An individual whose work may be affected by a proposed boundary change.

3.2 Clearance

Instructions used to remove equipment from service for personnel and equipment protection.

3.3 Clearance Assembly

A table that allows users to build lists of Clearance Requests and tasks for assembly into a Clearance Order. A Clearance Request should be assigned to a Clearance Assembly which then allows it to be assigned to a new or existing Clearance Order. For example, a Clearance Assembly can be for all work orders assigned to a particular work week or for all work orders on a specific component/system.

3.4 Clearance Cross Reference

A section within an Operations Clearance that may be used to track work activities associated with work lists and other related clearances.

3.5 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 9.2.1.1.25). Personal Clearances are not accepted electronically in PassPort. The Clearance Holder maintains a current Clearance Holder Training Qualification in PQD.

3.6 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.

3.7 Clearance Preparer

An individual qualified to develop Clearance Orders and Checklists.

3.8 Clearance Tags

Red tags installed on boundary points that isolate equipment from hazards in order to permit work to be performed safely.

3.9 Clearance Worker

An individual signed on to Attachment 13, Operations Clearance Acceptance/Release Form, and authorized to work inside the clearance boundary. Persons signed on to Attachment 13 are required to have received the OSHA required training for Authorized Employees.

3.10 Global Tags

Tags shared by more than one Clearance Order. Global tags cannot be lifted until all Clearance Orders requiring the boundary are lifted. Global tags do not indicate a Clearance Order number on the tag.

3.11 Grounding Device

Equipment used to provide additional protection for personnel when working on electrical equipment. For example, ground straps or grounding breakers.

3.12 Ground Tag

Orange tags installed on grounding devices for the purpose of identifying and tracking installed grounding devices.

3.13 Group Tagout

Multiple Clearance Workers performing assigned work task(s) under the direction of a Principal Clearance Holder.

3.14 Independent Verifier

An individual qualified to verify components are positioned correctly and tags are installed and removed according to the provisions of this procedure.

3.15 Matrix Clearance

An Operations Clearance where the specific boundary steps required are specified for each associated work order task. The Matrix association requires the steps identified for each task to be completed in order for a clearance holder to accept the Clearance Order for that work order task. The Matrix is built for each task by using "MATRIX-DEF" as the holder and assigning the required steps to that task on the Matrix panel. Matrix Clearances may have multiple hang checklists to establish system boundaries. When lifting portions of the Matrix Clearance, the boundary change process is used.

3.16 Model Clearance

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.

3.17 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.

3.18 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; It is acceptable for Personal Clearance to remain hanging for greater than one shift when the work does not impact power plant equipment.

For CR3 only, Personal Clearances are performed in accordance with site procedures.

3.19 Personal Clearance Preparer

An individual qualified to develop Personal Clearances.

3.20 Principal Clearance Holder

A designated Clearance Holder who has electronically accepted the clearance, (except as provided in paragraph 9.2.1.1.25), 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.

3.21 Principal Equipment

The pieces of equipment cleared for work. The equipment must be a valid piece of equipment from the PassPort Equipment Database.

3.22 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.

3.23 Requestor

The individual who initiates a clearance or a boundary change request.

3.24 Tag Hanger

An individual qualified to manipulate equipment and hang and remove tags according to the provisions of this procedure.

3.25 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.

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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 Independent 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 shall not accept a clearance by signing on to Attachment 13, working under the direction of a Principal Clearance Holder.

4.10.7 Clearance Holders shall accept a clearance electronically, using PassPort, except as provided in paragraph 9.2.1.1.25. 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 on to 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 General Administration (Cont.)

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 General Administration (Cont.)

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, 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 **General Administration** (Cont.)

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 <u>not</u> be operated for any purpose while under clearance. The following are exceptions to this requirement:

1. Verification of required valve position by the clearance Independent Verifier.

2. Additional torquing of boundary valves to gain adequate isolation. If personnel determine that torquing of boundary valves is needed, the WCC must be notified. The WCC will determine how best to perform and to document the additional valve torquing.

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 General Administration (Cont.)

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.

9.1.19 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.

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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 the applicable portions of a system and electrical lineup is required to be performed prior to placing the system in service. When plant conditions eliminate a majority of the hazards, but energy sources still exist which need isolated and tagged (such as Auxiliary Steam sources), plant conditions in conjunction with a clearance may be used to allow the work to be performed safely. When relying on plant conditions to perform work safely without a clearance, perform the following:

1. An SRO shall determine the plant Mode and any other required plant conditions (such as RCS level requirements) in which the maintenance activity can be performed safely without a clearance.

2. An SRO shall insert the applicable plant Mode in the Clearance Requirements value field of the Work Order Task and should list the other required plant conditions in the Clearance Requirements comments field.

3. When plant conditions will be used in conjunction with a clearance, an additional Clearance Requirements row shall be added such that separate requirements for the clearance and the plant condition can be documented. If plant conditions will be used in conjunction with a clearance, a note shall be added to the Special Instructions of the clearance to document this fact.

4. Prior to changing modes or changing other plant conditions that are being relied upon to eliminate hazards, Operations shall verify that the activities relying on the current plant conditions are completed or clearance orders are put in place to support any on-going maintenance.

5. The applicable portions of the system valve and electrical lineup shall be performed prior to placing the system in service.

9.1 General Administration (Cont.)

9.1.24 Station/Line Clearances are administered by System Operations. NGGM-IA-0003, Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants (BNP, HNP, RNP), and NGGM-IA-0031, Transmission Florida Interface Agreement for Operation, Maintenance, and Engineering Activities at Crystal River 3 Nuclear Plant (CR3), should be used to identify responsibility boundaries between Nuclear Plant Operations and System Operations.

9.1.25 All employees who need a clearance for protection must personally sign on to the clearance, through manual or electronic means, for all associated assigned work tasks. An employee needs a clearance for protection if the individual is performing hands-on work where direct contact is being made with the piece of equipment removed from service by the clearance <u>or</u> if the individual must physically breach the equipment removed from service by the clearance. If only a visual inspection is being performed and the equipment removed from service by the clearance is not physically breached (i.e. looking inside a disassembled valve or open heat exchanger from the outside) then the individual does not need to be signed on to the clearance. Plant conditions may be relied upon for protection in lieu of or combined with a clearance per paragraph 9.1.23 above. If a component is removed from the system and work is being performed on that component while not attached to the system (on the floor or in the shop), then the individual does not need to be signed on to the clearance (however, the workers removing the component from the system and reinstalling it into the system do need to be signed on to the clearance). (BNP only - Personnel do not need to accept the Drywell Access Clearance prior to entry into the BNP Drywell. Entry and closeout will be controlled by applicable site procedures and the clearance will be held by Operations). Examples of when an employee must sign on to a clearance:

- Performing decontamination activities or surveys directly on the shaft of a pump removed from service by a clearance.
- Inspecting an electrical connection removed from service by a clearance where the electrical connection must be physically contacted.
- Performing a visual inspection of a tank or heat exchanger removed from service by a clearance where physical entry into the tank or heat exchanger is required.
- Building scaffolding inside a component removed from service by a clearance.

9.2 Operations Clearances

9.2.1 Operations Clearance Preparation and Restoration

R 2.5.7

9.2.1.1 Administrative

1. Operations Clearances will be maintained by the Operations Department.

2. A Holder Lock may be applied to a clearance whenever special hazards or other abnormalities exist for a clearance such that the Clearance Preparer feels that verbal or face-to-face discussions with the Clearance Holder are warranted prior to allowing the clearance to be accepted.

3. 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.

4. 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.

5. 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.

6. 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.

7. Tagging on control panels requires the use of tags small enough to prevent obscuring plant status indications, controls, switches and labels.

9.2.1.1 **Administrative** (Cont.)

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. 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.

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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.

9.2.1.1 **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.	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.	4. 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.

9.2.1.1 **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.

9.2.1.1 Administrative (Cont.)

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.

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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9.2.1.1 Administrative (Cont.)

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 Clearances are tied together like this, there is no electronic link between the clearances. When more than one Operations Clearance is used to allow work, the other clearance numbers should be listed on the Clearance Cross Reference screen for the existing clearance and a note shall be added to the Clearance Order Special Instructions for the affected Clearances explaining the specifics (e.g. which Clearance Order is Master and which Clearance Order is Subordinate to the others).

21. If items are added to the Clearance Cross Reference, an entry should be made in the Clearance Order Special Instructions indicating the Clearance has cross references listed. Prior to making boundary changes, the Clearance Cross Reference Screen should be checked. Review of the Clearance 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.

9.2.1.1 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.

9.2.1.1 Administrative (Cont.)

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 or an approved Operations Clearance that contains an approved Checklist provided that two Clearance Preparer qualified individuals verify that the clearance boundary is adequate for the activity. For Matrix Clearances, a verification that the correct boundary steps are specified for each associated work order task is required.

28. If an approved checklist is modified, a second Clearance Preparer shall verify that the clearance is still adequate for the work activities, the boundary components are tagged correctly and the tagging sequence is correct. For Matrix Clearances, a verification that the correct boundary steps are specified for each associated work order task is required.

29. If a distributed checklist is modified, a second Clearance Preparer shall verify that the clearance is still adequate for the work activities, the boundary components are tagged correctly and the tagging sequence is correct. For Matrix Clearances, a verification that the correct boundary steps are specified for each associated work order task is required. Additionally, an SRO shall approve the modifications to the checklist. Tag hanging and verification documentation shall be maintained, either by retaining both checklists or by transferring this documentation to the new checklist.

9.2.1.1 **Administrative** (Cont.)

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30. (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".

31. 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.

32. (HNP and RNP only) When tagging 480 Volt Molded Case Circuit breakers, include clearance steps to ensure that Live-Dead-Live checks are performed to ensure that the breaker is open, prior to making the clearance ready for acceptance.

9.2.1.2 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. Clearance information should be communicated using an electronic Clearance Request, a Clearance Request Form (Attachment 2), or by verbal communication with the Clearance Preparer.

2. 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.

9.2.1.2 **Procedure for Operations Clearances** (Cont.)

3. Applicable Work Orders should be listed on Principal Equipment. If a Work Order(s) must be listed on the Clearance Cross Reference, then an entry will be made in the Special Instructions indicating that Work Order(s) are included on the Clearance Cross Reference.

4. Any pertinent information should be listed in the clearance Special Instructions.

5. The Clearance Preparer should use Attachment 11, Boundary Device Tagging Guidelines, for proper tagging of clearance boundary devices.

6. When grounds are needed for boundary isolation, generate ground checklists to control the ground installation and removal. Grounds shall be installed in accordance with Section 9.2.2, Operations Clearance Installation and Removal, and removed in accordance with Section 9.2.4, 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).

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 Clearance Order must be approved prior to routing a checklist for approval. For Matrix Clearances, route the Clearance Order for approval. For Matrix Clearances, the Clearance Order and the checklists may be concurrently routed for approval.

9. When preparing a Clearance Order and/or checklist, ensure that the proper user ID is in the prepared by field prior to routing the clearance for approval.

9.2.1.2 Procedure for Operations Clearances (Cont.)

10. A second Clearance Preparer who is a Licensed Operator shall verify that the clearance is adequate for the work activities, the boundary components are tagged correctly and the tagging sequence is correct. For Matrix Clearances, a verification that the correct boundary steps are specified for each associated work order task is required.

11. When removing a clearance, the "Initiate a Final Clearance Checklist" option in PassPort should be used to ensure that all tags currently hanging are listed on the "Lift" checklist. If a Boundary Change to a clearance has been performed, then the "Initiate a Final Clearance Checklist" option must be used. If the "Initiate a Final Clearance Checklist" option 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.

12. 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.

13. A second Clearance Preparer who is a Licensed Operator shall verify that the restoration positions and restoration sequence are correct. [CAPR NCR 133321-04]

9.2.2 Operations Clearance Installation and Removal

9.2.2.1 Administrative

1. Should plant needs 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.

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 the discrepancy.

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.

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.

9.2.2.1 Administrative (Cont.)

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.

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.

9.2.2.1 Administrative (Cont.)

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.

    d. The approval for waiving independent verification requirements shall be documented in the clearance Special Instructions.

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.

9.2.2.1 **Administrative** (Cont.)

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.

15. 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.

9.2.2.2 Procedure for Operations Clearances

NOTE:	When authorizing clearances with Global Tags, the first checklist "Distributed" that includes the Global Tags will actually include the Global Tag hang actions. Subsequent checklists will assume that the Global Tags have already been hung. While any given clearance cannot be accepted until all required tags are actually hanging in the field, if Global Tags are used and not authorized in the proper sequence, clearance process and/or outage efficiency problems can arise.

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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

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.

9.2.2.2 Procedure for Operations Clearances (Cont.)

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. An Independent Verifier shall verify the tags. The Independent Verifier shall initial in the "Verified By” block on the Checklist signifying proper verification. Independent Verifiers shall print their name at least once with their initials for each Checklist.

6. Once all tags are hung and verified and system conditions allow safe performance of the maintenance, the checklist shall be completed.

9.2.2.2 Procedure for Operations Clearances (Cont.)

7. If ground installation is required, perform the following:

   - The ground installer(s) shall verify the clearance boundaries are adequate for ground installation and accept the clearance prior to installing the grounds.
   - An SRO shall authorize the ground checklist indicating that it is appropriate to install the grounds.
   - The ground installer shall install the grounding devices according to corporate and site safety and grounding procedures. The ground installer will attach or remove the ground tags 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.
   - An Independent Verifier shall verify the ground tags are installed. The Independent Verifier shall initial in the "Verified By" block on the Checklist signifying proper verification. Independent Verifiers shall print their name at least once with their initials for each Checklist.
   - Once all ground tags are hung and verified and system conditions allow safe performance of the maintenance, the ground checklist shall be completed.

8. Prior to authorizing clearance removal, the SRO shall verify that grounds, if used, have been removed by verifying a Checklist for ground removal has been completed.

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.

9.2.2.2 Procedure for Operations Clearances (Cont.)

11. If removing a clearance tag and another clearance tag or other site specific configuration control tag is in place which conflicts with the restoration position of the clearance tag to be removed, remove the clearance tag to be removed, leave the component in its as-found position, and indicate, on the clearance checklist, the clearance tag number or the number of the other site specific configuration control tag which controls the component's position.

12. 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.

13. An Independent 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. Independent Verifiers verifying the restoration shall print their name at least once with their initials for each Checklist.

14. 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.

9.2.3 Operations Clearance Acceptance and Release

9.2.3.1 Administrative

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.

    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.

9.2.3.1 Administrative (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.

9.2.3.2 Procedure for Operations Clearances

1. All Clearance Holders who need the clearance for protection shall accept the clearance electronically for all Work Orders being worked under the clearance (except as provided in paragraph 9.2.1.1.25). All Clearance Workers who need the clearance for protection shall accept the clearance for all Work Orders being worked under the clearance by signing 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 Clearance 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.

9.2.3.2 Procedure for Operations Clearances (Cont.)

4. 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.

5. As work items are completed, each Clearance Holder shall ensure work tasks on Principal Equipment and the Clearance 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.

6. The last Clearance Holder requiring the use of grounds should notify the WCC that grounds may be removed.

7. The last Clearance Holder to release a clearance should notify the WCC that the clearance may be removed.

8. 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.

9. Should plant needs 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.

9.2.3.2 **Procedure for Operations Clearances** (Cont.)

10. 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.

9.2.4 Boundary Changes

9.2.4.1 Administrative

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1. Boundary changes include the addition and/or lifting of tags. Boundary changes are processed by creating Checklists.

2. Should plant needs 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 the clearance boundary change prior to the Clearance Holder/Principal Clearance Holder resuming work at the facility.

3. 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.

4. 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.

9.2.4.1 **Administrative** (Cont.)

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.

5. 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).

9.2.4.2 Procedure for Operations Clearances

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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), Page 1, shall be used for all boundary changes.

NOTE:	If the boundary change is temporarily lifting a Global tag then the checklist MUST be identified as a Temp Lift checklist type (TL).
NOTE:	If a Lift and Rehang of a Global Tag is performed on the same checklist, the Global Tag will lose its Global designation on the rehang.

2. A Clearance Preparer shall develop the requested clearance boundary change. A Lift and Rehang of a Global Tag should not be performed on the same checklist.

3. If performing a Matrix Clearance boundary change, place a Holder Lock on the clearance prior to routing the boundary change for approval.

9.2.4.2 **Procedure for Operations Clearances** (Cont.)

4. A second Clearance Preparer who is a Licensed Operator shall verify the boundary change is adequate.

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 Clearance 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.
NOTE:	When a Matrix Clearance boundary change checklist is routed for approval, if any steps on the boundary change are required boundaries for the matrix definition for a given work order task (or if there is no matrix defined for a given work order task) and that work order task is not finished (in the H/OPS (49) status or greater), then all Clearance Holders currently signed on to the clearance for each such work order task are included on the approval route list. If no employees are listed on the approval route list and all work order tasks which require steps on the boundary change as part of their matrix definition are still in the working status, then there are no Affected Employees and no notifications are required.

5. If the clearance boundary will be affected by the boundary change, place a Holder Lock on the clearance and ensure that all active Attachment 13, Operations Clearance Acceptance/Release Forms, are delivered to the WCC, 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.

6. 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. Page 2 of Attachment 6, Boundary Change Form, may be used to indicate the Affected Employees (or all Clearance Holders/Workers) and to later obtain the required approvals, but any appropriate form may be used as long as it is maintained as a QA Record.

7. 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.

8. The Requestor shall ensure that all Clearance Holders/Workers or just the Affected Employees, as required, understand and agree with the pending boundary change, are ready for the implementation of boundary change, have stopped or suspended work, as necessary, and have indicated their approval for the boundary change by signing or initialing. Page 2 of Attachment 6, Boundary Change Form, may be used to obtain the needed boundary change approvals but any appropriate form may be used as long as it is maintained as a QA Record. Per telecom approvals for boundary changes are acceptable in situations where obtaining an actual signature or initials is not reasonably possible.

9.2.4.2 Procedure for Operations Clearances (Cont.)

9. Principal Clearance Holders are responsible for obtaining approval for a boundary change from all associated work group employees manually signed on to the clearance using Attachment 13. Should plant needs dictate a boundary change, and all Clearance Workers are not available on site, tags may be removed 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 the clearance boundary change prior to the Clearance Worker(s) resuming work at the facility.

10. The Requestor shall notify the WCC when all appropriate personnel have approved the pending boundary change, as required, and work has been suspended as necessary, and shall sign Section 4.2 of Attachment 6.

11. 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

12. 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.

13. An Independent Verifier will perform an Independent Verification of the boundary change, if required. The Independent Verifier shall initial the Checklist and print their name at least once with their initials for each Checklist.

9.2.4.2 Procedure for Operations Clearances (Cont.)

14. Once all tags are hung and/or pulled and verified and system conditions allow work to be recommenced safely, the Checklist shall be completed, the clearance Holder Lock can be removed, and any affected Attachment 13, Operations Clearance Acceptance/Release Forms, can be returned for use.

15. The WCC will notify the Requestor when the boundary change has been completed.

16. The Requestor will accept the boundary change. This acceptance may be performed by telecom with WCC personnel.

17. 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.

9.3 Personal Clearances

9.3.1 Personal Clearance Preparation and Restoration

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9.3.1.1 Administrative

1. The responsible supervisor will maintain a crew Personal Clearance log book.

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 Personal 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. 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.

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

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

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

9.3.1.1 Administrative (Cont.)

13. For clearances that involve the removal of fuses, fuse control and accountability shall be according to site procedures.

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. Electrical power to a motor should be secured before cooling water and/or lubrication is secured.

16. 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.

17. 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.

9.3.1.1 **Administrative** (Cont.)

18. 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.

19. 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.

9.3.1.1 Administrative (Cont.)

20. System fill and vent should be performed according to site procedures.

21. 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.

22. 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.

23. 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.

24. Boundary changes shall not be performed on Personal Clearances.

9.3.1.2 Procedure for Personal Clearances

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)

9.3.1.2 **Procedure for Personal Clearances** (Cont.)

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.

9.3.2 Personal Clearance Installation and Removal

9.3.2.1 Administrative

1. Should plant needs dictate release of a clearance and all Clearance Holders are not available, the S-SO or associated responsible supervisor(s) may release the clearance, provided the Clearance Holders have been verified to be off site, reasonable efforts to contact the absent Clearance Holders have been made, and no personnel or equipment would be endangered by clearance removal. The Clearance Holders must be informed of clearance removal prior to the Clearance Holders resuming work at the facility.

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 their supervisor to resolve the discrepancy.

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.

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.

9.3.2.1 Administrative (Cont.)

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.

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.

9.3.2.1 Administrative (Cont.)

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.

    d. The approval for waiving independent verification requirements shall be documented in the clearance Special Instructions.

12. 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.

9.3.2.2 Procedure for Personal Clearances

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 Tag Hanger shall obtain concurrence from the WCC prior to hanging the Personal Clearance.

3. The Tag Hanger will position the components as required by the clearance form and in the correct sequence. The Tag 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. An Independent Verifier will perform an Independent Verification of the clearance by verifying the components are in the required positions and initialing on the clearance form. The Independent Verifier will initial and print their name on the bottom of the Clearance form.

5. 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.

9.3.2.2 Procedure for Personal Clearances (Cont.)

6. The Tag Hanger shall notify the WCC prior to removing a Personal Clearance.

7. If removing a clearance tag and another clearance tag or other site specific configuration control tag is in place which conflicts with the restoration position of the clearance tag to be removed, remove the clearance tag to be removed, leave the component in its as-found position, and indicate, on the clearance checklist, the clearance tag number or the number of the other site specific configuration control tag which controls the component's position.

8. The Tag 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 Tag Hanger will perform tag accountability prior to signing the clearance form.

9. If required, an Independent Verifier will perform an Independent Verification of the clearance by verifying the components are in the required positions and initialing on the clearance form. The Independent Verifier will initial and print their name on the bottom of the Clearance form.

10. The Clearance Log Sheet shall be updated to indicate that the clearance has been removed.

11. The clearance form should be reviewed by the responsible supervisor to ensure proper completion prior to being filed.

9.3.3 Personal Clearance Acceptance and Release

9.3.3.1 Administrative

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.

   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.

9.3.3.1 Administrative (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.

9.3.3.2 Procedure for Personal Clearances

1. The individual that will be performing the maintenance activity will sign the Clearance Form, accepting the clearance. Non-Clearance Holder qualified individuals may accept a Personal Clearance as long as they are under the supervision of a qualified Clearance Holder, the qualified Clearance Holder remains signed on to the Personal Clearance during this period, and the Non-Clearance Holder qualified individual is qualified as an Authorized Employee in accordance with Section 9.5 of this procedure.

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.

9.3.3.2 Procedure for Personal Clearances (Cont.)

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. After the work is completed, the Clearance Holder will release the clearance by signing the Clearance Form.

9.4 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.

9.4.1 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 an Independent Verifier.

5. Audit discrepancies and corrective action should be noted on the Operations Clearance Audit Form (Attachment 9) and reviewed by the S-SO.

9.4 Audits (Cont.)

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.

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.

9.4.2 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).

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.

9.4 Audits (Cont.)

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

9.4.3 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.

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.

9.5 Qualifications

Individual clearance qualification status is maintained in the Personnel Qualification Data System (PQD).

9.5.1 Independent Verifier – Qual. Group GN31/Qual. POI0005N

1. An Independent Verifier is an individual that has successfully completed the requirements of the Independent Verifier training program.

2. These individuals can perform tag verification duties associated with both Operations and Personal Clearances.

9.5.2 Tag Hanger – Qual. Group GN06/Qual. POQ0003N

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 an Independent Verifier.

3. These individuals can perform tag hanging duties associated with both Operations and Personal Clearances.

9.5.3 Clearance Preparer – Qual. Group GN07/Qual. POQ0004N

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 Independent Verifiers.

3. These individuals may perform clearance preparation, tag hanging and tag verification duties associated with both Operations and Personal Clearances.

9.5.4 Clearance Holder – Duty Area HLDR/Qual. OPR1301N

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.

9.5 Qualifications (Cont.)

9.5.5 Contractors and Non-Qualified Progress Energy Employees – Qual. Group GN34/Qual. GNI0005N

1. For contractors and Progress Energy employees who are not qualified as a Clearance Holder as defined by Section 9.5 of this procedure, the Clearance Holder qualified individual 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 9.2.1.1.25). 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.

2. Contractors and Progress Energy employees who are not qualified as a Clearance Holder as defined by Section 9.5 of this procedure must have received the OSHA required training for Authorized Employees before performing Clearance Worker functions or before signing on to a Personal Clearance under the supervision of a qualified Clearance Holder. [CAPR NCR 102355]

9.5.6 Personal Clearance Preparer – Qual. Group/Qual. are Site Specific

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.

2. Clearance Preparer qualified individuals may perform the duties of a Personal Clearance Preparer.

10.0 RECORDS

R
2.1.10
2.2.5
2.2.6

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
    - Clearance Cross-Reference
    - Checklist Instructions

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____

____

____

____

QA RECORD

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

QA RECORD

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:		

QA RECORD

ATTACHMENT 6
Sheet 1 of 2
Boundary Change Form

Clearance and Checklist Number ____________________

1.0 TYPE OF BOUNDARY CHANGE REQUEST (Select one)

____ Addition ____ Removal ____ Combination ____ Matrix

2.0 REASON FOR BOUNDARY CHANGE AND BOUNDARY CHANGE DETAILS (Step 9.2.4.2.1):

____

____

____

____

Requestor: ____________________ Phone #: __________ Date/Time: ______________

3.0 PREPARE BOUNDARY CHANGE (Steps 9.2.4.2.2, 9.2.4.2.3, 9.2.4.2.4)

[ ] Completed via computer entry [ ] Holder Lock applied before routing – Matrix Clearance (Step 9.2.4.2.3)

<u>OR</u>

____________________ ______/______ ____________________ ______/______

Prepared By Date / Time Verified By Date / Time

4.0 Notifications (Select One) [ ] Holder lock applied, Attachment 13s returned to WCC, if applicable (Step 9.2.4.2.5)

____ None Required – Addition to Clearance unless the boundary could be affected by adding tags (Go to 5.0)

____ Not Applicable – No Holders or Matrix Clearance with no Affected Employees (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 9.2.4.2.6, 9.2.4.2.7) (One must be an SRO, CNO for CR3 only)

____________________ ______/______ ____________________ ______/______

Determined By Date / Time Verified By Date / Time

4.2 EMPLOYEE APPROVALS: (Steps 9.2.4.2.8 – 9.2.4.2.10) Appropriate employees must understand, agree, and are ready for the implementation of the proposed boundary change, work has been stopped or suspended, as necessary, and approval for the boundary change given by signing or initialing.

Clearance Holder Agreement/Approval Obtained [ ] Not Applicable if "None Required" or "No Holders"

____________________ ______/______

Requestor's Signature Date / Time

5.0 AUTHORIZATION (Step 9.2.4.2.11): 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 9.2.4.2.14, 9.2.4.2.15): Tags hung/lifted and Checklist completed as requested.

[ ] Completed via computer entry [ ] Notify Requestor to Accept Boundary Change

<u>OR</u> [ ] Holder Lock removed, Attachment 13s returned, if applicable

____________________ ______/______

Completed By Date / Time

7.0 ACCEPT BOUNDARY CHANGE (Steps 9.2.4.2.16, 9.2.4.2.17): Appropriate employees notified as necessary.

[ ] Not Applicable if No Holders

____________________ ______/______ [ ] Accepted per telecom with WCC

Requestor <u>OR</u> WCC Notified Date / Time

QA RECORD

ATTACHMENT 6
Sheet 2 of 2
Boundary Change Form

Boundary Change Approvals: Clearance and Checklist Number ____________________

Work Order Number and Task	Clearance Holder/Worker Name (Print)	Approval Signature or Initials	Date

QA RECORD

ATTACHMENT 7
Sheet 1 of 2
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: ____

QA RECORD

ATTACHMENT 7
Sheet 2 of 2
Personal Clearance Form

Additional Special Instructions: ____

____

____

____

____

Clearance Accepted: ______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

Clearance Released: ______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

______________________ Date/Time: ________/________

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 ________/______________ ________/______________ ________/______________

QA RECORD

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. List Operations Clearances Audited, discrepancies, and corrective actions taken, as applicable (Steps 9.4.1.1 – 9.4.1.5):

Clearance Number	Discrepancies	Corrective Actions Taken

Continued Yes/No

QA RECORD

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 (Steps 9.4.1.6, 9.4.1.7):

Clearance Number	NCR Number	Reason	Status

3. Resolution of Items in Block 2 (Steps 9.4.1.7, 9.4.1.8):

Clearance Number	Resolution/Alternate Means

Audit Completion Date: ______________________________

______________________________ ____________
WCC-SRO Date

______________________________ ____________
Superintendent – Shift Operations ** Date

QA RECORD
** Ensure Scheduling Department is Notified (Step 9.4.1.8)

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

QA RECORD

ATTACHMENT 11
Sheet 1 of 5
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

ATTACHMENT 11
Sheet 2 of 5
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)	- A "fails closed" valve is a valve that closes by spring pressure when the air is vented off the valve. No air pressure remains present to keep the valve closed. If a valve uses air pressure to keep it closed, follow the requirements below for a "pressure balanced" valve – a manual positioning device or mechanical gag is required. - 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 - (HNP, RNP only) When tagging 480 Volt Molded Case Circuit breakers, include clearance steps to ensure that Live-Dead-Live checks are performed to ensure that the breaker is open, prior to making the clearance ready for acceptance.
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 Steps 9.2.2.1.6/9.3.2.1.6	- 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

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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.

CLEARANCE PREPARATION CHECKLIST			
YES	NO	N/A	Clearance #
			CLEARANCE PREPARATION
			System prints reviewed
			System OPs reviewed
			Electrical Load List reviewed
			Two isolation valve criteria required, >200°F or >500 psig, Caustic/Acid Sys.
			Tag hanging sequence correct (high energy to low energy sequence)
			Ground straps identified and applicable marked up drawings included
			Other unit effects identified (BNP Only)
			Special Instructions include the pertinent information • Energized Circuits • WO on Checklist X-Ref • Double valve iso. not met • Approval for waiving IV • Significant loss of function • Valve handwheels not tagged • Not completely drained/depressurized • Relying on Valve L/U for restoration
			Tagging sequence depressurizes system
			Vent and drain path administratively controlled
			(HNP, RNP Only) Live-Dead-Live Checks included for 480V MCC Breakers
			CLEARANCE VERIFICATION
			Second verification complete on Checklist Clearance package complete (Check Included Documents) ☐ Clearance request ☐ Clearance Cross Reference and/or Principal Equipment Screen ☐ Clearance form ☐ Required prints ☐ Checklist(s) ☐ OP valve and electrical lineup
			CLEARANCE AUTHORIZATION
			LCOs activated
			Control Room Notified
			CLEARANCE INSTALLATION
			Pre-Job Brief held prior to clearance hanging
			Tags hung
			Tags independently verified
			Plant responded as expected
			SRO notified that tags are hung

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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 on to this form signifies understanding and acceptance of the work boundary.

QA RECORD

ATTACHMENT 14
Sheet 1 of 1
Clearance Holder Checklist

This Checklist is intended to be an aid for Maintenance preparation in the clearance process. It is not required but may be used in conjunction with the procedure as necessary.

Name:

Clearance Number: **WO Task Number:**

YES	NO	N/A	**Clearance Preparation**
			Work package requires a clearance.
			Work Order Task is on Clearance.
			Special Instructions have been reviewed.
			Clearance boundary is adequate for work.
			Clearance Holders are qualified in PQD.
			Clearance Workers are qualified in PQD.
			Does Work Package require multiple clearances?
			Principal Clearance Holder has accepted the clearance electronically.
			The Principal Clearance Holder has entered their name and the associated Work Order and task number(s) on the "Contacts" panel of the clearance within PassPort.
			The Principal Clearance Holder has entered their name and the associated Work Order and task number(s) on the Attachment 13.
			A separate Attachment 13 is being used for each clearance controlled by the Principal Clearance Holder.
			Clearance Holders and Clearance Workers: a. Have signed on the clearance using PassPort or manually signed on to the clearance using Attachment 13. b. Understand the boundaries. c. Had the opportunity to walkdown the clearance boundaries. d. Had the opportunity to ask questions regarding the boundaries as necessary.
			Ensure all personnel from additional work groups associated with this clearance have signed on the clearance.

ATTACHMENT 15
Sheet 1 of 1
Clearance Conflict Checking Information

Clearance Conflicts show as a Red Triangle in the Global View Column of the Checklist Plan screen (T221). Clicking on the Gb (Global) View Triangle will show the conflict on the T240 panel. To see the Conflict Summary (T310), click the Conflict button on the Checklist Plan screen (T221). To see the Conflict Details (T311) and to determine the Conflict type, select a row on the Conflict Summary panel (T310) and hit Enter. The 12 Conflict Types are listed below. If the Conflict is fully understood and overriding the Conflict is desired (all Conflict Types may be overridden), select the specific Conflict row and select the Option to override the Conflict.

HPOS – **Hang Position Conflict** – The equipment was or is about to be isolated by another checklist and its position is different from the position of the step being checked.

HGBL – **Hang Global Conflict** – The step is a global step and a Lift is about to be performed.

HPE – **Hang Principal Equipment Conflict** - There is an active Clearance Order with the equipment item listed as Principle Equipment on its T213 panel.

HTL – **Hang Temp Lift Conflict** – The equipment was or is about to be temp lifted by another checklist.

HTAG – **Hang Tag Type Conflict** – The Danger Tag Type being hung is not compatible with a tag that is currently hanging on the equipment.

HDUP – **Hang Duplicated Conflict** – The tag being hung is already placed or is about to be placed by a different checklist for the same Clearance Order.

LPOS - **Lift Position Conflict** – The equipment was or is about to be isolated by another checklist and its position is different from the position of the step being checked.

LTL – **Temp Lift Conflict** – The checklist being processed is a Temp Lift and the step being checked is hanging or about to be hung on another checklist.

LNOH – **Lift without a Hang Conflict** – The checklist is attempting to process a LIFT of a step that was never completed as a HANG for the same Clearance Order –OR- The HANG exists, but the Global Ind for the HANG does not match the Global Ind for the planned LIFT (note that the Global Ind's may be out of synch if multiple hangs are processed for the step with different values for Global Ind or if the value of Global Ind for a hang is changed after the lift step is planned).

LLOK – **Lift Locked Conflict** – The isolation point being lifted will be set to Action Required = 'Y', but the Key Location specified for the step is locked or is about to be locked.

PEHG – **Principle Equipment Hang Conflict** – Another Clearance Order Checklist has already or is about to isolate the principle equipment.

PETL – **Principle Equipment Temp Lift Conflict** – Another Clearance Order Checklist has already or is about to perform a temp lift of the principle equipment.

REVISION SUMMARY

SECTION	CHANGE
2.1.5	PRR 173821. Changed reference to SAF-SUBS-00048. SAF-SUBS-00048 replaced SAF-PGNC-00048.
3.9, 4.1.10.6, 9.2.3.2.1	Based on discussions with the Operations Peer Group, all Clearance Holder qualified individuals must now accept a clearance electronically in PassPort. No longer may Clearance Holder qualified individuals accept a clearance by signing on to an Attachment 13. The Attachment 13 is provided for non-Clearance Holder qualified individuals only.
3.17, 9.3.2.2.6	Removed the requirement for the notification of the WCC for Personal Clearances extending past one shift. Added guidance to allow Personal Clearances to remain past one shift if power plant equipment is not affected. The performance of facilities or building maintenance almost always does not impact power plant equipment and there is no need to limit this type of work to one shift. Regardless, the WCC is required to be notified whenever a Personal Clearance is hung, thus any issues with the duration of the work will be addressed during that notification.
9.1, 9.2, 9.3	NCR 149188-04. Separated Operations Clearances and Personal Clearances into two distinct sections. This will reduce confusion in using the procedure. Any administrative requirements pertaining to both Operations and Personal Clearances were placed into both sections. All general administrative instructions related to the overall clearance process were placed into section 9.1.
9.1.17	PRR 171975. NCR 192764-07. Clarified the requirements for operating clearance tagged or ground tagged equipment. Only the Clearance Independent Verifier may perform a hand-on verification of component position. If additional torquing of boundary valves is needed, the WCC must be notified and determine the process for the torquing and the required documentation.
9.1.23	Clarified that plant conditions can be used in conjunction with a clearance to provide employee protection. Included the instructions to handle this situation. Clarified that other plant conditions (such as RCS level) may be specified along with plant Mode and included the instructions to document the other plant conditions. Clarified that the applicable portions of a system and electrical alignment is what is required prior to placing the equipment in service. While a full lineup is normally performed during refueling outages, this is not normally done during limited scope outages. With the current requirement for a full lineup, the Mode clearance concept cannot be used for these limited scope outages.
9.1.25	NCR 179820-04. Added requirements for when personnel are required to sign on to a clearance to perform their work and when they are not. There has been some confusion in this area in the past. Clarified that in some cases, no clearance is required (if relying on plant conditions per paragraph 9.1.23). Added BNP specific guidance related to drywell entry.
9.2.1.1.20	PRR 177299. Clarified the requirements for clearance order ties. Reinforced that clearance order ties do not provide an electronic tie between the clearances. Added a requirement to include Special Instructions to explain the clearance order ties (i.e. which clearance is master, and which clearance is subordinate to the others).

REVISION SUMMARY

SECTION	CHANGE
9.2.1.1.32, Attachment 11, 12	NCR 166657-05. HNP, RNP only. Included guidance based on Operating Experience reviews to perform Live-Dead-Live checks of 480 V Molded Case Circuit Breakers to ensure the breakers are open prior to allowing work start.
9.2.1.2, 9.2.2	PRR 102267. Removed the requirement to install grounds for Operations Clearances in accordance with the Boundary Changes portion of the procedure. Clarified that a separate ground checklist is used for grounds. Section 9.2.2, Operations Clearance Installation and Removal, is appropriate for the installation of grounds since the addition of grounds does not make the clearance boundary less safe. On the other hand, ground removal lessens the safe clearance boundaries and thus the formality of the boundary change process (holder locks, determination of affected holders, approval from holders) is appropriate.
9.2.1.2.8	PRR 173721. Clarified that for Matrix Clearances, the Clearance Order and the checklists may be concurrently routed for approval. For Matrix Clearances, the boundaries are listed on the Clearance Order itself, thus it makes sense to route both the Clearance Order and the checklists together.
9.2.2.2	PRR 173721. NCR 172272-06. Added a Note reminding personnel that when authorizing clearances with Global Tags, the first checklist that is "Distributed" actually will contain the Global Tag hang actions. If Global Tag clearances are not authorized in the proper order, outage efficiency problems can occur.
9.2.2.2.11, 9.3.2.2.7	PRR 177037. Added requirements for what to do when lifting clearance tags and another clearance tag or other site specific configuration control device is in place.
9.2.2.2.6, 9.2.4.2.14	Removed the requirement to sign and date for "Checklist Completion." Printed clearance checklists no longer include a block for these signatures. A checklist is completed using an Option in PassPort.
9.2.3.2.1	PRR 121456. Clarified that only personnel who need the clearance for protection must accept the clearance. Previously, the words "working within the boundaries of the clearance" was used. Personnel may be working within the boundaries of a clearance and not need the clearance for protection.
9.2.4.2, Attachment 6	NCR 170746-17. NCR 182093-05. Revised the clearance Boundary Change process because of the Harris INPO AFI. Formalized the process. Required all Clearance Holders and Clearance Workers to sign or initial for approval for all Boundary Changes. Per telecom approvals are acceptable under extenuating circumstances (i.e. worker in a contaminated area, etc.). Required placing a Holder Lock on Attachment 13s by requiring that all active Attachment 13s be brought to the WCC while the Boundary Change is in progress.
9.2.4.2.1 and Note preceding	NCR 176592-05. Added a Note and a procedural step precluding lifting and rehanging a Global Tag on the same checklist. If this is done, PassPort removes the Global designation of the tag on the rehang.
9.2.4.2.4	Clarified that a Licensed Operator must do the second verification of a Boundary Change. A previous revision made it a requirement for clearance second verifications to be made a Licensed Operator, but this section was missed.

REVISION SUMMARY

SECTION	CHANGE
9.2.4.2.5 (Note preceding), Attachment 6	NCR 177033-01. Clarified that when routing a Matrix Clearance boundary change for approval, Affected Employees signed on to the clearance associated with work order tasks that are completed (in the H/OPS or Finished status or greater) will not show up on the approval route list.
9.3.2.2	Changed tag hanging and verification steps to include "Tag Hanger" and "Independent Verifier" to be consistent with the remainder of the procedure.
9.3.3.2.1, 9.5.5.2, Attachment 7	PRR 198617. Added instructions to allow acceptance by additional personnel and by non-Clearance Holder qualified personnel. Added Page 2 of Attachment 7, Personal Clearance Form, to include extra room for Clearance Acceptance and Release, Clearance Special Instructions, and Tag Hanging and Lifting.
9.3.2.2.2	Changed "notify" to "obtain concurrence from". The WCC is agreeing that a Personal Clearance is appropriate and acceptable to hang.
9.5	PRR 127914. Added Qualification information (Duty Area/Qual. Group/Qual.) to clarify requirements. Didn't include information for Personal Clearance Preparers since these Qual. Groups and Quals. are site specific.
9.5.5.1	Changed "Progress Energy Employee" to "Clearance Holder qualified individual." It was never intended that only Progress Energy employees could be Principal Clearance Holders.
9.5.6	Added a step which clarifies that Clearance Preparer qualified individuals may perform Personal Clearance Preparer duties.
Attachment 15	PRR 170019. Added Attachment 15, Clearance Conflict Checking Information, to include information related to conflict checking, including all the conflict types, what they mean, and what is required to override them.
Attachment 9	PRR 167583. Improved form based on feedback. Makes form better match procedural requirements.
Throughout	Changed Checklist Cross Reference to Clearance Cross Reference. PassPort Version 10 included the Clearance Cross Reference section which is more appropriate to use then the Checklist Cross Reference.
Throughout	PRR 181647. Changed tag verifier to Independent Verifier. Independent Verifier is now the appropriate qualification in accordance with OPS-NGGC-1303.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE
ADMINISTRATIVE

A-1B-S

LESSON TITLE: Evaluate Reactor Water Level Instruments using Caution 1

LESSON NUMBER:

REVISION NO: 0

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.

Read the following to trainee.

TASK CONDITIONS:

Condition 1

Instrument	Reading	Available/Unavailable
Reactor Water Level (N004A)	153 inches	
Reactor Water Level (N004B)	154 inches	
Reactor Water Level (N004C)	151 inches	
Reactor Pressure	100 psig	
1258-1	340F	
1258-3	360F	
1258-2	330F	
1258-4	350F	

Condition 2

Instrument	Reading	Available/Unavailable
Reactor Water Level (N026A)	5 inches	
Reactor Water Level (N026B)	15 inches	
Reactor Pressure	950 psig	
1258-1	210F	
1258-3	225F	
1258-2	215F	
1258-2	207F	
Reactor Bldg 50ft Temperature	150F	

Condition 3

Instrument	Reading	Available/Unavailable
Reactor Water Level (N036)	-125 inches	
Reactor Water Level (N037)	-135 inches	
Reactor Pressure	300 psig	
1258-1	420F	
1258-3	435F	
1258-2	430F	
1258-4	445F	
Recirc. Pumps	OFF	

Condition 4

Instrument	Reading	Above TAF / Below TAF
Reactor Water Level N036/37	-40 inches	
Reactor Pressure	600 psig	
Reference Leg Area Temperature	220F	

Condition 5

Instrument	Reading	Above LL-4 / Below LL-4
Reactor Water Level N036/37	-65 inches	
Reactor Pressure	800 psig	
Reference Leg Area Temperature	180F	

INITIATING CUE:

Using CAUTION 1 (Unit Two) and the indications provided in:

- Condition 1, determine if level instruments N004A/B/C are available or unavailable for use in determining reactor water level.
- Condition 2, determine if level instruments N026A/B are available or unavailable for use in determining reactor water level.
- Condition 3, determine if level instruments N036/N037 are available or unavailable for use in determining reactor water level.
- Condition 4, determine if reactor water level is currently above or below TAF.
- Condition 5, determine if reactor water level is currently above or below LL-4.

PERFORMANCE CHECKLIST

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

Step 1 – Using the Narrow Range Level Instruments section of CAUTION 1, plot the given parameters of Condition 1 to determine availability of N004A/B/C.

Using 360F as the Reference Leg Temp, plot and determine that N004A/B are available, plot and determine that N004C is unavailable.

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

Step 2 - Using the Wide Range Level Instruments section of CAUTION 1, plot the given parameters of Condition 2 to determine availability of N026A/B.

Identify that RB 50ft Temperature is above 140F, therefore N026A/B are unavailable.

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

Step 3 - Using the Fuel Zone Level Instruments section of CAUTION 1, plot the given parameters of Condition 3 to determine availability of N036/37.

Using 360F as the Reference Leg Temp, determine that N036 is available since it is reading above -130 inches, determine that N037 is unavailable since it is reading below -130 inches.

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

Step 4 - Using the TAF Determination section of CAUTION 1, plot the given parameters of Condition 4 to determine if reactor water level is above or below TAF.

Plot the parameters of Condition 4 and determine that reactor water level is below TAF

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

Step 5 - Using the LL-4 Determination section of CAUTION 1, plot the given parameters of Condition 5 to determine if reactor water level is above or below LL-4.

Plot the parameters of Condition 5 and determine that reactor water level is above LL-4

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

TERMINATING CUE: When examinee has completed the requested information for each condition, the JPM may be terminated.

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

RELATED TASKS:

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.25 3.9/4.2

Ability to interpret reference materials, such as graphs, curves, tables, etc.

REFERENCES:

Unit 2 CAUTION 1

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123, Rev 2, Supp. 1.):

Admin – Conduct of Operations

Time Required for Completion: _15_ Minutes (approximate).

APPLICABLE METHOD OF TESTING

Performance: Simulate _ŏ_ Actual ___ Unit: ____

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

Time Critical: Yes ___ No _ŏ_ Time Limit _N/A_

Alternate Path: Yes ___ No _ŏ_

EVALUATION

Trainee:______________________________ SSN: ____________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

Did Trainee Verify Procedure Current?: Yes _____ No ______

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

Condition 1

Instrument	Reading	Available/Unavailable
Reactor Water Level (N004A)	153 inches	
Reactor Water Level (N004B)	154 inches	
Reactor Water Level (N004C)	151 inches	X
Reactor Pressure	100 psig	
1258-1	340F	
1258-3	360F	
1258-2	330F	
1258-4	350F	

Condition 2

Instrument	Reading	Available/Unavailable
Reactor Water Level (N026A)	5 inches	
Reactor Water Level (N026B)	15 inches	
Reactor Pressure	950 psig	
1258-1	210F	
1258-3	225F	
1258-2	215F	
1258-2	207F	
Reactor Bldg 50ft Temperature	150F	X

Condition 3

Instrument	Reading	Available/Unavailable
Reactor Water Level (N036)	-125 inches	
Reactor Water Level (N037)	-135 inches	X
Reactor Pressure	300 psig	
1258-1	420F	
1258-3	435F	
1258-2	430F	
1258-4	445F	
Recirc. Pumps	OFF	

Condition 4

Instrument	Reading	Above TAF / Below TAF
Reactor Water Level N036/37	-40 inches	
Reactor Pressure	600 psig	
Reference Leg Area Temperature	220F	

Condition 5

Instrument	Reading	Above LL-4 / Below LL-4
Reactor Water Level N036/37	-65 inches	
Reactor Pressure	800 psig	
Reference Leg Area Temperature	180F	

INITIATING CUE:

Using CAUTION 1 (Unit Two) and the indications provided in:

- Condition 1, determine if level instruments N004A/B/C are available or unavailable for use in determining reactor water level.
- Condition 2, determine if level instruments N026A/B are available or unavailable for use in determining reactor water level.
- Condition 3, determine if level instruments N036/N037 are available or unavailable for use in determining reactor water level.
- Condition 4, determine if reactor water level is currently above or below TAF.
- Condition 5, determine if reactor water level is currently above or below LL-4.

Attachment 6

Page 1 of 19

Reactor Water Level Caution

(Caution 1)

Reactor Water Level Caution
(Caution 1)

A reactor water level instrument may be used to determine reactor water level only when the conditions for use as listed in Table 1 are satisfied for that instrument.

TABLE 1

CONDITIONS FOR USE OF REACTOR WATER LEVEL INSTRUMENTS

NOTE: Reference leg area drywell temperature is determined using Figure 13, ERFIS, or Instructional Aid based on Figure 13.

NOTE: **IF** the temperature near any instrument run is in the UNSAFE region of the REACTOR SATURATION LIMIT (Figure 14), **THEN** the instrument may be unreliable due to boiling in the run.

NOTE: Immediate reference leg boiling is not expected to occur for short duration excursions into the unsafe region due to heating of the drywell. The thermal time constant associated with the mass of metal and water in the reference leg will prohibit immediate boiling of the reference leg. Reference leg boiling is an obvious phenomenon. Large scale oscillations of all water level instruments associated with the reference leg that is boiling will occur. This occurrence will be obvious and readily observable by the operator. Additionally, if the operator is not certain whether boiling has occurred, he can refer to plant history as provided on water level recorders or ERFIS. Reference leg boiling is indicated by level oscillations without corresponding pressure oscillations.

Instrument	Conditions for Use
Narrow Range Level Instruments C32-LI-R606A, B, C (N004A, B, C) C32-LPR-R608 (N004A, B) Indicating Range 150-210 Inches Cold Reference Leg	**Unit 1 Only**: The indicated level is in the SAFE region of Figure 15. **Unit 2 Only**: The indicated level is in the SAFE region of Figure 15A.
Shutdown Range Level Instruments B21-LI-R605A, B (N027A, B) Indicating Range 150-550 Inches Cold Reference Leg	The indicated level is in the SAFE region of Figure 16. To determine reactor water level at the Main Steam Line Flood Level (MSL), see Figure 21. Figure 21 has two curves: The upper curve is for reference leg area drywell temperature equal to or greater than 200°F. The lower curve is for reference leg area drywell temperature less than 200°F.

TABLE 1 (Cont'd)
Reactor Water Level Caution
(Caution 1)

Instrument	Conditions for Use
Wide Range Level Instruments B21-LI-R604A, B (N026A, B) C32-PR-R609 (N026B) Indicating Range 0-210 Inches Cold Reference Leg	1. Temperature on the Reactor Building 50' below 140°F (B21-XY-5948A A2-4, B21-XY-5948B A2-4, ERFIS Computer Point B21TA102, **OR** B21TA103) **AND** 2. **IF** the reference leg area drywell temperature is in the UNSAFE region of the Reactor Saturation Limit (Figure 14), **THEN** the indicated level is greater than 20 inches **OR** **IF** the reference leg area drywell temperature is in the SAFE region of the Reactor Saturation Limit (Figure 14), **THEN** the indicated level is greater than 10 inches.

TABLE 1 (Cont'd)

Reactor Water Level Caution
(Caution 1)

Instrument	Conditions for Use
Fuel Zone Level Instruments B21-LI-R610 (N036) B21-LR-R615 (N037) Indicating Range -150 - +150 Inches Cold Reference Leg	1. **IF** the reference leg area drywell temperature is less than 440°F, **THEN** the indicated level is greater than -150 inches **OR** **IF** the reference leg area drywell temperature is greater than or equal to 440°F, **THEN** the indicated level is greater than -130 inches. **AND** 2. Reactor Recirculation Pumps are shutdown. To determine reactor water level at TAF, see **Unit 1 Only**: Figure 17 and **Unit 2 Only**: Figure 17A To determine reactor water level at the minimum steam cooling level (LL-4), see **Unit 1 Only**: Figure 18 and **Unit 2 Only**: Figure 18A To determine reactor water level at the minimum zero injection level (LL-5), see **Unit 1 Only**: Figure 19 and **Unit 2 Only**: Figure 19A To determine reactor water level at 90 inches, see Figure 20. Continued on next page.

TABLE 1 (Cont'd)

Reactor Water Level Caution
(Caution 1)

Instrument	Conditions for Use
	Each figure has two curves: The upper curve for reference leg area drywell temperature greater than 200°F. The lower curve for reference leg area drywell temperature less than or equal to 200°F. **IF** containment conditions are such that reference leg area temperatures could **NOT** be controlled and maintained less than the 200°F requirement, **THEN** the upper lines on the graph should be utilized. These level instruments are valid for indication with RHR LPCI flow.

FIGURE 13

Level Instrument Reference Leg Area
Drywell Temperature Calculations

1. For all level instruments **except** B21-LI-R605 A, B, (N027 A, B); the reference leg area drywell temperature is the highest of the following points:

Recorder

CAC-TR-4426-1B, Point 1258-1 _____
CAC-TR-4426-1B, Point 1258-3 _____
CAC-TR-4426-2B, Point 1258-2 _____
CAC-TR-4426-2B, Point 1258-4 _____

OR

Microprocessor

CAC-TY-4426-1, Point 5801 _____
CAC-TY-4426-1, Point 5803 _____
CAC-TY-4426-2, Point 5802 _____
CAC-TY-4426-2, Point 5804 _____

FIGURE 13 (Cont'd)

Level Instrument Reference Leg Area
Drywell Temperature Calculations

2. For level instruments B21-LI-R605A, B (N027A, B), the reference leg area drywell temperature is the highest of the following points:

Recorder

CAC-TR-4426-1A, Point 1258-22 _____
CAC-TR-4426-1B, Point 1258-3 _____
CAC-TR-4426-2A, Point 1258-23 _____
CAC-TR-4426-2A, Point 1258-24 _____
CAC-TR-4426-2B, Point 1258-2 _____
CAC-TR-4426-2B, Point 1258-4 _____

OR

Microprocessor

CAC-TY-4426-1, Point 5822 _____
CAC-TY-4426-1, Point 5803 _____
CAC-TY-4426-2, Point 5823 _____
CAC-TY-4426-2, Point 5824 _____
CAC-TY-4426-2, Point 5802 _____
CAC-TY-4426-2, Point 5804 _____

ATTACHMENT 6
Page 8 of 19
FIGURE 14
Reactor Saturation Limit

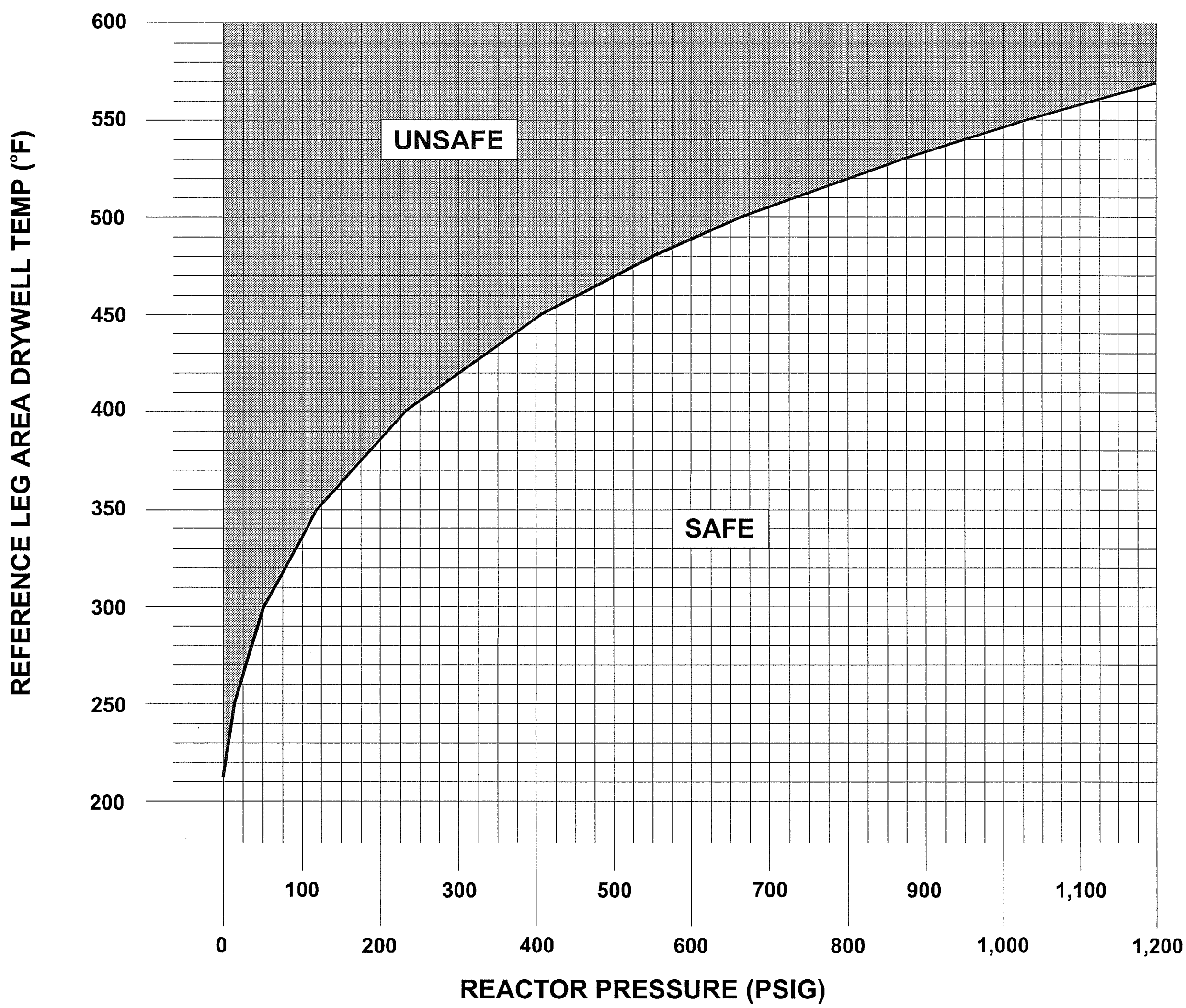
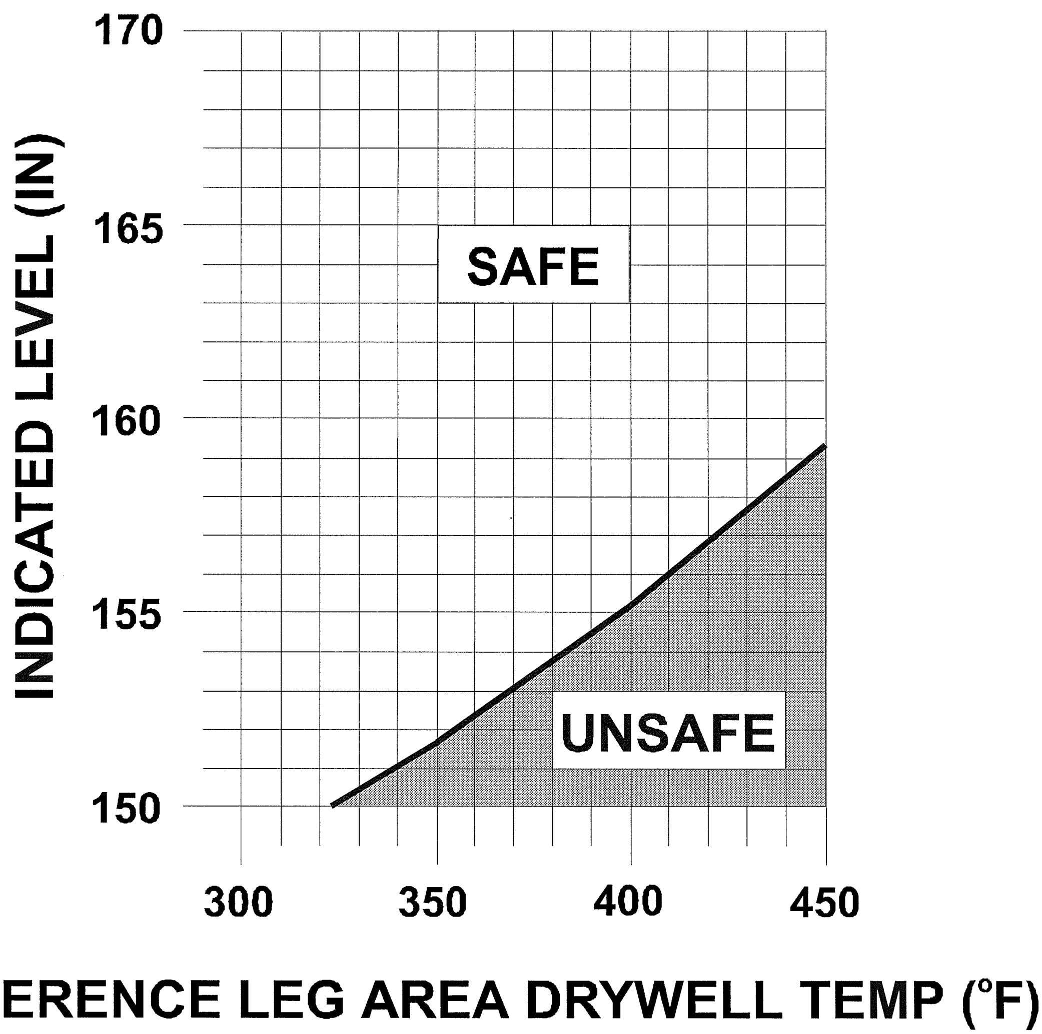


FIGURE 15

Unit 1 Narrow Range Level
Instrument (N004A, B, C) Caution



ATTACHMENT 6

FIGURE 15A

Unit 2 Narrow Range Level
Instrument (N004A, B, C) Caution

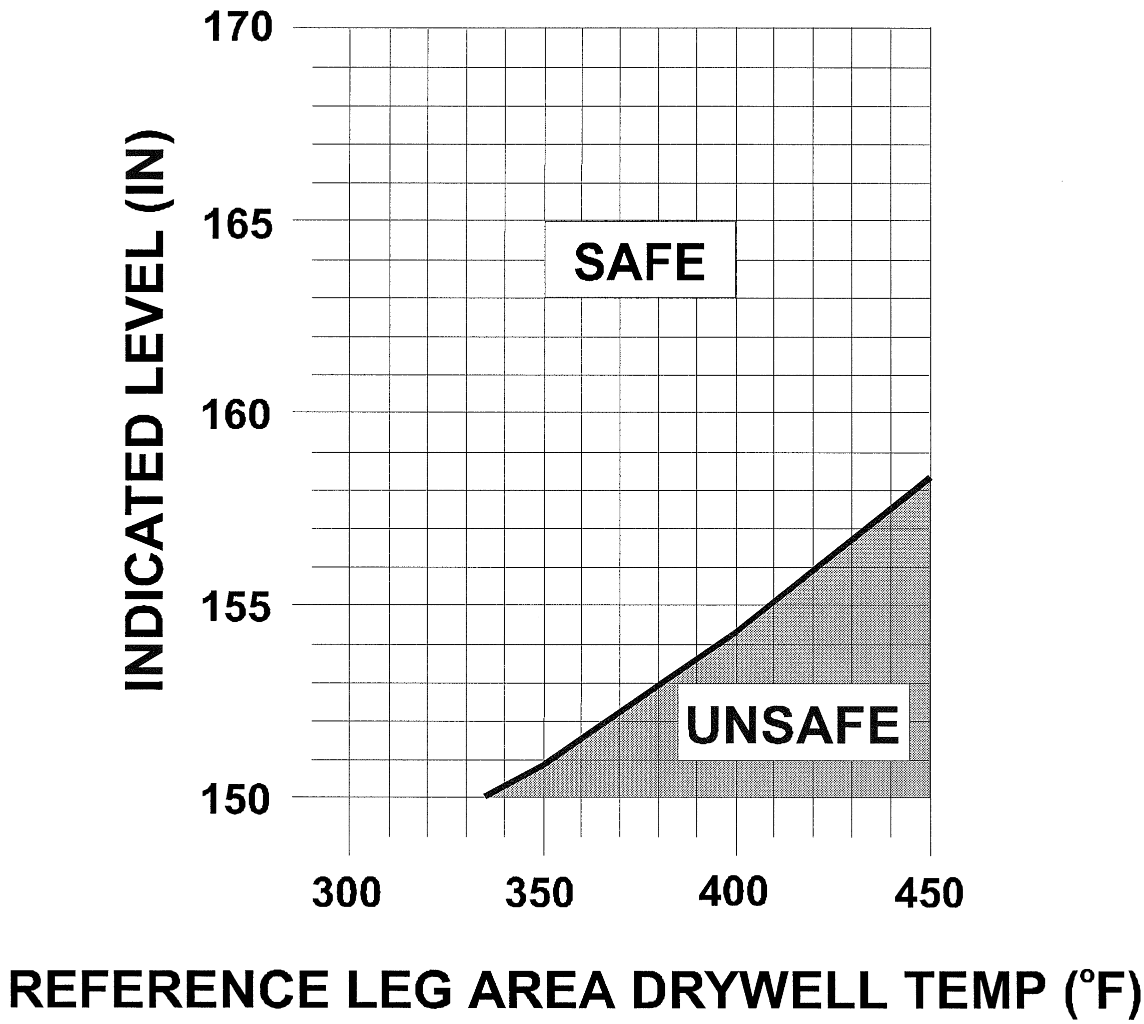
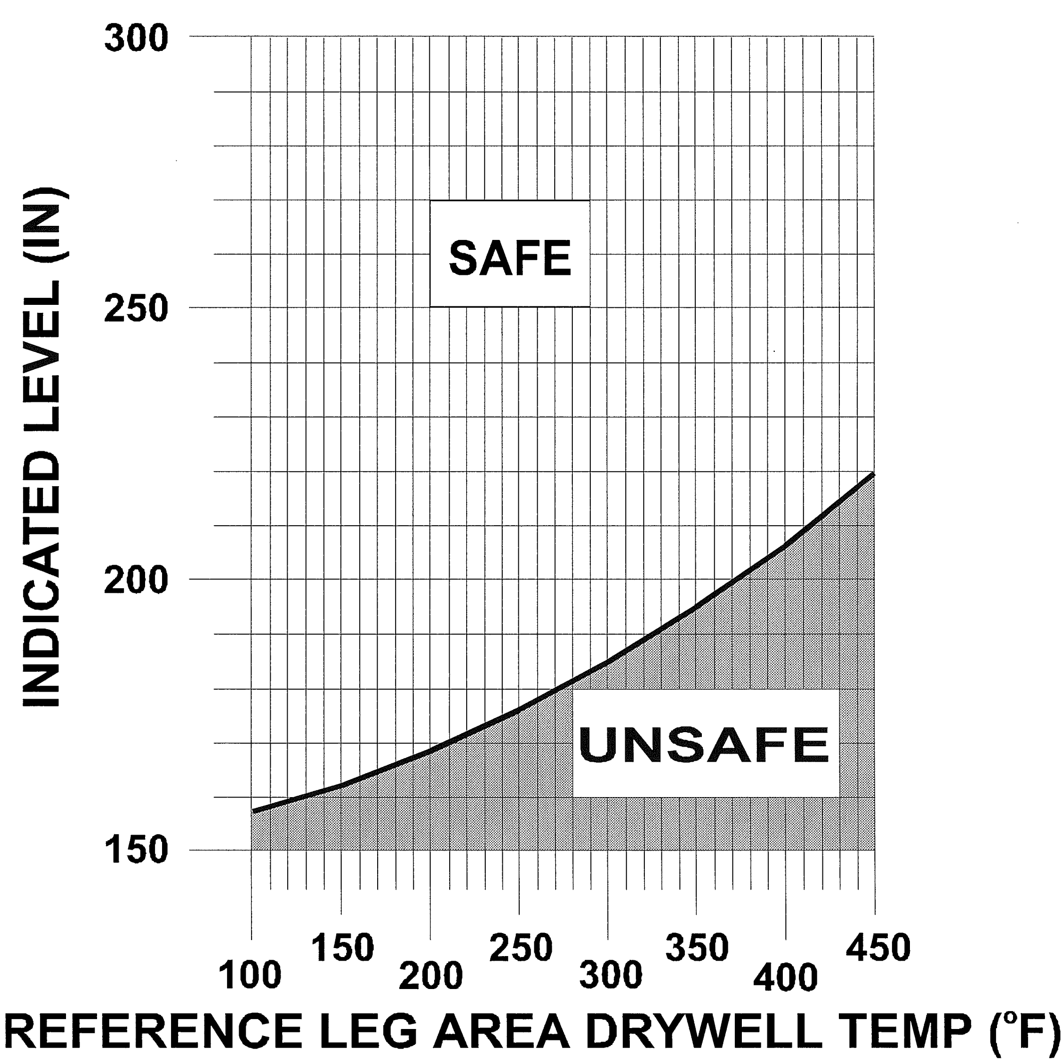
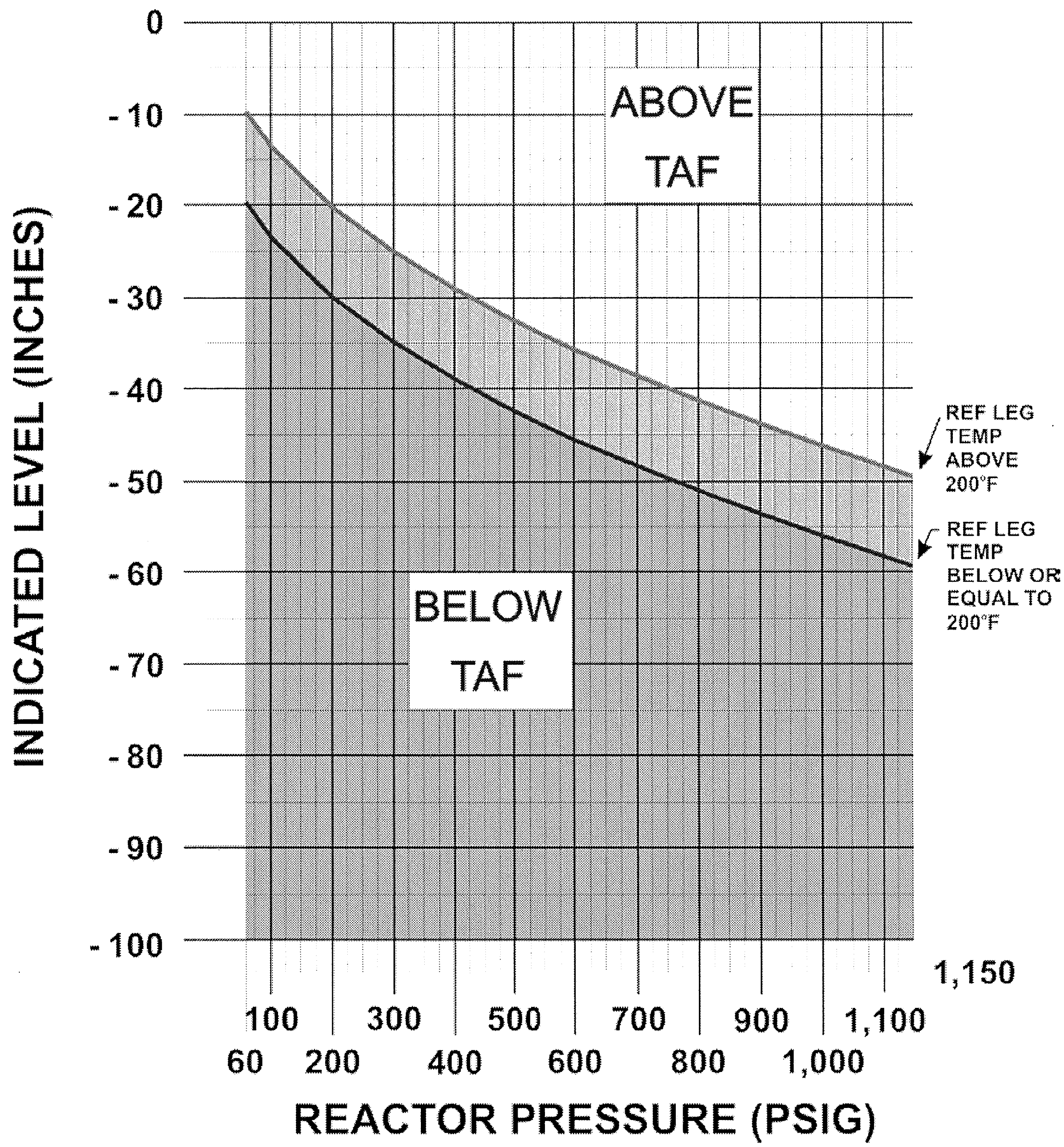


FIGURE 16
Shutdown Range Level
Instrument (N027A, B) Caution



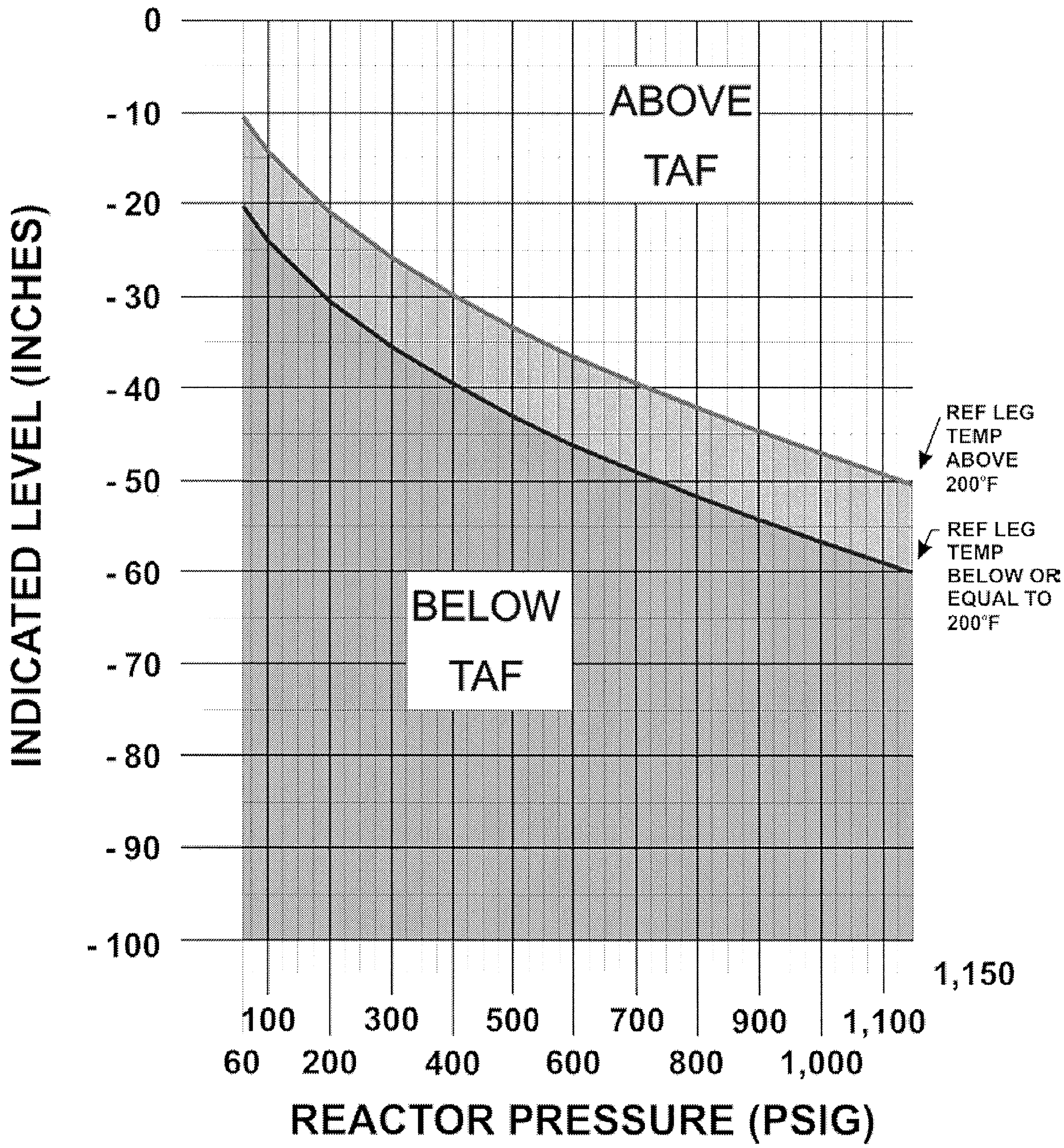
ATTACHMENT 6
Page 12 of 19
FIGURE 17
Unit 1 Reactor Water Level at TAF



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
TAF IS -7.5 INCHES.

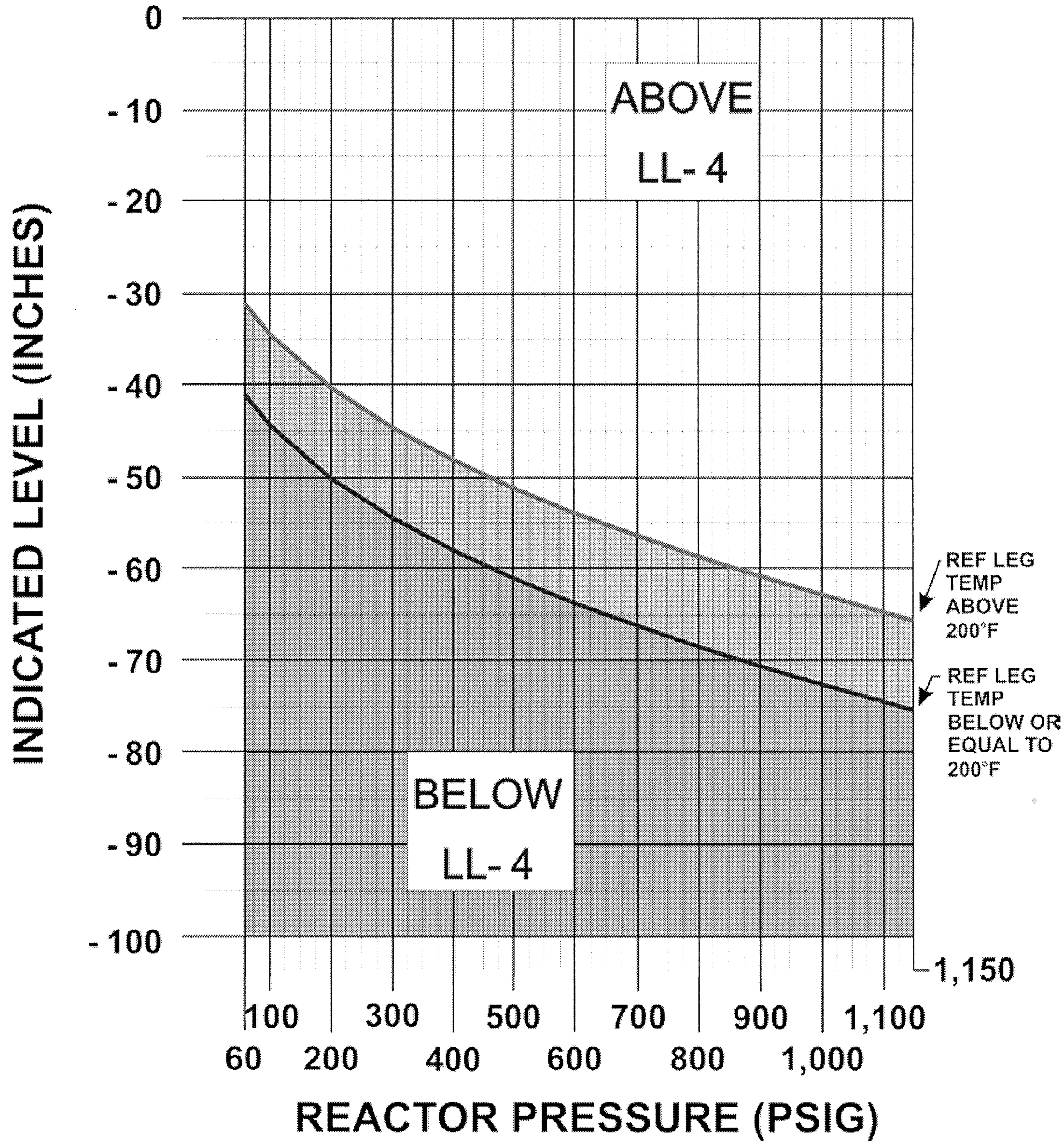
FIGURE 17A

Unit 2 Reactor Water Level at TAF



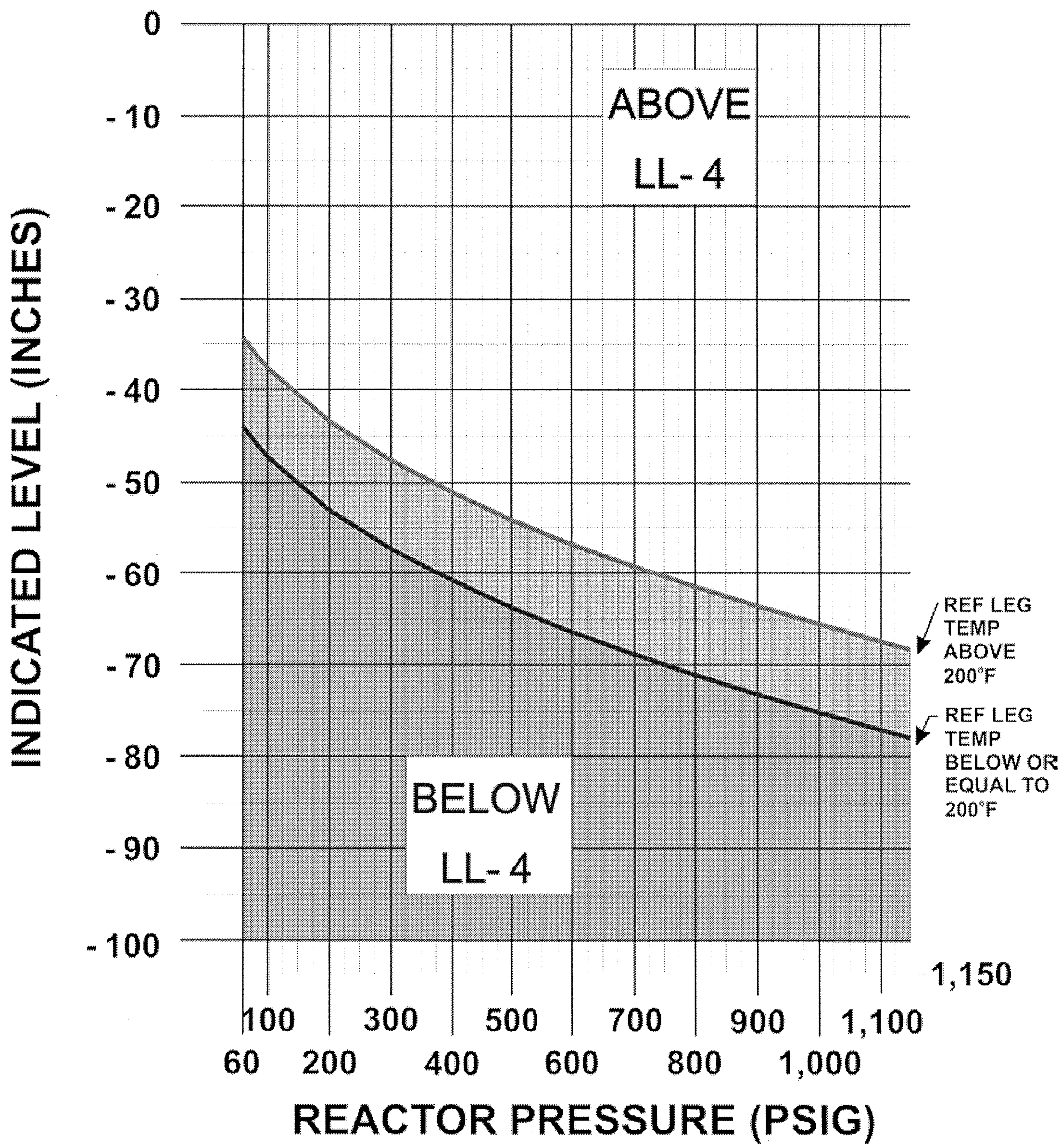
WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
TAF IS -7.5 INCHES.

ATTACHMENT 6
Page 14 of 19
FIGURE 18
Unit 1 Reactor Water Level at LL-4
(Minimum Steam Cooling Level)



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
LL-4 IS -30.0 INCHES.

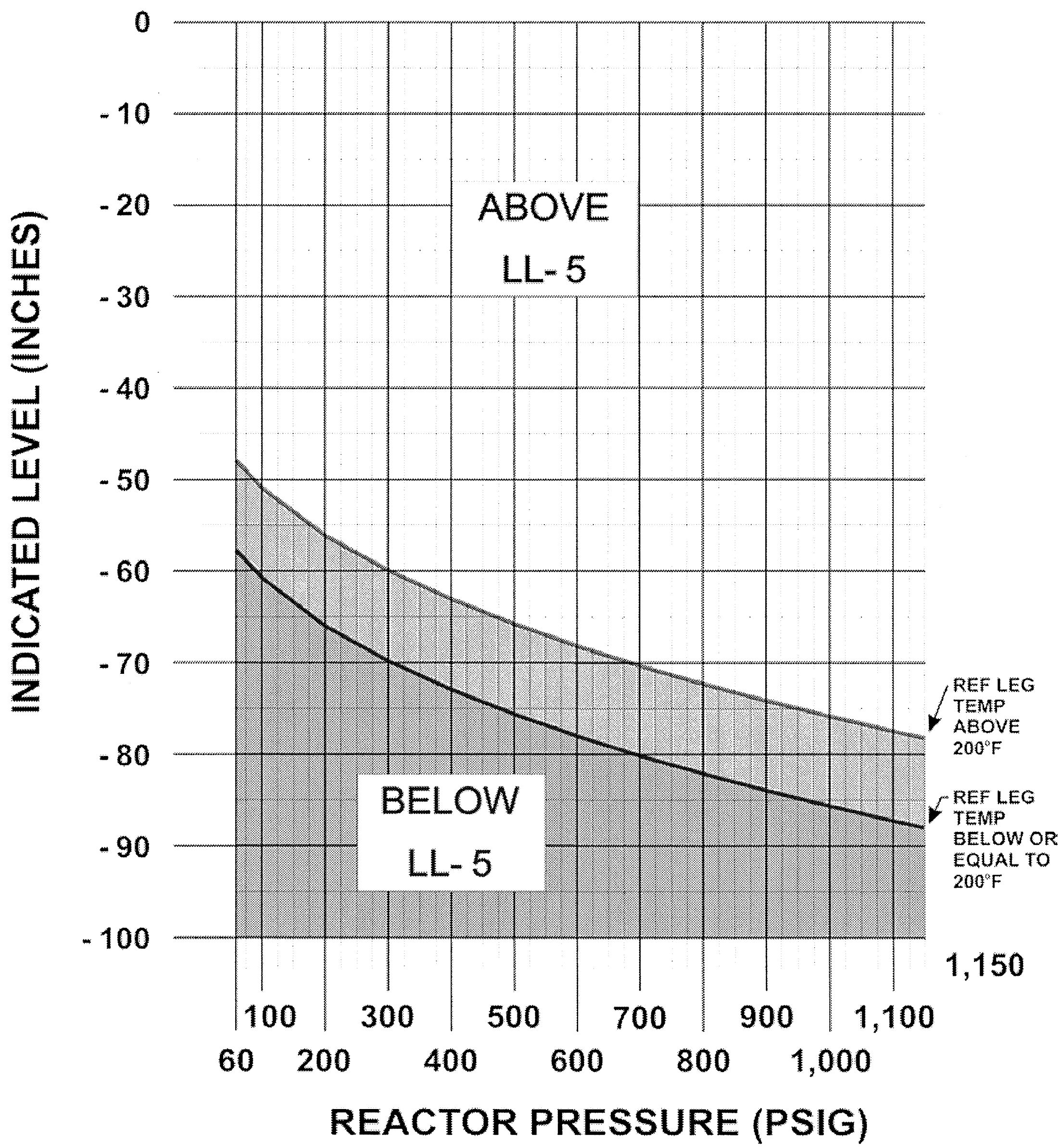
FIGURE 18A
Unit 2 Reactor Water Level at LL-4
(Minimum Steam Cooling Level)



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
LL-4 IS -32.5 INCHES.

FIGURE 19

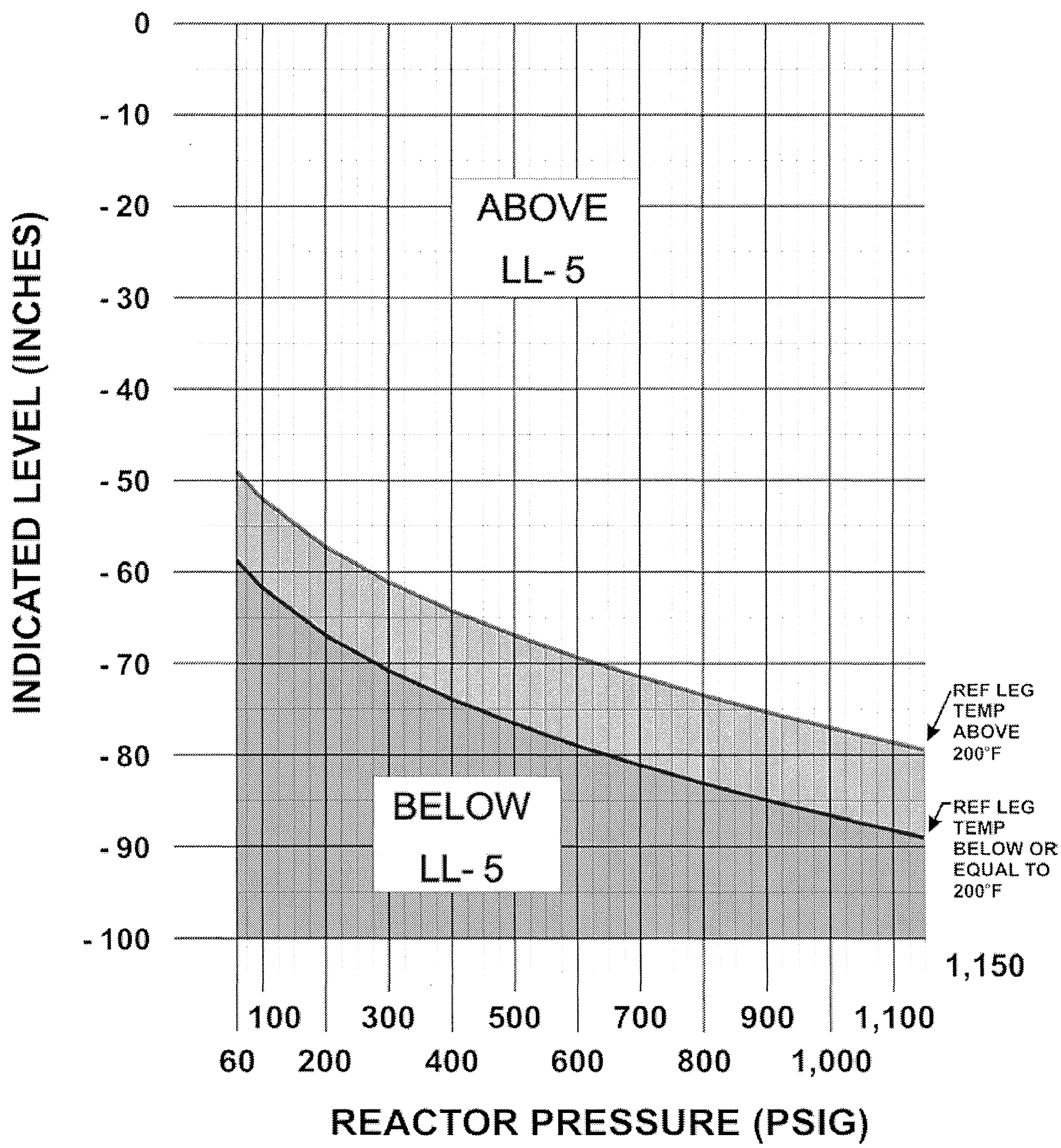
Unit 1 Reactor Water Level at LL-5
(Minimum Zero Injection Level)



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
LL-5 IS -47.5 INCHES.

FIGURE 19A

Unit 2 Reactor Water Level at LL-5
(Minimum Zero Injection Level)



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
LL-5 IS -47.5 INCHES.

PROGRESS ENERGY CAROLINAS
BRUNSWICK TRAINING SECTION

JOB PERFORMANCE MEASURE

ADMINISTRATIVE

A-1A-S

LESSON TITLE:	**Evaluate Core Spray System Operability Test Data**
LESSON NUMBER:	**LOT-ADM-JP-018-A01**
REVISION NO:	**0**

SAFETY CONSIDERATIONS:

None

EVALUATOR NOTES: (Do not read to trainee)

1. The applicable procedure section **WILL** be provided to the trainee.
2. This is an administrative JPM designed to be administered in any setting and may be administered to multiple candidates simultaneously in a classroom setting.
3. If this is the first JPM of the JPM set, read the JPM briefing contained NUREG 1021, Appendix E, or similar to the trainee.
4. Obtain copy of 0PT-07.2.4a and fill out Attachment 1 up to Unit SCO review. Under General Comments, Exceptions, and Corrective Actions fill in None.
5. Fill out Attachment 2 for Core Spray Pump 1A Test Information. Data should be within acceptance range with exception of:

   Incorrectly determine pump DP and record that value. Use numbers that when correctly subtracted place pump DP below the acceptance and required action range value.

   Fill out one vibration (1W A) as greater than maximum acceptance value but less than required action – in alert range.
6. Fill out Attachment 3 for Unit 1 Core Spray Loop A Valve Test Information Sheet. All data filled out should fall within acceptance range with the exception of:

   1-E21-F005A stoke open time should be filled out as greater than maximum value, but less than limiting value.

   1-E21-F031A stroke close time should be filled out as less than minimum value.
7. Provide filled out Attachments 1, 2, & 3 and Acceptance Criteria from 0PT-07.2.4a to examinee. Provide examinee an entire copy of 0PT-07.2.4a if requested (examiner should have available copy for each examinee).

Read the following to trainee.

TASK CONDITIONS:

1. 0PT-07.2.4a, Core Spray System Operability Test – Loop A, has just been completed on Unit One for Core Spray Loop 1A by an operator.
2. The operator who completed the test has determined all acceptance criteria are met with no exceptions as certified on Attachment 1.
3. The operator who completed the test has requested a peer check of the data that was recorded on Attachments 2 and 3 to ensure all acceptance criteria are met.
4. Another operator is checking the remainder of the procedure, other than Attachments 2 and 3 for satisfactory completion.

INITIATING CUE:

You are directed to evaluate the data recorded in 0PT-07.2.4a, Attachments 2 and 3, against the acceptance criteria of the test. Report any exceptions to satisfactory performance, and if required, any corrective action required by 0PT-07.2.4a.

PERFORMANCE CHECKLIST

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

Step 1 - Obtain a current revision of 0PT-02.4.7a.

Current Revision of 0PT-02.7.4a obtained.

SAT/UNSAT*

NOTE: If requested, provide copy of entire procedure 0PT-07.2.4a.

Step 2 – Evaluate data in the completed Attachments 2 and 3 and identify the following deficiencies:

a. Identify that Pump DP is incorrectly calculated and that actual DP is outside acceptance range and in required action range.

Identified that Pump DP psid is outside acceptance range and in required action range

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

b. Identify that Pump vibration position 1W A is in the alert range.

Identified that Pump vibration position 1W A is in the alert range

SAT/UNSAT*

c. Identify that Valve 1-E21-F005A is outside acceptance range but within limiting time for opening.
   Identified that Valve 1-E21-F005A is outside acceptance range but within limiting time for opening.

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

d. Identify that Valve 1-E21-F031A is outside (less than) minimum acceptance range for closing.
   Identify that Valve 1-E21-F031A is outside (less than) minimum acceptance range for closing.

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

Step 3 – Recommend the following corrective actions:

a. Declare Core Spray Pump 1A Inoperable based on pump DP.
   Recommended that Core Spray Pump 1A be declared Inoperable.

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

NOTE: It is not required to identify the following corrective action since testing is not required on inoperable equipment.

b. Double frequency of testing of Core Spray Pump 1A based on vibration in alert range until cause is determined and corrected.
Recommended that Core Spray Pump 1A testing frequency be doubled.

SAT/UNSAT*

c. Declare 1-E21-F005A Inoperable or immediately retest based on opening stroke time.
Recommended that 1-E21-F005A be declared inoperable or immediately retested.

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

d. Declare 1-E21-F031A Inoperable based on closing stroke time.
Recommended that 1-E21-F031A be declared inoperable.

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

TERMINATING CUE: When the examinee has reviewed Attachments 2 & 3 of PT 07.4.2a and recommended corrective actions, this JPM is complete.

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

RELATED TASKS:

209003B201, Perform Core Spray System Operability Test Per PT-07.2.4a (07.2.4b)

K/A REFERENCE AND IMPORTANCE RATING:

GEN 2.1.32 3.8/4.0

Ability to explain and apply system limits and precautions.

REFERENCES:

0PT-07.2.4a

TOOLS AND EQUIPMENT:

None.

ADMINISTRATIVE CATEGORY (from NUREG 1123):

Admin – Equipment Control

Validation Time: 15 Minutes

APPLICABLE METHOD OF TESTING

Performance:	Simulate	___	Actual	ŏ	Unit:	1
Setting:	Control Room	___	Simulator ___ (N/A for Admin or In-Plant JPMs)			
Time Critical:	Yes	___	No	ŏ	Time Limit	N/A
Alternate Path:	Yes	___	No	ŏ		

EVALUATION

Trainee:______________________________

JPM: Pass _____ Fail _____

Remedial Training Required: Yes _____ No _____

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

Comments: ____

____

____

____

____

Comments reviewed with Student

Evaluator Signature: ______________________________ Date:__________

TASK CONDITIONS:

1. 0PT-07.2.4a, Core Spray System Operability Test – Loop A, has just been completed on Unit One for Core Spray Loop 1A by an operator.
2. The operator who completed the test has determined all acceptance criteria are met with no exceptions as certified on Attachment 1.
3. The operator who completed the test has requested a peer check of the data that was recorded on Attachments 2 and 3 to ensure all acceptance criteria are met.
4. Another operator is checking the remainder of the procedure, other than Attachments 2 and 3 for satisfactory completion.

INITIATING CUE:

You are directed to evaluate the data recorded in 0PT-07.2.4a, Attachments 2 and 3, against the acceptance criteria of the test. Report any exceptions to satisfactory performance, and if required, any corrective action required by 0PT-07.2.4a.

ATTACHMENT 1
Page 1 of 1
Certification and Review Form

General Comments and Recommendations None.

	Initials	Name (Print)
Performed by:	JD	John Doe
	AB	Anne Body

Exceptions to satisfactory performance none

Corrective action required none

NOTE:	Pump test data shall be analyzed within 96 hours after completion of this PT. SCO review/approval of the PT satisfies this ASME Code requirement.

Test procedure has been satisfactorily completed:

Unit SCO: ______________________ ______________
Signature Date

Test procedure has **NOT** been satisfactorily completed:

Unit SCO: ______________________ ______________
Signature Date

Test has been reviewed by:

Shift Superintendent ______________________ ______________
Signature Date

Unit 1 Core Spray Pump A Test Information Data Sheet

1. The lubricant level (pump running) is normal. JO
2. Calculate pump dP as follows:

   Pump discharge pressure - suction pressure (run) = pump dP

   265.0 - 4.0 = 269.0

NOTE: Pump vibration measurement is required only during CPT. Vibration is measured at the test point marked on the pump for the correct bearing number and direction as indicated by the Test Position number as follows:

- the number indicates the bearing number from Attachment 5
- for position, N=North, S=South, E=East, W=West
- for direction, A=Axial, H=Horizontal, V=Vertical

NOTE: Reference values for pump suction and discharge pressures are provided for determining the suitability of alternate test gauges, if used.

UNIT 1 CORE SPRAY PUMP A TEST DATA							
TEST PARAMETER	ACTUAL VALUE	REFERENCE VALUE	ACCEPTANCE VALUE RANGE	ALERT RANGE		REQUIRED ACTION RANGE	
				LOW	HIGH	LOW	HIGH
Suction Press. (Stopped) psig	6.0	6.0	4 to 8	N/A	N/A	< 4	> 8
Suction Press. (Running) psig	4.0	4.0	N/A	N/A	N/A	N/A	N/A
Discharge Press. Psig	265.0	290.0	N/A	N/A	N/A	N/A	N/A
Quarterly Pump DP psid	269.0	290.9	261.9 to 319.9	N/A	N/A	< 261.9	> 319.9
CPT Pump DP psid	n/a	290.9	270.6 to 299.6	261.9 to <270.6	N/A	< 261.9	> 299.6
Flow Rate gpm	4700	4,700	N/A	N/A	N/A	N/A	N/A
Vibration-vel (in/s peak) Position 1S H	.300	0.133	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W A	.295	0.195	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W H	.425	0.144	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700

Performed By (Signature) J. Doe Date ________ Time ________

Reviewed, IST Group (Signature) ____________________ Date ________

Unit 1 Core Spray System (Loop A) Valve Test Information Sheet

Valve Number	Stroke Direction	Remote Position Indication (Initials)		Stroke Time Test (sec)	Stroke Time Acceptance Criteria (Seconds)				Fail-Safe Test (Initials)	Full-Stroke Exercise (Initials)	Check Valve Exercise (Initials)	Valve SAT/ UNSAT
		Stem	Ind. Lights		Acceptable Range Minimum (≥)	Acceptable Range Maximum (≤)	Limiting (≤)	Ref. Stroke Time				
1-E21-F015A	OPEN	AB	JD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SAT
1-E21-F015A	CLOSED	AB	JD	41.80	35.90	48.50	52.70	42.20	N/A		N/A	SAT
1-E21-F004A	CLOSED	AB	JD	11.60	9.85	13.33	14.49	11.59	N/A	N/A	N/A	SAT
1-E21-F005A	OPEN	AB	JD	13.75	10.01	13.55	14.73	11.78	N/A	N/A	N/A	SAT
1-E21-F005A	CLOSED	AB	JD	11.25	9.88	13.36	14.53	11.62	N/A		N/A	SAT
1-E21-F004A	OPEN	AB	JD	12.05	9.99	13.51	14.69	11.75	N/A		N/A	SAT
1-E21-F001A	CLOSED	AB	JD	81.40	68.51	92.69	100.75	80.60	N/A	N/A	N/A	SAT
1-E21-F001A	OPEN	AB	JD	84.25	72.73	98.39	106.95	85.56	N/A		N/A	SAT
1-E21-F031A	CLOSED	AB	JD	12.95	11.00	14.80	16.10	12.90	N/A	N/A	N/A	SAT
1-E21-F031A	OPEN	AB	JD	12.00	12.30	16.50	18.00	14.40	N/A		N/A	SAT
1-E21-F003A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	AB	SAT
1-E21-F029A	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	AB	SAT
1-E21-F030A	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	AB	SAT
1-E21-F029A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	AB	SAT
1-E21-F030A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	AB	SAT
1-E21-F003A	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	AB	SAT

NOTE: Spaces next to valve numbers shall be filled in with an appropriate entry, initials, or N/A.

Performed by (signature) ______________________ Date ____________

Performed by (signature) ______________________ Date ____________

Reviewed, IST Group (signature) ______________________ Date ____________

6.0 ACCEPTANCE CRITERIA

This test may be considered satisfactory when the following criteria are met:

6.1 Pump Tests

NOTE:	Acceptance Criteria 6.1.1 includes allowances for a number of items (such as flow diversion through the minimum flow valve, cracks, and the vent hole). Meeting the values shown assure that CS can provide 4100 gpm to the vessel with 113 psid between the Suppression Pool and the vessel as required by Technical Specifications.

R13 6.1.1 *CORE SPRAY PUMP A* operation develops a recirculation flow rate of 4700 gpm or greater against a system head of greater than or equal to 260 psig. (SR 3.5.1.6, SR 3.5.2.5)

6.1.2 *CORE SPRAY PUMP A* discharge pressure increases to greater than or equal to 300 psig within 5 seconds of control switch operation. (SR 3.5.1.12, SR 3.5.2.7)

6.1.3 The pump test data shall be compared to the allowable ranges identified in Test Information Attachment 2.

6.1.4 If deviations fall within the ALERT RANGE of Attachment 2, the frequency of testing shall be doubled until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set of reference values established per ISTB-6200.

6.1.5 If the deviations fall within the REQUIRED ACTION RANGE of Attachment 2, the pump shall be declared inoperable and not returned to service until the condition has been corrected.

6.1.6 When completed test results show deviations greater than the allowable ACCEPTANCE VALUE RANGE, the instruments involved may be recalibrated and the test rerun. However, this shall not preclude declaring the pump inoperable as required.

6.0 ACCEPTANCE CRITERIA

6.2 Valve Tests

NOTE:	Stroke time shall be measured from the time the control switch is repositioned to the time the valve is fully stroked by light indication. Deviations from this standard method of testing will be specified in the procedure.

6.2.1 Valve Stroke Time

1. Measured stroke times shall be within the ACCEPTABLE RANGE as specified by the minimum and maximum stroke times shown on Attachment 3.

2. For tests where the measured stroke time of a valve exceeds the maximum ACCEPTABLE stroke time but **does not** exceed the LIMITING stroke time, the valve shall be immediately retested or declared INOPERABLE.

   a. If a valve is retested, and the measured stroke time is within the ACCEPTABLE RANGE, the valve may be declared OPERABLE. A Condition Report (CR) shall be generated to ensure the OM Code requirement associated with the evaluation is completed by Engineering.

   b. If a valve is retested and the measured stroke time falls outside the ACCEPTABLE RANGE, a Tracking LCO shall be generated to track the time agreed upon by the Shift Superintendent and BESS in accordance with 0OI-01.08. Otherwise, declare the valve INOPERABLE and meet the requirements of all applicable Technical Specifications.

3. For tests where the measured stroke time of the valve is less than the minimum ACCEPTABLE stroke time, exceeds the LIMITING stroke time or the valve disc or stem fail to exhibit the required change of position, the valve shall immediately be declared INOPERABLE.

4. For Core Spray Injection Valves, E21-F004A and E21-F005A, the measured opening stroke time shall be less than or equal to 23.8 seconds to satisfy Core Spray Loop A response time requirements. (SR 3.5.1.12, SR 3.5.2.7).

6.0 ACCEPTANCE CRITERIA

6.2.2 Valve Full-Stroke Exercise

Full-stroke exercise requirements shall be satisfied by completely cycling a valve from the closed position to the open position and back to the closed position or from the open position to the closed position and back to the open position.

6.2.3 Valve Remote Position Indicator (RPI) Verification

At a refueling frequency (not to exceed 2 years), each RPI Verification identified on Attachment 3 shall be observed to verify that the valve position is accurately indicated in both the open and closed positions by the indicating lights on the RTGB when the valve stem or mechanical position indicator has stopped moving. RPI verification satisfies the requirements of SR 3.3.3.1.3.

6.2.4 Check Valve Exercising

1. Check valve exercising to the full open position shall be satisfied by demonstrating the ability to pass maximum accident condition flow.

2. Check valve exercising to the partial open position shall be satisfied by demonstrating the ability to pass sustained flow.

3. Check valve exercising to the closed position shall be considered satisfactory by demonstrating the ability to establish a differential pressure across the valve seat, or by verifying the absence of flow under pressure while venting the upstream side of the valve seat with pressure on the downstream side.

6.3 Leak Tightness Examination

6.3.1 Identified leakage is recorded on Attachment 4, Leak Identification Data Sheet, and a Work Request (WR) is initiated for any leakage with the exception of packing and gasket leakage less than 5 drops per minute (dpm). The WR shall state that identified leakage is required to be corrected or minimized as required by TS 5.5.2.

6.3.2 For ‘through-wall’ or ‘through-weld’ leakage, a Nuclear Condition Report (NCR) is initiated to assess structural integrity of the affected component.

6.0 ACCEPTANCE CRITERIA

R25

6.3.3 The following applicable actions are taken when the combined leakage total (AST Combined Leakage Log value plus leakage from components shown on Attachment 6) is greater than 0 gpm:

1. If the combined leakage is determined to be less than or equal to 1 gallon per minute (gpm), the normal work management process (PRI 3) for correcting leakage is implemented.

2. If the combined leakage is determined to be greater than 1 gpm and less than or equal to 20 gpm, the initiated WR should be identified as PRI 2 to expedite corrective actions to eliminate or reduce identified leakage as soon as plant conditions allow.

3. If the combined leakage is greater than 20 gpm, the initiated WR should be identified as PRI 2 to expedite corrective actions to eliminate or reduce identified leakage as soon as plant conditions allow. A Nuclear Condition Report (NCR) is initiated to have Engineering assess the impact to the AST (10CFR50.67) analysis.

1.0 PURPOSE

1.1 This test is performed to determine the operability of the Core Spray System A Loop. The test conforms to the requirements specified in Technical Specifications 5.5.6 to perform testing in accordance with ASME OM-Code. This test satisfies Technical Specification surveillance's SR 3.5.1.6 and 3.5.2.5 (for the Core Spray Pump). Performance of Valve Remote Position indicator Verification satisfies the requirements of SR 3.3.3.1.3. This test satisfies a portion of SRs 3.5.1.12 and 3.5.2.7 related to response time testing for Core Spray Pump A and E21-F005A.

1.2 This test also satisfies Technical Specification 5.5.2 for leak tightness inspection every 24 months.

1.3 The following test quantities shall be measured, calculated, or observed and recorded as applicable:

1.3.1 Valve stem travel or disk movement

1.3.2 Proper operation of the valve remote position indicator (RPI)

1.3.3 Time required for valve stroke

1.3.4 Pump inlet pressure

1.3.5 Pump discharge pressure

1.3.6 Pump vibration velocity

1.3.7 Pump flow rate

1.3.8 Pump lubricant level

1.3.9 Pump differential pressure (calculated)

2.0 REFERENCES

2.1 Technical Specifications

2.2 FSAR, Section 6.3

2.3 1(2)OP-18, Core Spray System Operating Procedure

2.4 1(2)OP-51, DC Electrical System Operating Procedure

2.5 0OI-01.08, Control of Equipment and System Status

2.6 Technical Requirements Manual (TRM)

2.7 0SD-18, Core Spray System Description

2.8 NUREG-1482, Revision 1, Guidelines for Inservice Testing at Nuclear Power Plants

2.9 ASME OM Code-2001, Code for Operation and Maintenance of Nuclear Power Plants through ASME OMb Code-2003 Addenda

2.10 NRC Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs

2.11 0ENP-17, Pump and Valve Inservice Testing (IST)

2.12 0ENP-16.1, IST Pump and Valve Data

R13 2.13 EC 46949, 2-E21-F004A/B and F005A/B Motor Pinion Gear Ratio Change & Compiling Core Spray Surveillance Requirements

2.14 EER 90-0315, Vibration Program for 1A and 2A Core Spray Pumps

R15 2.15 Response to NRC Bulletin 88-04, Potential Safety Related Pump Loss

2.16 D-25024, Sheet 2, Core Spray System, Unit 1

2.17 D-02524, Sheet 2, Core Spray System, Unit 2

2.0 REFERENCES

2.18 ESR 97-00508, ECCS Response Time Testing Methods

2.19 10 CFR 50.67, Accident Source Term

R20 2.20 Second Request for Additional Information, Brunswick Steam Electric Plant, Units 1 and 2 Response to Generic Letter 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power Operated Gate Valves"

2.21 EGR-NGGC-0010, System and Component Trending Program and System Libraries

2.22 0ENP-23, Predictive Maintenance Program

2.23 RFJ-14, Refueling Justification for Stroking E21-F015A/B.

2.24 0AP-54, Plant Leak Management

R25 2.25 Brunswick Steam Electric Plant Units 1 and 2, Issuance of Amendment RE: Alternative Source Term (License Amendments 221 and 246, dated May 30, 2002)

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Attachments 2 and 3 must be reviewed by the IST group.

3.2 Water from the suppression pool should not be injected into the reactor vessel during the performance of this test.

3.3 The following annunciators may alarm during the performance of this test:

3.3.1 *CORE SPRAY OR RHR PUMPS RUNNING* (A-03 2-1).

3.3.2 *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10).

3.4 Vibration velocity testing is required only during Comprehensive Pump Tests (CPT). When required, vibration velocity readings shall be taken at the test positions specified on the data sheet. Since there are multiple test points, ensure that the probe is located on the correct bearing (see Attachment 5) and in the correct direction as specified in the test position number.

3.0 PRECAUTIONS AND LIMITATIONS

3.5 For taking vibration readings, the probe shall be securely mounted at each test position. The probe must be in firm contact with the bearing housing when taking data.

3.6 When taking readings to be recorded on Attachment 2, the indicator/pointer fluctuation should be reduced to a minimum. A valve upstream of the gauge may be throttled to reduce fluctuation. Care should be taken to ensure proper communication between the gauge and main flow path.

3.7 Suitable test gauges may be used in place of any installed instrument. If used, the full-scale range of each analog instrument should be three times the reference value or less, with adequate range to prevent damage during use. Use of alternate test gauges requires recording the test gauge identification number, test gauge calibration date, and test gauge calibration due date.

3.8 Some steps of this test require independent verification.

3.9 An Operator should be stationed to monitor system piping for excessive motion and/or water hammer when a Core Spray Pump is started. The susceptible piping includes Core Spray discharge piping located in the overhead of the 50' elevation of the Reactor Building.

3.10 When opening system drain/vent valves, proper radiological control procedures shall be observed.

3.11 Core Spray Loop A shall be declared inoperable from the beginning of Valve Testing, Section 7.7, to when valve stroking is complete **AND** the *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10) is cleared.

3.12 During system venting, air is not expected in the system. Should air be found, initiate a W/O and notify the System Engineer. Presence of air in the system does not make the system inoperable but does imply component degradation at some point that must be addressed. The test may continue provided air can be removed from the system via the normal venting process.

3.13 The Comprehensive Pump Test (CPT) Acceptance Criteria is only applicable when performing a Comprehensive Pump Test. The Quarterly pump test Acceptance Criteria is only applicable when performing a Quarterly Test.

4.0 PREREQUISITES

4.1 No other testing or maintenance is in progress that will adversely affect the performance of this test.

4.2 The Core Spray System (Loop A) is in standby per 1(2)OP-18.

4.3 The station battery chargers are in operation per 1(2)OP-51.

4.4 **IF** a leakage walkdown is required, **THEN** 0AP-054 Alternative Source Term (AST) Combined Leakage Log value has been recorded on Attachment 4.

4.5 If Comprehensive Pump Testing is required, a temporary 0-30 psig digital pressure gauge, with an accuracy within 0.1%, is installed at A Core Spray Pump suction at *E21-PI-R001A INSTRUMENT DRAIN VALVE, E21-PI-R001A-6.*

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Confirm that no active corrective maintenance W/O exists on the following installed instruments. If any active W/O exists, operability of the instrument must be resolved and recorded in the General Comments and Recommendations section before the instrument may be used.

	Instrument	W/R-W/O	W/R-W/O #
5.1.1	E21-PT-N001A	yes / no	________
5.1.2	E21-FT-N003A	yes / no	________
5.1.3	E21-PI-R600A	yes / no	________
5.1.4	E21-FI-R601A	yes / no	________
5.1.5	E21-PI-2651	yes / no	________
5.1.6	E21-PI-7119A	yes / no	________
5.1.7	E21-PI-R001A	yes / no	________

5.0 SPECIAL TOOLS AND EQUIPMENT

5.2 If CPT is required, a digital 0-30 psig pressure gauge, with an accuracy within 0.1%, is installed at *E21-PI-R001A INSTRUMENT DRAIN VALVE, E21-PI-R001A-6.* If used, note:

5.2.1 ID number ________

5.2.2 Calibration date ________

5.2.3 Calibration due date ________

5.3 Suitable test gauges may be used to obtain data in place of any installed instrument. If used, note:

5.3.1 ID number ________

5.3.2 Range of instrument ________

5.3.3 Calibration date ________

5.3.4 Calibration due date ________

5.3.5 Parameter measured ________

5.4 A stopwatch with the following data recorded below:

5.4.1 Stopwatch identification number. ________

5.4.2 Stopwatch calibration date. ________

5.4.3 Stopwatch calibration due date. ________

5.5 If a CPT is performed, Predictive Maintenance personnel will provide the vibration monitoring instrument used for data collection. Record the required data below:

5.5.1 Vibration monitor identification number. ________

5.5.2 Transducer identification number. ________

5.5.3 Vibration monitor/transducer calibration date. ________

5.5.4 Vibration monitor/transducer calibration due date. ________

5.6 Vent and drain rig

5.7 Tubing, valves, and fittings to install test gauges (as required).

5.8 Ladder for vibration readings, if required

7.0 PROCEDURAL STEPS

Initials

7.1 **OBTAIN** permission from the Unit SCO to perform this test, **AND ENSURE** LCO requirements have been reviewed in accordance with 0OI-01.08. _____ Unit SCO

7.2 **ENSURE** all prerequisites listed in Section 4.0 are met. _____

7.3 **CONFIRM** required data has been recorded in Section 5.0. _____

7.4 **NOTIFY** Maintenance the pumps are being tested so they can observe the pump run, if desired. _____

NOTE:	A leakage walkdown is required to be performed each 24 months per TS 5.5.2.b.

7.5 **IF** a leakage walkdown is required of *CORE SPRAY LOOP A* during the performance of this procedure, **THEN PREPARE** to perform a system walkdown to identify system leaks. _____

7.6 **IF** CPT is required, **THEN ENSURE** a 0-30 psig digital pressure gauge is installed at *E21-PI-R001A INSTRUMENT DRAIN VALVE, E21-PI-R001A-6.* _____

7.0 PROCEDURAL STEPS

Initials

7.7 Valve Testing

NOTE: Those steps associated with valve remote position indicator (RPI) verification are performed each refueling, not to exceed 2 years, or after maintenance which affects RPI performance. **IF** RPI verification is **NOT** required for this test, **THEN** N/A may be entered in the Initials.

NOTE: Steps 7.7.1 through 7.7.3.2 are required to be performed only during refueling outages in an effort to prevent voiding Core Spray piping during power operations. **IF** these steps are **NOT** required for this test, **THEN** NA may be entered where appropriate.

R20

CAUTION

Core Spray Loop A shall be declared inoperable from the beginning of Valve Testing to when valve stroking is complete **AND** the *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10) is cleared.

7.7.1 **IF** performing during a refueling outage, **THEN ENSURE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* is closed. _____

7.7.2 **IF** performing during a refueling outage**, THEN OPEN** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A*. _____

1. **CONFIRM** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. _____

7.7.3 **IF** performing during a refueling outage**, THEN CLOSE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. _____

1. **CONFIRM** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A*, valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. _____

7.0 PROCEDURAL STEPS

Initials

2. **IF** entrance into this procedure was necessary only to perform stroking and timing of *E21-F015A*, **THEN GO TO AND PERFORM** Section 7.8 **AND** applicable steps of Section 7.10. _____

7.7.4 **ENSURE** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* is open. _____

7.7.5 **CLOSE** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* **AND RECORD** valve stroke time on Attachment 3. _____

1. **CONFIRM** Core Spray *OUTBOARD INJECTION VLV, E21-F004A*, valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. _____

7.7.6 **ENSURE** Core Spray *INBOARD INJECTION VLV, E21-F005A,* is closed. _____

7.7.7 **OPEN** Core Spray *INBOARD INJECTION VLV, E21-F005A,* **AND RECORD** valve stroke time on Attachment 3. _____

1. **CONFIRM** Core Spray *INBOARD INJECTION VLV, E21-F005A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. _____

7.7.8 **CLOSE** Core Spray *INBOARD INJECTION VLV, E21-F005A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. _____

1. **CONFIRM** Core Spray *INBOARD INJECTION VLV, E21-F005A,* valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. _____

7.0 PROCEDURAL STEPS

Initials

7.7.9 **OPEN** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. ____

1. **CONFIRM** Core Spray *OUTBOARD INJECTION VLV, E21-F004A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. ____

7.7.10 **ENSURE** Core Spray *TORUS SUCTION VLV, E21-F001A,* is open. ____

7.7.11 **CLOSE** Core Spray *TORUS SUCTION VLV, E21-F001A,* **AND RECORD** valve stroke time on Attachment 3. ____

1. **CONFIRM** Core Spray *TORUS SUCTION VLV, E21-F001A,* valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. ____

7.7.12 **OPEN** Core Spray *TORUS SUCTION VLV, E21-F001A,* **AND RECORD** the valve stroke time and full-stroke exercise on Attachment 3. ____

1. **CONFIRM** Core Spray *TORUS SUCTION VLV, E21-F001A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. ____

7.7.13 **ENSURE** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* is open. ____

7.7.14 **CLOSE** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* **AND RECORD** valve stroke time on Attachment 3. ____

1. **CONFIRM** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* valve stem travels to the closed position when indicating lights indicate closed, **AND RECORD** remote position indicator results on Attachment 3. ____

7.0 PROCEDURAL STEPS

Initials

7.7.15 **OPEN** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* **AND RECORD** valve stroke time and full-stroke exercise on Attachment 3. _____

1. **CONFIRM** Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* valve stem travels to the open position when indicating lights indicate open, **AND RECORD** remote position indicator results on Attachment 3. _____

NOTE:	A higher pressure indication on *E21-PI-R600A* than on *E21-PI-R001A* confirms *CORE SPRAY PUMP DISCHARGE CHECK VALVE, E21-F003A*, is in the closed position.

7.7.16 **CONFIRM** *CORE SPRAY PUMP DISCHARGE CHECK VALVE, E21-F003A,* is in the closed position **AND RECORD** position on Attachment 3. _____

7.8 Filling and Venting Core Spray Loop A

NOTE:	**IF** air is observed in the discharge piping, a W/R should be prepared to correct any problems.

7.8.1 **IF** the keepfill station for *CORE SPRAY LOOP A* is available, **THEN PERFORM** the following:

1. **ENSURE** that a vent and drain rig is attached to *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* _____

2. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* until a solid stream of water issues from the vent line, **THEN CLOSE** *E21-V23.* _____

NOTE:	Observation of a solid stream of water from *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* confirms *KEEPFILL STATION CHECK VALVES, E21-F029A* and *E21-F030A* go to the partial open position.

3. **CONFIRM** *KEEPFILL STATION CHECK VALVES, E21-F029A* and *E21-F030A*, go to the partial open position **AND RECORD** position on Attachment 3. _____

7.0 PROCEDURAL STEPS

Initials

CAUTION

Failure to follow Steps 7.8.2.1 through 7.8.2.8 in the order specified may cause the *KEEPFILL RELIEF VALVE, E21-F024A*, to lift and damage the seat of *KEEPFILL STATION PRESSURE CONTROL VALVE, E21-PCV-F026A.*

7.8.2 **IF** it is desired to use the *KEEPFILL STATION E21-PCV-F026A BYPASS VALVE, E21-F028A*, **OR** the valve is already open, **THEN PERFORM** the following:

1. **ENSURE** that a vent and drain rig is attached to *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* _____

2. **ENSURE** *KEEPFILL STATION E21-PCV-F026A DOWNSTREAM ISOLATION VALVE, E21-F027A,* is closed. _____

3. **IF** necessary, **THROTTLE OPEN** *KEEPFILL STATION E21-PCV-F026A BYPASS VALVE, E21-F028A.* _____

4. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23*, until a solid stream of water issues from the vent line, **THEN CLOSE** *E21-V23*. _____

NOTE: Observation of a solid stream of water from *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* confirms *KEEPFILL STATION CHECK VALVES, E21-F029A* and *E21-F030A* go to the partial open position.

5. **CONFIRM** *KEEPFILL STATION CHECK VALVES, E21-F029A* and *E21-F030A*, go to the partial open position **AND RECORD** position on Attachment 3. _____

6. **CLOSE** *KEEPFILL STATION E21-PCV-F026A BYPASS VALVE, E21-F028A.* ___/___ Ind.Ver.

7.0 PROCEDURAL STEPS

Initials

7. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* until *CORE SPRAY PUMP A DISCHARGE PRESSURE INDICATOR, E21-PI-R600A* (Panel H12-P601), indicates 40 to 70 psig, **THEN CLOSE** *E21-V23.* _____

8. **SLOWLY OPEN** *KEEPFILL STATION E21-PCV-F026A DOWNSTREAM ISOLATION VALVE, E21-F027A.* __/__ Ind.Ver.

7.8.3 **IF** required, **REMOVE** the vent and drain rig from the *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* _____

7.8.4 **CONFIRM** *CORE SPRAY LOOP A SYS PRESS LOW* (A-01 2-10) is cleared. _____

7.9 Pump Testing

7.9.1 **IF** Quarterly testing is to be performed, **THEN OBSERVE** *CORE SPRAY PUMP A* suction pressure (stopped), as indicated on *E21-PI-R001A,* **AND RECORD** on Attachment 2. _____

7.9.2 **IF** Comprehensive Pump Testing is to be performed, **THEN PERFORM** the following:

1. **OPEN** *E21-PI-R001A INSTRUMENT DRAIN VALVE, E21-PI-R001A-6.* _____

2. **OBSERVE** *CORE SPRAY PUMP A* suction pressure (stopped), as indicated on temporary gauge, **AND RECORD** on Attachment 2. _____

7.0 PROCEDURAL STEPS

Initials

> **CAUTION**
>
> Do **NOT** cross-connect the Nuclear and Conventional Service Water headers by simultaneously opening *NUC SW TO VITAL HEADER VLV, SW-V117*, and *CONV SW TO VITAL HEADER VLV, SW-V111*.

7.9.3 **ENSURE** one of the following valves is open:

1. *NUC SW TO VITAL HEADER VLV, SW-V117* _____

OR

2. *CONV SW TO VITAL HEADER VLV, SW-V111.* _____

7.9.4 **ENSURE** *VITAL HEADER XTIE VLV, SW-V118*, is open. _____

7.9.5 **ENSURE** *WELL WATER TO VITAL HEADER VALVE, SW-V141,* is closed. _____

7.9.6 **STATION** an operator to monitor system piping for excessive motion and water hammer when a Core Spray pump is started. _____

7.9.7 **ENSURE** proper *CORE SPRAY PUMP A* lubricant level. _____

7.0 PROCEDURAL STEPS

Initials

NOTE: The following step requires that the time interval from pump start to discharge pressure at 300 psig be measured with a stopwatch. It may be advisable to place a temporary non-destructive mark on the pressure indicator at 300 psig to assist in timing.

R15

CAUTION

Operation of the Core Spray Pump in the minimum flow mode should be minimized.

7.9.8 **START** *CORE SPRAY PUMP A* while monitoring pump discharge pressure on *E21-PI-R600A*, **AND CONFIRM** pressure increases to greater than or equal to 300 psig in less than or equal to 5.0 seconds. _____

Response Time _____ sec.

7.9.9 **RECORD** the time that *CORE SPRAY PUMP A* was started. _____

Time ________

7.9.10 **ENSURE** the following:

1. *CORE SPRAY DIVISION I ROOM COOLER FAN* has started. _____
2. *SERVICE WATER OUTLET VALVE, SW-V128*, is open. _____

7.9.11 **THROTTLE OPEN** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* to obtain greater than or equal to 4700 gpm as indicated on *E21-FI-R601A.* _____

7.9.12 **WHEN** flow is greater than 603 gpm, **CONFIRM** that the Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* closes. _____

R13 7.9.13 **CONFIRM** *CORE SPRAY PUMP A* discharge pressure is greater than or equal to 260 psig, as indicated on *E21-PI-R600A.* _____

> **NOTE:** A higher pressure indication on *E21-PI-R600A* than on *E21-PI-2651* confirms *KEEPFILL STATION CHECK VALVES, E21-F030A* or *E21-F029A*, goes to the closed position. If indication on *E21-PI-2651* is "pegged", then proceed to Step 7.9.15. If test is satisfactory, then N/A Step 7.9.15.
>
> **NOTE:** Operability of the keep-fill check valves is performed as a pair. If the check valves cannot be determined to be closed, then a W/R shall be written to repair or replace both *E21-F030A* and *E21-F029A*.

7.9.14 **CONFIRM** *KEEPFILL STATION CHECK VALVES, E21-F030A* or *E21-F029A*, goes to the closed position, **AND RECORD** on Attachment 3. _____

> **NOTE:** Confirming the absence of flow under pressure while venting at *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786*, satisfies reverse exercising requirements for *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A.* This does **NOT** imply that drainage will not be present.

R15 7.9.15 **IF** test conditions in Step 7.9.14 cannot be met, **THEN PERFORM** the following steps to satisfy exercising *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A*, to the closed position:

1. **CONNECT** hose at *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786*, **AND ROUTE** to floor drain. _____

2. **CLOSE** *KEEPFILL STATION E21-PCV-F026A UPSTREAM ISOLATION VALVE, E21-F025A.* _____

3. **ENSURE** *CORE SPRAY LOOP A KEEPFILL ISOLATION VALVE, TD-V13,* is closed. _____

4. **OPEN** *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786,* **AND ALLOW** piping to drain for a minimum of 3 minutes. _____

5. **CONFIRM** the absence of pressurized flow from drain hose **AND RECORD** *KEEPFILL STATION CHECK VALVES, E21-F030A* and/or *E21-F029A* go to the closed position on Attachment 3. _____

7.0 PROCEDURAL STEPS

Initials

6. **CLOSE** *E21-PI-2651 INSTRUMENT DRAIN VALVE, E21-IV-786.* ___/___ Ind.Ver.

CAUTION

Damage to the *KEEPFILL STATION PRESSURE CONTROL VALVE, E21-PCV-F026A*, may occur if it is placed in service too rapidly.

7. **SLOWLY OPEN** *KEEPFILL STATION E21-PCV-F026A UPSTREAM ISOLATION VALVE, E21-F025A.* ___/___ Ind.Ver.

7.9.16 **SLOWLY OPEN** *E21-PI-7119A INSTRUMENT ISOLATION VALVE, E21-V5000.* _____

NOTE: The Core Spray Pump shall be operated under conditions as stable as the system permits prior to recording test data.

7.9.17 **THROTTLE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* to obtain 4700 gpm as indicated on *E21-FI-R601A*. _____

7.9.18 **IF** the Quarterly test is being performed, **THEN PERFORM** the following:

1. **OBSERVE** *CORE SPRAY PUMP A* suction pressure (running), as indicated on *E21-PI-R001A,* **AND RECORD** on Attachment 2. _____

2. **OBSERVE** *CORE SPRAY PUMP A* discharge pressure, as indicated on *E21-PI-7119A,* **AND RECORD** on Attachment 2. _____

3. **CALCULATE** Core Spray Pump differential pressure, **AND RECORD** in Quarterly Pump DP on Attachment 2. _____

4. **RECORD** *CORE SPRAY PUMP A* System flow, as indicated on *FLOW INDICATOR E21-FI-R601A,* on Attachment 2. _____

7.9.19 **IF** Comprehensive Pump Testing is being performed, **THEN PERFORM** the following:

1. **OBSERVE** *CORE SPRAY PUMP A* suction pressure (running), as indicated on temporary gauge, **AND RECORD** on Attachment 2. _____

2. **OBSERVE** *CORE SPRAY PUMP A* discharge pressure, as indicated on *E21-PI-7119A,* **AND RECORD** on Attachment 2. _____

3. **CALCULATE** Core Spray Pump differential pressure, **AND RECORD** in CPT Pump DP on Attachment 2. _____

4. **OBSERVE** *CORE SPRAY PUMP A* System flow, as indicated on *FLOW INDICATOR E21-FI-R601A,* **AND RECORD** on Attachment 2. _____

5. **MEASURE** *CORE SPRAY PUMP A* vibration velocity (in/sec peak) at the test positions indicated, **AND RECORD** on Attachment 2. _____

7.9.20 **ENSURE** proper lubricant level **AND RECORD** on Attachment 2. _____

NOTE:	Flow indication of at least 5000 gpm on *FLOW INDICATOR E21-FI-R601A* confirms *CORE SPRAY PUMP A DISCHARGE CHECK VALVE, E21-F003A,* goes to the full open position.

7.9.21 **THROTTLE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A,* to obtain 5000 gpm as indicated on *E21-FI-R601A.* _____

7.9.22 **CONFIRM** *CORE SPRAY PUMP A DISCHARGE CHECK VALVE, E21-F003A,* fully opens **AND RECORD** on Attachment 3. _____

NOTE:	A leakage walkdown is required to be performed at least once per 24 months per TS 5.5.2.

7.9.23 **IF** required, **PERFORM** a leakage walkdown of the components identified on Attachment 6, **AND RECORD** leakage on Attachment 4, Leak Identification Data Sheet. _____

7.0 PROCEDURAL STEPS

Initials

7.9.24 **CLOSE** *E21-PI-7119A INSTRUMENT ISOLATION VALVE, E21-V5000.* ___/___ Ind.Ver.

7.9.25 **IF** CPT was performed**, THEN CLOSE** *E21-PI-R001A INSTRUMENT DRAIN VALVE, E21-PI-R001A-6.* ___/___ Ind.Ver.

7.9.26 **CLOSE** Core Spray *FULL FLOW TEST BYP VLV, E21-F015A.* _____

7.9.27 **WHEN** *CORE SPRAY LOOP A* flow is less than 603 gpm, **ENSURE** that Core Spray *MIN FLOW BYPASS VLV, E21-F031A,* opens. _____

7.9.28 **STOP** *CORE SPRAY PUMP A* **AND RECORD** the time. _____

Time ____________

7.9.29 **CONFIRM** the following:

1. *CORE SPRAY DIVISION I ROOM COOLER FAN* is off. _____
2. *SERVICE WATER OUTLET VALVE, SW-V128,* is closed. _____

7.9.30 **IF** required, **ENSURE** the following valves are closed:

1. *NUC SW TO VITAL HEADER VLV, SW-V117* ___/___ Ind.Ver.
2. *CONV SW TO VITAL HEADER VLV, SW-V111* ___/___ Ind.Ver.

7.9.31 **CALCULATE** *CORE SPRAY PUMP A* run time. _____

__________ - ________ = __________
7.9.28 7.9.9

7.0 PROCEDURAL STEPS

Initials

7.9.32 **IF** required to relieve high system pressure condition or ensure the system is filled and vented, **THEN PERFORM** the following

1. **ENSURE** a vent and drain rig is attached to *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* _____

2. **THROTTLE OPEN** *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23,* until a solid stream of water issues from the vent line, **THEN CLOSE** *E21-V23.* _____

3. **IF** required, **REMOVE** the vent and drain rig from *CORE SPRAY DIVISION I LINE VENT VALVE, E21-V23.* _____

7.10 System Restoration

7.10.1 **ALIGN** valves as specified in Table 1. _____

NOTE: Independent verification is required for valve lineup.

TABLE 1
SYSTEM VERIFICATION LINEUP SHEET

VALVE NO.	DESCRIPTION	REQUIRED POSITION	INITIALS IND. VER.
E21-F001A	Core Spray Pump A Suppression Pool Suction Valve	OPEN	/
E21-F004A	Core Spray Outboard Injection Valve	OPEN	/
E21-F005A	Core Spray Inboard Injection Valve	CLOSED	/
E21-F031A	Core Spray Minimum Flow Bypass Valve	OPEN	/
E21-F015A	Core Spray Test Bypass Valve	CLOSED	/
E21-V23	Core Spray Division I Line Vent Valve	CLOSED	/

7.10.2 **IF** installed, **REMOVE** drain hose installed at *E21-PI-2651, INSTRUMENT DRAIN VALVE, E21-IV-786.* _____

7.10.3 **IF** CPT was performed, **THEN REMOVE** the temporary gauge at *E21-PI-R001A INSTRUMENT DRAIN VALVE, E21-PI-R001A-6.* _____

7.0 PROCEDURAL STEPS

Initials

7.10.4	**IF** necessary, **REMOVE** the temporary mark on pressure indicator *E21-PI-R600A*.	_____
7.10.5	**ENSURE** the required information has been recorded on the cover page.	_____
7.10.6	**NOTIFY** the Unit SCO when this test is complete or found to be unsatisfactory.	_____

Certification and Review Form

General Comments and Recommendations ______________________________

____

	Initials	Name (Print)
Performed by:	_____	____________________
	_____	____________________
	_____	____________________
	_____	____________________
	_____	____________________

Exceptions to satisfactory performance ______________________________

____

Corrective action required ______________________________

____

> **NOTE:** Pump test data shall be analyzed within 96 hours after completion of this PT. SCO review/approval of the PT satisfies this ASME Code requirement.

Test procedure has been satisfactorily completed:

Unit SCO: ______________________________ ________________
Signature Date

Test procedure has **NOT** been satisfactorily completed:

Unit SCO: ______________________________ ________________
Signature Date

Test has been reviewed by:

Shift Superintendent ______________________________ ________________
Signature Date

Unit 1 Core Spray Pump A Test Information Data Sheet

1. The lubricant level (pump running) is normal. ________________
2. Calculate pump dP as follows:

   Pump discharge pressure - suction pressure (run) = pump dP

   _____________ - ________________ = _______________

NOTE: Pump vibration measurement is required only during CPT. Vibration is measured at the test point marked on the pump for the correct bearing number and direction as indicated by the Test Position number as follows:

- the number indicates the bearing number from Attachment 5
- for position, N=North, S=South, E=East, W=West
- for direction, A=Axial, H=Horizontal, V=Vertical

NOTE: Reference values for pump suction and discharge pressures are provided for determining the suitability of alternate test gauges, if used.

UNIT 1 CORE SPRAY PUMP A TEST DATA							
TEST PARAMETER	ACTUAL VALUE	REFERENCE VALUE	ACCEPTANCE VALUE RANGE	ALERT RANGE		REQUIRED ACTION RANGE	
				LOW	HIGH	LOW	HIGH
Suction Press. (Stopped) psig		6.0	4 to 8	N/A	N/A	< 4	> 8
Suction Press. (Running) psig		4.0	N/A	N/A	N/A	N/A	N/A
Discharge Press. Psig		290.0	N/A	N/A	N/A	N/A	N/A
Quarterly Pump DP psid		290.9	261.9 to 319.9	N/A	N/A	< 261.9	> 319.9
CPT Pump DP psid		290.9	270.6 to 299.6	261.9 to <270.6	N/A	< 261.9	> 299.6
Flow Rate gpm		4,700	N/A	N/A	N/A	N/A	N/A
Vibration-vel (in/s peak) Position 1S H		0.133	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W A		0.195	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W H		0.144	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700

Performed By (Signature) __________________________ Date ________ Time _______

Reviewed, IST Group (Signature) ___________________ Date _________

Unit 2 Core Spray Pump A Test Information Data Sheet

1. The lubricant level (pump running) is normal. ________________
2. Calculate pump dP as follows:

   Pump discharge pressure - suction pressure (run) = pump dP

   ____________ - ______________ = ______________

NOTE: Pump vibration measurement is required only during CPT. Vibration is measured at the test point marked on the pump for the correct bearing number and direction as indicated by the Test Position number as follows:

- the number indicates the bearing number from Attachment 5
- for position, N=North, S=South, E=East, W=West
- for direction, A=Axial, H=Horizontal, V=Vertical

NOTE: Reference values for pump suction and discharge pressures are provided for determining the suitability of alternate test gauges, if used.

UNIT 2 CORE SPRAY PUMP A TEST DATA							
TEST PARAMETER	ACTUAL VALUE	REFERENCE VALUE	ACCEPTANCE VALUE RANGE	ALERT RANGE		REQUIRED ACTION RANGE	
				LOW	HIGH	LOW	HIGH
Suction Press. (Stopped) psig		6.0	4 to 8	N/A	N/A	< 4	> 8
Suction Press. (Running) psig		4.0	N/A	N/A	N/A	N/A	N/A
Discharge Press. Psig		290.0	N/A	N/A	N/A	N/A	N/A
Quarterly Pump DP psid		283.1	260.0 to 311.4	N/A	N/A	< 260.0	> 311.4
CPT Pump DP psid		283.1	263.3 to 291.5	260.0 to <263.3	N/A	< 260.0	> 291.5
Flow Rate gpm		4,700	N/A	N/A	N/A	N/A	N/A
Vibration-vel (in/s peak) Position 1S H		0.230	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W A		0.212	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700
Vibration-vel (in/s peak) Position 1W H		0.156	0 to 0.325	N/A	> 0.325 to 0.700	N/A	> 0.700

Performed By (Signature) ______________________ Date ________ Time _______

Reviewed, IST Group (Signature) __________________ Date _________

Unit 1 Core Spray System (Loop A) Valve Test Information Sheet

Valve Number	Stroke Direction	Remote Position Indication (Initials)		Stroke Time Test (sec)	Stroke Time Acceptance Criteria (Seconds)				Fail-Safe Test (Initials)	Full-Stroke Exercise (Initials)	Check Valve Exercise (Initials)	Valve SAT/ UNSAT
		Stem	Ind. Lights		Acceptable Range Minimum (≥)	Acceptable Range Maximum (≤)	Limiting (≤)	Ref. Stroke Time				
1-E21-F015A	OPEN			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1-E21-F015A	CLOSED				35.90	48.50	52.70	42.20	N/A		N/A	
1-E21-F004A	CLOSED				9.85	13.33	14.49	11.59	N/A	N/A	N/A	
1-E21-F005A	OPEN				10.01	13.55	14.73	11.78	N/A	N/A	N/A	
1-E21-F005A	CLOSED				9.88	13.36	14.53	11.62	N/A		N/A	
1-E21-F004A	OPEN				9.99	13.51	14.69	11.75	N/A		N/A	
1-E21-F001A	CLOSED				68.51	92.69	100.75	80.60	N/A	N/A	N/A	
1-E21-F001A	OPEN				72.73	98.39	106.95	85.56	N/A		N/A	
1-E21-F031A	CLOSED				11.00	14.80	16.10	12.90	N/A	N/A	N/A	
1-E21-F031A	OPEN				12.30	16.50	18.00	14.40	N/A		N/A	
1-E21-F003A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E21-F029A	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E21-F030A	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E21-F029A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E21-F030A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1-E21-F003A	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

NOTE: Spaces next to valve numbers shall be filled in with an appropriate entry, initials, or N/A.

Performed by (signature) ______________________ Date ______________

Performed by (signature) ______________________ Date ______________

Reviewed, IST Group (signature) ______________________ Date ______________

Unit 2 Core Spray System (Loop A) Valve Test Information Sheet

Valve Number	Stroke Direction	Remote Position Indication (Initials)		Stroke Time Test (sec)	Stroke Time Acceptance Criteria (Seconds)				Fail-Safe Test (Initials)	Full-Stroke Exercise (Initials)	Check Valve Exercise (Initials)	Valve SAT/ UNSAT
		Stem	Ind. Lights		Acceptable Range		Limiting (≤)	Ref. Stroke Time				
					Minimum (≥)	Maximum (≤)						
2-E21-F015A	OPEN			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2-E21-F015A	CLOSED				36.30	49.10	53.30	42.70	N/A		N/A	
2-E21-F004A	CLOSED				9.38	12.70	13.80	11.04	N/A	N/A	N/A	
2-E21-F005A	OPEN				10.20	13.80	15.00	12.00	N/A	N/A	N/A	
2-E21-F005A	CLOSED				10.30	13.94	15.15	12.12	N/A		N/A	
2-E21-F004A	OPEN				9.61	13.01	14.14	11.31	N/A		N/A	
2-E21-F001A	CLOSED				70.00	94.60	102.90	82.34	N/A	N/A	N/A	
2-E21-F001A	OPEN				67.20	90.80	98.70	79.03	N/A		N/A	
2-E21-F031A	CLOSED				12.20	16.40	17.90	14.33	N/A	N/A	N/A	
2-E21-F031A	OPEN				13.10	17.70	19.20	15.41	N/A		N/A	
2-E21-F003A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E21-F029A	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E21-F030A	PART OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E21-F029A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E21-F030A	CLOSED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2-E21-F003A	OPEN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

NOTE: Spaces next to valve numbers shall be filled in with an appropriate entry, initials, or N/A.

Performed by (signature) ______________________ Date ____________

Performed by (signature) ______________________ Date ____________

Reviewed, IST Group (signature) ______________________ Date ____________

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Leak Identification Data Sheet

NOTE: For packing and gaskets, a WR is required to be initiated and documented if leakage exceeds 5 dpm.

NOTE: Each WR/WO listed is required to state that identified leakage is to be corrected or minimized as required by TS 5.5.2.

SYSTEM: Core Spray System A Loop Unit ___________

Component	Nature of Leak	Leakage Rate[1]	WR/WO#
	Sum of Identified Leakage:		
	AST Combined Leakage Log value from 0AP-054:	+	
	Total:	=	

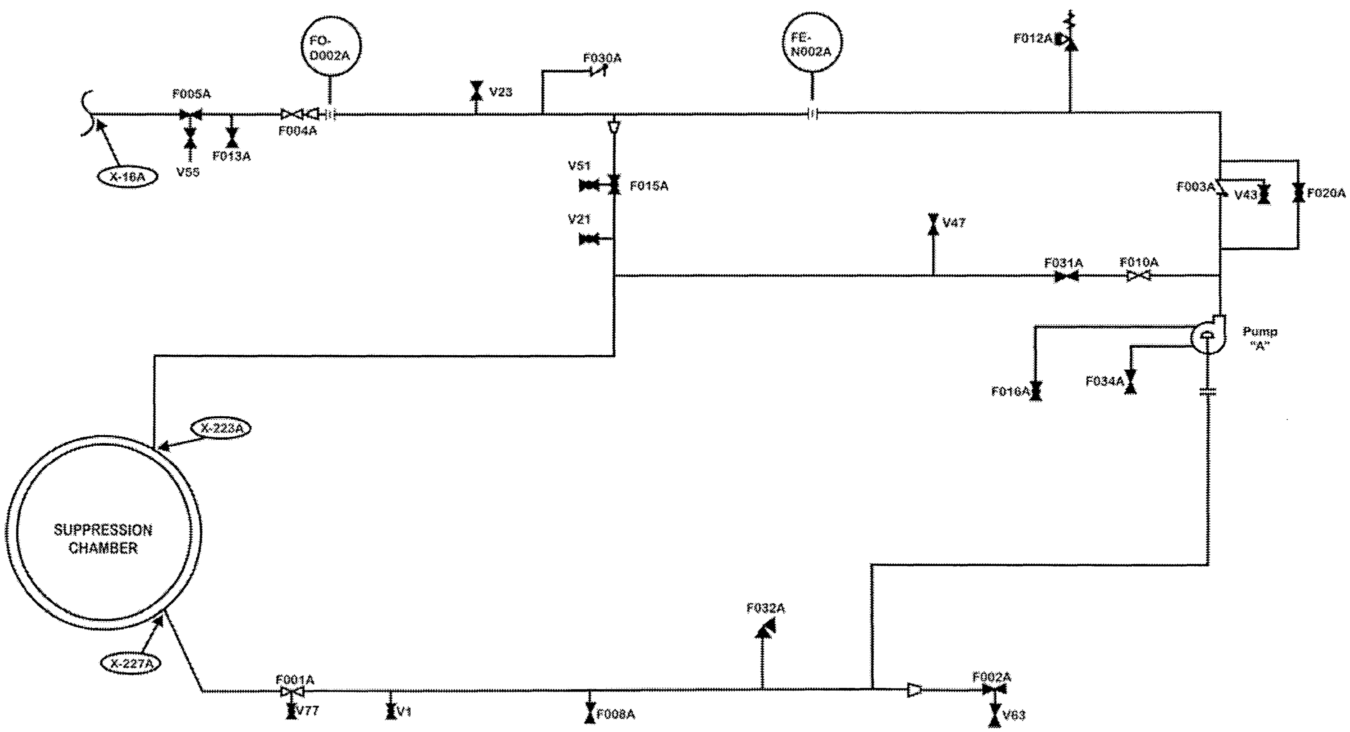
[1] Conversion Factor: (dpm x 1.6×10^{-3}) ÷ 60 = gpm

Examination Performed by: _______________/__________________ Date ________
(Signature) (Print Name)

Examination Performed by: _______________/__________________ Date ________
(Signature) (Print Name)

Leakage Inspection Boundary

NOTE:	Because of drawing limitations, instrumentation lines connected to boundaries are not shown. The leakage inspection boundary for instrumentation lines extends to and includes the last instrument root valve before the instrument.
NOTE:	The Suppression Chamber is **NOT** required to be examined. It is shown for clarification only



Leakage Inspection Guidance

When performing leakage inspections for TS 5.5.2, the following guidance should be followed to the extent practical.

1. The leakage inspection should be conducted by examining the accessible exposed surfaces for evidence of leakage.

2. For insulated components or components whose external surfaces are inaccessible for direct inspection, the leakage inspection should be performed on surrounding areas (i.e. floors or equipment surfaces located under the component) for evidence of leakage or other areas to which leakage may be channeled.

3. For vertical surfaces, the inspection of the lowest elevation where leakage may be detected should be performed.

4. For ALARA, a leakage inspection using remote visual equipment or the use of an installed leakage detection system to identify leakage is acceptable.

REVISION SUMMARY

Revision 58 incorporates upgrade of ASME OM Code to 2001 with 2003 Addenda; incorporates Comprehensive Pump Test criteria; incorporates check valve testing of E21-F003A close and E21-F029A/30A part open.

Revision 57 incorporates PRR214582 (CORR 207570-14) and PRR20653 (CORR 207575-16) program changes to perform a Leakage Walkdown in accordance with TS 5.5.2. Changes include documenting leakage as required for Alternate Source Term (License Amendments 221 and 246 dated May 30, 2002).

Revision 56 adds Step 7.8.33 to vent system as required.

Revision 55 incorporated EC63657 by changing pump flow rate from 4626 to 4700 gpm (steps 6.1.1 and 7.8.10), adding a new step (7.8.23) to increase flow to 5000 gpm, changing Note prior to new step (7.8.23) to 5000 gpm, remove the statement inside the "( )" in Step 2.13, and changed the IST pump psid value to 260.

Revision 54 makes an editorial correction to add the Tech Spec reference to Section 6.3 per NAS Observation 69604 (This reference is already listed in the Purpose Section).

Revision 53 revises the stroke time acceptance criteria for 1-E21-F004A and 1-E21-F005A to reflect the gear ratio change incorporated IAW EC 51210/54126.

Revision 52 makes editorial corrections to update the cover page and word processing format and makes changes to reflect EC 46949, Rev 2, re-evaluation of CS injection valve and pump performance requirements.

Revision 51 revises the stroke time acceptance criteria for 2-E21-F004A and 2-E21-F005A to reflect the gear ratio change incorporated IAW EC 46949/EC 50010.

Revision 50 adds "if performing during a refueling outage" to clarify required testing associated with stroking E21-F015A.

Revision 49 updates stroke time data for 2-E21-F005A iaw the IST program; added frequency of each refueling outage for stroking/timing E21-F015A; added NOTES/step informing operators E21-F015A is required to be stroked/timed during refuel outages only and routes procedure users to applicable sections if test is being performed only to test E21-F015A

Revision 48 removes reference to specific vibration instrument, IRD Model 890, and replaces with generic reference; Add P&L and caution identifying Core Spray Loop A is inop during valve stroking and until the Loop A low pressure alarm clears.

Revision 47 revises purpose to include Tech Spec Section 5.5.2.a and adds Precaution and Limitations regarding actions if air is found in the system during testing.