REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-008

Energize Main Feeder Busses From CT-5

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Energize Main Feeder Busses From CT-5

Alternate Path:

No

Facility JPM #:

CRO-008

K/A Rating(s):

System: 055
K/A: EA1.07
Rating: 4.3/4.5

Task Standard:

Energize Main Feeder Busses from CT-5.

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

EOP, Encl 5.38 (Restoration of Power)

Validation Time: 10 minutes

Time Critical: No

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Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. **RECALL** Snap 216
2. Import Files (CRO-008)
3. Place simulator in **RUN**

Tools/Equipment/Procedures Needed:

EOP, Encl 5.38 (Restoration of Power)

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

With Keowee Unit 1 out of service for maintenance, Unit 1 experienced a lockout on CT-1 followed by a unit trip.

Blackout tab of the EOP in progress

The Blackout tab directs the initiation of Encl. 5.38 (Restoration of Power).

INITIATING CUES:

The CR SRO / procedure director directs you to initiate Encl. 5.38, Restoration of Power, to regain power to the Main Feeder Buses.

START TIME: _____

STEP 1: Step 1 Verify power has been restored. STANDARD: Determine power has NOT been restored by observing MFB voltage on 1AB1. Perform RNO step. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 1 **RNO** **GO TO** Step 3. STANDARD: **GO TO** Step 3. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 3 Place 1HP-31 in HAND and reduce demand to 0. STANDARD: Place 1HP-31 in HAND and reduce demand to 0 using the toggle switch. Located on 1UB1. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Step 4 Close 1HP-21. STANDARD: Close 1HP-21 by depressing the closed pushbutton on the RZ module located on 1VB2. COMMENTS:	___ SAT ___ UNSAT
STEP 5: Step 5 Verify any of the following energized: • MFB1 • MFB2 STANDARD: Observes that zero (0) volts are indicated on both MFBs meters located on 1AB1. COMMENTS:	___ SAT ___ UNSAT

STEP 6: Step 5 **RNO** **GO TO** Step 8. STANDARD: **GO TO** Step 8. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Step 8 Verify CT-1 indicates ≈ 4160 volts. STANDARD: Observes that zero (0) volts is indicated on CT-1 on 1AB1. COMMENTS:	___ SAT ___ UNSAT
STEP 8: Step 8 **RNO** **GO TO** Step 18. STANDARD: **GO TO** Step 18. COMMENTS:	___ SAT ___ UNSAT
STEP 9: Step 18 Verify both Standby Bus #1 and Standby Bus #2 are de-energized. STANDARD: Observes that zero (0) volts is indicated both Standby Buses located on 2AB3. COMMENTS:	___ SAT ___ UNSAT
STEP 10: Step 19 Verify all Keowee units operating. STANDARD: Determine that both Keowee units are Emergency Lockout by observing the Statalarms 2SA-17/A1 and 2SA-18/A1. Perform RNO step. COMMENTS:	___ SAT ___ UNSAT

STEP 11: Step 19 **RNO** 1. Emergency start Keowee units: • KEOWEE EMER START CHANNEL A • KEOWEE EMER START CHANNEL B 2. **IF NO** Keowee units are operating, **THEN GO TO** Step 36. STANDARD: Place the KEOWEE EMER START CHANNEL A switch to start located on 1UB1. **Note: KEOWEE EMER START CHANNEL B switch is not modeled.** **Note: Since both Keowee units are locked out the candidate may decide not to operate the emergency start switches.** COMMENTS:	___ SAT ___ UNSAT
STEP 12: Step 35 **IAAT** CT-5 indicates ≈ 4160 volts, **THEN GO TO** Step 50. STANDARD: Observes that approximately 4160 volts is indicated on the CT-5 voltage meter located on 1AB1. COMMENTS:	___ SAT ___ UNSAT
STEP 13: Step 49 Place the following switches in MAN: • MFB_1 AUTO/MAN • MFB_2 AUTO/MAN • STANDBY 1 AUTO/MAN • STANDBY 2 AUTO/MAN STANDARD: Rotates the AUTO/MAN selector switch to the MANUAL position for each of the switches listed above. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 14: Step 50 Open the following breakers: • $N1_1$ MFB1 NORMAL FDR • $N2_1$ MFB2 NORMAL FDR • $E1_1$ MFB1 STARTUP FDR • $E2_1$ MFB2 STARTUP FDR STANDARD: Verify each of the above breakers is OPEN by observing the white breaker open light is LIT on 1AB1. COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 51 Place the following switches in MAN: • CT4 BUS 1 AUTO/MAN • CT4 BUS 2 AUTO/MAN • CT5 BUS 1 AUTO/MAN • CT5 BUS 2 AUTO/MAN STANDARD: Rotates the AUTO/MAN selector switch to the MANUAL position for each of the switches listed above located on 2AB3. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 16: Step 52 Open the following breakers: • SK1 CT4 STBY BUS 1 FEEDER • SK2 CT4 STDY BUS 2 FEEDER STANDARD: Verify each of the above breakers is OPEN by observing the white breaker open light is LIT on 2AB3. COMMENTS:	___ SAT ___ UNSAT

STEP 17: Step 53 Close the following breakers: • SL1 CT5 STBY BUS 1 FEEDER • SL2 CT5 STBY BUS 2 FEEDER STANDARD: Go to the CLOSED position for each of the switches listed above located on 1AB3.. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 18: Step 54 Place the following switches in AUTO: • CT5 BUS 1 AUTO/MAN • CT5 BUS 2 AUTO/MAN STANDARD: Rotates the AUTO/MAN selector switch to the AUTO position for each of the switches listed above. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 19: Step 55 Verify Standby Bus #1 energized. STANDARD: Observes that ≈ 4160 volts are indicated for Standby Bus #1 located on 2AB3. COMMENTS:	___ SAT ___ UNSAT
STEP 20: Step 56 Notify CR SRO in each unit where a blackout exists that Standby Bus #1 is energized. STANDARD: Notifies CR SRO that Standby Bus #1 is energized located on 2AB3. ***Cue: If asked, inform candidate that only Unit 1 is affected.*** COMMENTS:	___ SAT ___ UNSAT

STEP 21: Step 57 Close the following breakers: • $S1_1$ STBY BUS 1 TO MFB1 • $S2_1$ STBY BUS 2 TO MFB2 STANDARD: Goes to the CLOSED position for each of the switches listed above. **Note:** Only 1 of the Stby Busses must be energized to restore power to MFBs. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 22: Step 58 Verify any of the following energized: • 1TC • 1TD • 1TE STANDARD: Observes that ≈ 4160 volts indicated on either MFB voltmeters or OAC. COMMENTS:	___ SAT ___ UNSAT
STEP 22: Step 59 Notify Unit 1 CR SRO of status of 4160V SWGR. STANDARD: Notifies CR SRO of status of 4160V SWGR COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
3	Step is required to protect the RCP seals.
13	Step is required to satisfy power switching logic.
15	Step is required to satisfy power switching logic.
17	Step is required to energize the Main Feeder Bus.
18	Step is required to provide undervoltage protection.
21	Step is required to energize the Main Feeder Bus.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

With Keowee Unit 1 out of service for maintenance, Unit 1 experienced a lockout on CT-1 followed by a unit trip.

Blackout tab of the EOP in progress

The Blackout tab directs the initiation of Encl. 5.38 (Restoration of Power).

INITIATING CUES:

The CR SRO / procedure director directs you to initiate Encl. 5.38, Restoration of Power, to regain power to the Main Feeder Buses.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Verify power has been restored.	__ **GO TO** Step 3.
2. __ **EXIT** this enclosure.	
3. __ Place 1HP-31 in HAND and reduce demand to 0.	
4. __ Close 1HP-21.	
5. Verify any of the following energized: __ MFB1 __ MFB2	__ **GO TO** Step 8.
6. Notify Unit 1 CR SRO of the following: __ Status of MFB1 and MFB2 __ Power **CANNOT** be restored to 4160V SWGR __ Attempts will be made to energize Standby Buses	
7. __ **GO TO** Step 68.	
8. __ Verify CT-1 indicates ≈ 4160 volts.	__ **GO TO** Step 18.
9. Place the following switches in MAN: __ MFB1 AUTO/MAN __ MFB2 AUTO/MAN	
10. Open the following: __ $N1_1$ MFB1 NORMAL FDR __ $N2_1$ MFB2 NORMAL FDR	
11. Close the following breakers: __ $E1_1$ MFB1 STARTUP FDR __ $E2_1$ MFB2 STARTUP FDR	
12. Verify any of the following energized: __ 1TC __ 1TD __ 1TE	1. __ **IF** MFB1, **OR** MFB2 is energized, **THEN GO TO** Step 68. 2. __ **GO TO** Step 18.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. __ Verify blackout was experienced <u>only</u> on Unit 1.	1. Notify Unit 1 CR SRO of the following: __ Status of 4160V SWGR __ Unit 1 will take lead in energizing Standby Buses if needed by another unit 2. __ **GO TO** Step 16.
14. __ Notify Unit 1 CR SRO of status of 4160V SWGR.	
15. __ **EXIT** this enclosure.	

• • • **END** • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. __ **IAAT** another unit requests energizing a Standby Bus, **THEN GO TO** Step 110.	
17. __ **WHEN** directed by Unit 1 CR SRO, **THEN EXIT** this enclosure.	

••• END •••

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18. __ Verify both Standby Bus #1 and Standby Bus #2 are de-energized.	1. __ **IF** Standby Bus #1 is energized, **THEN** notify Unit 1 CR SRO that Standby Bus #1 is energized. 2. __ Notify CR SRO in all other units where a blackout exists of the status of Standby Bus #1 and Standby Bus #2. 3. __ **GO TO** Step 30.
19. __ Verify both Keowee units operating.	1. Emergency start Keowee units: __ KEOWEE EMER START CHANNEL A __ KEOWEE EMER START CHANNEL B 2. __ **IF NO** Keowee units are operating, **THEN GO TO** Step 36.
20. Verify both Keowee units in Oconee Control (statalarms on): __ UNIT 1 OCONEE CONTROL (2SA-17/E-1) __ UNIT 2 OCONEE CONTROL (2SA-18/E-1)	__ Notify Keowee Operator to place both Keowee units in Oconee Control.
21. __ Verify both Keowee units operating.	1. __ **IF** UNIT 1 EMER FDR ACB 3 is closed, **AND** Unit 1 Keowee is **NOT** operating, **THEN** open UNIT 1 EMER FDR ACB 3. 2. __ **IF** UNIT 2 EMER FDR ACB 4 is closed, **AND** Unit 2 Keowee is **NOT** operating, **THEN** open UNIT 2 EMER FDR ACB 4.
22. Ensure one of the following is closed for an operating Keowee unit: ✓ **Unit 1**: UNIT 1 EMER FDR ACB 3 ✓ **Unit 2**: UNIT 2 EMER FDR ACB 4	
23. __ Verify CT-4 indicates ≈ 4160 volts.	__ **GO TO** Step 36.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. Place the following transfer switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN	
25. Place the following switches in ON: __ STBY BUS 1 SYNCHRONIZING __ STBY BUS 2 SYNCHRONIZING	
26. Close the following breakers: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STDY BUS 2 FEEDER	
27. Place the following switches in OFF: __ STBY BUS 1 SYNCHRONIZING __ STBY BUS 2 SYNCHRONIZING	
28. __ Verify Standby Bus #1 energized.	1. __ **IF** Standby Bus #2 is de-energized, **THEN GO TO** Step 36. 2. Notify CR SRO in <u>all other units where a blackout exists</u> of the following: __ Standby Bus #2 is energized. __ Standby Bus #1 **CANNOT** be energized. 3. __ **GO TO** Step 30.
29. __ Notify CR SRO in each unit where a blackout exists that Standby Bus #1 is energized.	
30. Place the following switches in MAN: __ MFB1 AUTO/MAN __ MFB2 AUTO/MAN __ STANDBY 1 AUTO/MAN __ STANDBY 2 AUTO/MAN	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31. Open the following breakers: __ $N1_1$ MFB1 NORMAL FDR __ $N2_1$ MFB2 NORMAL FDR __ $E1_1$ MFB1 STARTUP FDR __ $E2_1$ MFB2 STARTUP FDR	
32. Close the following breakers: __ $S1_1$ STBY BUS 1 TO MFB1 __ $S2_1$ STBY BUS 2 TO MFB2	
33. Verify <u>any</u> of the following energized: __ 1TC __ 1TD __ 1TE	__ **GO TO** Step 64.
34. __ Notify Unit 1 CR SRO of status of 4160V SWGR.	
35. __ **EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36. __ **IAAT** CT-5 indicates ≈ 4160 volts, **THEN GO TO** Step 50.	
37. __ Notify other affected units that power to the Standby Buses is **NOT** available. Unit 1 will continue efforts to restore power.	
38. __ Verify blackout exists on all three units.	1. __ Place 1HP-120 in manual and reduce demand to zero. 2. __ **GO TO** Step 40.
39. __ Dispatch one operator to perform Encl 5.32 (Load Shed of Inverters During SBO). (**PS**)	
40. __ Verify Lee Station gas turbines were powering the Standby Bus prior to the loss of power.	__ **GO TO** Step 42.
41. __ **GO TO** Step 136.	
42. __ Notify TCC to close OCB-101 and OCB-35.	
43. __ **WHEN** any of the following conditions exist: __ OCB-35 and OCB-101 are closed __ It is determined that any OCB (35 or 101) **CANNOT** be closed **THEN** continue in this enclosure.	
44. __ Contact Lee Station to supply emergency power to Oconee per OP/0/A/1107/003 B (Procedure For Furnishing Power To Oconee).	
45. __ Verify a Lee Station gas turbine is available to align to ONS.	__ **GO TO** Step 136.

IF AT ANY TIME:

(36) CT-5 indicates ≈ 4160 volts… (**GO TO** path to energize Standby Buses)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
46. Notify Unit 1 CR SRO of the following: __ Power could **NOT** be restored to 4160V SWGR or Standby Buses __ Lee Station has been notified to restore power to CT-5 __ Attempts will be made to restore power to 4160V SWGR via Standby Buses when CT-5 is re-powered	
47. __ Verify blackout exists on Unit 2 <u>or</u> 3.	1. __ Place 1HP-120 in manual and reduce demand to zero. 2. __ **GO TO** Step 49.
48. Notify CR SRO in <u>all other units where a blackout exists</u> of the following: __ Standby Buses could **NOT** be energized __ Lee Station has been notified to restore power to CT-5 __ Attempts will be made to restore power to Standby Buses when CT-5 is re-powered	
49. __ **WHEN** directed by Unit 1 CR SRO, **THEN EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
50. Place the following switches in MAN: __ MFB1 AUTO/MAN __ MFB2 AUTO/MAN __ STANDBY 1 AUTO/MAN __ STANDBY 2 AUTO/MAN	
51. Open the following breakers: __ $N1_1$ MFB1 NORMAL FDR __ $N2_1$ MFB2 NORMAL FDR __ $E1_1$ MFB1 STARTUP FDR __ $E2_1$ MFB2 STARTUP FDR	
52. Place the following switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN __ CT5 BUS 1 AUTO/MAN __ CT5 BUS 2 AUTO/MAN	
53. Open the following breakers: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STDY BUS 2 FEEDER	
54. Close the following breakers: __ SL1 CT5 STBY BUS 1 FEEDER __ SL2 CT5 STBY BUS 2 FEEDER	
55. Place the following switches in AUTO: __ CT5 BUS 1 AUTO/MAN __ CT5 BUS 2 AUTO/MAN	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
56. __ Verify Standby Bus #1 energized.	1. __ **IF** Standby Bus #2 is de-energized, **THEN** perform the following: A. __ Notify CR SRO in all units where a blackout exists that **NO** Standby Buses can be energized. B. __ **GO TO** Step 64. 2. Notify CR SRO in <u>all other units where a blackout exists</u> of the following: __ Standby Bus #2 is energized. __ Standby Bus #1 **CANNOT** be energized. 3. __ **GO TO** Step 58.
57. __ Notify CR SRO in each unit where a blackout exists that Standby Bus #1 is energized.	
58. Close the following breakers: __ S1, STBY BUS 1 TO MFB1 __ S2, STBY BUS 2 TO MFB2	
59. Verify <u>any</u> of the following energized: __ 1TC __ 1TD __ 1TE	__ **GO TO** Step 64.
60. __ Notify Unit 1 CR SRO of status of 4160V SWGR.	
61. __ Verify Jocassee Hydro is being aligned to ONS.	__ **GO TO** Step 63.
62. __ Notify TCC that Jocassee Hydro is **NO** longer needed.	
63. __ **EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
64. __ Verify blackout exists on all three units.	1. __ Place 1HP-120 in manual and reduce demand to zero. 2. __ **GO TO** Step 66.
65. __ Dispatch one operator to perform Encl 5.32 (Load Shed of Inverters During SBO). (**PS**)	
66. __ Notify Unit 1 CR SRO that power could **NOT** be restored to 4160V SWGR.	
67. __ **EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
68. __ Verify blackout exists on all three units.	1. __ Place 1HP-120 in manual and reduce demand to zero. 2. __ **GO TO** Step 70.
69. __ Dispatch one operator to perform Encl 5.32 (Load Shed of Inverters During SBO). (**PS**)	
70. __ Verify Standby Bus #1 de-energized.	1. __ Notify Unit 1 CR SRO that power could **NOT** be restored to 4160V SWGR. 2. __ Notify CR SRO in each unit where a blackout exists that Standby Bus #1 is energized. 3. __ **EXIT** this enclosure.
71. Emergency start Keowee units: __ KEOWEE EMER START CHANNEL A __ KEOWEE EMER START CHANNEL B	
72. __ Verify both Keowee units operating.	__ **IF NO** Keowee units are operating, **THEN GO TO** Step 91.
73. Verify both Keowee units in Oconee Control (statalarms on): __ UNIT 1 OCONEE CONTROL (2SA-17/E-1) __ UNIT 2 OCONEE CONTROL (2SA-18/E-1)	__ Notify Keowee Operator to place both Keowee units in Oconee Control.
74. __ Verify both Keowee units operating.	1. __ **IF** UNIT 1 EMER FDR ACB 3 is closed, **AND** Unit 1 Keowee is **NOT** operating, **THEN** open UNIT 1 EMER FDR ACB 3. 2. __ **IF** UNIT 2 EMER FDR ACB 4 is closed, **AND** Unit 2 Keowee is **NOT** operating, **THEN** open UNIT 2 EMER FDR ACB 4.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
75. Ensure one of the following is closed for an operating Keowee unit: ✓ **Unit 1**: UNIT 1 EMER FDR ACB 3 ✓ **Unit 2**: UNIT 2 EMER FDR ACB 4	
76. __ Verify CT-4 indicates ≈ 4160 volts.	__ **GO TO** Step 91.
77. __ Verify blackout exists only on Unit 1.	__ **GO TO** Step 83.
78. __ Place CT4 BUS 1 AUTO/MAN switch in MAN.	
79. __ Place STBY BUS 1 SYNCHRONIZING switch in ON.	
80. __ Close SK1 CT4 STBY BUS 1 FEEDER.	
81. __ Place STBY BUS 1 SYNCHRONIZING switch in OFF.	
82. __ **GO TO** Step 87.	
83. Place the following transfer switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN	
84. Place the following switches in ON: __ STBY BUS 1 SYNCHRONIZING __ STBY BUS 2 SYNCHRONIZING	
85. Close the following breakers: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STDY BUS 2 FEEDER	
86. Place the following switches in OFF: __ STBY BUS 1 SYNCHRONIZING __ STBY BUS 2 SYNCHRONIZING	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
87. __ Verify Standby Bus #1 energized.	1. __ **IF** Standby Bus #2 is de-energized, **THEN GO TO** Step 91. 2. __ **IF** a blackout exists on another unit, **THEN** notify affected units that Standby Bus #2 is energized. 3. __ Notify Unit 1 CR SRO that power could **NOT** be restored to 4160V SWGR. 4. __ **EXIT** this enclosure.
88. __ Notify Unit 1 CR SRO that power could **NOT** be restored to 4160V SWGR.	
89. __ Notify CR SRO on each unit where a blackout exists that Standby Bus #1 is energized.	
90. __ **EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
91. __ **IAAT** CT-5 indicates ≈ 4160 volts, **THEN GO TO** Step 97.	
92. __ Notify TCC to close OCB-101 and OCB-35.	
93. __ **WHEN** any of the following conditions exist: __ OCB-35 and OCB-101 are closed __ It is determined that any OCB (35 or 101) **CANNOT** be closed **THEN** continue in this enclosure.	
94. __ Contact Lee Station to supply emergency power to Oconee per OP/0/A/1107/003 B (Procedure For Furnishing Power To Oconee).	
95. Notify CR SRO on each unit where a blackout exists of the following: __ Standby Buses could **NOT** be energized __ Lee Station has been notified to restore power to CT-5 __ Attempts will be made to restore power to Standby Buses when CT-5 is re-powered	
96. __ **WHEN** directed by Unit 1 CR SRO, **THEN EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
97. __ Verify blackout exists only on Unit 1.	__ **GO TO** Step 103.
98. Place the following switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT5 BUS 1 AUTO/MAN	
99. __ Open breaker SK1 CT4 STBY BUS 1 FEEDER.	
100.__ Close breaker SL1 CT5 STBY BUS 1 FEEDER.	
101.__ Place CT5 BUS 1 AUTO/MAN in AUTO.	
102.__ **GO TO** Step 107.	
103.Place the following switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN __ CT5 BUS 1 AUTO/MAN __ CT5 BUS 2 AUTO/MAN	
104.Open the following breakers: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STDY BUS 2 FEEDER	
105.Close the following breakers: __ SL1 CT5 STBY BUS 1 FEEDER __ SL2 CT5 STBY BUS 2 FEEDER	
106.Place the following switches in AUTO: __ CT5 BUS 1 AUTO/MAN __ CT5 BUS 2 AUTO/MAN	
107.__ Verify Standby Bus #1 energized.	1.__ **IF** a blackout exists on another unit, **AND** Standby Bus #2 is energized, **THEN** notify affected units that Standby Bus #2 is energized. 2.__ Notify CR SRO on each unit where a blackout exists that Standby Bus #1 could **NOT** be energized. 3.__ **GO TO** Step 109.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
108.__ Notify CR SRO on each unit where a blackout exists that Standby Bus #1 is energized.	
109.__ **EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status A blackout does **NOT** exist on Unit 1. Another unit has requested energizing Standby Buses.	
110.__ Verify both Standby Bus #1 and Standby Bus #2 are de-energized.	1.__ Notify all units needing power on Standby Buses of the status of Standby Bus #1 and #2. 2.__ **EXIT** this enclosure.
111.__ Verify both Keowee units operating.	1. Emergency start Keowee units: __ KEOWEE EMER START CHANNEL A __ KEOWEE EMER START CHANNEL B 2.__ **IF NO** Keowee units are operating, **THEN GO TO** Step 123.
112. Verify both Keowee units in Oconee Control (statalarms on): __ UNIT 1 OCONEE CONTROL (2SA-17/E-1) __ UNIT 2 OCONEE CONTROL (2SA-18/E-1)	__ Notify Keowee Operator to place both Keowee units in Oconee Control.
113.__ Verify both Keowee units operating.	1.__ **IF** UNIT 1 EMER FDR ACB 3 is closed, **AND** Unit 1 Keowee is **NOT** operating, **THEN** open UNIT 1 EMER FDR ACB 3. 2.__ **IF** UNIT 2 EMER FDR ACB 4 is closed, **AND** Unit 2 Keowee is **NOT** operating, **THEN** open UNIT 2 EMER FDR ACB 4.
114. Ensure one of the following is closed for an operating Keowee unit: ✓ **Unit 1**: UNIT 1 EMER FDR ACB 3 ✓ **Unit 2**: UNIT 2 EMER FDR ACB 4	
115.__ Verify CT-4 indicates ≈ 4160 volts.	__ **GO TO** Step 123.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
116. Place the following transfer switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN	
117. Place the following switches in ON: __ STBY BUS 1 SYNCHRONIZING __ STBY BUS 2 SYNCHRONIZING	
118. Close the following breakers: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STDY BUS 2 FEEDER	
119. Place the following switches in OFF: __ STBY BUS 1 SYNCHRONIZING __ STBY BUS 2 SYNCHRONIZING	
120. __ Verify Standby Bus #1 energized.	1. __ **IF** Standby Bus #2 is energized, **THEN** perform the following: A. Notify all units needing power on Standby Buses of the following: __ Standby Bus #2 is energized. __ Standby Bus #1 **CANNOT** be energized. B. __ **EXIT** this enclosure. 2. __ **GO TO** Step 123.
121. __ Notify all units needing power on Standby Buses that Standby Bus #1 is energized.	
122. __ **EXIT** this enclosure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
123.__ **IAAT** CT-5 indicates ≈ 4160 volts, **THEN GO TO** Step 129.	
124.__ Notify TCC to close OCB-101 and OCB-35.	
125.__ **WHEN** any of the following conditions exist: __ OCB-35 and OCB-101 are closed __ It is determined that any OCB (35 or 101) **CANNOT** be closed **THEN** continue in this enclosure.	
126.__ Contact Lee Station to supply emergency power to Oconee per OP/0/A/1107/003 B (Procedure For Furnishing Power To Oconee).	
127. Notify all units needing power on Standby Buses of the following: __ Standby Buses could **NOT** be energized __ Lee Station has been notified to restore power to CT-5 __ Attempts will be made to restore power to Standby Buses when CT-5 is re-powered	
128.__ **WHEN** directed by CR SRO on unit needing power on Standby Buses, **THEN EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
129. Place the following switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN __ CT5 BUS 1 AUTO/MAN __ CT5 BUS 2 AUTO/MAN	
130. Open the following breakers: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STDY BUS 2 FEEDER	
131. Close the following breakers: __ SL1 CT5 STBY BUS 1 FEEDER __ SL2 CT5 STBY BUS 2 FEEDER	
132. Place the following switches in AUTO: __ CT5 BUS 1 AUTO/MAN __ CT5 BUS 2 AUTO/MAN	
133. __ Verify Standby Bus #1 energized.	1. __ **IF** Standby Bus #2 is energized, **THEN** notify all units needing power on Standby Buses of the following: __ Standby Bus #2 is energized. __ Standby Bus #1 **CANNOT** be energized. 2. __ **GO TO** Step 135.
134. __ Notify all units needing power on Standby Buses that Standby Bus #1 is energized.	
135. __ **EXIT** this enclosure.	

• • • END • • •

IF AT ANY TIME:

(36) CT-5 indicates ≈ 4160 volts… (**GO TO** path to energize Standby Buses)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Unit Status

- A station blackout exists at ONS.
- Power is **NOT** available from CT-1, CT-4, or CT-5.

136. Verify a 230KV Switchyard Isolation has occurred as indicated by either of the following:
   __ 1SA-15/E-6 (EL SWYD ISOLATION CONFIRMED CHNL A LOGIC)
   __ 1SA-14/E-6 (EL SWYD ISOLATION CONFIRMED CHNL B LOGIC)

1. Open the following PCBs:

✓	PCB	✓	PCB	✓	PCB
	8		17		26
	12		21		28
	15		24		33

2. __ **WHEN** all the PCBs in the previous step are opened, **THEN** continue.

137. __ Verify any Keowee unit is operating.
   __ **GO TO** Step 145.

138. __ Verify Keowee Unit 1 operating.
   __ **GO TO** Step 141.

139. Perform the following:
   A. __ Open ACB-3.
   B. __ Close ACB-1.

1. __ **IF** Keowee Unit 2 is operating, **THEN** perform the following:
   A. __ Open ACB-1.
   B. __ **GO TO** Step 141.
2. __ **GO TO** Step 145.

140. __ **GO TO** Step 142.

141. Perform the following:
   A. __ Open ACB-4.
   B. __ Close ACB-2.

__ **GO TO** Step 145.

NOTE

Retransfer-to-Startup logic will be satisfied and the E-breakers will close to provide power to MFB1 and MFB2.

142. __ Close PCB-9.
   __ **GO TO** Step 145.

143. __ Verify power is restored.
   __ **GO TO** Step 145.

144. __ **EXIT** this Enclosure.

• • • END • • •

IF AT ANY TIME:

(36) CT-5 indicates ≈ 4160 volts… (**GO TO** path to energize Standby Buses)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
145.__ Notify Unit 1 SRO that Jocassee Hydro will be aligned to ONS via the Jocassee Black line.	
146.__ Notify the TCC of the following: "Jocassee Hydro is needed to power ONS and the 230KV Yellow Bus has been separated from the grid."	

NOTE

The following alarms will be received when SY Isolate is defeated in the following step:

- SA-16/A-1 through SA-16/A-4 (EXTERNAL GRID PROTECTIVE SYSTEM CHANNEL * VOLTAGE RELAY COIL TROUBLE)
- SA-15/B-1 (CHANNEL #1 DC SUPPLY FAILURE)
- SA-15/B-3 (CHANNEL #2 DC SUPPLY FAILURE)

147. Dispatch an operator to open the following DC breakers: (230 kV Relay House) __ DYC-13 (EXTERNAL GRID TROUBLE PROTECTIVE SYS VOLTAGE SYS #1) __ DYC-14 (EXTERNAL GRID TROUBLE PROTECTIVE SYS FREQ SYS #1) __ DYG-12 (EXTERNAL GRID TROUBLE PROT SYS VOLTAGE SYS #2) __ DYG-18 (EXTERNAL GRID TROUBLE PROT SYS FREQ SYS #2)	

IF AT ANY TIME:

(36) CT-5 indicates ≈ 4160 volts… (**GO TO** path to energize Standby Buses)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
148.__ Position PCB-14 Recloser to BLOCKED.	
149.__ **WHEN** the DC breakers in Step 147 are open, **THEN** open the following: __ PCB-9 __ PCB-14	
150.__ **WHEN** TCC notifies ONS that the Jocassee Black Line is energized, **THEN** continue.	

NOTE

When PCB-15 is closed, Retransfer-to-Startup logic will be satisfied and the E-breakers will close to provide power to MFB1 and MFB2.

151.__ Close PCB-15.	
152.__ Notify TCC of ONS power status.	
153.__ Notify the TSC to develop a recovery plan to transfer power when another power source becomes available.	
154.__ **EXIT** this Enclosure.	

•••END•••

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REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-016

ESTABLISH EFDW FLOW THROUGH STARTUP VALVES

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Establish EFDW flow through Startup valves.

Alternate Path:

Yes

Facility JPM #:

CRO-015

K/A Rating(s):

System: APE-054
K/A: AA2.04
Rating: 4.2/4.3

Task Standard:

EFDW flow is established to the affected header through the startup valve.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:

EOP Rule 3, (Loss of Main or Emergency FDW)
EOP Rule 7, (SG Feed Control)
EOP Enclosure 5.27, (Alternate Methods for Controlling EFDW Flow)

Validation Time: 10 minutes

Time Critical: NO

==========

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time _____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. **Recall** Snap 215
2. **Import** files for CRO-016
3. Go to **RUN**

Tools/Equipment/Procedures Needed:

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The reactor has just tripped

Immediate Manual Actions are complete

INITIATING CUES:

The SRO directs you to perform a Symptom Check.

START TIME: _____

STEP 1: Performs a Symptom Check STANDARD: Performs Symptom Check and determines that there are no symptoms to report but will perform Rule 3 due to a loss of Main Feedwater COMMENTS:	___ SAT ___ UNSAT
STEP 2: Rule 3: Step 3 Verifies that any Emergency Feedwater Pumps are operating. STANDARD: Checks MD EFDWP & TD EFDWP switch lights are on and Pumps have discharge pressure. Candidate will perform step and **GO TO** step 32. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Rule 3: Step 32 **IAAT** both or the following exist: **An** EFDW control valve will **NOT** control in AUTO The same EFDW control valve will **NOT** respond in MANUAL **THEN** perform Steps 33 & 34. STANDARD: Determines that 1FDW-315 is NOT controlling properly (1A SG level is > 30" and increasing). Attempts to take MANUAL control of 1FDW 315 (**which will not work**). Concludes that 1FDW-315 has failed open. Performs Steps 33 & 34 COMMENTS:	___ SAT ___ UNSAT

STEP 4: Rule 3: Step 34 Initiates Enclosure 5.27 (Alternate Methods for Controlling EFDW Flow) STANDARD: Removes Encl. 5.27 from EOP and initiates. COMMENTS:	___ SAT ___ UNSAT
STEP 5: Encl 5.27: Step 1 Identify the failure: 1FDW-315 has Failed Open [GO TO Step 16] STANDARD: Candidate determines the next procedural step from table in Step 1. Proceeds to step 16. COMMENTS:	___ SAT ___ UNSAT
STEP 6: Encl 5.27: Steps 16 Verify 1A MD EFDWP is operating STANDARD: Candidate verifies 1A MD EFDWP is operating. Verify red light on and green light off and discharge pressure. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Encl 5.27: Steps 17 Stop 1A MD EFDWP STANDARD: Candidate places switch to OFF. Verify red light off and green light illuminated. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 8: Encl 5.27: Step 18 Place 1 TD EFDW Pump in PULL TO LOCK STANDARD: Candidate places the U1 TD EFDW Pump in PULL to LOCK COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 9: Encl 5.27: Step 19 Place 1FDW-35 in HAND and set demand to 0% STANDARD: Candidate places 1FDW-35 in HAND and uses toggle switch to reduce demand to 0%. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 10: Encl 5.27: Step 20 Close 1FDW-33 STANDARD: Candidate closes SU Control Block Valve (1FDW-33) and verifies proper light indication. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 11: Encl 5.27: Step 21 Verify 1A MD EFDWP will be used. STANDARD: Candidate verify 1A MD EFDWP will be used. **Cue: if candidate asks if 1A MD EFDWP will be used, inform him/her that it will be used.** COMMENTS:	___ SAT ___ UNSAT

STEP 12: Encl 5.27: Step 22 Close 1FDW-372 Open 1FDW-374 STANDARD: Candidate locates valves, closes 1FDW-372, opens 1FDW-374 and verifies proper light indication. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 13: Encl 5.27: Step 23 Verify 1FDW-36 closed Verify 1FDW-38 open STANDARD: Candidate locates valves, verifies 1FDW-36 closed and 1FDW-38 open and proper light indication. COMMENTS:	___ SAT ___ UNSAT
STEP 14: Encl 5.27: Step 24 Start 1A MD EFDWP STANDARD: Candidate places 1A MD EFDWP switch to RUN and verifies pump start and proper light indication and discharge pressure. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE: Flow from the TD EFDWP through a S/U control valve should be read on the FDW SU FLOW gauge. Flow from MD EFDWP through a S/U control valve should be read on the MDEFWP DISCH FLOW gauge.	___ SAT ___ UNSAT
STEP 14: Encl 5.27: Step 25 Verify either of the following exists: • HPI Forced Cooling is maintaining core cooling • CBP Feed providing SG feed STANDARD: Candidate determines that neither condition is met and goes to the RNO. COMMENTS:	
STEP 15: Encl 5.27: Step 25 **RNO** **IF** any SG is being fed, **THEN** perform the following: • Throttle 1FDW-35 to establish 100 gpm. • Throttle 1FDW-35 to obtain desired SG level per Rule 7 (SG Feed Control) Notify CR SRO of SG Feed Status (**not critical**) STANDARD: Candidate throttles 1FDW-35 to attain ~ 100 gpm flow initially on MD EFWP DISCH FLOW gauge, then throttles 1FDW-35 as necessary to establish ~ 25" XSUR (per Rule 7 table 4) Rule 7 Table 4 specifies the level to establish when using EFDWP is 30" (use MFDW setpoint if feeding via S/U CVs). The MFDW setpoint (i.e. when using the S/U CVs) is 25". **Note: The candidate does not need to establish this level to complete the JPM. 1FDW-315 must be open and SG level increasing.** COMMENTS: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
6	This step is required to ensure the EFDW valves will operate.
7	This step is required to ensure the EFDW valves will operate.
10	This step is required to align the MD EFDWP to the S/U header.
12	This step is required to start the 1A MD EFDWP.
14	This step is required to establish flow to the 1A SG.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The reactor has just tripped

Immediate Manual Actions are complete

INITIATING CUES:

The SRO directs you to perform a Symptom Check.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE This rule is **NOT** applicable if loss of Main FDW/EFDW is due to Turbine Building flooding.	
1. __ **IAAT NO** SGs can be fed with FDW (Main/CBP/Emergency), **AND** any of the following exist: __ RCS pressure reaches 2300 psig **OR** NDT limit __ Pzr level reaches 375″ [340″ acc] **THEN PERFORM** Rule 4 (Initiation of HPI Forced Cooling).	
2. __ Start EFDW pumps to feed all intact SGs.	
3. __ Verify any EFDW pump operating.	__ **GO TO** Step 5.
4. __ **GO TO** Step 32.	
5. Place the following in MANUAL and close: __ 1FDW-315 __ 1FDW-316	__ Notify CR SRO of failure.
6. Verify both of the following: __ Any CBP operating __ TBVs available on an intact SG	__ **GO TO** Step 14.
7. __ Select OFF for both digital channels on AFIS HEADER A.	
8. __ Select OFF for both digital channels on AFIS HEADER B.	
9. Place Startup Block valve control switch for all intact SGs in OPEN: ✓ **1A SG** ✓ **1B SG** 1FDW-33 1FDW-42	
10. Simultaneously position Startup Control valves 10 - 20% open on all intact SGs: ✓ **1A SG** ✓ **1B SG** 1FDW-35 1FDW-44	

IF AT ANY TIME:

(1) **NO** SGs can be fed with FDW (Main/CBP/Emergency) **AND** <u>any</u> of the following exist:

- RCS pressure reaches 2300 psig **OR** NDT limit
- Pzr level reaches 375″ [340″ acc] …

(**PERFORM** Rule 4)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11. Perform the following: __ Place 1FDW-31 switch in CLOSE. __ Place 1FDW-40 switch in CLOSE. __ Close 1FDW-32. __ Close 1FDW-41.	
12. __ Verify Rule 4 (Initiation of HPI Forced Cooling) in progress.	**CAUTION** Until SGs are dry, lower SG pressure slowly to prevent overcooling. 1. __ Lower SG pressure in available SGs to ≈ 500 psig. 2. __ Control FDW flow to stabilize RCS P/T by throttling the following as necessary: • Startup Control valves • TBVs 3. __ Notify CR SRO that CBP feed is in progress.{22} 4. Place the following switches to OPEN: __ 1FDW-38 __ 1FDW-47 5. Place the following switches to CLOSE: __ 1FDW-36 __ 1FDW-45 6. __ **GO TO** Step 14.
13. Close the following: __ 1FDW-35 __ 1FDW-44	1. __ **IF** 1FDW-35 fails open, **THEN** place 1FDW-33 control switch to CLOSE. 2. __ **IF** 1FDW-44 fails open, **THEN** place 1FDW-42 control switch to CLOSE.
14. __ Verify 1 TD EFDW PUMP is available for manual start.	__ **GO TO** Step 16.
15. __ Dispatch an operator to perform Encl 5.26 (Manual Start of TDEFDWP). (**PS**)	

IF AT ANY TIME:

(1) **NO** SGs can be fed with FDW (Main/CBP/Emergency) **AND** <u>any</u> of the following exist:

- RCS pressure reaches 2300 psig **OR** NDT limit
- Pzr level reaches 375″ [340″ acc] …

(**PERFORM** Rule 4)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. __ Verify cross-tie with Unit 2 is desired.	1. Dispatch an operator to open the following: __ 3FDW-313 (3A EFDW LINE DISCH TO 3A S/G X-CONN) __ 3FDW-314 (3B EFDW LINE DISCH TO 3B S/G X-CONN) 2. __ **GO TO** Step 18.
17. Dispatch an operator to open the following: __ 2FDW-313 (2A EFDW LINE DISCH TO 2A S/G X-CONN) __ 2FDW-314 (2B EFDW LINE DISCH TO 2B S/G X-CONN)	
18. __ Dispatch an operator to 1FDW-313 <u>and</u> have them notify the CR when in position.	
19. Notify alternate unit to perform the following: A. __ Place <u>both</u> EFDW control valves in manual and closed. B. __ Start their TD EFDW PUMP.	Notify alternate unit to perform the following: A. __ Place <u>both</u> EFDW control valves in manual and closed. B. __ Start <u>both</u> MD EFDW pumps.
20. __ **WHEN** <u>either</u> of the following exists: __ Operator is in position at 1FDW-313 __ Unit 1 TD EFDW PUMP has been manually started **THEN** continue.	
21. __ **IAAT** an operator is in position at 1FDW-313, **AND** Unit 1 TD EFDW PUMP is **NOT** operating, **THEN** notify the operator to open the following: __ 1FDW-313 (1A EFDW LINE DISCH TO 1A S/G X-CONN) __ 1FDW-314 (1B EFDW LINE DISCH TO 1B S/G X-CONN)	__ **GO TO** Step 22.

IF AT ANY TIME:

(1) **NO** SGs can be fed with FDW (Main/CBP/Emergency) **AND** <u>any</u> of the following exist:

- RCS pressure reaches 2300 psig **OR** NDT limit
- Pzr level reaches 375″ [340″ acc] …

(**PERFORM** Rule 4)

(21) an operator is in position at 1FDW-313 **AND** Unit 1 TD EFDW PUMP is **NOT** operating ... (notify the operator to open 1FDW-313 and 1FDW-314)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22. Verify either of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ Establish 100 gpm to an available intact SG. 2. __ **WHEN** heat transfer is observed, **THEN** feed and steam SG to stabilize T_c. 3. __ **IF** second SG is intact and available to feed, **THEN** perform the following: A. __ Establish 100 gpm to second SG. B. __ **WHEN** heat transfer is observed, **THEN** feed and steam both SGs to stabilize T_c. 4. __ **IF** $T_c > 550°F$, **THEN** initiate cool down to ≤ 550°F by feeding and steaming intact SGs at a rate that prevents RCS saturation using either of the following: __ TBVs __ ADVs 5. Notify CR SRO of the following: __ SG feed status. __ Rule 3 actions are continuing. 6. __ **GO TO** Step 24.
23. __ **WHEN** either of the following exists: __ Unit 1 TD EFDW PUMP running __ Alignment complete from alternate unit. {22} **THEN** notify CR SRO of the following: A. __ Source of EFDW availability. B. __ Rule 3 actions are continuing.	

IF AT ANY TIME:

(1) **NO** SGs can be fed with FDW (Main/CBP/Emergency) **AND** any of the following exist:

- RCS pressure reaches 2300 psig **OR** NDT limit
- Pzr level reaches 375″ [340″ acc] …

(**PERFORM** Rule 4)

(21) an operator is in position at 1FDW-313 **AND** Unit 1 TD EFDW PUMP is **NOT** operating ... (notify the operator to open 1FDW-313 and 1FDW-314)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. __ **IAAT** CBPs were feeding the SGs, **AND** CBP feed has been lost, **THEN** perform the following: A. __ Close TBVs. B. __ Close 1FDW-35. C. __ Close 1FDW-44.	
25. __ **IAAT** both of the following exist: __ An EFDW control valve will **NOT** control in AUTO __ The same EFDW control valve will **NOT** respond in MANUAL **THEN** perform Steps 26 and 27.	__ **GO TO** Step 28.
26. __ Notify CR SRO that Encl 5.27 (Alternate Methods for Controlling EFDW Flow) is being initiated. {22}	
27. __ Initiate Encl 5.27 (Alternate Methods for Controlling EFDW Flow).	
28. __ Verify any SCM ≤ 0°F.	__ **IF** overcooling, **OR** exceeding limits in Rule 7 (SG Feed Control), **THEN** throttle EFDW, as necessary.
29. Notify the alternate unit to perform the following: __ Monitor EFDWP parameters. __ Maintain UST level > 7.5'. __ Enter appropriate TS/SLC for EFDW valves closed in manual.	
30. __ **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation).	
31. __ **WHEN** directed by CR SRO, **THEN EXIT** this rule.	

• • • END • • •

IF AT ANY TIME:

(1) **NO** SGs can be fed with FDW (Main/CBP/Emergency) **AND** <u>any</u> of the following exist:

- RCS pressure reaches 2300 psig **OR** NDT limit
- Pzr level reaches 375″ [340″ acc] …

(**PERFORM** Rule 4)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32. __ **IAAT** both of the following exist: __ An EFDW control valve will **NOT** control in AUTO __ The same EFDW control valve will **NOT** respond in MANUAL **THEN** perform Steps 33 and 34.	__ **GO TO** Step 35.
33. __ Notify CR SRO that Encl 5.27 (Alternate Methods for Controlling EFDW Flow) is being initiated. {22}	
34. __ Initiate Encl 5.27 (Alternate Methods for Controlling EFDW Flow).	
35. __ Verify any SCM ≤ 0°F.	**CAUTION** ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling. __ **IF** overcooling, **OR** exceeding limits in Rule 7 (SG Feed Control), **THEN** throttle EFDW, as necessary.
36. __ **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation).	
37. __ **WHEN** directed by CR SRO, **THEN EXIT** this rule.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Identify the failure:	

✓	Valve	Failed Position	GO TO Step
	1FDW-315	Closed	2
	1FDW-315	Open	16
	1FDW-316	Closed	39
	1FDW-316	Open	53

2. __ Verify 1A MD EFDWP operating.	1. __ **IF** 1 TD EFDW PUMP can be used to feed SGs, **THEN** dispatch an operator to locally open 1FDW-94 (TD EFDWP DISCH TO 1A S/G NORMAL EMERG HDR) (T-1, 6'N of C-20, 7' up). 2. __ **IF** EFDW is being supplied from an alternate unit, **THEN** perform the following: A. __ Notify SRO that the startup path **CANNOT** be used. B. __ **EXIT** this enclosure.
3. __ Stop 1A MD EFDWP.	
4. __ Verify 1B MD EFDWP is operating.	1. __ Close 1FDW-368. 2. __ **GO TO** Step 6.
5. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
6. __ Place 1FDW-35 in HAND <u>and</u> set demand to 0%.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **EXIT** this enclosure.
7. __ Close 1FDW-33.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **EXIT** this enclosure.
8. __ Verify 1A MD EFDWP will be used.	__ **GO TO** Step 10.
9. __ Open 1FDW-374.	__ **GO TO** Step 2 to use the TDEFDWP.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. Verify the following: __ 1FDW-36 closed __ 1FDW-38 open	Position control switch for the following: __ 1FDW-36 to CLOSE __ 1FDW-38 to OPEN
11. __ Start 1A MD EFDWP.	__ **WHEN** 1FDW-94 is locally opened, **THEN** start 1 TD EFDW PUMP.

NOTE

- Flow from the TD EFDWP through a S/U control valve should be read on the FDW SU FLOW gauge.
- Flow from a MD EFDWP through a S/U control valve should be read on the MDEFWP DISCH FLOW gauge.

12. Verify either of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ **IF** any SG is being fed, **THEN** perform the following: A. __ Throttle 1FDW-35 to establish 100 gpm. B. __ Throttle 1FDW-35 to obtain desired SG level per Rule 7 (SG Feed Control). 2. __ **IF NO** SG is being fed, **AND** $T_c > 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-35 to establish 100 gpm. B. __ Initiate cool down to $\leq 550°F$ by feeding with 1FDW-35 and steaming intact SGs at a rate that prevents RCS saturation. 3. __ **IF NO** SG is being fed, **AND** $T_c \leq 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-35 to establish 100 gpm. B. __ Feed with 1FDW-35 and steam intact SGs to stabilize $T_c \leq 550°F$. 4. __ Notify CR SRO of SG feed status. 5. __ **GO TO** Step 14.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. __ Notify CR SRO that EFDW is available.	
14. __ **IAAT** proper SG level is reached per Rule 7 (SG Feed Control), **AND** SG level permits auto level control, **THEN** place 1FDW-35 in AUTO.	
15. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. __ Verify 1A MD EFDWP operating.	1. __ **IF** 1 TD EFDW PUMP can be used to feed SGs, **THEN** perform the following: A. __ Dispatch an operator to locally open 1FDW-94 (TD EFDWP DISCH TO 1A S/G NORMAL EMERG HDR) (T-1, 6'N of C-20, 7' up). B. __ Place 1 TD EFDW PUMP in PULL TO LOCK. C. __ Close 1FDW-368. D. __ **GO TO** Step 19. 2. __ **IF** EFDW is being supplied from an alternate unit, **THEN** perform the following: A. __ Notify alternate unit to stop EFDWPs supplying Unit 1. B. __ **GO TO** Step 29.
17. __ Stop 1A MD EFDWP.	
18. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
19. __ Place 1FDW-35 in HAND <u>and</u> set demand to 0%.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **GO TO** Step 29.
20. __ Close 1FDW-33.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **GO TO** Step 29.
21. __ Verify 1A MD EFDWP will be used.	__ **GO TO** Step 23.
22. Perform the following: __ Close 1FDW-372 __ Open 1FDW-374	__ **GO TO** Step 16 to use the TDEFDWP.
23. Verify the following: __ 1FDW-36 closed __ 1FDW-38 open	Position control switch for the following: __ 1FDW-36 to CLOSE __ 1FDW-38 to OPEN

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. __ Start 1A MD EFDWP.	__ **WHEN** 1FDW-94 is locally opened, **THEN** start 1 TD EFDW PUMP.

NOTE

- Flow from the TD EFDWP through a S/U control valve should be read on the FDW SU FLOW gauge.
- Flow from a MD EFDWP through a S/U control valve should be read on the MDEFWP DISCH FLOW gauge.

25. Verify either of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ **IF** any SG is being fed, **THEN** perform the following: A. __ Throttle 1FDW-35 to establish 100 gpm. B. __ Throttle 1FDW-35 to obtain desired SG level per Rule 7 (SG Feed Control). 2. __ **IF NO** SG is being fed, **AND** $T_c > 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-35 to establish 100 gpm. B. __ Initiate cool down to $\leq 550°F$ by feeding with 1FDW-35 and steaming intact SGs at a rate that prevents RCS saturation. 3. __ **IF NO** SG is being fed, **AND** $T_c \leq 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-35 to establish 100 gpm. B. __ Feed with 1FDW-35 and steam intact SGs to stabilize $T_c \leq 550°F$. 4. __ Notify CR SRO of SG feed status. 5. __ **GO TO** Step 27.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26. __ Notify CR SRO that EFDW is available.	
27. __ **IAAT** proper SG level is reached per Rule 7 (SG Feed Control), **AND** SG level permits auto level control, **THEN** place 1FDW-35 in AUTO.	
28. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29. Dispatch an operator to the Pen Room to perform the following: A. __ Close 1FDW-315 (1A S/G EFDW CONTROL). B. __ Establish communications with the Control Room.	
30. __ Verify 1A MD EFDWP can be started to feed SGs.	1. __ **IF** 1 TD EFDW PUMP can be used to feed SGs, **THEN** perform the following: A. __ Notify operator to locally close 1FDW-94 (TD EFDWP DISCH TO 1A S/G NORMAL EMERG HDR) (T-1, 6'N of C-20, 7' up). B. __ Open 1FDW-368. 2. __ **GO TO** Step 33.
31. __ Open 1FDW-372.	
32. __ Close 1FDW-374.	
33. __ **WHEN** 1FDW-315 has been locally closed, **THEN** continue in this enclosure.	
34. __ Start 1A MD EFDWP.	1. __ **IF** EFDW is aligned from an alternate unit, **THEN** perform the following: A. __ Notify alternate unit to start EFDWPs to supply Unit 1. B. __ **GO TO** Step 35. 2. __ **WHEN** 1FDW-94 is locally closed, **THEN** start 1 TD EFDW PUMP.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35. Verify either of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ **IF** any SG is being fed, **THEN** perform the following: A. __ Locally throttle 1FDW-315 to establish 100 gpm. B. __ Locally throttle 1FDW-315 to obtain desired SG level per Rule 7 (SG Feed Control). 2. __ **IF NO** SG is being fed, **AND** $T_c > 550°F$, **THEN** perform the following: A. __ Locally throttle 1FDW-315 to establish 100 gpm. B. __ Initiate cool down to ≤ 550°F by feeding with 1FDW-315 and steaming intact SGs at a rate that prevents RCS saturation. 3. __ **IF NO** SG is being fed, **AND** $T_c \leq 550°F$, **THEN** perform the following: A. __ Locally throttle 1FDW-315 to establish 100 gpm. B. __ Feed with 1FDW-315 and steam intact SGs to stabilize $T_c \leq 550°F$. 4. __ Notify CR SRO of SG feed status. 5. __ **GO TO** Step 37.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36. __ Notify CR SRO that EFDW is available.	
37. __ **IAAT** local control of an EFDW control valve is ineffective, **AND** manual control of 1 TD EFDW PUMP is desired, **THEN** dispatch an operator to perform the following: A. __ Establish communication with the Control Room. B. __ Throttle 1MS-94 (TD EFDWP STOP VALVE) as required to establish desired EFDW flowrate and/or SG level.	
38. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39. __ Verify 1B MD EFDWP operating.	1. __ **IF** 1 TD EFDW PUMP can be used to feed SGs, **THEN** dispatch an operator to locally open 1FDW-96 (TD EFDWP DISCH TO 1B S/G NORMAL EMERG HDR) (T-1, 6'N of C-20, 7' up). 2. __ **IF** EFDW is being supplied from an alternate unit, **THEN** perform the following: A. __ Notify SRO that the startup path **CANNOT** be used. B. __ **EXIT** this enclosure.
40. __ Stop 1B MD EFDWP.	
41. __ Verify 1A MD EFDWP is operating.	1. __ Close 1FDW-369. 2. __ **GO TO** Step 43.
42. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
43. __ Place 1FDW-44 in HAND <u>and</u> set demand to 0%.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **EXIT** this enclosure.
44. __ Close 1FDW-42.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **EXIT** this enclosure.
45. __ Verify 1B MD EFDWP will be used.	__ **GO TO** Step 47.
46. __ Open 1FDW-384.	__ **GO TO** Step 39 to use the TDEDFWP.
47. Verify the following: __ 1FDW-45 closed __ 1FDW-47 open	Position control switch for the following: __ 1FDW-45 to CLOSE __ 1FDW-47 to OPEN

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
48. __ Start 1B MD EFDWP.	__ **WHEN** 1FDW-96 is locally opened, **THEN** start 1 TD EFDW PUMP.

NOTE

- Flow from the TD EFDWP through a S/U control valve should be read on the FDW SU FLOW gauge.
- Flow from a MD EFDWP through a S/U control valve should be read on the MDEFWP DISCH FLOW gauge.

49. Verify either of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ **IF** any SG is being fed, **THEN** perform the following: A. __ Throttle 1FDW-44 to establish 100 gpm. B. __ Throttle 1FDW-44 to obtain desired SG level per Rule 7 (SG Feed Control). 2. __ **IF NO** SG is being fed, **AND** $T_c > 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-44 to establish 100 gpm. B. __ Initiate cool down to $\leq 550°F$ by feeding with 1FDW-44 and steaming intact SGs at a rate that prevents RCS saturation. 3. __ **IF NO** SG is being fed, **AND** $T_c \leq 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-44 to establish 100 gpm. B. __ Feed with 1FDW-44 and steam intact SGs to stabilize $T_c \leq 550°F$. 4. __ Notify CR SRO of SG feed status. 5. __ **GO TO** Step 51.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
50. __ Notify CR SRO that EFDW is available.	
51. __ **IAAT** proper SG level is reached per Rule 7 (SG Feed Control), **AND** SG level permits auto level control, **THEN** place 1FDW-44 in AUTO.	
52. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
53. __ Verify 1B MD EFDWP operating.	1. __ **IF** 1 TD EFDW PUMP can be used to feed SGs, **THEN** perform the following: A. __ Dispatch an operator to locally open 1FDW-96 (TD EFDWP DISCH TO 1B S/G NORMAL EMERG HDR) (T-1, 6'N of C-20, 7' up). B. __ Place 1 TD EFDW PUMP in PULL TO LOCK. C. __ Close 1FDW-369. D. __ **GO TO** Step 56. 2. __ **IF** EFDW is being supplied from an alternate unit, **THEN** perform the following: A. __ Notify alternate unit to stop EFDWPs supplying Unit 1. B. __ **GO TO** Step 66.
54. __ Stop 1B MD EFDWP.	
55. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
56. __ Place 1FDW-44 in HAND <u>and</u> set demand to 0%.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **GO TO** Step 66.
57. __ Close 1FDW-42.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **GO TO** Step 66.
58. __ Verify 1B MD EFDWP will be used.	__ **GO TO** Step 60.
59. Perform the following: __ Close 1FDW-382 __ Open 1FDW-384	__ **GO TO** Step 53 to use the TDEFDWP.
60. Verify the following: __ 1FDW-45 closed __ 1FDW-47 open	Position control switch for the following: __ 1FDW-45 to CLOSE __ 1FDW-47 to OPEN

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
61. __ Start 1B MD EFDWP.	__ **WHEN** 1FDW-96 is locally opened, **THEN** start 1 TD EFDW PUMP.

NOTE

- Flow from the TD EFDWP through a S/U control valve should be read on the FDW SU FLOW gauge.
- Flow from a MD EFDWP through a S/U control valve should be read on the MDEFWP DISCH FLOW gauge.

62. Verify either of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ **IF** any SG is being fed, **THEN** perform the following: A. __ Throttle 1FDW-44 to establish 100 gpm. B. __ Throttle 1FDW-44 to obtain desired SG level per Rule 7 (SG Feed Control). 2. __ **IF NO** SG is being fed, **AND** $T_c > 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-44 to establish 100 gpm. B. __ Initiate cool down to $\leq 550°F$ by feeding with 1FDW-44 and steaming intact SGs at a rate that prevents RCS saturation. 3. __ **IF NO** SG is being fed, **AND** $T_c \leq 550°F$, **THEN** perform the following: A. __ Throttle 1FDW-44 to establish 100 gpm. B. __ Feed with 1FDW-44 and steam intact SGs to stabilize $T_c \leq 550°F$. 4. __ Notify CR SRO of SG feed status. 5. __ **GO TO** Step 64.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
63. __ Notify CR SRO that EFDW is available.	
64. __ **IAAT** proper SG level is reached per Rule 7 (SG Feed Control), **AND** SG level permits auto level control, **THEN** place 1FDW-44 in AUTO.	
65. __ **EXIT** this enclosure.	

•••END•••

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
66. Dispatch an operator to the Pen Room to perform the following: A. __ Close 1FDW-316 (1B S/G EFDW CONTROL). B. __ Establish communications with the Control Room.	
67. __ Verify 1B MD EFDWP can be started to feed SGs.	1. __ **IF** 1 TD EFDW PUMP can be used to feed SGs, **THEN** perform the following: A. __ Notify operator to locally close 1FDW-96 (TD EFDWP DISCH TO 1B S/G NORMAL EMERG HDR) (T-1, 6'N of C-20, 7' up). B. __ Open 1FDW-369. 2. __ **GO TO** Step 70.
68. __ Open 1FDW-382.	
69. __ Close 1FDW-384.	
70. __ **WHEN** 1FDW-316 has been locally closed, **THEN** continue in this enclosure.	
71. __ Start 1B MD EFDWP.	1. __ **IF** EFDW is aligned from an alternate unit, **THEN** perform the following: A. __ Notify alternate unit to start EFDWPs to supply Unit 1. B. __ **GO TO** Step 72. 2. __ **WHEN** 1FDW-96 is locally closed, **THEN** start 1 TD EFDW PUMP.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
72. Verify either of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ **IF** any SG is being fed, **THEN** perform the following: A. __ Locally throttle 1FDW-316 to establish 100 gpm. B. __ Locally throttle 1FDW-316 to obtain desired SG level per Rule 7 (SG Feed Control). 2. __ **IF NO** SG is being fed, **AND** $T_c > 550°F$, **THEN** perform the following: A. __ Locally throttle 1FDW-316 to establish 100 gpm. B. __ Initiate cool down to $\leq 550°F$ by feeding with 1FDW-316 and steaming intact SGs at a rate that prevents RCS saturation. 3. __ **IF NO** SG is being fed, **AND** $T_c \leq 550°F$, **THEN** perform the following: A. __ Locally throttle 1FDW-316 to establish 100 gpm. B. __ Feed with 1FDW-316 and steam intact SGs to stabilize $T_c \leq 550°F$. 4. __ Notify CR SRO of SG feed status. 5. __ **GO TO** Step 74.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
73. __ Notify CR SRO that EFDW is available.	
74. __ **IAAT** local control of an EFDW control valve is ineffective, **AND** manual control of 1 TD EFDW PUMP is desired, **THEN** dispatch an operator to perform the following: A. __ Establish communication with the Control Room. B. __ Throttle 1MS-94 (TD EFDWP STOP VALVE) as required to establish desired EFDW flowrate and/or SG level.	
75. __ **EXIT** this enclosure.	

• • • END • • •

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REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-038A

Restart RCP

CANDIDATE: _____

EXAMINER: _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Restart RCP

Alternate Path:

No

Facility JPM #:

CRO-038A

K/A Rating(s):

System: 003
K/A: A4.03
Rating: 2.8/2.5

Task Standard:

1A1 RCP is started correctly per EOP Enclosure 5.6 (RCP Restart).

Preferred Evaluation Location:

Simulator __X___ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

EOP Enclosure 5.6 (RCP Restart)

Validation Time: 20 minutes

Time Critical: No

==========

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

_____/_____

NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. **Recall** Snap 213.
2. **Import** files for CRO-038A.
3. **Go** to Run.
4. **If** necessary to maintain Pzr level > 100", take 1HP-120 to hand and raise Pzr level. Then place 1HP-120 back in auto.

Tools/Equipment/Procedures Needed:

EOP Enclosure 5.6 (RCP Restart)

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Reactor tripped from 100% power.

1TA and 1TB did not auto transfer to CT-1 on the trip resulting in tripping of all RCPs.

Power has been restored to 1TA and 1TB.

EOP Subsequent Action in progress at Step 4.54.

INITIATING CUES:

SRO directs you to initiate EOP Enclosure 5.6 (RCP Restart) to start 1A1 RCP.

START TIME: _____

STEP 12: Step 11 Verify Pzr level is < 375" [340" acc]. STANDARD: Monitor Pzr level on 1UB1 and determine level is < 375". COMMENTS:	___ SAT ___ UNSAT
STEP 13: Step 12 Verify 1RC-4 is closed to isolate leakage past PORV. STANDARD: Observe 1RC-4 position indication on 1UB1 and determine 1RC-4 is open by red light illuminated. Continue to Step 12 **RNO** COMMENTS:	___ SAT ___ UNSAT
STEP 14: Step 12 **RNO** Open 1RC-4. STANDARD: Observe 1RC-4 position indication on 1UB1 and determine 1RC-4 is open by red light illuminated. COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 13 Position 1RC-1 is in manual and closed. STANDARD: Locate 1RC-1 on 1UB1 and press "close". Verify the blue AUTO light goes out and the white "close" light illuminates. COMMENTS:	___ SAT ___ UNSAT

STEP 16: Step 14 Ensure the following are open: • 1LPSW-6 (already open) • 1LPSW-15 (already open) STANDARD: Verify 1LPSW-6 and 1LPSW-15 are open on the RZ modules located on 1VB2. COMMENTS:	___ SAT ___ UNSAT
STEP 17: Step 15 Open the following for each RCP to be started using OAC graphic LPS02: • 1LPSW-7&8 (1A1) STANDARD: Open 1LPSW-7&8 by rotating the switch in the open direction and verify they both are open on the OAC by calling up graphic LPS02. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 18: Step 16 Ensure ≈ 8 gpm seal injection for each RCP to be started. • 1A1 STANDARD: Ensure ≈ 8 gpm seal injection for 1A1 RCP by observing seal injection flow meter on 1VB3. COMMENTS:	___ SAT ___ UNSAT

STEP 19: Step 17 Open the following for each RCP to be started: • 1HP-228 (1A1) (already open) STANDARD: Verify 1HP-228 open by observing red open light illuminated on 1VB3. COMMENTS:	___ SAT ___ UNSAT
STEP 20: Step 18 Open the following: • 1HP-20 (already open) • 1HP-21 (already open) STANDARD: Verify 1HP-20 open by observing indication on the RZ module located on 1VB2. Verify 1HP-21 open by observing red open light illuminated on 1UB1. COMMENTS:	___ SAT ___ UNSAT
STEP 21: Step 19 Open the following: • 1CC-7 (already open) • 1CC-8 (already open) STANDARD: COMMENTS:	___ SAT ___ UNSAT

STEP 22: Step 20 Ensure at least one of the following are operating: • 1A CC PUMP (already on) • 1B CC PUMP (off) STANDARD: COMMENTS:	___ SAT ___ UNSAT
STEP 23: Step 21 Verify CC TOTAL FLOW ≥ 575 gpm. STANDARD: Candidate determines that CC TOTAL FLOW is ≥ 575 gpm. COMMENTS:	___ SAT ___ UNSAT
STEP 24: Step 22 Verify HPI CD tab is in progress. STANDARD: Determine HPI CD tab is **NOT** in progress. Continue to Step 22 **RNO**. ***Cue: If asked, inform candidate that the HPI CD tab NOT in progress.*** COMMENTS:	___ SAT ___ UNSAT
STEP 25: Step 22 **RNO** **GO TO** Step 24 STANDARD: COMMENTS:	___ SAT ___ UNSAT

STEP 26: Step 24 Verify ICC tab is in progress STANDARD: Determine ICC tab is **NOT** in progress Continue to Step 24 **RNO** ***Cue: If asked, inform candidate that the ICC tab NOT in progress.*** COMMENTS:	___ SAT ___ UNSAT
STEP 27: Step 24 **RNO** **GO TO** Step 26 STANDARD: COMMENTS:	___ SAT ___ UNSAT
NOTE If SCM is lost due to RCP restart, performance of Rule 2 (Loss of SCM) may be delayed for up to 2 minutes to allow SCM to recover. STEP 28: Step 26 **IAAT** any SCM is = 0°F due to RCP restart, **THEN** ensure full HPI flow per Rule 6 (HPI). STANDARD: Candidate should indicate that if any SCM is = 0°F due to RCP restart, then they would ensure full HPI flow per Rule 6 (HPI). COMMENTS:	___ SAT ___ UNSAT

STEP 29: Step 27 **IAAT** any SCM is = 0°F for ≈ 2 minutes following RCP restart, **THEN GO TO** LOSCM tab. STANDARD: Candidate should indicate if any SCM is = 0°F for ≈ 2 minutes following RCP restart they would inform the SRO to go to the LOSCM tab. COMMENTS:	___ SAT ___ UNSAT
STEP 30: Step 28 Start AC or DC lift oil pump for an RCP to be started. STANDARD: Start AC or DC lift oil pump for the 1A1 RCP by locating switch on 1AB1 and placing the switch in the start position. The red light should come on and the white light should go off. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 31: Step 29 **WHEN** computer alarm for low lift oil pump discharge pressure clears for RCP to be started, **THEN** start RCP. STANDARD: Monitor computer alarms on the OAC "Alarm" screen located on 1UB2 and when low lift oil pump discharge pressure alarm clears, start the 1A1 RCP by rotating the switch located on 1AB1 clockwise. The red light should illuminate and the green light should go off. Monitor RCP amps to ensure they return to normal. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 32: Step 30 Stabilize RCS P/T. STANDARD: Monitor RCS P/T to determine if it is stable. ***Cue: when candidate initiates actions to stabilize P/T, inform candidate that another operator will continue the actions to stabilize the plant.*** COMMENTS:	___ SAT ___ UNSAT
STEP 33: Step 31 **WHEN** RCP motor current stabilizes, **THEN** stop respective RCP lift oil pump. STANDARD: Monitor RCP motor current by observing amp gauge on 1AB1 and when it stabilizes stop the 1A1 lift pump previously started by placing the switch on 1AB1 in the trip position. Observe the red light goes off and the green light illuminates. **NOTE: Simulator operator- verify Timer #1 actuates to cause RCP vibrations to increase to the emergency Hi setpoint.** COMMENTS:	___ SAT ___ UNSAT
STEP 34: Respond to ARG 1SA-09, D-2 (RC Pump Vibration High) and 1SA-09, E2 (RC Pump vibration Emergency High) STANDARD: Candidate reviews ARG 1SA-09, D-2 and E2, displays OAC graphic to verify the RCP condition. Candidate recommends performing AP/16, Abnormal Reactor Coolant Pump Operation. **Cue: When the candidate notifies the SRO that entry into AP/16 is required, direct candidate to perform AP/16 actions.** COMMENTS:	___ SAT ___ UNSAT

STEP 35: Perform AP/16, Abnormal Reactor Coolant Pump Operation. STANDARD: Candidate performs actions of AP/16, Abnormal Reactor Coolant Pump Operation. **Cue: If the candidate does not enter AP/16, ask for a recommendation. Candidate should recommend performing AP/16, Abnormal Reactor Coolant Pump Operation** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 36: Step 4.1 (AP/16) **IAAT** any RCP meets immediate trip criteria of Encl 5.1 (RCP Immediate Trip Criteria), Then perform Steps 4.2 – 4.8. STANDARD: Candidate verifies RCP immediate trip criteria from AP/16, Encl 5.1 has been met and continues to step 4.2 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 37: Step 4.2 Verify MODE 1 or 2 STANDARD: Candidate determines the reactor is in mode 3 and performs the RNO step. COMMENTS:	___ SAT ___ UNSAT

	CRITICAL STEP
STEP 38: Step 4.2 **RNO** Stop 1A1 RCP STANDARD: Candidate stops 1A1 RCP and verifies both red lights are out, the white light is on and amps indicate zero. COMMENTS: END TASK	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
17	This step aligns cooling water to the RCP.
24	This step required for the RCP to satisfy RCP start interlock requirements.
32	This step required for the RCP to satisfy RCP start interlock requirements.
33	This step required to start the RCP.

CHANGE 36 A
ENTIRE ENCLOSURE ASH

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. X Verify ICC tab in progress.	✓ **GO TO** Step 3.
2. __ **GO TO** Step 14.	
3. X Verify <u>any</u> RCP operating.	✓ **GO TO** Step 5.
4. __ **GO TO** Step 6.	
5. Verify <u>all</u> the following: ✓ Boiler condenser cooling has **NOT** occurred ✓ Nat Circ cooling exists in at least one RCS loop	1. __ Obtain TSC concurrence to perform RCP restart. 2. __ **IF** TSC does **NOT** concur with RCP restart, **THEN EXIT** this enclosure.
6. ✓ Ensure <u>all</u> SCMs are > 0°F.	
7. ✓ Ensure adequate RCP NPSH per Encl 5.18 (P/T Curves).	
8. Verify <u>any</u> of the following exist: X Either hot leg level < 597″ X Either train of vessel head level < 171″ X RVLIS indications **NOT** available **AND NO** RCPs operating	1. ✓ Ensure Pzr level is > 100″ [180″ acc]. 2. ✓ **GO TO** Step 10.
9. __ Ensure Pzr level > 200″ [235″ acc].	
10. X Verify HPI CD tab in progress.	Close the following: ✓ 1RC-155 ✓ 1RC-156 ✓ 1RC-157 ✓ 1RC-158 ✓ 1RC-159 ✓ 1RC-160
11. __ Verify Pzr level is < 375″ [340″ acc].	__ Reduce RCS pressure to < 2000 psig.
12. __ Verify 1RC-4 is closed to isolate leakage past PORV.	__ Open 1RC-4.
13. __ Position 1RC-1 in manual and closed.	
14. Open the following: __ 1LPSW-6 __ 1LPSW-15	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. Open the following for each RCP to be started using OAC graphic LPS02: __ 1LPSW-7&8 (1A1) __ 1LPSW-13&14 (1A2) __ 1LPSW-9&10 (1B1) __ 1LPSW-11&12 (1B2)	
16. Ensure ≈ 8 gpm seal injection for each RCP to be started. __ 1A1 __ 1A2 __ 1B1 __ 1B2	
17. Open the following for each RCP to be started: __ 1HP-228 (1A1) __ 1HP-226 (1A2) __ 1HP-232 (1B1) __ 1HP-230 (1B2)	
18. Open the following: __ 1HP-20 __ 1HP-21	
19. Open the following: __ 1CC-7 __ 1CC-8	
20. Ensure <u>at least one</u> of the following are operating: __ 1A CC PUMP __ 1B CC PUMP	
21. __ Verify CC TOTAL FLOW ≥ 575 gpm.	Open the following as necessary to obtain ≥ 575 gpm total CC flow: __ 1HP-1 __ 1HP-2
22. __ Verify HPI CD tab is in progress.	__ **GO TO** Step 24.
23. __ **GO TO** Step 38.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. __ Verify ICC tab is in progress.	__ **GO TO** Step 26.
25. __ **GO TO** Step 49.	

NOTE

If SCM is lost due to RCP restart, performance of Rule 2 (Loss of SCM) may be delayed for up to 2 minutes to allow SCM to recover.

26. __ **IAAT** any SCM is = 0°F due to RCP restart, **THEN** ensure full HPI flow per Rule 6 (HPI).	
27. __ **IAAT** any SCM is = 0°F for ≈ 2 minutes following RCP restart, **THEN GO TO** LOSCM tab.	
28. __ Verify SEAL RETURN TEMP < 195°F for the RCP to be started (OAC graphic RCPMPALL).	__ **WHEN** any RCP SEAL RETURN TEMP < 195°F, **THEN GO TO** Step 15.
29. __ Start AC or DC oil lift pump for RCP to be started.	
30. __ **WHEN** computer alarm for low oil lift pump discharge pressure clears for RCP to be started, **THEN** start RCP.	
31. __ Stabilize RCS P/T.	
32. __ **WHEN** RCP motor current stabilizes, **THEN** stop respective RCP oil lift pump.	
33. __ Verify starting another RCP is desired.	__ **GO TO** Step 35.
34. __ **GO TO** Step 26.	
35. __ Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
36. Return the following components to their desired position: __ 1RC-1 __ Pzr heaters	
37. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Unit Status

HPI CD tab is in progress.

NOTE

- If SCM is lost due to RCP restart, performance of Rule 2 (Loss of SCM) may be delayed for up to 2 minutes to allow SCM to recover.
- Transition to LOSCM tab is **NOT** required if SCM is lost during RCP restart in HPI CD tab.

38. __ **IAAT** any SCM is = 0°F due to RCP restart, **THEN** ensure full HPI flow per Rule 6 (HPI).	
39. __ Verify SEAL RETURN TEMP < 195°F for the RCP to be started (OAC graphic RCPMPALL).	__ **WHEN** any RCP SEAL RETURN TEMP < 195°F, **THEN GO TO** Step 15.
40. __ Start AC or DC oil lift pump for RCP to be started.	
41. __ **WHEN** computer alarm for low oil lift pump discharge pressure clears for RCP to be started, **THEN** start RCP.	
42. __ Stabilize RCS P/T.	
43. __ **WHEN** RCP motor current stabilizes, **THEN** stop respective RCP oil lift pump.	
44. __ Verify starting another RCP is desired.	__ **GO TO** Step 46.
45. __ **GO TO** Step 38.	
46. __ Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
47. Return the following components to their desired position: __ 1RC-1 __ Pzr heaters	
48. __ **EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status ICC tab in progress.	
49. __ Start AC or DC oil lift pump for RCP to be started.	
50. __ **WHEN** computer alarm for low oil lift pump discharge pressure clears for RCP to be started, **THEN** start RCP.	
51. __ **IAAT** RCP motor current stabilizes, **THEN** stop respective RCP oil lift pump.	
52. __ Verify starting another RCP is desired.	__ **GO TO** Step 54.
53. __ **GO TO** Step 49.	
54. __ Monitor OAC graphic RCPMPALL to analyze operating RCP parameters.	
55. Return the following components to their desired position: __ 1RC-1 __ Pzr heaters	
56. __ **EXIT** this enclosure.	

• • • END • • •

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Enclosure 5.1

RCP Immediate Trip Criteria {2}

	1A1		1A2		1B1		1B2	
MTR UPPER TH BRG TEMP 1	190°F		190°F		190°F		190°F	
MTR UPPER TH BRG TEMP 2	190°F		190°F		190°F		190°F	
MTR DOWN TH BRG TEMP	190°F		190°F		190°F		190°F	
MTR UPR GUIDE BRG TEMP	190°F		190°F		190°F		190°F	
MTR LWR GUIDE BRG TEMP	190°F		190°F		190°F		190°F	
MTR STATOR TEMP 1	295°F		295°F		295°F		295°F	
MTR STATOR TEMP 2	295°F		295°F		295°F		295°F	
MTR UPPER AIR TEMP								
MTR LOWER AIR TEMP								
MTR UPPER OIL POT TEMP								
MTR LOWER OIL POT TEMP								
MTR UPPER OIL POT LEVEL								
MTR LOWER OIL POT LEVEL								
	X	Y	X	Y	X	Y	X	Y
UPPER BRG DISPLACEMENT (MILS)	20	20	20	20	20	20	20	20
MTR COUPLING DISPLACEMENT (MILS)	20	20	20	20	20	20	20	20
MTR STAND VELOCITY PROBE (MILS)	5	5	5	5	5	5	5	5
SPOOL PIECE DISPLACEMENT (MILS)	20 *25	20 *25	20 *25	20 *25	20 *25	20 *25	20 *25	20 *25
SEAL LEAKOFF TEMP								
SEAL LEAKAGE FLOW								
UPPER SEAL D/P								
UPPER SEAL CAVITY PRESS								
UPPER SEAL HOUSING TEMP	260°F		260°F		260°F		260°F	
SEAL RETURN TEMP	260°F		260°F		260°F		260°F	
SEAL RETURN FLOW								
MIDDLE SEAL D/P								
LOWER SEAL CAVITY PRESS								
LOWER SEAL D/P								
RADIAL BEARING TEMP	225°F		225°F		225°F		225°F	
SEAL INJECTION FLOW								

*All of the following must apply: 1- MODE 3, 4, or 5. 2- Only one RCP pump operating in affected loop. 3- Vibration is read on installed and continuously monitored ADRE equipment. 4- Vibration directly related to changing RCS temperature/pressure.

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ **IAAT** any RCP meets immediate trip criteria of Encl 5.1 (RCP Immediate Trip Criteria), **THEN** perform Steps 2 - 8.	__ **GO TO** Step 9.
2. __ Verify MODE 1 or 2.	1. __ Stop the affected RCP. 2. __ **IF NO** RCPs operating, **AND** LPI is providing heat removal, **THEN** perform the following: A. __ Secure LPSW to LPI coolers until LPI Cooler outlet temperature equals T_c. B. __ Adjust LPSW to LPI coolers to stabilize LPI Cooler outlet temperature. 3. __ **IF NO** RCPs operating, **AND** SGs are providing heat removal, **THEN** initiate the U1 EOP due to loss of forced circulation. 4. __ **GO TO** Step 9.
3. __ Verify three RCPs will remain operating after affected RCP is tripped.	1. __ Trip Rx. 2. __ Stop the affected RCP. 3. __ **GO TO** Step 9.
4. __ Verify Rx power is ≤ 70% as indicated on all NIs.	1. __ Trip Rx. 2. __ Stop the affected RCP. 3. __ **GO TO** Step 9.
5. __ Verify FDW masters in Auto.	**CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity. 1. __ Stop the affected RCP. 2. __ Manually adjust FDW masters to achieve desired ΔT_c. 3. __ **GO TO** Step 8.

IF AT ANY TIME:

(1) <u>any</u> RCP meets immediate trip criteria… (perform steps to stop RCP)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. __ Stop the affected RCP.	
7. __ Verify ICS re-ratios feedwater to establish desired ΔT_c.	1. __ Place DELTA T_c station in HAND. 2. __ Manually adjust DELTA T_c station to achieve desired ΔT_c. **CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity. 3. __ **IF** DELTA T_c station does **NOT** control, **THEN** perform the following: A. Place the following in HAND: __ 1A FDW MASTER __ 1B FDW MASTER B. __ Manually adjust FDW masters to achieve desired ΔT_c. 4. __ Initiate AP/28 (ICS Instrument Failure).
8. __ Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).	
9. __ Verify RCP vibration indication is available for monitoring in Control Room.	1. __ Dispatch an operator to obtain vibration data per Encl 5.3 (RCP Machine View Monitor Operation) (A-6-602). 2. __ **IF** additional assistance is required, **THEN** contact Maintenance (PM2).
10. __ Monitor RCS flow for indication of degradation.	

IF AT ANY TIME:

(1) <u>any</u> RCP meets immediate trip criteria… (perform steps to stop RCP)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11. Monitor RCP parameters for operational abnormalities: __ OAC Display: (Turn-on Code "RCP") • Motor bearing temperatures • Seal return temperature • Seal return flow • RCP motor input power __ Loose Parts Monitor	
12. __ **IAAT** high vibration exists per statalarm 1SA-9/D-2, (RC PUMP VIBRATION HIGH) **AND** vibration continues to increase with the potential to exceed trip criteria **THEN** perform Steps 13 - 20.	__ **GO TO** Step 21.

IF AT ANY TIME:

(1) any RCP meets immediate trip criteria… (perform steps to stop RCP)

(12) high vibration exists **AND** vibration continues to increase with the potential to exceed trip criteria … (perform steps to stop RCP)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. __ Verify MODE 1 or 2.	1. __ **IF** time and plant conditions allow, **THEN** perform the following: A. __ Start a previously secured RCP per OP/1/A/1103/006 (RCP Operation). B. __ Stop the affected RCP. C. __ **GO TO** Step 21. 2. __ **IF** only one RCP operating, **AND** LPI is providing heat removal, **THEN** perform the following: A. __ Secure LPSW to LPI coolers until LPI Cooler outlet temperature equals T_c. B. __ Stop the affected RCP. C. __ Adjust LPSW to LPI coolers to stabilize LPI Cooler outlet temperature. 3. __ **IF** only one RCP operating, **AND** SGs are providing heat removal, **THEN** perform the following: A. __ Stop the affected RCP. B. Perform one of the following: __ Restart LPI system per OP/1/A/1102/001 (Controlling Procedure for Unit Startup). __ Initiate the U1 EOP due to loss of forced circulation. 4. __ **IF** more than one RCP operating, **THEN** perform the following: A. __ Stop the affected RCP. B. __ Stabilize RCS temperature using the following, as necessary: • TBVs or ADVs • LPSW to LPI Coolers 5. __ **GO TO** Step 21.

IF AT ANY TIME:

(1) any RCP meets immediate trip criteria… (perform steps to stop RCP)

(12) high vibration exists **AND** vibration continues to increase with the potential to exceed trip criteria … (perform steps to stop RCP)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14. __ Verify three RCPs will remain operating after affected RCP is tripped.	1. __ **IF** time and RCP conditions permit, **THEN** perform the following: A. **PERFORM** one of the following, as necessary, to shutdown the unit: __ AP/29 (Rapid Unit Shutdown) __ OP/1/A/1102/004 (Operation at Power) and OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown) B. __ Stop the affected RCP. C. __ **GO TO** Step 20. 2. __ Trip Rx. 3. __ Stop the affected RCP. 4. __ **GO TO** Step 21.
15. __ Verify Rx power is ≤ 70% as indicated on all NIs.	1. __ Direct an RO to initiate Encl 5.2 (Rapid Power Reduction). 2. __ **WHEN** Rx power is ≤ 70% on all NIs, **THEN** continue this procedure.
16. __ Verify FDW masters in Auto.	**CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity. 1. __ Stop the affected RCP. 2. __ Manually adjust FDW masters to achieve desired ΔT_c. 3. __ **GO TO** Step 19.

IF AT ANY TIME:

(1) <u>any</u> RCP meets immediate trip criteria… (perform steps to stop RCP)

(12) high vibration exists **AND** vibration continues to increase with the potential to exceed trip criteria … (perform steps to stop RCP)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17. __ Stop the affected RCP.	
18. __ Verify ICS re-ratios feedwater to establish desired ΔT_c.	1. __ Place DELTA T_c station in HAND. 2. __ Manually adjust DELTA T_c station to achieve desired ΔT_c. **CAUTION** Total feedwater flow should be maintained constant to prevent changes in core reactivity. 3. __ **IF** DELTA T_c station does **NOT** control, **THEN** perform the following: A. Place the following in HAND: __ 1A FDW MASTER __ 1B FDW MASTER B. __ Manually adjust FDW masters to achieve desired ΔT_c. 4. __ Initiate AP/28 (ICS Instrument Failure).
19. __ Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).	

IF AT ANY TIME:

(1) <u>any</u> RCP meets immediate trip criteria… (perform steps to stop RCP)

(12) high vibration exists **AND** vibration continues to increase with the potential to exceed trip criteria … (perform steps to stop RCP)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20. Initiate the following notifications: __ Notify OSM to make required notifications of OMP 1-14 (Notifications). __ Notify STA __ Notify Rx Engineering __ Notify SOC if load reduction was required. __ Notify Chemistry to take RCS boron samples on a 1 hour frequency.	
21. __ **IAAT** an RCP has been shutdown for ≥ 30 minutes, **THEN** close the associated RCP motor cooler inlet/outlet valve: __ 1LPSW-7&8 (1A1 RCP) __ 1LPSW-9&10 (1B1 RCP) __ 1LPSW-13&14 (1A2 RCP) __ 1LPSW-11&12 (1B2 RCP)	
22. __ **WHEN** conditions permit, **THEN EXIT** this procedure.	

• • • END • • •

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REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-085
ADJUST RADIATION MONITOR SETPOINTS

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Adjust radiation monitor setpoints.

Alternate Path:

No

Facility JPM #:

CRO-501

K/A Rating(s):

System: 001
K/A: 073 A4.01
Rating: 3.9/3.9

Task Standard:
Adjust 1RIA-37 and 1RIA-38 for a GWD release per procedure.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:
OP/1-2/A/1104/008, GWD system
PT/0/A/230/01, Radiation Monitor Check

Validation Time: 8 minutes **Time Critical:** NO

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. **RECALL** SNAP 220

2. Go to **RUN**

Tools/Equipment/Procedures Needed:
OP/1&2/A/1104/018, Encl. 4.9 & 4.10

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Release of "B" GWD tank is desired

No other GWRs in progress.

OP/1&2/A/1104/018, Enclosure 4.9 (GWD Tank Release) is in progress and completed up to Step 3.1

INITIATING CUES:

SRO directs you to continue the release of the "B" GWD tank beginning at Step 3.1 of Enclosure 4.9.

START TIME: _____

STEP 2: Step 3.1 Record background readings for 1RIA-37 & 1RIA-38 on Enclosure 4.10 "GWD Tank Sample Request". STANDARD: Determine background readings for 1RIA-37 & 1RIA-38 by observing the RIA readings on the RIA View Node and record on Enclosure 4.10. **Note: The background readings should be as follows:** **1RIA-37 Background reading is: ~ 1.346 E4 cps** **1RIA-38 Background reading is: ~ 1.114 E2 cps** Continue to Step 3.2 COMMENTS:	___ SAT ___ UNSAT
NOTE: The RIA required to terminate release (RIA within range) must be operable or two independent samples must be taken (SLC 16.11.3). STEP 3: Step 3.2 Recommended 1RIA-37 and 38 High and Alert setpoints: • 1RIA-37 **2.32 E5** cpm above background • 1RIA-38 **3.13 E2** cpm above background STANDARD: Obtain this information from the sample request and record on form. Continue to Step 3.3 COMMENTS:	___ SAT ___ UNSAT

NOTE: Release setpoint = background cpm + recommend cpm above background.	**CRITICAL STEP**
STEP 4: Step 3.3 Adjust 1RIA-37 setpoints for release as follows: 3.3.1 Document 1RIA-37 setpoints PT/0/A/0230/001 (Radiation Monitor Check) 3.3.2 Perform one of the following: A. **IF** above instrument range over-ride 1RIA-37 setpoints: • Set 1RIA-37 Alert setpoint at zero • Set 1RIA-37 High setpoint at zero Or B. **IF** required to set alarms: • Set 1RIA-37 Alert setpoint between **2.47 E5 and 2.43 E5 cpm** • Set 1RIA-37 High setpoint between **2.47 E5 and 2.43 E5 cpm**	___ SAT ___ UNSAT
STANDARD: Refer to PT/0/A/0230/001 (Radiation Monitor Check) and document setpoints. Determine setpoints for release are NOT above instrument range and N/A step 3.3.2.A Determine required setpoints **by adding background to data from the sample request** and enter it in PT/0/A/0230/001 and on this form. Continue to Step 3.4 **Note: the candidate will have to get a copy of PT/0/A/0230/01 from the procedure cart.**	
COMMENTS:	

STEP 5:	Step 3.4 Adjust 1RIA-38 setpoints for release per one of the following: 3.4.1 Document 1RIA-38 setpoints in PT/0/A/0230/001 (Radiation Monitor Check) 3.3.2 Perform one of the following: A. **IF** above instrument range over-ride 1RIA-38 setpoints: • Set 1RIA-38 Alert setpoint at zero • Set 1RIA-38 High setpoint at zero Or B. **IF** required to set alarms: • Set 1RIA-38 Alert setpoint between **426 and 422 cpm** • Set 1RIA-38 High setpoint between **426 and 422 cpm**	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Refer to PT/0/A/0230/001 (Radiation Monitor Check) and document setpoints. Determine setpoints for release are NOT above instrument range and N/A step 3.3.2.A Determine required setpoints by adding background to data from the sample request and enter it in PT/0/A/0230/001 and on this form. Continue to Step 3.5	
COMMENTS:		
	END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Required to set RIA to prevent station release above limits.
5	Required to set RIA to prevent station release above limits.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Release of "B" GWD tank is desired

No other GWRs in progress.

OP/1&2/A/1104/018, Enclosure 4.9 (GWD Tank Release) is in progress and completed up to Step 3.1

INITIATING CUES:

SRO directs you to continue the release of the "B" GWD tank beginning at Step 3.1 of Enclosure 4.9.

1. Initial Conditions

1.1 UNIT 1&2 GWD DISCH FLOW (1MSCCR0001) instrument operable.

1.2 Initiate Enclosure 4.10 "GWD Tank Sample Request."

1.3 Review Limits and Precautions.

2. Procedure

NOTE:
- Steps in PT/1-2/A/0230/002 (GWD Tank Release) completed prior to GWD Tank release to satisfy SR 16.11.3.12 on 1RIA-37 & 38. {3}
- If any instrument is unavailable, the associated surveillance requirement is **NOT** required. {3}

2.1 Perform steps for prior to GWD Tank release in PT/1-2/A/0230/002 (GWD Tank Release). {3}

2.2 **WHEN** sample results are received:

2.2.1 **IF** sample results allow release as determined by CR SRO, continue to Step 2.3.

2.2.2 **IF** sample results are too high in activity for release, complete Enclosure 4.10 "GWD Tank Sample Request" and return to RP.

_____ • Stop this Enclosure

2.3 Determine any other GWR(s) are in progress at station.

	Releases in Progress	Release Rate of Station Limit
U1	☐ Yes ☑ No	_____
U2	☐ Yes ☑ No	_____
U3	☐ Yes ☑ No	_____

2.4 Ensure RIA-45 setpoints adjusted for U1&2 GWD Tank release per PT/0/A/0230/001 (Radiation Monitor Check).

3. GWD Release

_____ 3.1 Record background readings for 1RIA-37 & 1RIA-38 on Enclosure 4.10 "GWD Tank Sample Request".

NOTE: The RIA required to terminate release (RIA within range) must be operable or two independent samples must be taken (SLC 16.11.3).

3.2 Recommended 1RIA-37 and 38 High and Alert setpoints:

_____ • 1RIA-37 _____ cpm above background

_____ • 1RIA-38 _____ cpm above background

NOTE: Release setpoint = background cpm + recommended cpm above background.

3.3 Adjust 1RIA-37 setpoints for release as follows:

_____ 3.3.1 Document 1RIA-37 setpoints in PT/0/A/0230/001 (Radiation Monitor Check)

3.3.2 Perform <u>one</u> of the following:

A. **<u>IF</u>** above instrument range over-ride 1RIA-37 setpoints:

_____ _____ • Set 1RIA-37 Alert setpoint at zero

_____ _____ • Set 1RIA-37 High setpoint at zero

<u>Or</u>

B. **<u>IF</u>** required to set alarms:

_____ _____ • Set 1RIA-37 Alert setpoint at _____cpm

_____ _____ • Set 1RIA-37 High setpoint at _____cpm

3.4 Adjust 1RIA-38 setpoints for release per one of the following:

_____ 3.4.1 Document 1RIA-38 setpoints in PT/0/A/0230/001 (Radiation Monitor Check)

3.4.2 Perform one of the following:

A. **IF** above instrument range over-ride 1RIA-38 setpoints:

_____ _____ • Set 1RIA-38 Alert setpoint at zero

_____ _____ • Set 1RIA-38 High setpoint at zero

Or

B. **IF** required to set alarms:

_____ _____ • Set 1RIA-38 Alert setpoint at _____cpm

_____ _____ • Set 1RIA-38 High setpoint at _____cpm

_____ 3.5 Ensure GWR DISCHARGE FLOW CONTROL in "HAND".

_____ 3.6 Verify GWR DISCHARGE FLOW CONTROL "CLOSED".

_____ 3.7 Open GWD-100 (Decay Tanks Discharge Header Block). (A-2-209/E 13' N of Door)

3.8 **IF** releasing GWD Tank A perform the following:

_____ _____ • Open GWD-98 (Decay Tank 1A Discharge Block) (A-2-209/E 14' N of Door)

_____ _____ • Place GWD-4 (A GWD TANK DISCHARGE) switch to "AUTO"

3.9 **IF** releasing GWD Tank B perform the following:

_____ _____ • Open GWD-99 (Decay Tank 1B Discharge Block) (A-2-209/E 14' N of Door)

_____ _____ • Place GWD-5 (B GWD TANK DISCHARGE) switch to "AUTO"

3.10 **IF** releasing GWD Tank C perform the following:

_____ _____ • Open GWD-204 (Decay Tank 1C Discharge Block) (IRW Building)

_____ _____ • Place GWD-206 (C INTERIM GWD TANK DISCH) switch to "OPEN"

3.11 **IF** releasing GWD Tank D perform the following:

_____ _____ • Open GWD-205 (Decay Tank 1D Discharge Block) (IRW Building)

_____ _____ • Place GWD-207 (D INTERIM GWD TANK DISCH) switch to "OPEN"

NOTE:
- Station Limit release rates, per SLC 16.11, will **NOT** be exceeded if recommended release rates per Enclosure 4.10 "GWD Tank Sample Request" are followed.
- Limit and Precautions have required approval levels for release.

3.12 Approval granted for release.

_____ _____/_____
Approval Date Time

_____ 3.13 Recommended Release Rate from Enclosure 4.10 "GWD Tank Sample Request":

_____ cfm.

NOTE:
- If U1 Penetration Room Ventilation (PRV) system is shutdown, RIA-32 U1 Penetration Room sample point does **NOT** sample general area air properly. {2}
- With U1 PRV system shutdown, RIA-32 sample point for U1 Penetration Room is sampling air in piping between U1 Unit Vent and PRV discharge. {2}
- During or just after GWD Release RIA-32 counts may increase while selected to U1 Penetration Room causing 1SA-8 B-9 "Process Monitor Radiation High" to alarm. {2} {11}

_____ 3.14 Note on Turnover sheet that just after or during a GWD release 1SA-8 B-9 "Process Monitor Radiation High" may alarm from RIA-32 sample point selected to U1 Penetration Room. {2} {11}

- **IF** 1SA-8 B-9 is due to RIA-32 -U1 Penetration Room, it should be considered an expected alarm.

_____ 3.15 Adjust GWR DISCHARGE FLOW CONTROL to obtain desired release rate.

_____ 3.16 Record "Begin GWR # _____" in Auto Log.

_____ 3.17 Notify U2 CR to place a note on turnover sheet "If 2RIA-45 alarms, notify U1 CR".

_____ 3.18 Notify U3 CR to place a note on turnover sheet "If 3RIA-45 alarms, notify U1 CR".

NOTE:
- Steps in PT/1-2/A/0230/002 (GWD Tank Release) completed during GWD Tank release to satisfy SR 16.11.3.1 on 1RIA-37 & 38 and Effluent Flow Rate Monitor. {3}
- If any instrument is unavailable, the associated surveillance requirement is **NOT** required. {3}

_____ 3.19 **IF** equilibrium count rate is achieved **AND** auto termination does **NOT** occur, perform steps for during GWD Tank release in PT/1-2/A/0230/002 (GWD Tank Release). {3}

NOTE: If 1RIA 37 or 38 High Alarm is received:
- GWD Tank discharge valve should automatically close.
- "Enable Control" screen on RIA VIEW NODE should show "INHIBIT".

3.20 **IF** automatic termination occurs:

_____ 3.20.1 Close GWR Discharge Flow Controller.

_____ 3.20.2 Investigate cause of alarm.

_____ 3.20.3 **IF** required, request an independent sample on GWD tank.

_____ 3.20.4 Record maximum cpm of 1RIA-37 and 1RIA-38:
1RIA-37 _____ cpm
1RIA-38 _____ cpm.

_____ 3.20.5 **IF** required, perform Enclosure 4.17 "GWD Tank Release With Revised RIA Setpoints".

_____ 3.20.6 **IF** required, terminate release.

_____ 3.20.7 **IF** release was terminated, manually reset valve inhibit on "Enable Control" screens of RIA VIEW NODE.

_____ 3.21 **WHEN** GWD Tank is ≈ 5 psig, close GWR DISCHARGE FLOW CONTROL.

_____ 3.22 Add N^2 to affected GWD tank to increase pressure to 15-20 psig per Enclosure 4.19 "Adding Nitrogen To GWD Tank".

_____ 3.23 Adjust GWR DISCHARGE FLOW CONTROL to obtain desired release rate.

NOTE:	If GWD system/tank maintenance is required the GWD tank may need depressurizing

3.24 **IF** required depressurize GWD tank as follows:

_____ 3.24.1 **WHEN** GWD Tank is depressurized, close GWR DISCHARGE FLOW CONTROL

_____ 3.24.2 Continue with Section 4 "GWD Termination".

3.25 **IF** nothing requires GWD tank to be depressurized perform the following:

_____ 3.25.1 **WHEN** GWD Tank is ≈ 5 psig, close GWR DISCHARGE FLOW CONTROL

_____ 3.25.2 Continue with Section 4, "GWD Termination".

4. GWD Termination:

_____ 4.1 Record "Stop GWR # _____" in Auto Log.

_____ 4.2 Complete Enclosure 4.10 "GWD Tank Sample Request" and route to RP.

4.3 **IF** GWD Tank A released, isolate as follows:

_____ _____ • Close GWD-98 (Decay Tank 1A Discharge Block) (A-2-209/E 14' N of Door)

_____ _____ • Close GWD-l00 (Decay Tanks Discharge Header Block) (A-2-209/E 13' N of Door)

_____ • Place GWD-4 (A GWD TANK DISCHARGE) switch to "CLOSED"

4.4 **IF** GWD Tank B released, isolate as follows:

_____ _____ • Close GWD-99 (Tank 1B Discharge Block) (A-2-209/E 14' N of Door)

_____ _____ • Close GWD-l00 (Decay Tanks Discharge Header Block) (A-2-209/E 13' N of Door)

_____ • Place GWD-5 (B GWD TANK DISCHARGE) switch to "CLOSED"

4.5 **IF** GWD Tank C released, isolate as follows:

_____ _____ • Close GWD-204 (Decay Tank 1C Discharge Block) (IRW Building)

_____ _____ • Close GWD-100 (Decay Tanks Discharge Header Block) (A-2-209/E 13' N of Door)

_____ • Place GWD-206 (C INTERIM GWD TANK DISCH) switch to "CLOSED"

4.6 **IF** GWD Tank D released, isolate as follows:

_____ _____ • Close GWD-205 (Decay Tank 1D Discharge Block) (IRW Building)

_____ _____ • Close GWD-100 (Decay Tanks Discharge Header Block) (A-2-209/E 13' N of Door)

_____ • Place GWD-207 (D INTERIM GWD TANK DISCH) switch to "CLOSED"

NOTE:	Throttling drain valves may cause GWD tank pressure to decrease rapidly. Drain valves should be throttled ≈ 1/4 turn open initially.

4.7 **IF** released, check GWD Tank A for accumulation of water as follows: (A-2-209)

_____ _____ • Throttle open LWD-240 (Waste Gas Tank 1A Drain).

_____ _____ • Throttle open LWD-352 (Waste Gas Tank 1A Drain Block).

_____ _____ • Throttle open LWD-350 (Waste Gas Tank 1A Drain).

_____ _____ • Throttle open LWD-351 (Waste Gas Tank 1A Drain Block).

4.7.1 **WHEN** no water passes through sight-glass, position the following:

_____ _____ • Close LWD-240 (Waste Gas Tank 1A Drain).

_____ _____ • Close LWD-352 (Waste Gas Tank 1A Drain Block).

_____ _____ • Close LWD-350 (Waste Gas Tank 1A Drain).

_____ _____ • Close LWD-351 (Waste Gas Tank 1A Drain Block).

NOTE:	Throttling drain valves may cause GWD tank pressure to decrease rapidly. Drain valves should be throttled ≈ 1/4 turn open initially.

4.8 **IF** released, check GWD Tank B for accumulation of water as follows: (A-2-209)

_____ _____ • Throttle open LWD-241 (Waste Gas Tank 1B Drain).

_____ _____ • Throttle open LWD-355 (Waste Gas Tank 1B Drain Block).

_____ _____ • Throttle open LWD-353 (Waste Gas Tank 1B Drain).

_____ _____ • Throttle open LWD-354 (Waste Gas Tank 1B Drain Block).

4.8.1 **WHEN** no water passes through sight-glass, position the following:

_____ _____ • Close LWD-241 (Waste Gas Tank 1B Drain)

_____ _____ • Close LWD-355 (Waste Gas Tank 1B Drain Block)

_____ _____ • Close LWD-353 (Waste Gas Tank 1B Drain)

_____ _____ • Close LWD-354 (Waste Gas Tank 1B Drain Block)

NOTE:	Throttling drain valves may cause GWD tank pressure to decrease rapidly. Drain valves should be throttled ≈ 1/4 turn open initially.

4.9 **IF** released, check GWD Tank C for accumulation of water as follows: (Interim Bldg)

_____ _____ • Throttle open GWD-197 (Waste Gas Tank 1C Drain)

_____ _____ • Throttle open GWD-198 (Waste Gas Tank 1C Drain)

4.9.1 **WHEN** no water passes through sight-glass:

_____ _____ • Close GWD-197 (Waste Gas Tank 1C Drain)

_____ _____ • Close GWD-198 (Waste Gas Tank 1C Drain)

NOTE:	Throttling drain valves may cause GWD tank pressure to decrease rapidly. Drain valves should be throttled ≈ 1/4 turn open initially.

4.10 **IF** released, check GWD Tank D for accumulation of water as follows: (Interim Bldg)

_____ _____ • Throttle open GWD-200 (Waste Gas Tank 1D Drain Isolation)

_____ _____ • Throttle open GWD-201 (Waste Gas Tank 1D Drain Isolation)

4.10.1 **WHEN** no water passes through sight-glass:

_____ _____ • Close GWD-200 (Waste Gas Tank 1D Drain Isolation)

_____ _____ • Close GWD-201 (Waste Gas Tank 1D Drain Isolation)

NOTE:	GWD Filters drain to HAWT.

4.11 Drain GWD Filters as follows: (A-2-210/Waste Gas Compressor Rm)

_____ _____ • Throttle LWD-242 (Waste Gas Absolute Filter Drain)

_____ _____ • Throttle LWD-243 (Waste Gas Charcoal Filter Drain)

4.11.1 After one minute: (A-2-210/Waste Gas Compressor Rm)

_____ _____ • Close LWD-242 (Waste Gas Absolute Filter Drain)

_____ _____ • Close LWD-243 (Waste Gas Charcoal Filter Drain)

_____ 4.12 Perform purge on 1RIA-37 and 1RIA-38 per Enclosure 4.18 "1RIA-37 and 38 Purge."

_____ 4.13 Ensure complete RIA-45 setpoints adjustment for U1&2 GWD Tank release per PT/0/A/0230/001 (Radiation Monitor Check).

4.14 Set RIA alarms as follows:

_____ • Set 1RIA-37 Alert setpoint at zero

_____ • Set 1RIA-37 High setpoint at zero

_____ • Set 1RIA-38 Alert setpoint at zero

_____ • Set 1RIA-38 High setpoint at zero

_____ 4.15 **IF** required, remove note from Turnover sheet for RIA-32 alarming.

_____ 4.16 Notify U2 CR to remove Turnover sheet notes for 2RIA-45 alarms.

_____ 4.17 Notify U3 CR to remove Turnover sheet notes for 3RIA-45 alarms.

_____ 4.18 Ensure PT/1-2/A/0230/002 (GWD Tank Release) complete. {3}

_____ 4.19 **IF** GWD tank was depressurized, stop here until maintenance is complete.

4.20 **IF** GWD tank was depressurized, perform the following:

_____ 4.20.1 **WHEN** maintenance is complete, ensure ____ GWD tank is isolated.

_____ 4.20.2 Pressurize ____ GWD tank to ≈ 5 psig nitrogen per Enclosure 4.19 "Adding Nitrogen To GWD Tank".

NOTE: Isolated GWD Tank must be sampled for hydrogen within 24 hours.

4.21 Sample isolated GWD Tank:

_____ 4.21.1 Verify GWD Tank pressure is ≈ 5 psig.

_____ 4.21.2 Record date and time GWD Tank was isolated below and in Auto Log.

Date_____ Time _____ Tank_____

_____ 4.21.3 Request sample for hydrogen on isolated GWD Tank.

_____ 4.21.4 Refer to Limits and Precautions for allowable hydrogen concentration.

Enclosure 4.10

GWD Tank Sample Request

Gaseous Analysis Request For GWD Tank # B

GWR # 091002

Tank Isolated: Date 03/02/09 Time 1530

Independent Sample Analysis Required ☐ Yes ☒ No

Sample Analysis Results

Iodine 2.48 E-10 µci/ml

Gaseous 3.71 E-6 µci/ml

RP Representative L. Burkhart Date/Time 03/02/09 / 0700

Independent Sample Analysis Results

Iodine N/A

Gaseous N/A

RP Representative N/A Date/Time

Independent Data Entry Checks completed N/A

RP Representative

Independent Sample agrees with initial sample N/A

RP Representative

Recommended Release Rates

☐ 1/3 Station Limit 9.0 E6 cfm

☐ 2/3 Station Limit 1.8 E7 cfm

NOTE: If 1RIA-37&38 are inoperable, set High and Alert setpoints to zero.

Recommended High and Alert setpoints for:

1RIA-37 2.32 E5 cpm above background

1RIA-38 3.13 E2 cpm above background

Enclosure 4.10

GWD Tank Sample Request

GASEOUS RELEASE VOLUME UPDATE

___B___ GWD Tank Release

GWD Tank Pressure: _____ psig

GWD tank volume per OP/0/A/1108/001 (Curves And General Information) _____ (ft^3)

Started: Date _____ Time _____

RIA Background Reading:

IF available, 1RIA-37_____

IF available, 1RIA-38_____

Actual Release Rate: _____ cfm

RIA Equilibrium Readings during Release:

IF available, 1RIA-37_____

IF available, 1RIA-38_____

Terminated: Date _____ Time _____

Tank Pressure: Finish _____ psig

Comments: _____

_____

_____

Route this GWD Tank Sample Request to RP.

_____ _____/_____
CRO Date Time

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-097
ALIGN HPI/LPI PIGGYBACK MODE

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Align HPI/LPI Piggyback Mode.

Alternate Path:

Yes

Facility JPM #:

CRO-097

K/A Rating(s):

System: EPE-009
K/A: EK3.21
Rating: 4.2/4.5

Task Standard:
Steps of EOP are properly completed by the student to align HPI/LPI piggyback mode. Perform Encl. 5.12, ECCS Suction Swap to RBES.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:
Encl. 5.12, ECCS Suction Swap to RBES.

Validation Time: 11 minutes **Time Critical:** NO

==========

Candidate: _____ Time Start: _____

NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. **Recall** Snap 212 (MPS400 @ 0.23, Cold Leg SBLOCA).
2. **Import** files for CRO-097.
3. **Go** to Run

Tools/Equipment/Procedures Needed:
EP/1/A/1800/01 and Encl. 5.12, ECCS Suction Swap to RBE.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

A small break LOCA has occurred which is depleting the BWST.

The RCS is saturated.

The BWST level is 19.0 feet and RB level is increasing.

EP/1800/01 in progress and LOCA CD has been completed up to step 8.

Both LPI pumps are off due to low LPI flow conditions.

INITIATING CUES:

The Procedure Director has directed you to transfer ECCS suction to the RBES per Enclosure 5.12, (ECCS Suction Swap to RBES).

START TIME: _____

STEP 1: Step 1 Start: • 1A LPI Pump • 1B LPI Pump STANDARD: The candidate attempts to start both LPI pumps and recognizes that both pumps fail to start. The candidate will go to the RNO for step 1 to align the 1C LPI pump. **Cue: if the candidate notifies the SRO that 1A and 1B LPI pumps failed to start, direct candidate to continue on in the procedure.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Step 1 **RNO** If NO LPI pumps are operating: **THEN GO TO** Step 85. STANDARD: The candidate verifies NO LPI PUMPs are operating and continues to step 85. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: Step 85 Open: • 1LP-6 • 1LP-7 • 1LP-9 • 1LP-10 • 1LP-17 • 1LP-18 STANDARD: The Candidate opens the valves listed above. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Step 86 Start 1C LPI pump STANDARD: The Candidate starts 1C LPI pump COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Step 87 Verify either: • LPI Flow Train A plus LPI Flow Train B ≥ 3400 gpm • Only one LPI header is operating **AND** flow in that header is ≥ 2900 gpm STANDARD: The candidate will go to the RNO for step 87 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 6: Step 87 RNO **GO TO** Step 89 STANDARD: The candidate will go to step 89 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Step 89 Verify three HPI pumps operating. STANDARD: Candidate observes that all 3 HPI Pumps are operating. COMMENTS:	___ SAT ___ UNSAT
STEP 8: Step 90 Stop 1B HPI PUMP. STANDARD: The candidate stops the 1B HPI pump. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 9: Step 91 Simultaneously open: • 1LP-15 • 1LP-16 STANDARD: The candidate opens 1LP-15 and 1LP-16 at the same time. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE Total LPI flow = LPI header flow + HPI header flow + seal injection STEP 10: Step 92 Maximize total LPI flow < 2900 gpm by throttling HPI flow. STANDARD: Candidate determines that the LPI flow is maximized < 2900 gpm. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 11: Step 93 Limit total HPI flow to ≤ 750 gpm including seal injection. STANDARD: Candidate throttles total HPI flow (including seal injection) to ≤ 750 gpm. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: Step 94 Place LDST LEVEL INTERLOCK switch in DISABLE. STANDARD: Candidate places the LDST LEVEL INTERLOCK switch in the DISABLE position. COMMENTS:	___ SAT ___ UNSAT

STEP 13: Step 95 Position valve switches to close until valve travel is initiated: • 1HP-23 • 1HP-24 • 1HP-25 STANDARD: Candidate rotates the controls switches for 1HP-23, 24 and 25 to the CLOSE position until the green CLOSED lights are observed to come on, then the switches are released and student proceeds to Step 14 without waiting to verify that the valves actually close COMMENTS: **Note: Student should not wait on RED open light indication to extinguish.**	___ SAT ___ UNSAT
STEP 14: Step 96 Simultaneously position the following valve switches to open until valve travel is initiated: • 1HP-939 • 1HP-940 STANDARD: Candidate rotates the controls switches for 1HP-939 and 940 to the OPEN position until the red OPEN lights are observed to come on, then the switches are released and student proceeds to Step 16 without waiting to verify that the valves actually open COMMENTS: **Note: Student should not wait on the GREEN close light indication to extinguish.**	___ SAT ___ UNSAT
STEP 15: Step 97 Verify either fully open: • 1LPSW-4 • 1LPSW-5 STANDARD: Candidate verifies that 1LPSW-4 & 1LPSW-5 are both OPEN. COMMENTS:	___ SAT ___ UNSAT

STEP 16: Step 98 Verify both open: • 1LPSW-4 • 1LPSW-5 STANDARD: Candidate verifies that 1LPSW-4 & 1LPSW-5 are both OPEN. COMMENTS:	___ SAT ___ UNSAT
STEP 17: Step 99 **GO TO** Step 106. STANDARD: Candidate continues to step 106. COMMENTS:	___ SAT ___ UNSAT
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'. STEP 18: Step 106 **WHEN** BWST level is ≤ 9', **AND** RB level is rising, **THEN** continue in this enclosure. STANDARD: Candidate monitors BWST level and continues the enclosure when BWST level decreases to 9 feet. ***Cue: Inform student operator that you are using time compression and activate TIMER #1 to decrease BWST Level to 9 feet at this time. Also indicate RB level is rising.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 19: Step 107 Simultaneously open the following: • 1LP-19 • 1-LP-20 STANDARD: Candidate opens 1LP-19 and 1-LP-20. COMMENTS: END TASK	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Necessary to establish flow in the LPI headers to supply the HPIP suctions from the BWST.
6	Necessary to ensure that the flow is sufficient to the 1A HPI pump to maintain adequate NPSH.
7	Necessary to allow the flow from the LPI headers to the HPI pump suctions.
11	ECCS pump damage due to run out with inadequate suction head may occur if total HPI flow is not determined properly and throttled appropriately.
19	Necessary to ensure suction to LPI.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A small break LOCA has occurred which is depleting the BWST.

The RCS is saturated.

The BWST level is 19.0 feet and RB level is increasing.

EP/1800/01 in progress and LOCA CD has been completed up to step 8.

Both LPI pumps are off due to low LPI flow conditions.

INITIATING CUES:

The Procedure Director has directed you to transfer ECCS suction to the RBES per Enclosure 5.12, (ECCS Suction Swap to RBES).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Start: __ 1A LPI PUMP __ 1B LPI PUMP	1. __ **IF** either are operating: __ 1A LPI PUMP __ 1B LPI PUMP **THEN GO TO** Step 2. 2. __ **IF NO** LPI pumps are operating, **THEN GO TO** Step 85. 3. __ **IF** 1C LPI PUMP is operating, **THEN GO TO** Step 87.
2. Verify either: __ LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm __ Only one LPI header is operating, **AND** flow in that header is ≥ 2900 gpm	__ **GO TO** Step 4.
3. __ **GO TO** Step 52.	
4. __ Verify three HPI pumps operating.	__ **GO TO** Step 6.
5. __ Stop 1B HPI PUMP.	
6. Simultaneously open: __ 1LP-15 __ 1LP-16	1. __ **IF** 1LP-15 is closed, **AND** 1B LPI PUMP is operating, **THEN** perform the following: A. __ **IF NO** flow on LPI FLOW TRAIN A, **THEN** perform the following: 1. __ Secure 1A LPI PUMP. 2. __ **GO TO** Step 10. B. __ **GO TO** Step 11. 2. __ **IF** 1LP-16 is closed, **AND** 1A LPI PUMP is operating, **THEN** perform the following: A. __ **IF NO** flow on LPI FLOW TRAIN B, **THEN** perform the following: 1. __ Secure 1B LPI PUMP. 2. __ **GO TO** Step 10. B. __ **GO TO** Step 11.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. __ Verify two LPI pumps operating.	__ **GO TO** Step 10.
8. __ Verify total HPI flow including seal injection is > 500 gpm.	__ **IF** both exist: __ **NO** flow on LPI FLOW TRAIN A __ **NO** flow on LPI FLOW TRAIN B **THEN** perform the following: A. __ **IF** 1LPSW-4 is open, **THEN** perform the following: 1. __ Secure 1B LPI PUMP. 2. __ **GO TO** Step 10. B. __ **IF** 1LPSW-5 is open, **THEN** perform the following: 1. __ Secure 1A LPI PUMP. 2. __ **GO TO** Step 10. C. __ **IF** both exist: __ 1LPSW-4 power available __ 'A' LPI cooler LPSW flow DIXON has power **THEN** perform the following: 1. __ Throttle 1LPSW-4 to establish 3000 - 3300 gpm. 2. __ Secure 1B LPI PUMP. 3. __ **GO TO** Step 10. D. __ **IF** both exist: __ 1LPSW-5 power available __ 'B' LPI cooler LPSW flow DIXON has power **THEN** perform the following: 1. __ Throttle 1LPSW-5 to establish 3000 - 3300 gpm. 2. __ Secure 1A LPI PUMP. 3. __ **GO TO** Step 10.
9. __ **GO TO** Step 12.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Total LPI flow = LPI header flow + HPI header flow + seal injection.	
10. __ Maximize total LPI flow < 3100 gpm by throttling HPI flow.	
11. __ Limit total HPI flow to ≤ 750 gpm including seal injection.	
12. __ Place LDST LEVEL INTERLOCK switch in DISABLE.	
13. Position valve switches to close until valve travel is initiated: __ 1HP-23 __ 1HP-24 __ 1HP-25 {3}	__ Continue procedure.
14. Simultaneously position valve switches to open until valve travel is initiated: __ 1HP-939 __ 1HP-940	__ Continue procedure.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. Verify either fully open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 18.
16. Verify both open: __ 1LPSW-4 __ 1LPSW-5	1. __ **IF** 1LPSW-4 is closed, **AND** 1LP-16 is open, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Stop 1A LPI PUMP. D. __ **GO TO** Step 23. 2. __ **IF** 1LPSW-5 is closed, **AND** 1LP-15 is open, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Stop 1B LPI PUMP. D. __ **GO TO** Step 23.
17. __ **GO TO** Step 24.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The DIXON LPSW flow indicators must be used when determining post accident flow readings.	
18. Verify both: __ 'A' LPI cooler LPSW flow DIXON has power __ 1LP-15 open	__ **IF** 1LP-16 is open, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Stop 1A LPI PUMP. D. __ **GO TO** Step 23.
19. Verify both: __ 1LP-16 open __ 'B' LPI cooler LPSW flow DIXON has power	__ **IF** 1LP-15 is open, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Stop 1B LPI PUMP. D. __ **GO TO** Step 23.
20. __ Throttle 1LPSW-4 for 3000-3300 gpm flow to 1A LPI cooler.	__ **IF** 1LPSW-4 is closed, **AND** 1LP-16 is open, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Stop 1A LPI PUMP. D. __ **GO TO** Step 23.
21. __ Throttle 1LPSW-5 for 3000-3300 gpm flow to 1B LPI cooler.	__ **IF** 1LPSW-5 is closed, **AND** 1LP-15 is open, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Stop 1B LPI PUMP. D. __ **GO TO** Step 23.
22. __ **GO TO** Step 24.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Total LPI flow = LPI header flow + HPI header flow + seal injection.	
23. __ Maximize total LPI flow < 3100 gpm by throttling HPI flow.	
24. Verify both: __ Step 8 RNO was used to secure an LPI pump due to low flow conditions. __ LPSW is aligned to cooler associated with stopped LPI pump.	__ **GO TO** Step 26.
25. __ **WHEN** BWST level is ≤ 10', **THEN** start any LPI pump previously stopped due to low flow conditions.	
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'.	
26. __ **WHEN** BWST level is ≤ 9', **AND** RB level is rising, **THEN** continue in this enclosure. {4}	
27. Simultaneously open: __ 1LP-19 __ 1LP-20	1. __ **IF** 1LP-19 fails to open, **THEN** stop the 1A RBS PUMP. 2. __ **IF** 1LP-20 fails to open, **THEN** stop the 1B RBS PUMP.
28. __ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 29 - 33.	__ **GO TO** Step 33.
29. __ Verify 1LP-19 open.	__ Stop 1A LPI PUMP.
30. __ Verify 1LP-20 open.	__ Stop 1B LPI PUMP.
31. Simultaneously close: __ 1LP-21 __ 1LP-22	1. __ **IF** 1LP-21 fails to close, **THEN** perform the following: __ Stop 1A LPI PUMP. __ Stop 1A RBS PUMP. 2. __ **IF** 1LP-22 fails to close, **THEN** perform the following: __ Stop 1B LPI PUMP. __ Stop 1B RBS PUMP.

IF AT ANY TIME:

(28) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32. __ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).	
33. __ Verify two LPI pumps operating.	1. __ Maximize total LPI flow < 3100 gpm by throttling HPI flow. 2. __ Limit total HPI flow to ≤ 750 gpm including seal injection.
34. __ **IAAT** an operating LPI Pump (1A **OR** 1B) fails, **THEN** perform Steps 35 - 42.	__ **GO TO** Step 43.
35. __ Verify any LPI pump operating.	1. __ **IF** 1A LPI PUMP or 1B LPI PUMP is available, **THEN** attempt to start the available LPI pump. 2. __ **IF** any LPI pump is operating, **THEN GO TO** Step 36. 3. __ **GO TO** Step 38.
36. Open valves for the running LPI pump: ✓ **1A LPI Pump** — ✓ **1B LPI Pump** 1LP-15 — 1LP-16 1LP-17 — 1LP-18 1LPSW-4 — 1LPSW-5	1. Open the following: __ 1LP-9 __ 1LP-10 2. Open valves for the running LPI pump: ✓ **1A LPI Pump** — ✓ **1B LPI Pump** 1LP-16 — 1LP-15 1LP-18 — 1LP-17 1LPSW-5 — 1LPSW-4 3. Close valves for the running LPI pump: ✓ **1A LPI Pump** — ✓ **1B LPI Pump** 1LP-15 — 1LP-16 1LP-17 — 1LP-18 1LPSW-4 — 1LPSW-5
37. __ **GO TO** Step 42.	

IF AT ANY TIME:

(28) BWST level is ≤ 6' … (transfer suction to only the RB sump)

(34) an operating LPI Pump (1A **OR** 1B) fails … (verify any LPI pump operating **OR** start 1C LPI pump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38. Verify: __ 1LP-19 open __ 1LP-21 closed **OR** 1LP-28 closed	1. __ Open 1LP-7. 2. __ **GO TO** Step 40.
39. __ Open 1LP-6.	1. __ Open 1LP-20. 2. __ Close 1LP-22 **OR** 1LP-28. 3. __ Open 1LP-7.
40. Open valves to align 1C LPI PUMP to <u>only one</u> header that has LPSW aligned to the LPI cooler:	

✓	A LPI HDR	✓	B LPI HDR
	1LP-15		1LP-16
	1LP-9		1LP-10
	1LP-17		1LP-18

41. __ Start 1C LPI PUMP.	
42. Perform the following: A. __ Maximize <u>total</u> LPI flow < 3100 gpm by throttling HPI flow. B. __ Limit <u>total</u> HPI flow to ≤ 750 gpm including seal injection.	

IF AT ANY TIME

(28) BWST level is ≤ 6' … (transfer suction to only the RB sump)

(34) an operating LPI Pump (1A **OR** 1B) fails … (verify any LPI pump operating **OR** start 1C LPI pump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
43. __ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
44. __ **IAAT** the TSC is operational, **THEN** notify TSC to provide guidance on long term operation of LPI pumps.	
45. __ **WHEN** 1LP-28 is closed, **THEN** continue in this enclosure.	
46. __ Verify 1LP-19 open.	__ **GO TO** Step 50.
47. __ Verify 1A LPI PUMP operating.	__ **IF** TSC approves restart, **THEN** perform the following: A. __ Start 1A LPI PUMP. B. __ **GO TO** Step 50.
48. __ Verify 1LP-20 open.	__ **GO TO** Step 50.
49. __ Verify 1B LPI PUMP operating.	__ **IF** TSC approves restart, **THEN** start 1B LPI PUMP.
50. __ Initiate Encl 5.4 (Makeup to the BWST) to replenish inventory for subsequent use if needed.	
51. __ **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm **OR** Only one LPI header in operation with header flow ≥ 2900 gpm.	
52. __ **WHEN** BWST level is ≤ 15', **THEN** stop all HPI pumps.	
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'.	
53. __ **WHEN** BWST level ≤ 9', **AND** RB level is rising, **THEN** continue procedure.	
54. Simultaneously open: __ 1LP-19 __ 1LP-20	1. __ **IF** 1LP-19 fails to open, **THEN** stop the 1A RBS PUMP. 2. __ **IF** 1LP-20 fails to open, **THEN** stop the 1B RBS PUMP.
55. __ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 56 - 59.	__ **GO TO** Step 60.
56. __ Verify 1LP-19 open.	__ Stop the 1A LPI PUMP.
57. __ Verify 1LP-20 open.	__ Stop the 1B LPI PUMP.
58. Simultaneously close: __ 1LP-21 __ 1LP-22	1. __ **IF** 1LP-21 fails to close, **THEN** perform the following: __ Stop 1A LPI PUMP. __ Stop 1A RBS PUMP. 2. __ **IF** 1LP-22 fails to close, **THEN** perform the following: __ Stop 1B LPI PUMP. __ Stop 1B RBS PUMP.
59. __ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).	

IF AT ANY TIME:

(55) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
60. Verify <u>any</u> are open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 63.
61. Verify <u>both</u> are open: __ 1LPSW-4 __ 1LPSW-5	1. __ **IF** 1LPSW-4 is closed, **AND** flow exists on LPI FLOW TRAIN B, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Stop 1A LPI PUMP. C. __ Close 1LP-17. D. __ **GO TO** Step 67. 2. __ **IF** 1LPSW-5 is closed, **AND** flow exists on LPI FLOW TRAIN A, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Stop 1B LPI PUMP. C. __ Close 1LP-18. D. __ **GO TO** Step 67.
62. __ **GO TO** Step 67.	

IF AT ANY TIME:

(55) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The DIXON LPSW flow indicators must be used when determining post accident flow readings.	
63. __ Verify 'A' LPI cooler LPSW flow DIXON has power.	__ **IF** flow exists on LPI FLOW TRAIN B, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Stop 1A LPI PUMP. C. __ Close 1LP-17. D. __ **GO TO** Step 67.
64. __ Verify 'B' LPI cooler LPSW flow DIXON has power.	__ **IF** flow exists on LPI FLOW TRAIN A, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Stop 1B LPI PUMP. C. __ Close 1LP-18. D. __ **GO TO** Step 67.
65. __ Throttle 1LPSW-4 for 3000-3300 gpm flow to the 1A LPI cooler.	__ **IF** flow exists on LPI FLOW TRAIN B, **THEN** perform the following: A. __ Close 1LPSW-4. B. __ Open 1LPSW-5. C. __ Stop 1A LPI PUMP. D. __ Close 1LP-17. E. __ **GO TO** Step 67.
66. __ Throttle 1LPSW-5 for 3000-3300 gpm flow to the 1B LPI cooler.	__ **IF** flow exists on LPI FLOW TRAIN A, **THEN** perform the following: A. __ Close 1LPSW-5. B. __ Open 1LPSW-4. C. __ Stop 1B LPI PUMP. D. __ Close 1LP-18.

IF AT ANY TIME:

(55) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
67. __ **IAAT** an operating LPI Pump (1A **OR** 1B) fails, **THEN** perform Steps 68 - 74.	__ **GO TO** Step 75.
68. __ Verify <u>any</u> LPI pump operating.	__ **GO TO** Step 71.
69. Perform for the <u>running</u> LPI pump: ✓ **1A LPI Pump** / ✓ **1B LPI Pump** Open 1LP-17 / Open 1LP-18 Close 1LP-18 / Close 1LP-17 Close 1LPSW-5 / Close 1LPSW-4 Open 1LPSW-4 / Open 1LPSW-5	1. Open the following: __ 1LP-9 __ 1LP-10 2. Perform for the <u>running</u> LPI pump: ✓ **1A LPI Pump** / ✓ **1B LPI Pump** Open 1LP-18 / Open 1LP-17 Close 1LP-17 / Close 1LP-18 Close 1LPSW-4 / Close 1LPSW-5 Open 1LPSW-5 / Open 1LPSW-4
70. __ **GO TO** Step 75.	
71. Verify: __ 1LP-19 open __ 1LP-21 closed **OR** 1LP-28 closed	1. __ Open 1LP-7. 2. __ **GO TO** Step 73.
72. __ Open 1LP-6.	1. __ Open 1LP-20. 2. __ Close 1LP-22 **OR** 1LP-28. 3. __ Open 1LP-7.
73. Open valves to align 1C LPI PUMP to <u>all</u> headers with LPSW aligned: ✓ **A LPI HDR** / ✓ **B LPI HDR** 1LP-9 / 1LP-10 1LP-17 / 1LP-18	
74. __ Start 1C LPI PUMP.	

IF AT ANY TIME:

(55) BWST level is ≤ 6' … (transfer suction to only the RB sump)

(67) an operating LPI Pump (1A **OR** 1B) fails ... (verify any LPI pump operating **OR** start 1C LPI pump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
75. Open: __ 1HP-939 __ 1HP-940	__ Continue procedure.
76. __ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
77. Close: __ 1LP-15 __ 1LP-16	__ Continue procedure.
78. __ **WHEN** 1LP-28 is closed, **THEN** continue in this enclosure.	
79. __ Verify 1LP-19 open.	__ **GO TO** Step 83.
80. __ Verify 1A LPI PUMP operating.	__ **IF** TSC approves restart, **THEN** perform the following: A. __ Start 1A LPI PUMP. B. __ **GO TO** Step 83.
81. __ Verify 1LP-20 open.	__ **GO TO** Step 83.
82. __ Verify 1B LPI PUMP operating.	__ **IF** TSC approves restart, **THEN** start 1B LPI PUMP.
83. __ Initiate Encl 5.4 (Makeup to the BWST) to replenish inventory for subsequent use if needed.	
84. __ **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
85. Open: __ 1LP-6 __ 1LP-7 __ 1LP-9 __ 1LP-10 __ 1LP-17 __ 1LP-18	
86. __ Start 1C LPI PUMP.	
87. Verify either: __ LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm __ Only one LPI header is operating, **AND** flow in that header is ≥ 2900 gpm	__ **GO TO** Step 89.
88. __ **GO TO** Step 121.	
89. __ Verify three HPI pumps operating.	__ **GO TO** Step 91.
90. __ Stop 1B HPI PUMP.	
91. Simultaneously open: __ 1LP-15 __ 1LP-16	1. __ **IF** 1LP-15 is closed, **THEN** perform the following: A. __ **IF NO** flow on LPI FLOW TRAIN A, **THEN** close 1LP-9. B. __ **GO TO** Step 92. 2. __ **IF** 1LP-16 is closed, **AND NO** flow on LPI FLOW TRAIN B **THEN** close 1LP-10.

NOTE

Total LPI flow = LPI header flow + HPI header flow + seal injection.

92. __ Maximize total LPI flow < 2900 gpm by throttling HPI flow.	
93. __ Limit total HPI flow to ≤ 750 gpm including seal injection.	
94. __ Place LDST LEVEL INTERLOCK switch in DISABLE.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
95. Position valve switches to close until valve travel is initiated: __ 1HP-23 __ 1HP-24 __ 1HP-25 {3}	__ Continue procedure.
96. Simultaneously position valve switches to open until valve travel is initiated: __ 1HP-939 __ 1HP-940	__ Continue procedure.
97. Verify any are open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 100.
98. Verify both are open: __ 1LPSW-4 __ 1LPSW-5	1. __ **IF** 1LPSW-4 is closed, **AND** 1LP-16 is open, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Close 1LP-9. D. __ **GO TO** Step 105. 2. __ **IF** 1LPSW-5 is closed, **AND** 1LP-15 is open, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Close 1LP-10. D. __ **GO TO** Step 105.
99. __ **GO TO** Step 106.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The DIXON LPSW flow indicators must be used when determining post accident flow readings.	
100. Verify both: __ 'A' LPI cooler LPSW flow DIXON has power __ 1LP-15 open	__ **IF** 1LP-16 is open, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Close 1LP-9. D. __ **GO TO** Step 105.
101. Verify both: __ 'B' LPI cooler LPSW flow DIXON has power __ 1LP-16 open	__ **IF** 1LP-15 is open, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Close 1LP-10. D. __ **GO TO** Step 105.
102.__ Throttle 1LPSW-4 for 3000-3300 gpm flow to 1A LPI cooler.	__ **IF** 1LPSW-4 is closed, **AND** 1LP-16 is open, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Close 1LP-9. D. __ **GO TO** Step 105.
103.__ Throttle 1LPSW-5 for 3000-3300 gpm flow to 1B LPI cooler.	__ **IF** 1LPSW-5 is closed, **AND** 1LP-15 is open, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection. C. __ Close 1LP-10. D. __ **GO TO** Step 105.
104.__ **GO TO** Step 106.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Total LPI flow = LPI header flow + HPI header flow + seal injection.	
105.__ Maximize total LPI flow < 2900 gpm by throttling HPI flow.	
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'.	
106.__ **WHEN** BWST level is ≤ 9', **AND** RB level is rising, **THEN** continue in this enclosure. {4}	
107. Simultaneously open: __ 1LP-19 __ 1LP-20	1.__ **IF** 1LP-19 fails to open, **THEN** perform the following: A. __ Stop the 1A RBS PUMP. B. __ Close 1LP-6. 2.__ **IF** 1LP-20 fails to open, **THEN** perform the following: A. __ Stop the 1B RBS PUMP. B. __ Close 1LP-7.
108.__ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 109 - 111.	__ **GO TO** Step 111.
109. Simultaneously close: __ 1LP-21 __ 1LP-22	1.__ **IF** 1LP-21 fails to close, **THEN** perform the following: __ Stop 1A RBS PUMP. __ Close 1LP-6. 2.__ **IF** 1LP-22 fails to close, **THEN** perform the following: __ Stop 1B RBS PUMP. __ Close 1LP-7.
110.__ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).	

IF AT ANY TIME:

(108) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
111. Perform the following: A. __ Maximize total LPI flow < 2900 gpm by throttling HPI flow. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection.	
112.__ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
113.__ **IAAT** the TSC is operational, **THEN** notify TSC to provide guidance for recovery of LPI pumps.	
114.__ **WHEN** 1LP-28 is closed, **THEN** continue in this enclosure.	
115.__ Verify 1LP-19 open.	__ **GO TO** Step 119.
116.__ Verify 1LP-6 open.	__ **IF** TSC approves, **THEN** perform the following: A. __ Open 1LP-6. B. __ **GO TO** Step 119.
117.__ Verify 1LP-20 open.	__ **GO TO** Step 119.
118.__ Verify 1LP-7 open.	__ **IF** TSC approves, **THEN** open 1LP-7.
119.__ Initiate Encl 5.4 (Makeup to the BWST) to replenish inventory for subsequent use if needed.	
120.__ **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

• • • END • • •

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status LPI FLOW TRAIN A plus LPI FLOW TRAIN B ≥ 3400 gpm **OR** Only one LPI header in operation with header flow ≥ 2900 gpm.	
121.__ **WHEN** BWST level is ≤ 15', **THEN** stop all HPI pumps.	
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'.	
122.__ **WHEN** BWST level ≤ 9', **AND** RB level is rising, **THEN** continue procedure.	
123. Simultaneously open: __ 1LP-19 __ 1LP-20	1.__ **IF** 1LP-19 fails to open, **THEN** perform the following: A. __ Stop the 1A RBS PUMP. B. __ Close 1LP-6. 2.__ **IF** 1LP-20 fails to open, **THEN** perform the following: A. __ Stop the 1B RBS PUMP. B. __ Close 1LP-7.
124.__ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 125 - 126.	__ **GO TO** Step 127.
125. Simultaneously close: __ 1LP-21 __ 1LP-22	1.__ **IF** 1LP-21 fails to close, **THEN** perform the following: __ Stop 1A RBS PUMP. __ Close 1LP-6. 2.__ **IF** 1LP-22 fails to close, **THEN** perform the following: __ Stop 1B RBS PUMP. __ Close 1LP-7
126.__ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).	

IF AT ANY TIME:

(124) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
127. Verify <u>any</u> are open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 130.
128. Verify <u>both</u> are open: __ 1LPSW-4 __ 1LPSW-5	1. __ **IF** 1LPSW-4 is closed, **AND** flow exists on LPI FLOW TRAIN B, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Close 1LP-17. C. __ **GO TO** Step 134. 2. __ **IF** 1LPSW-5 is closed, **AND** flow exists on LPI FLOW TRAIN A, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Close 1LP-18. C. __ **GO TO** Step 134.
129. __ **GO TO** Step 134.	

IF AT ANY TIME:

(124) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The DIXON LPSW flow indicators must be used when determining post accident flow readings.	
130.__ Verify 'A' LPI cooler LPSW flow DIXON has power.	__ **IF** flow exists on LPI FLOW TRAIN B, **THEN** perform the following: A. __ Open 1LPSW-5. B. __ Close 1LP-17. C. __ **GO TO** Step 134.
131.__ Verify 'B' LPI cooler LPSW flow DIXON has power.	__ **IF** flow exists on LPI FLOW TRAIN A, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ Close 1LP-18. C. __ **GO TO** Step 134.
132.__ Throttle 1LPSW-4 for 3000-3300 gpm flow to the 1A LPI cooler.	__ **IF** flow exists on LPI FLOW TRAIN B, **THEN** perform the following: A. __ Close 1LPSW-4. B. __ Open 1LPSW-5. C. __ Close 1LP-17. D. __ **GO TO** Step 134.
133.__ Throttle 1LPSW-5 for 3000-3300 gpm flow to the 1B LPI cooler.	__ **IF** flow exists on LPI FLOW TRAIN A, **THEN** perform the following: A. __ Close 1LPSW-5. B. __ Open 1LPSW-4. C. __ Close 1LP-18.

IF AT ANY TIME:

(124) BWST level is ≤ 6' … (transfer suction to only the RB sump)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
134. Open: __ 1HP-939 __ 1HP-940	__ Continue procedure.
135.__ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
136. Close: __ 1LP-15 __ 1LP-16	__ Continue procedure.
137.__ **WHEN** 1LP-28 is closed, **THEN** continue in this enclosure.	
138.__ Verify 1LP-19 open.	__ **GO TO** Step 142.
139.__ Verify 1LP-6 is open.	__ **IF** TSC approves, **THEN** perform the following: A. __ Open 1LP-6. B. __ **GO TO** Step 142.
140.__ Verify 1LP-20 open.	__ **GO TO** Step 142.
141.__ Verify 1LP-7 is open.	__ **IF** TSC approves, **THEN** open 1LP-7.
142.__ Initiate Encl 5.4 (Makeup to the BWST) to replenish inventory for subsequent use if needed.	
143.__ **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

• • • END • • •

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REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-106
PLACE SPARE DEBORATING IX IN SERVICE

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Place the Spare Deborating IX in service for purification

Alternate Path:

Yes

Facility JPM #:

CRO-106

K/A Rating(s):

System: 004
K/A: A4.17
Rating: 2.7/2.7

Task Standard:
Perform OP/1/A/1103/004 C, Deborating IXs, Encl. 4.9 to place the Spare Deborating IX in service.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:
OP/1/A/1103/004 C, Deborating IXs. Encl. 4.9

Validation Time: 15 minutes

Time Critical: NO

==========

Candidate: _____ Time Start: _____

NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

Provide a copy of Limits and Precautions for OP/1/A/1103/004 C, Deborating IXs. Direct the candidate to review L & Ps during the pre-job brief prior to entering into the simulator area. This is to prevent using simulator time to perform this review.

1. **Recall** Snap 209 (3% IC), BOL, RCS [B] = 1749 ppm actual; put on Boron Status Board
2. **Import** files for CRO-106.
3. **Verify** ICS in **Auto** (Diamond and both FDW Masters).
4. Provide a copy of OP/1/A/1103/004 C, Deborating IXs. AND a working copy of Encl. 4.9, (Spare Deborating IX for RCS Purification)
5. Fill out a copy of the "IX Status Log" to show the Spare Deborating IX boron to be within ±20 ppm of RCS boron. (Ex. Make Spare Deb IX = 1752 ppm)
6. As part of the procedure, a second Letdown Filter will be placed into service. This will require the "Component Boron Log" for the 1B Letdown Filter to be filled out with values showing that it has recently been used and should be ~equal to RCS boron.
7. Ensure the BORON status board shows BOL parameters; especially that RCS Boron = 1750 ppm
8. Ensure reactivity management controls are established in the Control Room.
9. **Go** to Run

Tools/Equipment/Procedures Needed:

OP/1/A/1103/004 C, Deborating IXs. Encl. 4.9

Demineralizer Log Sheet for Spare Deb IX

Component Boron Concentration Log Sheet for 1B Letdown Filter

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit 1 startup in progress following a refueling outage

Unit 1 Power = 3% stable for the past 45 mins.

Unit 1 RCS Boron = 1749 ppm

Primary Chemistry requests that the Spare Deborating IX be placed in service for RCS purification for the next two (2) hrs.

The Spare Deborating IX is loaded with cation resin.

Unit 2 & 3 are at 100%.

INITIATING CUES:

The Unit 1 CR SRO directs you to Place the Spare Deborating IX in service for RCS purification per OP/1A/1103/004 C, Deborating IXs, Encl. 4.9 (Spare Deborating IX For RCS Purification).

START TIME: _____

STEP 1: Steps 1.1 – 1.6 Initial Conditions are verified STANDARD: The candidate verifies and ensures Initial Conditions; all initial conditions will be met. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 1.7 Review Limits and Precautions STANDARD: The candidate reviews L and Ps. This review was pre-staged. COMMENTS:	___ SAT ___ UNSAT
NOTE: • This procedure affects reactivity management by placing IX and Letdown Filter in service causing possible RCS boron change. (R.M.) • U1 Deborating IX can affect RCS boron because it contains ≈ 1200 gal of borated water as listed in "IX Status Log". (R.M.) **NOTE:** Cation resin will **NOT** remove boron from RCS. (R.M.) STEP 3: Step 2.1 **IF** Spare Deborating IX is loaded with Cation resin (De-lith IX): ___ Check Spare Deborating IX boron status: **IF** RCS > 100 ppm **AND** IX boron as listed in "IX Status Log" is ± 50 ppm of current RCS boron STANDARD: The candidate checks "IX Status Log" and determines that Spare Deb IX boron is within ± 50 ppm of current RCS boron and continues to Step 2.1.2 COMMENTS:	___ SAT ___ UNSAT

NOTE: If IX boron is within acceptable limits IX may be placed in service with minimal reactivity affects. (R.M.) **NOTE:** Anion resin will remove boron. (R.M.) STEP 4: Step 2.2 **IF** Spare Deborating IX is loaded with anion resin (Deborating IX): STANDARD: The candidate determines this step does not apply; continues to Step 2.3 COMMENTS:	___ SAT ___ UNSAT
STEP 5: Step 2.3 Spare Deborating IX has acceptable boron status to be placed in service. STANDARD: The candidate determines IX boron is acceptable and continues to step 2.4. ***Cue: As SRO, initial the step (SRO required initial). Inform the candidate to continue.*** COMMENTS:	___ SAT ___ UNSAT

NOTE: Placing an idle Letdown Filter in service can affect core reactivity by adding ≈ 60 gals of water at a different boron concentration. {5} {6} (R.M.)

STEP 6: Step 2.4

IF two Letdown Filters are available **AND NOT** already in service: (**1B Letdown Filter is not is service**)

- Review Component Boron Log for out-of-service Letdown Filter boron.
- Determine RCS boron based on placing second Letdown Filter in service. (**RCS Boron will not change**)
- RCS boron __(1749)_____ ppm
- **IF** RCS makeup is required to achieve acceptable boron, determine RCS makeup sources and volumes per OP/1/A/1103/004 (Soluble Poison Control). (**NOT Required**)
- Verify acceptable RCS boron **OR** ensure appropriate RCS makeup plans determined to ensure acceptable boron. (**Acceptable**)
- Position the following:
  - Ensure 1HP-17 (1A LETDOWN FILTER INLET) switch "OPEN"
  - Ensure 1HP-18 (1B LETDOWN FILTER INLET) switch "OPEN"

STANDARD: Candidate reviews the Component Boron Log for the 1B Letdown Filter and determines that: it will have no affect on RCS boron, additional makeup is NOT required, and that acceptable RCS boron will exist.

Candidate opens: 1HP-17 (already open) and **1HP-18 (must be opened)**; placing 1B Letdown Filter in service

COMMENTS:

CRITICAL STEP

___ SAT

___ UNSAT

STEP 7: Step 2.5

IF RCS makeup is required to ensure acceptable boron, makeup per OP/1/A/1103/004 (Soluble Poison Control). (**Make up is not required**)

STANDARD: Candidate determines that RCS makeup is not required.

COMMENTS:

___ SAT

___ UNSAT

STEP 8:	Step 2.6 Align Spare Deborating IX for service: • Verify closed 1CS-27 (DEBOR IX INLET). • Ensure closed 1CS-26 (LETDOWN TO RC BHUT). {17} • Open 1CS-32 & 37 (SPARE DEBOR IX INLET & OUTLET). • Verify 1HP-15 Controller in "MANUAL". • Open 1HP-16 (LDST MAKEUP ISOLATION).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	The candidate performs the above items to align the Spare Deb IX: • Verify closed 1CS-27 (already closed). • Ensure closed 1CS-26 (LETDOWN TO RC BHUT). • Open 1CS-32 & 37 (SPARE DEBOR IX INLET & OUTLET). • Verify 1HP-15 Controller in "MANUAL". (already in manual) • Open 1HP-16 (LDST MAKEUP ISOLATION).	
COMMENTS:		
STEP 9:	Step 2.7 Position 1HP-14 (LDST BYPASS) to "BLEED" to place Spare Deborating IX in service.	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	The candidate positions 1HP-14 (LDST BYPASS) to "BLEED".	
COMMENTS:		

NOTE: Anytime IX is placed in service CRD movement may result. (R.M.)	
STEP 10: Step 2.8 Begin monitoring: Neutron Error for expected changes (R.M.) CRD position for expected changes (R.M.)	___ SAT ___ UNSAT
STANDARD: Candidate monitors Neutron Error and CRD motion. No unexpected changes will occur.	
COMMENTS:	
END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
6	Places the required additional Letdown Filter in service
8	Aligns the Spare Deborating IX
9	Initiates flow through the Spare Deborating IX

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 startup in progress following a refueling outage

Unit 1 Power = 3% stable for the past 45 mins.

Unit 1 RCS Boron = 1749 ppm

Primary Chemistry requests that the Spare Deborating IX be placed in service for RCS purification for the next two (2) hrs.

The Spare Deborating IX is loaded with cation resin.

Unit 2 & 3 are at 100%.

INITIATING CUES:

The Unit 1 CR SRO directs you to Place the Spare Deborating IX in service for RCS purification per OP/1A/1103/004 C, Deborating IXs, Encl. 4.9 (Spare Deborating IX For RCS Purification).

Duke Energy Oconee Nuclear Station **Deborating IXs** **Continuous Use**	Procedure No. **OP/1/A/1103/004 C** Revision No. **014** Electronic Reference No. **OP0097V5**

PERFORMANCE

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Deborating IXs

1. Purpose

This procedure provides procedural guidance for primary IX operation and RCS boron and lithium concentration change.

2. Limits and Precautions

2.1 This procedure controls activities that can affect reactivity management by placing Deborating IXs in service and causing RCS boron to change. {2} (R.M.)

2.2 The following Limits and Precautions concern reactivity management: (R.M.)

2.2.1 Positive Reactivity additions should be made by only one method at a time. {2}

2.2.2 When > 50 ppm changes are being made to RCS boron, Pzr sampling should be requested. {12}

2.2.3 If all RCPs are shutdown, RCS makeup sources should be premixed to a boron > 1% Δk/k SDM prior to RCS makeup. {1}

2.2.4 Makeup to RCS with a source < 1% Δk/k SDM boron should only be performed with at least one RCP operating. {1}

2.2.5 IA supply valves should be closed on idle IX(s) to reduce chance of placing wrong IX in service due to human error. {8}

- An idle IX is a IX that will **NOT** be placed in service within the next seven days

2.3 With no additions to LDST in progress, 1HP-15 Controller should be aligned for Normal Operation per OP/1/A/1103/004 (Soluble Poison Control).

2.4 If 1CS-41 is used to stop flow rather than 1CS-26 during Delith or Deboration a 0.4" decrease in LDST level may occur when complete as 1CS-41 is opened. {16}

2.5 When a Deborating IX is placed in service, LDST level may change (generally ≈ 2") due to compression/expansion of a gas bubble in the IX. The magnitude of LDST level change may vary from time to time. {18}

3. Procedure

3.1 Operate Deborating IX(s) per appropriate enclosure.

4. Enclosures

4.1 IX Operation Information

U1 Deborating IX

4.2 U1 Deborating IX For RCS Deboration (Rx At Power)

4.3 U1 Deborating IX For RCS Purification (Rx At Power)

4.4 U1 Deborating IX For RCS De-lith (Rx At Power)

4.5 U1 Deborating IX Rinse To MWHUT

4.6 U1 Deborating IX For RCS Purification/De-lith (Rx Shutdown)

4.7 U1 Deborating IX For RCS Deboration (Rx Shutdown)

Spare Deborating IX

4.8 Spare Deborating IX For RCS Deboration (Rx At Power)

4.9 Spare Deborating IX For RCS Purification (Rx At Power)

4.10 Spare Deborating IX For RCS De-lith (Rx At Power)

4.11 Spare Deborating IX Rinse To MWHUT

4.12 Spare Deborating IX For RCS Purification (Rx Shutdown)

4.13 Spare Deborating IX For RCS Deboration (Rx Shutdown)

IX Fill Procedures

4.14 U1 Deborating IX Fill From 1B BHUT

4.15 Spare Deborating IX Fill From 1B BHUT

IX IA Valves

4.16 Deborating IXs IA Valves

Appendix

1. Initial Conditions

1.1 None

NOTE: This enclosure provides information about effects of Deborating IXs on reactivity management. (R.M.)

2. Procedure (R.M.)

2.1 Deborating IX volumes:

- U1 Deborating & Spare Deborating IX(s): 60 ft^3 of resin
- Estimated IX water volume: 1200 gal

2.2 To obtain representative sample on effluent of Deborating IX, IX requires a minimum of 15 minutes flush time.

2.3 A saturated IX is defined as:

- BORON SATURATED: IX in service for > two hours with no reactivity change observed
- LITHIUM SATURATED: IX in service for de-lith with samples indicating minimal/no change in lithium concentration
- When a change in IX combination or flow rate is made, IX should be considered **NOT** saturated

2.4 Letdown flow affects on IX(s): (no temperature change considered)

- Low Letdown flow allows resin contact time to be increased thus IX efficiency increases.
- Higher Letdown flow causes resin contact time to be decreased thus IX efficiency decreases.
- RCS system turnover time decreases with higher Letdown flow. This exposes resin to more system volume thus offsetting IX efficiency decrease.

2.5 Letdown flow with one IX in service:

- Normal design flow: 70 gpm.
- Maximum design flow: 150 gpm.
- 100-120 gpm seems to be optimum flow for cleanup with one IX.
- High Letdown flow (> 130 gpm) through <u>one</u> IX can cause channeling (fluid flow directed through only a portion of IX resin).

2.6 Inlet fluid temperature effects on IX(s):

- A change in inlet fluid temperature may cause CRD movement
- IX resin characteristics and efficiency are dependent on IX inlet fluid temperature. A change in inlet temperature will cause IX characteristics to change.
- Slow temperature changes will cause resin characteristics to change smaller amounts. Slow changes in IX characteristics produce smaller effects
- Rapid temperature changes (temperature change: < 2 min) affect IX resin's ion capture. Rapid changes are seen as increases in activity samples and reactivity changes
- Rapid temperature increase can cause IX to initially release their ion capture (activity, boron, lithium, etc.)
- After temperature is stable, IX will reach new saturated conditions with new characteristics. Normally IX will return to original saturated conditions.
- Rapid temperature decreases should cause an opposite effect. A rapid IX inlet temperature decrease is **<u>NOT</u>** conservative reactivity management because IX affinity for boron will increase.

2.7 Cation resin bed (Reactivity Management Information):

- Cation resin removes positive charged nuclide.
- Cation resin will also remove the highest activity producing nuclide (Cobalt, etc.).
- Cation resin removes lithium.
- Cation resin will **NOT** remove boron.
- Cation resin bed is commonly loaded in Deborating IX(s).
- Cation resin bed is used for RCS lithium control and RCS Crud Burst.

2.8 Anion resin bed (Reactivity Management Information):

- Anion resin removes negative charged nuclide.
- Anion resin will remove boron.
- Anion resin bed is commonly loaded in Deborating IX(s).
- Anion resin bed is used for RCS deboration.

2.9 RCS PH concerns (lithium control):

- High PH (> 7) is base (caustic).
- Low PH (< 7) is acid (acidic).
- Primary Chemistry PH changes range: 5 to ≈ 7.4.
- Primary Chemistry PH range during power operation: ≈ 7.2 to ≈ 7.4.
- Chemistry monitors & controls PH.
- Chemistry procedures set PH control bands.
- OPS maintains PH within control bands based on Chemistry recommendations with De-lith IX(s).
- Maintaining a slightly caustic PH within RCS will cause solids (activated crud) to plate out within RCS piping thus reducing dose rates.
- Lowering PH within acidic range will cause solids (activated crud) to go into solution within RCS thus increasing dose rates and allowing capture by IX (crud burst).

2.10 Inlet fluid PH (lithium control) effects on IX(s):

- Change in PH will cause IX characteristics to change.
- Slow changes in PH are seldom noticed in resin characteristic changes.
- Rapid PH changes (PH change; short timeframe) may cause resin to over compensate. This over compensation shows up in activity samples and reactivity changes.
- Rapid PH decrease can cause IX to release some of its ion capture (activity, boron, lithium, etc.). Later IX(s) reach new saturated conditions with new characteristics.
- Rapid PH increases should cause an opposite effect. These conditions are **NOT** a concern since large PH increases are hard to achieve.
- Rapid PH changes can be contributed to misuse of De-lith IX(s) and rapid increases in RCS boron.

1. Initial Conditions

_____ 1.1 Verify CRD Group 6 > 95% withdrawn.

_____ 1.2 Chemist has requested purification with Spare Deborating IX.

_____ 1.3 Verify U1 Deborating IX **NOT** in service.

_____ 1.4 Verify Spare Deborating IX **NOT** in service on U2.

_____ 1.5 Ensure Letdown flow 68 - 80 gpm.

1.6 **IF** "T/O SHEET" CR tag is on 1CS-32 & 37 switch indicating IA is isolated:

_____ 1.6.1 Ensure petcocks used to bleed off pressure are closed.

1.6.2 Position the following:

- _____ Open IA-2889 (IA Isolation to 1CS-32) (AB-2-Rm 214)
- _____ Open IA-2890 (IA Isolation to 1CS-37) (AB-2-Rm 214)

_____ 1.6.3 Remove "T/O SHEET" CR Tag from 1CS-32 & 37 switch

_____ 1.7 Ensure R3 reactivity management controls established in the Control Room per SOMP 01-02 (Reactivity Management). {10} (R.M.)

_____ 1.8 Review Limits and Precautions.

NOTE:
- This procedure affects reactivity management by placing IX and Letdown Filter in service causing possible RCS boron change. (R.M.)
- Spare Deborating IX can affect RCS boron because it contains ≈ 1200 gal of borated water as listed in "IX Status Log". (R.M.)

2. Procedure

NOTE: Cation resin will **NOT** remove boron from RCS. (R.M.)

2.1 **IF** Spare Deborating IX is loaded with Cation resin (De-lith IX): {7}

_____ 2.1.1 Check Spare Deborating IX boron status: (R.M.)

☐ **IF** RCS > 100 ppm **AND** IX boron as listed in "IX Status Log" is ± 50 ppm of current RCS boron

☐ **IF** RCS ≤ 100 ppm **AND** IX boron as listed in "IX Status Log" is ± 5 ppm of current RCS boron

☐ **IF** RCS ≤ 100 ppm **AND** IX boron as listed in "IX Status Log" is more than ± 5 ppm of current RCS boron but is within ± 25 ppm of current RCS boron:

1. Determine RCS boron change resulting from placing IX in service (assume 1200 gal addition at boron listed in "IX Status Log").
2. Determine RCS makeup sources and volumes required to compensate for RCS boron changes per OP/1/A/1103/004 (Soluble Poison Control).

NOTE: If IX boron is within acceptable limits, IX may be placed in service with minimal reactivity affects. (R.M.)

_____ 2.1.2 **IF** Spare Deborating IX boron status is within either guideline of Step 2.1.1, continue with procedure to place IX in service. (R.M.)

_____ 2.1.3 **IF** Spare Deborating IX boron status is **NOT** within guidelines of Step 2.1.1, perform Enclosure 4.11 "Spare Deborating IX Rinse To MWHUT" until acceptable boron status per Step 2.1.1 is achieved. (R.M.)

NOTE:	Anion resin will remove boron. (R.M.)

2.2 **IF** Spare Deborating IX is loaded with anion resin (Deborating IX): {7}

_____ 2.2.1 Check Spare Deborating IX boron status: (R.M.)

☐ **IF** RCS ≥ 300 ppm **AND** IX boron as listed in "IX Status Log" is ± 20 ppm of current RCS boron

☐ **IF** RCS 100-299 ppm **AND** IX boron as listed in "IX Status Log" is ± 10 ppm of current RCS boron

☐ **IF** RCS < 100 ppm **AND** IX boron as listed in "IX Status Log" is ± 5 ppm of current RCS boron

NOTE:	If IX boron is within acceptable limits, IX may be placed in service with minimal reactivity affects. (R.M.)

_____ 2.2.2 **IF** Spare Deborating IX boron status is within either guideline of Step 2.2.1, continue with procedure to place IX in service. (R.M.)

_____ 2.2.3 **IF** Spare Deborating IX boron status is **NOT** within guidelines of Step 2.2.1, perform Enclosure 4.11"Spare Deborating IX Rinse To MWHUT" until acceptable boron status per Step 2.2.1 is achieved. (R.M.)

_____ 2.3 Spare Deborating IX has acceptable boron status to be placed in service. (R.M.)
SRO

NOTE: Placing an idle Letdown Filter in service can affect core reactivity by adding ≈ 60 gals of water at a different boron concentration. {5} {6} (R.M.)

2.4 **IF** two Letdown Filters are available **AND NOT** already in service: {6} (R.M.)

_____ 2.4.1 Review Component Boron Log for out-of-service Letdown Filter boron.

_____ 2.4.2 Determine RCS boron based on placing second Letdown Filter in service.

_____ 2.4.3 RCS boron _____ ppm

_____ 2.4.4 **IF** RCS makeup is required to achieve acceptable boron, determine RCS makeup sources and volumes per OP/1/A/1103/004 (Soluble Poison Control).

_____ 2.4.5 Verify acceptable RCS boron **OR** ensure appropriate RCS makeup plans determined to ensure acceptable boron.
SRO

_____ 2.4.6 Position the following:

☐ Ensure 1HP-17 (1A LETDOWN FILTER INLET) switch "OPEN"

☐ Ensure 1HP-18 (1B LETDOWN FILTER INLET) switch "OPEN"

_____ 2.5 **IF** RCS makeup is required to ensure acceptable boron, makeup per OP/1/A/1103/004 (Soluble Poison Control).

2.6 Align Spare Deborating IX for service:

_____ 2.6.1 Verify closed 1CS-27 (DEBOR IX INLET).

_____ 2.6.2 Ensure closed 1CS-26 (LETDOWN TO RC BHUT). {17}

_____ 2.6.3 Open 1CS-32 & 37 (SPARE DEBOR IX INLET & OUTLET).

_____ 2.6.4 Verify 1HP-15 Controller in "MANUAL".

_____ 2.6.5 Open 1HP-16 (LDST MAKEUP ISOLATION).

_____ 2.7 Position 1HP-14 (LDST BYPASS) to "BLEED" to place Spare Deborating IX in service.

NOTE: Anytime IX is placed in service CRD movement may result. (R.M.)

_____ 2.8 Begin monitoring:

☐ Neutron Error for expected changes (R.M.)

☐ CRD position for expected changes (R.M.)

NOTE:
- Chemistry procedures require a minimum of 15 minutes flush for Deborating IXs. (R.M.)
- Steps 2.9, 2.10, 2.11 and 2.12 may be performed in any sequence.

_____ 2.9 **IF** Spare Deborating IX will be in service for > 20 minutes notify Chemist to begin flush for sample of Spare Deborating IX effluent. (R.M.)

2.10 **IF** unexpected changes are noted: (R.M.)

☐ Continue enclosure to remove Spare Deborating IX from service

☐ Notify CR SRO for evaluation

2.11 **IF** RCS makeup is required, perform Section 3 "RCS Makeup With Spare Deborating IX in service".

NOTE:
- Opening 1CS-26 will remove Spare Deborating IX from service.
- Step 2.12 may be performed as many times as required to reduce inventory.

2.12 **IF** required, reduce RCS inventory (Bleed):

☐ 2.12.1 Open 1CS-26 (LETDOWN TO RC BHUT).

☐ 2.12.2 **WHEN** complete, close 1CS-26 (LETDOWN TO RC BHUT).

_____ 2.13 **IF** Spare Deborating IX has been is in service > 20 minutes, prior to completing purification ensure Chemist has sampled Spare Deborating IX effluent. (R.M.)

2.14 **WHEN** purification is complete:

_____ 2.14.1 Position 1HP-14 (LDST BYPASS) to "NORMAL".

_____ 2.14.2 Close 1HP-16 (LDST MAKEUP ISOLATION).

_____ 2.14.3 Reset 1HP-15 Controller for Normal Operation.

_____ 2.14.4 Close 1CS-32 & 37 (SPARE DEBOR IX INLET & OUTLET).

_____ 2.14.5 Open 1CS-26 (LETDOWN TO RC BHUT).

_____ 2.15 Record IX use in Auto Log.

NOTE: 1B Letdown Filter is the preferred filter to leave in service for ALARA.

_____ 2.16 **IF** desired, remove one Letdown Filter from service:

☐ 2.16.1 Verify > 10 minutes since normal Letdown alignment. {5} (R.M.)

2.16.2 Position one of the following:

☐ 1HP-17 (1A LETDOWN FILTER INLET) switch to "CLOSE"

Or

☐ 1HP-18 (1B LETDOWN FILTER INLET) switch to "CLOSE"

☐ 2.16.3 Record RCS boron for out-of-service Letdown Filter in Component Boron Log. {6} (R.M.)

NOTE: IA supply valves should be closed on idle IX(s) to reduce chance of placing wrong IX in service due to human error. {8} (R.M.)

2.17 **IF** Spare Deborating IX will **NOT** be used within the next seven days:

2.17.1 Position the following: (AB-2-Rm 214)

_____ • Close IA-2889 (IA Isolation to 1CS-32)

_____ • Close IA-2890 (IA Isolation to 1CS-37)

_____ 2.17.2 Bleed off pressure from operator using petcocks (AB-2-Rm 214)

_____ 2.17.3 Place a "T/O SHEET" CR tag on 1CS-32 & 37 switch

_____ 2.18 Record in "IX Status Log" for Spare Deborating IX either of the following: (R.M.)

☐ **IF** Spare Deborating IX sample was **NOT** taken, record current RCS boron

☐ **IF** Spare Deborating IX sample was taken, record IX effluent

NOTE:	Section 3 may be repeated as many times as necessary for RCS volume control

3. RCS Makeup With Spare Deborating IX In Service

☐ 3.1 Position 1HP-14 (LDST BYPASS) to "NORMAL".

☐ 3.2 Close 1HP-16 (LDST MAKEUP ISOLATION).

☐ 3.3 Open 1CS-26 (LETDOWN TO BHUTS).

☐ 3.4 Make-up as required per OP/1/A/1103/004 (Soluble Poison Control).

☐ 3.5 **IF** required after makeup, perform RCS leakage.

☐ 3.6 Close 1CS-26 (LETDOWN TO BHUTS).

☐ 3.7 Verify 1HP-15 Controller in "MANUAL".

☐ 3.8 Ensure open 1HP-16 (LDST MAKEUP ISOLATION).

☐ 3.9 Position 1HP-14 (LDST BYPASS) to "BLEED".

1. Initial Conditions

_____ 1.1 Verify CRD Group 6 > 95% withdrawn.

_____ 1.2 Chemist has requested De-lith with Spare Deborating IX.

_____ 1.3 Verify U1 Deborating IX **NOT** in service.

_____ 1.4 Verify Spare Deborating IX **NOT** in service on U2.

_____ 1.5 Ensure Letdown flow 68 - 80 gpm.

1.6 **IF** "T/O SHEET" CR tag is on 1CS-32 & 37 switch indicating IA is isolated:

_____ 1.6.1 Ensure petcocks used to bleed off pressure are closed.

1.6.2 Position the following:

- _____ Open IA-2889 (IA Isolation to 1CS-32) (AB-2-Rm 214)
- _____ Open IA-2890 (IA Isolation to 1CS-37) (AB-2-Rm 214)

_____ 1.6.3 Remove "T/O SHEET" CR Tag from 1CS-32 & 37 switch

_____ 1.7 Ensure R3 reactivity management controls established in the Control Room per SOMP 01-02 (Reactivity Management). {10} (R.M.)

_____ 1.8 Review Limits and Precautions.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-206
LOSS OF NORMAL HPI MAKEUP

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Loss of Normal HPI Makeup

Alternate Path:

No

Facility JPM #:

CRO-206

K/A Rating(s):

System: 004
K/A: A2.07
Rating: 3.4/3.7

Task Standard:
Perform AP/1/A/1700/014, Loss of Normal HPI Makeup and/or RCP Seal Injection.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:
AP/1/A/1700/014, Loss of Normal HPI Makeup and/or RCP Seal Injection.

Validation Time: 10 minutes **Time Critical:** NO

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. **Recall** Snap **210** (100% IC).
2. **Import** files for CRO-206.
3. **Go** to Run.
4. **Ensure** LDST is in the low end (≈80") to prevent over filling during JPM.

Tools/Equipment/Procedures Needed:

AP/014, Loss of Normal HPI Makeup and/or RCP Seal Injection

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

All 3 units are at 100%.
No LCOs in effect.
No equipment is OOS at this time.

INITIATING CUES:

You are to respond to plant conditions.

START TIME: _____

STEP 1: Step N/A • Identify 1HP-120 failed closed and notify CR SRO. STANDARD: The candidate verifies 1HP-120 has failed closed and notifies CR SRO. **Simulator Operator: When candidate assumes the watch, fire timer T01 to cause 1HP-120 to fail closed.** ***Cue: Once the candidate identifies the failure and notifies the CR SRO:*** ***If he requests to enter AP/14, THEN agree with his request.*** ***If he makes no recommendation, THEN ask the candidate what procedure he would recommend to be entered.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Step 3.1 **IAAT** RCP seal injection flow is lost, **AND** Component Cooling is lost, **THEN** perform the following: • Trip the RX • Stop all RCPs • Initiate AP/25 (SSF EOP) STANDARD: The candidate verifies Component Cooling has not been lost. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 3.2 **IAAT** loss of suction to operating HPI pumps is indicated: • Motor amps low or cycling • Discharge pressure low or cycling • Abnormal LDST level trend **THEN GO TO** Step 3.3. STANDARD: The candidate verifies loss of suction to operating HPI pumps has not occurred. COMMENTS:	___ SAT ___ UNSAT

STEP 4: Step 3.2 **RNO** **GO TO** Step 4.7 STANDARD: The candidate continues to step 4.7. COMMENTS:	___ SAT ___ UNSAT
STEP 5: Step 4.7 Announce AP entry using PA System. STANDARD: The candidate announces AP entry using PA System. COMMENTS:	___ SAT ___ UNSAT
STEP 6: Step 4.8 Verify any HPI pump operating. STANDARD: The candidate verifies 'A' HPI pump operating. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Step 4.9 Verify RCP seal injection or HPI makeup line leak indicated by any of the following: • Report of line leak • Abnormal LDST level decrease • 1RIA-32 (AUX BLDG GAS) • 1RIA-45 (NORM VENT GAS) • RB RIAs in alarm • Abnormal RBNS level increase • Abnormal LAWT or HAWT level increase STANDARD: The candidate verifies that no leakage exists. COMMENTS:	___ SAT ___ UNSAT

STEP 8: Step 4.9 **RNO** **GO TO** Step 4.11 STANDARD: The candidate continues to step 4.11. COMMENTS:	___ SAT ___ UNSAT
STEP 9: Step 4.11 Verify RCP seal injection flow exists to any RCP. STANDARD: The candidate verifies RCP seal injection flow exists to all RCPs. COMMENTS:	___ SAT ___ UNSAT
STEP 10: Step 4.12 Verify 1HP-120 has failed. STANDARD: The candidate verifies 1HP-120 has failed closed. COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 4.13 **GO TO** Step 176. STANDARD: The candidate continues to step 176. COMMENTS:	___ SAT ___ UNSAT

STEP 12: Step 4.176 Perform the following as necessary to maintain Pzr level > 200": • Close 1HP-6 • Throttle 1HP-7 • Throttle 1HP-26 STANDARD: The candidate throttles 1HP-26 to restore Pzr level to normal band. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 13: Step 4.177 Place 1HP-120 to Hand and close. STANDARD: The candidate places 1HP-120 to Hand and close. COMMENTS:	___ SAT ___ UNSAT
STEP 14: Step 4.178 Notify SPOC to investigate and repair 1HP-120. STANDARD: The candidate notifies SPOC to investigate and repair 1HP-120. COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 4.179 **WHEN** 1HP-120 is repaired, **THEN** slowly re-establish flow through 1HP120. STANDARD: The candidate will hold at this step until 1HP-120 is repaired. COMMENTS: END TASK	___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Requires the correct AP be entered
12	Required to restore and maintain Pzr level.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

All 3 units are at 100%.
No LCOs in effect.
No equipment is OOS at this time.

INITIATING CUES:

You are to respond to plant conditions.

Duke Energy Oconee Nuclear Station **LOSS OF NORMAL HPI MAKEUP AND/OR RCP SEAL INJECTION**	Procedure No. **AP/1/A/1700/014** Revision No. **016** Electronic Reference No. **OX002RGR**

PERFORMANCE

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1. Entry Conditions

1.1 Loss of or leak from any of the following:

- Normal HPI makeup
- RCP seal injection to any RCP

1.2 Directed entry from any of the following:

- AP/1/A/1700/016 (Abnormal Reactor Coolant Pump Operation)
- Alarm Response Guide

2. Automatic Systems Actions {3}

2.1 Standby HPI pump starts on low RCP seal injection flow (22 gpm).

2.2 All RCP seal return valves close upon loss of both RCP seal injection (< 22 gpm) and CC (< 575 gpm) with RCS pressure > 400 psig.

3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 __ **IAAT** RCP seal injection flow is lost, **AND** Component Cooling is lost, **THEN** perform the following: A. __ Trip the Rx. B. __ Stop all RCPs. C. __ Initiate AP/25 (SSF EOP).	
3.2 __ **IAAT** loss of suction to operating HPI pumps is indicated: • Motor amps low or cycling • Discharge pressure low or cycling • Abnormal LDST level trend **THEN GO TO** Step 3.3.	__ **GO TO** Step 4.7.
3.3 __ Stop all HPI pumps.	

IF AT ANY TIME:

(3.1) RCP seal injection and CC are lost … (trip Rx, stop all RCPs, and initiate AP/25)

(3.2) loss of suction to operating HPI pumps is indicated … (stop all HPI pumps)

4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 __ Close 1HP-5.	
4.2 __ Announce AP entry using PA System.	
4.3 __ Place 1HP-120 in HAND and close.	
4.4 __ Place 1HP-31 in HAND and close.	
4.5 Verify RCP seal injection or HPI makeup line leak indicated by <u>any</u> of the following: __ Report of line leak __ Abnormal LDST level decrease __ 1RIA-32 (AUX BLDG GAS) __ 1RIA-45 (NORM VENT GAS) __ RB RIAs in alarm __ Abnormal RBNS level increase __ Abnormal LAWT or HAWT level increase	__ **GO TO** Step 4.14.
4.6 __ **GO TO** Step 4.130.	

IF AT ANY TIME:

(3.1) RCP seal injection and CC are lost … (trip Rx, stop all RCPs, and initiate AP/25)

(3.2) loss of suction to operating HPI pumps is indicated … (stop all HPI pumps)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.7 __ Announce AP entry using PA System.	
4.8 __ Verify <u>any</u> HPI pump operating.	1. __ Close 1HP-5. 2. __ Place 1HP-120 in HAND and close. 3. __ Place 1HP-31 in HAND and close. 4. __ Attempt to start the standby HPI pump. 5. __ **IF** standby HPI pump started, **THEN GO TO** Step 4.111. 6. __ **GO TO** Step 4.14.
4.9 Verify RCP seal injection or HPI makeup line leak indicated by <u>any</u> of the following: __ Report of line leak __ Abnormal LDST level decrease __ 1RIA-32 (AUX BLDG GAS) __ 1RIA-45 (NORM VENT GAS) __ RB RIAs in alarm __ Abnormal RBNS level increase __ Abnormal LAWT or HAWT level increase	__ **GO TO** Step 4.11.
4.10 __ **GO TO** Step 4.129.	
4.11 __ Verify RCP seal injection flow exists to <u>any</u> RCP.	1. __ Start the standby HPI pump. 2. __ Place 1HP-31 in HAND and close. 3. __ **GO TO** Step 4.14.
4.12 __ Verify 1HP-120 has failed.	__ **WHEN** conditions permit, **THEN EXIT** this procedure.
4.13 __ **GO TO** Step 4.176.	

IF AT ANY TIME:

(3.1) RCP seal injection and CC are lost … (trip Rx, stop all RCPs, and initiate AP/25)

(3.2) loss of suction to operating HPI pumps is indicated … (stop all HPI pumps)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.14 __ Ensure proper operation of CC System.	
4.15 Dispatch an operator to close the following (AB-3-306, Unit 1 CRD Filter Rm): __ 1HP-64 (1A1 RCP SEAL INJECTION THROTTLE) __ 1HP-65 (1A2 RCP SEAL INJECTION THROTTLE) __ 1HP-66 (1B1 RCP SEAL INJECTION THROTTLE) __ 1HP-67 (1B2 RCP SEAL INJECTION THROTTLE)	
4.16 __ Verify <u>all</u> RCP seal return temperatures ≤ 200°F. (Turn-on code "RCP")	__ **GO TO** Step 4.19.
4.17 Open the following: __ 1HP-20 __ 1HP-21	
4.18 Open the following for operating RCPs with seal return temperatures ≤ 200°F: __ 1HP-228 __ 1HP-226 __ 1HP-232 __ 1HP-230	

IF AT ANY TIME:

(3.1) RCP seal injection and CC are lost … (trip Rx, stop all RCPs, and initiate AP/25)

(3.2) loss of suction to operating HPI pumps is indicated … (stop all HPI pumps)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.176 Perform the following as necessary to maintain Pzr level > 200″: __ Close 1HP-6. __ Throttle 1HP-7. __ Throttle 1HP-26.	__ **IF** makeup is necessary, **AND** 1HP-26 fails to open, **THEN** dispatch an operator to throttle 1HP-122 (RC VOLUME CONTROL BYPASS) (Unit 1 Pen Rm, SW of 1HP-120).
4.177 __ Place 1HP-120 in HAND and close.	
4.178 __ Notify SPOC to investigate and repair 1HP-120.	
4.179 __ **WHEN** 1HP-120 is repaired, **THEN** slowly re-establish flow through 1HP-120.	
4.180 __ Place 1HP-120 in AUTO.	
4.181 __ Close 1HP-26.	
4.182 __ Verify 1HP-122 (RC VOLUME CONTROL BYPASS) throttled.	__ **GO TO** Step 4.184.
4.183 __ Dispatch an operator to close 1HP-122 (RC VOLUME CONTROL BYPASS) (Unit 1 Pen Rm, SW of 1HP-120).	

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-501
ESTABLISHING CONTAINMENT CLOSURE

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Establishing containment Closure

Alternate Path:

Yes

Facility JPM #:

CRO-006

K/A Rating(s):
System: 103
K/A: A2.03
Rating: 3.5*/3.8*

Task Standard:
Components and systems aligned per Enclosure 5.1 of AP/1/A/1700/26, Loss of Decay Heat Removal.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:
AP/1/A/1700/26, Enclosure 5.1 Establishing RB Containment Closure.

Validation Time: 15 minutes

Time Critical: NO

==========

Candidate: _____ Time Start: _____

NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. **Recall** Snap 214.
2. **Import** files- none.
3. **Go** to Run.
4. **Trip** 1A LPIP.
5. **Go** back to **FREEZE**.

Tools/Equipment/Procedures Needed:
AP/1/A/1700/26, Enclosure 5.1 Establishing RB Containment Closure.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit 1 was on normal decay heat removal mode. Decay heat removal on Unit 1 was lost due to LPI pump cavitation.

Plant conditions:
- LPI pumps have been tripped.
- There is a N2 bubble in the Pressurizer.
- The RCS loops are full and intact.
- The Steam Generators are available for heat transfer.
- RCPs are secured.
- HPI is secured.
- RCS temperature is 120°F and RCS pressure is 32 psig.

INITIATING CUES:

The Control Room SRO directs you to establish Reactor Building Closure per AP/1/A/1700/26, Enclosure 5.1 (Establishing RB Containment Closure), starting at step 7.0.

START TIME: _____

STEP 1: Step 7 Close the following: • 1RC-7 (already closed) • 1BS-1 (already closed) • 1BS-2 (already closed) • 1GWD-13 • 1FDW-103 (already closed) • 1FDW-104 (already closed) • 1FDW-106 • 1FDW-108 (already closed) • 1PR-81 (already closed) • 1PR-84 (already closed) • 1PR-87 (already closed) • 1PR-90 (already closed) • 1LWD-2 • 1CS-6 • 1RC-164 (already closed) STANDARD: Candidate locates and closes the above valves. • *1RC-7 • *1BS-1 • *1BS-2 • 1GWD-13 • *1FDW-103 • *1FDW-104 • 1FDW-106 • *1FDW-108 • *1PR-81 • *1PR-84 • *1PR-87 • *1PR-90 • 1LWD-2 • 1CS-6 • *1RC-164 *Already closed COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 2: Step 8 Verify any RCP operating. STANDARD: Candidate verifies no RCPs are running and continues to RNO. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 8 **RNO** Close 1HP-21. STANDARD: Candidate closes 1HP-21. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Step 9 Verify RCS makeup supplied by HPI injection headers. STANDARD: Candidate verified RCS makeup is not supplied by HPI injection headers and continues to RNO. COMMENTS:	___ SAT ___ UNSAT

STEP 5: Step 9 **RNO** 1. Close the following: • 1HP-5 (already closed) • 1HP-26 (already closed) • 1HP-410 (already closed) • 1HP-409 (already closed) • 1HP-27 (already closed) • 1HP-120 (already closed) 2. Dispatch an operator to close the following (East Pen Rm, pen #9): • 1HP-122 (RC VOLUME CONTROL BYPASS) STANDARD: Candidate verifies the above valves are already closed and dispatches an operator to 1HP-122. ***Cue: When asked inform candidate that operator has been dispatched and using time compression 1HP-122 is closed*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Step 10 Verify LPI in sump recirculation mode. STANDARD: Candidate verifies LPI is NOT in the sump recirculation mode and continues to the RNO. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Step 10 **RNO** Close 1LP-20. **GO TO** Step 12. STANDARD: Candidate locates and verifies closed 1LP-20 Continues to Step 12. COMMENTS:	___ SAT ___ UNSAT

STEP 8:	Step 12 Verify alternate LPI suction aligned.	
STANDARD:	Candidate verifies alternate LPI suction is NOT aligned and continues to RNO.	___ SAT
COMMENTS:		___ UNSAT
STEP 9:	Step 12 RNO Close 1LP-19	
STANDARD:	Candidate locates and verifies closed 1LP-19	___ SAT
COMMENTS:		___ UNSAT
STEP 10:	Step 13 Verify RB radiation monitors in service.	
STANDARD:	Candidate verifies RB radiation monitors in service at the radiation monitor panel. RB radiation monitors are 1RIA-47, 48, 49, 49A. Radiation monitors should indicate green or blue.	___ SAT
COMMENTS:		___ UNSAT
STEP 11:	Step 14 Verify CC system operating.	
STANDARD:	Candidate verifies CC system operating by observing 1A CC pump running, CC Total Flow ~750 gpm located on 1AB3.	___ SAT
COMMENTS:		___ UNSAT

STEP 12: Step 15 Verify 1A RBCU operating with LPSW aligned. STANDARD: Candidate verifies 1A RBCU operating with LPSW aligned by observing red ON lights illuminated for RBCU 1A and 1LPSW-16 OPEN and 1LPSW-18 Throttled located on 1AB3 COMMENTS:	___ SAT ___ UNSAT
STEP 13: Step 16 Verify 1B RBCU operating with LPSW aligned. STANDARD: Candidate verifies 1B RBCU is NOT operating by red ON light is not illuminated and 1LPSW-19 Open and 1LPSW-21 Throttled on 1AB3. Continues to RNO. COMMENTS:	___ SAT ___ UNSAT
STEP 14: Step 16 **RNO** 1. Close the following: • 1LPSW-19 • 1LPSW-21 2. Dispatch an operator to close the following valves: • 1LPSW-242 (1B RBCU OUTLET SAMPLE BLOCK PENE (35)) • 1LPSW-259 (1B RBCU OUTLET PENE (35)) STANDARD: Candidate locates and closes 1LPSW-19 and 1LPSW-21 located on 1AB3 and dispatches an operator to close1LPSW-242 and 1LPSW-259 ***Cue: When asked, inform candidate that NEO has been dispatched and using time compression 1LPSW-242 and 1LPSW-259 are closed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 15:	Step 17 Verify 1C RBCU operating with LPSW aligned.	
STANDARD:	Candidate verifies 1C RBCU operating with LPSW aligned by observing red ON lights illuminated for 1C RBCU and 1LPSW-22 OPEN and 1LPSW-24 Throttled located on 1AB3	___ SAT ___ UNSAT
COMMENTS:		
STEP 16:	Step 18 Verify RB AUX Coolers in service.	
STANDARD:	Candidate locates RB AUX Coolers on 1AB3 and verifies in service by observing red ON lights illuminated.	___ SAT ___ UNSAT
COMMENTS:		
STEP 17:	Step 19 Verify any RCP operating.	
STANDARD:	Candidate verifies no RCPs are operating by verifying no red ON lights illuminated located on 1AB1and continues to RNO.	___ SAT ___ UNSAT
COMMENTS:		
STEP 18:	Step 19 **RNO** Close the following: • 1LPSW-6 • 1LPSW-15	**CRITICAL STEP** ___ SAT
STANDARD:	Candidate locates and closes 1LPSW-6 and 1LPSW-15 on RZ Modules (1VB2).	___ UNSAT
COMMENTS:		
	END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	This step must be performed to establish containment closure.
3	This step must be performed to establish containment closure.
5	This step must be performed to establish containment closure.
14	This step must be performed to establish containment closure.
18	This step must be performed to establish containment closure.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 was on normal decay heat removal mode. Decay heat removal on Unit 1 was lost due to LPI pump cavitation.

Plant conditions:

- LPI pumps have been tripped.
- There is a N2 bubble in the Pressurizer.
- The RCS loops are full and intact.
- The Steam Generators are available for heat transfer.
- RCPs are secured.
- HPI is secured.
- RCS temperature is 120°F and RCS pressure is 32 psig.

INITIATING CUES:

The Control Room SRO directs you to establish Reactor Building Closure per AP/1/A/1700/26, Enclosure 5.1 (Establishing RB Containment Closure), starting at step 7.0.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Notify the following: ✓ OSM to reference the following: • OMP 1-14 (Notifications) • Emergency Plan ✓ STA ✓ RP	

NOTE

When the LPI system has been restored to the normal DHR mode with RCS pressure and temperature within the desired range, containment closure activities may be discontinued.

2. Notify WCC SRO to perform the following: ✓ Notify SPOC to remove obstructions and close RB emergency hatch outer door per AM/0/A/1400/032 (Hatch - Emergency - Installation and Removal of Temporary Door Closure For Outage Services). ✓ Notify I&E to close all RB instrument penetrations by performing AM/0/A/0150/004 (Containment Operability Verification Procedure). ✓ Notify Containment Closure Coordinator of a Loss of DHR and to implement Contingency Actions in OP/1/A/1502/009 (Containment Closure Control).	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3. X **IAAT** <u>any</u> containment penetration **CANNOT** be isolated as required, **THEN** perform the following as needed: __ Contact SPOC for equipment failure. __ Contact Containment Closure Coordinator to ensure penetration isolated per OP/1/A/1502/009 (Containment Closure Control).	
4. ✓ Stop RB purge.	
5. Close the following: ✓ 1PR-2 ✓ 1PR-5	1.__ **IF** 1PR-2 **NOT** closed, **THEN** close 1PR-1. 2.__ **IF** 1PR-5 **NOT** closed, **THEN** close 1PR-6.

NOTE

Use a minimum of two operators per Enclosure.

6. Dispatch operators to perform the following enclosures: ✓ Encl 5.2 (East Penetration Room Valve Checklist) ✓ Encl 5.3 (West Penetration Room Valve Checklist) ✓ Encl 5.4 (Miscellaneous Valve Checklist)	

IF AT ANY TIME:

(3) <u>any</u> containment penetration **CANNOT** be isolated… (contact SPOC, contact Containment Closure Coordinator)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. Close the following: __ 1RC-7 __ 1BS-1 __ 1BS-2 __ 1GWD-13 __ 1FDW-103 __ 1FDW-104 __ 1FDW-106 __ 1FDW-108 __ 1PR-81 __ 1PR-84 __ 1PR-87 __ 1PR-90 __ 1LWD-2 __ 1CS-6 __ 1RC-164	
8. __ Verify <u>any</u> RCP operating.	__ Close 1HP-21.

IF AT ANY TIME:

(3) <u>any</u> containment penetration **CANNOT** be isolated… (contact SPOC, contact Containment Closure Coordinator)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. __ Verify RCS makeup supplied by HPI injection headers.	1. Close the following: __ 1HP-5 __ 1HP-26 __ 1HP-410 __ 1HP-409 __ 1HP-27 __ 1HP-120 2. Dispatch an operator to close the following (East Pen Rm, pen #9): __ 1HP-122 (RC VOLUME CONTROL BYPASS)
10. __ Verify LPI in sump recirculation mode.	1. __ Close 1LP-20. 2. __ **GO TO** Step 12.
11. __ **GO TO** Step 13.	
12. __ Verify alternate LPI suction aligned.	__ Close 1LP-19.
13. __ Verify RB radiation monitors in service.	1. __ Stop sample pump. 2. Close the following: __ 1PR-8 __ 1PR-10
14. __ Verify CC system operating.	__ Close 1CC-8.

IF AT ANY TIME:

(3) <u>any</u> containment penetration **CANNOT** be isolated… (contact SPOC, contact Containment Closure Coordinator)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. __Verify 1A RBCU operating with LPSW aligned.	1. Close the following: __ 1LPSW-16 __ 1LPSW-18 2. Dispatch an operator to close the following (East Pen Rm): __ 1LPSW-241 (1A RBCU OUTLET SAMPLE BLOCK PENE (34)) __ 1LPSW-258 (1A RBCU OUTLET PENE (34) DRN)
16. __Verify 1B RBCU operating with LPSW aligned.	1. Close the following: __ 1LPSW-19 __ 1LPSW-21 2. Dispatch an operator to close the following (East Pen Rm): __ 1LPSW-242 (1B RBCU OUTLET SAMPLE BLOCK PENE (35)) __ 1LPSW-259 (1B RBCU OUTLET PENE (35) DRN)
17. __Verify 1C RBCU operating with LPSW aligned.	1. Close the following: __ 1LPSW-22 __ 1LPSW-24 2. Dispatch an operator to close the following (East Pen Rm): __ 1LPSW-243 (1C RBCU OUTLET SAMPLE BLOCK PENE (33)) __ 1LPSW-257 (1C RBCU OUTLET PENE (33) DRN)
18. __Verify RB Aux Coolers in service.	Close the following: __ 1LPSW-1055 __ 1LPSW-1061
19. __Verify <u>any</u> RCP operating.	Close the following: __ 1LPSW-6 __ 1LPSW-15

IF AT ANY TIME:

(3) <u>any</u> containment penetration **CANNOT** be isolated… (contact SPOC, contact Containment Closure Coordinator)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION To prevent loss of RCS inventory, do **NOT** isolate IA to RB if nozzle dams are installed.	
20. __ Verify IA pressure supplied to RB.	__ Dispatch an operator to close 1IA-90 (INSTRUMENT AIR PENE (41) ISOLATION) (East Pen Rm, Pen #41).
CAUTION Closing 1SF-60 will isolate pump suction if aligned in Refueling Cooling Mode, Filling/Draining the FTC, or flushing for hot spots per OP/1/A/1102/015 (Filling and Draining FTC).	
21. Verify any of the following in progress: __ 1B SF Cooling Pump is being used in Refueling Cooling Mode __ Filling the FTC __ Draining the FTC __ Flushing for hot spots per OP/1/A/1102/015 (Filling and Draining FTC)	__ Dispatch an operator to close 1SF-60 (CANAL FILL PENE (56) BLOCK) (A-4, West Pen Rm, W-70A, 12' N, 1' off floor).
22. __ **WHEN** all personnel requiring use of Breathing Air have evacuated RB, **THEN** dispatch an operator to close 1BA-171 (BA TO RB PENE (48) ISOLATION) (East Pen Rm, Pen #48).	
23. __ **WHEN** containment closure has been established, **THEN** perform the following: __ Review system alignment changes / valve repositioning per completed Encl 5.1, 5.2, 5.3, and 5.4 with CR SRO and Containment Closure Coordinator. __ Notify RP that BA has been isolated to RB.	
24. __ **WHEN** conditions permit, **THEN EXIT** this enclosure.	

• • • END • • •

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REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

NLO-017
ALIGN COOLING WATER TO HPIPs FROM STATION ASWPs

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Align cooling water to HPIPs from station ASWPs.

Alternate Path:

No

Facility JPM #:

NLO-017

K/A Rating(s):

System: SF4-076
K/A: A2.01
Rating: 3.5*/3.7*

Task Standard:
Perform EOP Encl. 5.10 "Station ASW Pump Alignment" for valve and breaker alignment required to provide cooling water to HPIP's from ASWP performed.

Preferred Evaluation Location:

Simulator ____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:
EOP Encl. 5.10 Station ASW Pump Alignment. AP/1,2,3/A/1700/11.

Validation Time: 16 minutes **Time Critical:** NO

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Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:
600 volt breaker rackout tool
"Station ASW Pump Alignment" Enclosure of EP/1,2,3/A/1800/001
"Rack In 600 Volt Breaker" Enclosure of OP/0/A/1107/011

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

A Station Blackout has occurred. The SSF Diesel Generator will not start, rendering the SSF RCMU Pumps inoperable. Standby Bus #1 has subsequently been energized from CT-5. I&E personnel have aligned the 'A' HPIP to the ASWP Switchgear.

INITIATING CUES:

The Control Room SRO directs you to align cooling water to the High Pressure Injection Pumps on Unit_1_ (specify unit) per "Station ASW Pump Alignment" Enclosure of EP/1,2,3/A/1800/001.

START TIME: _____

NOTE All equipment operated in the following steps is located in A-1-128, ASW Pump Rm. STEP 1: Step 1 Obtain racking equipment and pipe wrench from EOP equipment locker U2AB1 (A-1, hallway near U2 elevator lobby). STANDARD: Student locates the equipment locker containing the required racking and protective equipment. • Safety glasses • Face shield • Hard hat • Rubber gloves with leather protectors • Flame-resistant clothing • Pipe wrench • Breaker racking tool **(This step may be simulated and discussed, at the discretion of the instructor.)** ***CUE: Inform the student that for this JPM, it is not necessary to break the security seal on the locker for demonstrating equipment to be utilized.*** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 2 Open CCW-99 (AUX SERVICE WATER PUMP SUCTION). STANDARD: Candidate locates CCW-99 and simulates rotating handwheel counterclockwise to the open position. ***CUE: After the student locates and simulates placing CCW-99 in the open position, inform student CCW-99 position indicator is pointing to the "open" position.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: Step 3 Open CCW-247 (AUX SERVICE WATER PUMP RECIRC). STANDARD: Candidate locates CCW-247 and simulates rotating handwheel in the counterclockwise direction by pulling chain operator. ***CUE: After student locates and simulates placing CCW-247 in the open position, inform student that CCW-247 is open and the valve is at a counterclockwise hard stop position.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Step 4 Open CCW-308 (AUX SERVICE WATER PUMP VENT). STANDARD: Candidate locates CCW-308, removes plug, and simulates rotating the valve counterclockwise to the open position. ***CUE: After student simulates opening CCW-308, inform him/her that a solid stream of water is issuing from the valve.*** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Step 5 **WHEN** all air is vented from Station ASW Pump, **THEN** close CCW-308. STANDARD: Candidate recognizes from previous instructor cue that all air is vented from Station ASW pump and simulated rotating CCW-308 clockwise to the close position. ***CUE: After student simulates closing CCW-308, inform him/her that water flow has stopped and CCW-308 is at a clockwise hard stop position.*** COMMENTS:	___ SAT ___ UNSAT

STEP 6: Step 6 Rack in ASWS-6B (STATION ASW PUMP BKR) (ASW 4160/600V SWGR ASWS-6). STANDARD: Candidate simulates donning protective clothing/equipment and simulates racking is ASW pump breaker (ASWS-6B). ***Cue: After the student simulates racking in the breaker, inform student that the AUX SERVICE WATER PUMP Switch green "Trip" indicating light is ON.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Step 7 Close ASW SWGR FDR (ASW SWGR FDR FROM B1T- UNIT 10) (ASW 4160/600V SWGR ASWS-5). STANDARD: Candidate verifies that "ASW SWGR FDR From B1T- Unit 10" is closed. Note: This breaker is normally closed at all times. ***CUE: After student locates breaker, inform student that the two red CLOSED lights are lit and that the white OPEN light is off.*** COMMENTS:	___ SAT ___ UNSAT
STEP 8: Step 8 **IAAT** AP/6 (Natural Disaster) directs restoring the Station ASW pump to standby, **THEN GO TO** Step 14. STANDARD: Candidate continues to step 9. ***CUE: Inform student that the IAAT Condition is NOT met.*** COMMENTS:	___ SAT ___ UNSAT

STEP 9: Step 9 **WHEN** notified that Standby Bus #1 is energized, **AND** notified to start the Station ASW pump, **THEN** perform the following (ASW 4160/600V SWGR ASWS-5): • Close ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FEEDER). • Close STATION ASW PUMP SW (STATION ASW PUMP CONTROL SWITCH) (ASW 4160V SWGR ASWX-5). STANDARD: Candidate locates and closes ASW Switchgear Transformer Feeder breaker on ASWS-5 and simulates rotating the handle to the closed position. ***CUE: After candidate simulates closing the breaker inform student that the red "closed" light is ON and the green "trip" light is OFF.*** Candidate locates Station ASW Pump Switch on ASWS-5 and simulates rotating the handle to the CLOSED position. ***CUE: After candidate simulates closing the breaker, inform student that the Station ASW Pump Switch red CLOSED light is ON and the green TRIP light is OFF.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 10: Step 10 Close CCW-309 (AUX SERVICE WATER PUMP DISCH DRAIN) (12' West of ASW pump). STANDARD: Candidate locates CCW-309 and simulates closing CCW-309 by rotating the valve in a clockwise position to a hard stop. ***CUE: Inform candidate that CCW-309 is clockwise and at a hard stop position.*** COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 11 Open CCW-101 (AUX SERVICE WATER PUMP DISCHARGE). STANDARD: Candidate locates CCW-101 and simulates opening the valve by rotating the handwheel in the counterclockwise direction by pulling on the chain operator. ***CUE: Inform student that CCW-101 is counterclockwise and at a hard stop position.*** COMMENTS: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
2	Necessary to align flowpath
3	Necessary to align flowpath
6	Necessary to provide power to the pump.
7	Necessary to provide power to the pump.
9	Necessary to provide power to the pump.
11	Necessary to provide flowpath.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A Station Blackout has occurred. The SSF Diesel Generator will not start, rendering the SSF RCMU Pumps inoperable. Standby Bus #1 has subsequently been energized from CT-5. I&E personnel have aligned the 'A' HPIP to the ASWP Switchgear.

INITIATING CUES:

The Control Room SRO directs you to align cooling water to the High Pressure Injection Pumps on Unit_1_ (specify unit) per "Station ASW Pump Alignment" Enclosure of EP/1,2,3/A/1800/001.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE All equipment operated in the following steps is located in A-1-128, ASW Pump Rm.	
1. __ Obtain racking equipment and pipe wrench from EOP equipment locker U2AB1 (A-1, hallway near U2 elevator lobby).	
2. __ Open CCW-99 (AUX SERVICE WATER PUMP SUCTION).	
3. __ Open CCW-247 (AUX SERVICE WATER PUMP RECIRC).	
4. __ Open CCW-308 (AUX SERVICE WATER PUMP VENT).	
5. __ **WHEN** all air is vented from Station ASW Pump, **THEN** close CCW-308.	
6. __ Rack in ASWS-6B (STATION ASW PUMP BKR) (ASW 4160/600V SWGR ASWS-6).	
7. __ Close ASW SWGR FDR (ASW SWGR FDR FROM B1T- UNIT 10) (ASW 4160/600V SWGR ASWS-5).	
8. __ **IAAT** AP/6 (Natural Disaster) directs restoring the Station ASW Pump to standby, **THEN GO TO** Step 14.	

IF AT ANY TIME:

(8) AP/6 (Natural Disaster) directs restoring the Station ASW Pump to standby ... (**GO TO** steps to re-align to standby)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. __ **WHEN** notified that Standby Bus #1 is energized, **AND** notified to start the Station ASW pump, **THEN** perform the following (ASW 4160/600V SWGR ASWS-5): A. __ Close ASW TRANSFORMER FDR (ASW SWITCHGEAR TRANSFORMER FEEDER). B. __ Close STATION ASW PUMP SW (STATION ASW PUMP CONTROL SWITCH) (ASW 4160/600V SWGR ASWS-5).	
10. __ Close CCW-309 (AUX SERVICE WATER PUMP DISCH DRAIN) (12' West of ASW Pump).	
11. __ Open CCW-101 (AUX SERVICE WATER PUMP DISCHARGE).	
12. __ Verify Turbine Building flood is in progress.	1. __ Notify CRO that Station ASW Pump is operating. 2. __ **GO TO** Step 14.
13. __ Notify <u>all</u> Control Rooms that Station ASW Pump is operating.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14. __ **WHEN** Station ASW Pump is no longer needed on Unit 1, **THEN** continue in this enclosure.	
15. Verify <u>either</u> of the following conditions: __ Station ASW Pump is supplying SGs on <u>any</u> other unit. __ Station ASW Pump is needed to supply HPI pump motor coolers on <u>any</u> unit.	__ **GO TO** Step 17.
16. __ **GO TO** Step 21.	
17. __ Open STATION ASW PUMP SW (STATION ASW PUMP CONTROL SWITCH) (ASW 4160/600V SWGR ASWS-5).	
18. Close the following: __ CCW-99 (AUX SERVICE WATER PUMP SUCTION) __ CCW-101 (AUX SERVICE WATER PUMP DISCHARGE) __ CCW-247 (AUX SERVICE WATER PUMP RECIRC)	
19. __ Open CCW-309 (AUX SERVICE WATER PUMP DISCH DRAIN) (12' West of ASW Pump).	
20. __ Rack out ASWS-6B (STATION ASW PUMP BKR) (ASW 4160/600V SWGR ASWS-6).	
21. __ **EXIT** this enclosure.	

••• END •••

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REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

NLO-037
PLACE A CONTROL BATTERY CHARGER IN SERVICE

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Place a control battery charger in service.

Alternate Path:

No

Facility JPM #:

NLO-037

K/A Rating(s):
System: 063
K/A: K1.03
Rating: 2.9/3.5

Task Standard:
Control Battery Charger is placed in service per procedure.

Preferred Evaluation Location:

Simulator ____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:
OP/1107/010, Removal from service and Restoration to service of a Control Charger.

Validation Time: 12 minutes **Time Critical:** NO

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:
"Removal and Restoration Control Charger 1CA" Enclosure 4.3 of OP/1/A/1107/10

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Last week, the _1CA_ Control Battery Charger was removed from service on Unit 1 which is currently operating at 100% power. I&E personnel have informed the Control Room SRO that _1CA_ Control Battery Charger is ready to be placed back in service. The Standby Control Charger is currently in service. "Removal and Restoration Control Charger 1CA" Enclosure 4.3 of OP/1/A/1107/10 has been completed up to Step 2.2.

INITIATING CUES:

The Control Room SRO directs you to place the _1CA_ Control Charger in service and remove the Standby Control Charger from service on Unit _1_ by procedure.
.

START TIME: _____

STEP 1: Step 2.2.1 At MCC 1XS1: Ensure closed 1XS1-F4A (1CA BATT CHGR BKR). STANDARD: The Candidate locates the appropriate breaker for the designated Control Battery Charger and closes the breaker. ***Cue: Indicate to candidate that power supply breaker is already closed in.*** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 2.2.2 At CONTROL CHARGER 1CA: • Close AC INPUT circuit breaker. • Verify off AC POWER FAILURE light. • Verify after 20-30 seconds DC VOLTS meter indicates 131-140 Volts. • Close DC OUTPUT circuit breaker. STANDARD: AC INPUT CIRCUIT BREAKER is placed in the ON position. ***Cue: Breaker is closed*** AC power failure light is verified off. ***Cue: AC POWER FAILURE light is off*** DC volts meter is verified to read 131-140 volts after 20-30 seconds. ***Cue: after 20-30 seconds the voltage is ~135 Volts*** DC output breaker is closed. ***CUE: DC OUTPUT circuit breaker is closed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

		CRITICAL STEP
STEP 3:	Step 2.2.3 At MCC 1DCA: • Close 1DCA-1B (1CA BATT CHGR TO 1DCA BKR). • Open 1DCA-2B (1CS BATT CHGR TO 1CA BATT BKR).	___ SAT ___ UNSAT
STANDARD:	1DCA-1B is closed. ***CUE: After student simulates closing breaker, indicate to student that breaker is closed in.*** 1DCA-2B is opened. ***CUE: After student simulates opening breaker, indicate to student that breaker is opened.***	
COMMENTS:		
STEP 4:	Step 2.2.4 At CONTROL CHARGER 1CA: • Verify CONTROL CHARGER 1CA supplying load as indicated on DC AMPERES meter. • Ensure ALARM ENABLE/DEFEAT switch in "ENABLE".	___ SAT ___ UNSAT
STANDARD:	The DC AMPERES meter is observed and verified to indicate load on the battery charger. ***CUE: Indicate to student that the DC AMPERES meter indicates approximately 190 amps.*** The ALARM ENABLE/DEFEAT switch is located on the Control Charger cabinet and placed in the ENABLE position. ***CUE: Indicate to student that the ENABLE/DEFEAT switch is in the Enable position.***	
COMMENTS:		

STEP 5:	Step 2.2.5 At CONTROL CHARGER 1CS: A. Place ALARM ENABLE/DEFEAT switch to "DEFEAT". B. Open DC OUTPUT circuit breaker. C. Open AC INPUT circuit breaker.	___ SAT ___ UNSAT
STANDARD:	The ALARM ENABLE/DEFEAT switch is located on the Control Charger cabinet and placed in the DEFEAT position. ***CUE: After candidate simulates placing the ALARM ENABLE/DEFEAT switch in DEFEAT, indicate to the candidate that it is defeat .*** DC OUTPUT circuit breaker is placed in the OFF position. ***CUE: After candidate simulates opening breaker, indicate to the candidate that DC Output CIRCUIT BREAKER is open.*** AC INPUT circuit breaker is placed in the OFF position. ***CUE: After candidate simulates opening breaker, indicate to the candidate that AC Input CIRCUIT BREAKER is open.***	
COMMENTS:		
	END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
2	Necessary to place 1CA Battery Charger in service.
3	Necessary to place 1CA Battery Charger in service.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Last week, the _1CA_ Control Battery Charger was removed from service on Unit 1 which is currently operating at 100% power. I&E personnel have informed the Control Room SRO that _1CA_ Control Battery Charger is ready to be placed back in service. The Standby Control Charger is currently in service. "Removal and Restoration Control Charger 1CA" Enclosure 4.3 of OP/1/A/1107/10 has been completed up to Step 2.2.

INITIATING CUES:

The Control Room SRO directs you to place the _1CA_ Control Charger in service and remove the Standby Control Charger from service on Unit _1_ by procedure.

Duke Energy Oconee Nuclear Station **Operation Of Batteries And Battery Chargers** **Multiple Use**	Procedure No. **OP/1/A/1107/010** Revision No. **040** Electronic Reference No. **OX002VMX**
PERFORMANCE	

* * * * * * * * * * UNCONTROLLED FOR PRINT * * * * * * * * * *

(ISSUED) - PDF Format

Operation Of Batteries And Battery Chargers

1. Purpose

To describe steps necessary for starting up, shutting down and operating battery chargers.

2. Limits And Precautions

2.1 For 1CA, 1CB, SY-1, SY-2 Batteries and Chargers:

- If in MODE 1, 2, 3, or 4, refer to TS 3.8.3.
- If in MODE 5, 6, or NO MODE, refer to TS 3.8.4.

2.2 For 1PA and 1PB Batteries and Chargers:

- If in MODE 1, 2, or 3, refer to SLC 16.8.3.

2.3 Do **NOT** connect a charger directly to a DC bus without a battery in service (directly or via bus tie breakers) to that bus. Chargers connected directly to DC buses, without dampening effect of an in-service battery, could create voltage spikes causing damage to components supplied by DC bus.

2.4 Do **NOT** transfer SY-S POWER SELECT SWITCH with SY-S STBY BATT CHARGER in service.

2.5 Past operating experience has shown that Battery Breaker and Battery Charger Breaker can be confused and incorrect breaker operated. Care should be taken to ensure correct breaker for evolution is operated.

2.6 The preferred temperature range for all station batteries is between 70°F and 80°F. {4}

- The need for temporary auxiliary cooling should be considered for extended periods of extreme battery room temperature. {4}
- As a guideline, an extended period of extreme battery room temperature is considered to be temperatures from 91°F - 95°F for 30 days or > 95°F for 5 days. {4}
- Battery room temperatures between 80°F and 90°F do **NOT** require auxiliary cooling.
- If battery room temperatures are expected to increase to > 90°F, auxiliary cooling could be used as a conservative measure. {4}
- Do **NOT** allow battery room temperature to exceed 110°F. {4}

NOTE:
- Minimum average electrolyte temperature is 60°F per TS 3.8.5.3.
- Step 2.7 does **NOT** apply to POWER BATTERY rooms.

2.7 If battery room temperature is < 65°F:

- Notify I&E to measure cell electrolyte temperature per IP/0/A/3000/001 (Instrumentation And Control Battery Weekly Surveillance).
- Initiate actions as required to restore battery room temperature ≥ 70°F.

2.8 If POWER BATTERY room temperature is < 60°F:

- Notify I&E to measure cell electrolyte temperature per IP/0/A/3000/001 (Instrumentation And Control Battery Weekly Surveillance).

3. Procedure

3.1 Perform appropriate enclosure to remove from service and restore to service Batteries and Battery Chargers.

3.2 Perform Enclosure 4.24 "125VDC Ground Detection System Operation" to operate 125 VDC Ground Detection System.

4. Enclosures

4.1 Removal And Restoration 1CA Battery

4.2 Removal And Restoration 1CB Battery

4.3 Removal And Restoration Control Charger 1CA

4.4 Removal And Restoration Control Charger 1CB

4.5 Removal And Restoration Control Charger 1CS (Complete Isolation)

4.6 Removal And Restoration 1PA Battery

4.7 Removal And Restoration 1PB Battery

4.8 Removal And Restoration Power Charger 1PA

4.9 Removal And Restoration Power Charger 1PB

4.10 Removal And Restoration Power Charger 1PS (Complete Isolation)

4.11 Removal And Restoration SY-1 Battery

4.12 Removal And Restoration SY-2 Battery

4.13 Removal And Restoration Charger SY-1

4.14 Removal And Restoration Charger SY-2

4.15 Removal And Restoration Charger SY-S (Complete Isolation)

4.16 Removal And Restoration SY-3 Battery

4.17 Removal And Restoration SY-4 Battery

4.18 Removal And Restoration Charger SY-3

4.19 Removal And Restoration Charger SY-4

4.20 Removal And Restoration Charger SY-S2 (Complete Isolation)

4.21 Placing SY-3 Battery On Equalizing Charge And Returning To Normal SY-3 Battery

4.22 Placing SY-4 Battery On Equalizing Charge And Returning To Normal SY-4 Battery

1. Initial Conditions

_____ 1.1 Verify CONTROL CHARGER 1CS **NOT** supplying 1CB BATTERY.

_____ 1.2 Verify requirements of TS 3.8.3 or TS 3.8.4 met.

_____ 1.3 Review Limits and Precautions.

2. Procedure

NOTE: Red Tags should be attached per appropriate R&R.

2.1 Removal From Service:

2.1.1 At MCC 1XS3:

_____ _____ A. Ensure closed 1XS3-2C (1CS STDBY BATT CHGR BKR).

2.1.2 At CONTROL CHARGER 1CS:

_____ _____ A. Close AC INPUT circuit breaker.

_____ _____ B. Verify off AC POWER FAILURE light.

_____ _____ C. Verify after 20-30 seconds DC VOLTS meter indicates 131-140 Volts.

_____ _____ D. Close DC OUTPUT circuit breaker.

_____ E. Place ALARM ENABLE/DEFEAT switch to "ENABLE".

2.1.3 At MCC 1DCB:

_____ _____ A. **IF** required, lock and remove Kirk Key from 1DCB-2B (1CS BATT CHGR TO 1CB BATT BKR) compartment.

2.1.4 At MCC 1DCA:

_____ _____ A. Unlock Kirk Key interlock inside 1DCA-2B (1CS BATT CHGR TO 1CA BATT BKR) compartment.

_____ _____ B. Close 1DCA-2B (1CS BATT CHGR TO 1CA BATT BKR).

_____ _____ C. Open 1DCA-1B (1CA BATT CHGR TO 1DCA BKR).

2.1.5 At CONTROL CHARGER 1CS:

_____ _____ A. Verify CONTROL CHARGER 1CS supplying load as indicated on DC AMPERES meter.

2.1.6 At CONTROL CHARGER 1CA:

_____ A. Place ALARM ENABLE/DEFEAT switch to "DEFEAT".

_____ _____ B. Open DC OUTPUT circuit breaker.

_____ _____ C. Open AC INPUT circuit breaker.

_____ _____ 2.1.7 **IF** Electrical Maintenance requests complete battery charger isolation, open 1XS1-F4A (1CA BATT CHGR BKR).

NOTE: Red Tags should be removed per appropriate R&R.

2.2 Restoration To Service:

2.2.1 At MCC 1XS1:

_____ _____ A. Ensure closed 1XS1-F4A (1CA BATT CHGR BKR).

2.2.2 At CONTROL CHARGER 1CA:

_____ _____ A. Close AC INPUT circuit breaker.

_____ _____ B. Verify off AC POWER FAILURE light.

_____ _____ C. Verify after 20-30 seconds DC VOLTS meter indicates 131-140 Volts.

_____ _____ D. Close DC OUTPUT circuit breaker.

2.2.3 At MCC 1DCA:

_____ _____ A. Close 1DCA-1B (1CA BATT CHGR TO 1DCA BKR).

_____ _____ B. Open 1DCA-2B (1CS BATT CHGR TO 1CA BATT BKR).

2.2.4 At CONTROL CHARGER 1CA:

_____ _____ A. Verify CONTROL CHARGER 1CA supplying load as indicated on DC AMPERES meter.

_____ B. Ensure ALARM ENABLE/DEFEAT switch in "ENABLE".

2.2.5 At CONTROL CHARGER 1CS:

_____ A. Place ALARM ENABLE/DEFEAT switch to "DEFEAT".

_____ _____ B. Open DC OUTPUT circuit breaker.

_____ _____ C. Open AC INPUT circuit breaker.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

NLO-800
HPSW AB FLOOD ISOLATION

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

HPSW AB Flood Isolation

Alternate Path:

Yes

Facility JPM #:

NLO-800

K/A Rating(s):

System: 001
K/A: BW/A07 AA2.2
Rating: 3.3/3.7

Task Standard:
AP/1-2/A/1700/030 Encl. 5.1 is used isolate HPSW during an AB flood.

Preferred Evaluation Location:

Simulator ____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:
AP/1-2/A/1700/030 Encl. 5.1 Auxiliary Building flood.

Validation Time: 15 minutes **Time Critical:** NO

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Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time: _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:

AP/1-2/A/1700/030 Encl. 5.1 Auxiliary Building flood.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

All 3 units are at 100% power.

Auxiliary Building flooding is occurring.

HPSW has been determined to be the source of flood water.

INITIATING CUES:

The Control Room Supervisor directs you to perform AP/1-2/A/1700/030 Encl. 5.1, HPSW AB Flood Isolation.

START TIME: _____

NOTE Keys for valve locks are available in <u>any</u> Emergency Equipment cabinet. <u>STEP 1</u>: Step 1 Close HPSW-959 (HPSW SUPPLY TO FLOW LIMITER BLOCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers). <u>STANDARD</u>: The candidate locates and attempts to close HPSW-959. ***Cue: When the candidate locates and attempts to close HPSW-959, inform candidate that HPSW-959 chain will not move.*** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 2</u>: Step 1 **RNO** Close HPSW-962 (HPSW SUPPLY TO AUX BLDG BLOSCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers). <u>STANDARD</u>: The candidate locates and closes HPSW-962. ***Cue: when the candidate indicates that HPSW-962 is closed, inform the candidate that HPSW is fully clockwise and on the hard stop.*** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3:	Step 2 Close the following: • HPSW-3 (A HPSW PUMP DISCHARGE) (T-1/J-26, A HPSW Pump Room) • HPSW-6 (B HPSW PUMP DISCHARGE) (T-1/G-29, B HPSW Pump Room. • HPSW-9 (HPSW JOCKEY PUMP DISCHARGE) (T-1/J-29, 10' SW) • HPSW-11 (A HPSW PUMP TIE TO HIGH PRESSURE HDE B) (T-1/H-26, 6' SW)	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	The candidate locates and closes the following valves: • HPSW-3 (A HPSW PUMP DISCHARGE) • HPSW-6 (B HPSW PUMP DISCHARGE) • HPSW-9 (HPSW JOCKEY PUMP DISCHARGE) • HPSW-11 (A HPSW PUMP TIE TO HIGH PRESSURE HDE B)	
COMMENTS:		
STEP 4:	Step 3 Notify control Room HPSW isolation is complete.	___ SAT
STANDARD:	The candidate notifies the control Room HPSW isolation is complete.	
COMMENTS:		___ UNSAT
	END TASK	

STOP TIME: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
2	Step ensures proper isolation of HPSW leak.
3	Step ensures proper isolation of HPSW leak.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

All 3 units are at 100% power.

Auxiliary Building flooding is occurring.

HPSW has been determined to be the source of flood water.

INITIATING CUES:

The Control Room Supervisor directs you to perform AP/1-2/A/1700/030 Encl. 5.1, HPSW AB Flood Isolation.

Enclosure 5.1

HPSW AB Flood Isolation

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ **IAAT** the source of flooding is isolated, **THEN** notify Control Room.	
NOTE Keys for valve locks are available in any Emergency Equipment cabinet.	
2. __ Close HPSW-959 (HPSW SUPPLY TO FLOW LIMITER BLOCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers).	__ Close HPSW-962 (HPSW SUPPLY TO AUX BLDG BLOCK VALVE) (T-1/M-21 south, west of RCW Heat Exchangers).
3. Close the following: __ HPSW-3 (A HPSW PUMP DISCHARGE) (T-1/J-26, A HPSW Pump Room) {2} __ HPSW-6 (B HPSW PUMP DISCHARGE) (T-1/G-29, B HPSW Pump Room) {2} __ HPSW-9 (HPSW JOCKEY PUMP DISCHARGE) (T-1/J-29, 10' SW) {2} __ HPSW-11 (A HPSW PUMP TIE TO HIGH PRESSURE HDR B) (T-1/H-26, 6' SW)	
4. __ Notify Control Room HPSW isolation is complete.	
5. __ **EXIT** this enclosure.	

• • • END • • •