Draft Submittal
(Pink Paper)

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

OCONEE JUNE 2006-301 EXAM

05000269, 05000270, AND 05000287/2006301

JUNE 19 - 28, 2006 AND JUNE 30, 2006 (WRITTEN)

2/9/06

Initial Submittal

Facility: **Oconee** Date of Examination: **June, 2006**

Examination Level: RO ☒ SRO ☐ Operating Test Number: **1**

Administrative Topic	Type Code*	Describe activity to be performed
Conduct of Operations GEN 2.1.33 (3.4/4.0)	**D, R**	**Admin-116, Reactor Power Imbalance Verification** - Tech Specs/COLR; PT/600/01, (**RO only**) (12 min)
Conduct of Operations		
Equipment Control GEN 2.2.12 (3.0/3.4)	**D, R**	**Admin-204, Perform weekly surveillance test to determine RIA-40 setpoint** PT/230/001 Encl. 13.10 (Operation of RIA-40) (**RO Only**) (20 min)
Radiation Control GEN 2.3.10 (2.9/3.3)	**N, R**	**Admin-303, Determine Radiation Protection Requirements for an Activity** (13 min)
Emergency Plan GEN 2.4.39 (3.3/3.1)	**N, C**	**Admin-406, Perform the Emergency Plan Requirements for a Hazmat Event** RP/1000/017, Spill Response (**RO Only**) (14 min)

Note: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

Initial Submittal

Facility: **Oconee** Date of Examination: **June, 2006**

Examination Level: RO ☐ SRO ☒ Operating Test Number: **1**

Administrative Topic	Type Code*	Describe activity to be performed
Conduct of Operations GEN 2.1.7 (3.7/4.4)	**D, S**	**Admin-115, Calculated Estimated Critical Boron** PT/1/A/1103/015, Reactivity Balance (**SRO Only**) (10 min)
Conduct of Operations GEN 2.1.10 (2.7/3.9)	**N, S**	**Admin-114, Mode Change Verification** PT/A/0600/001B, Encl. 13.23 (**SRO Only**) (20 min)
Equipment Control GEN 2.2.17 (2.3/3.5)	**N, R**	**Admin-205, Evaluate an Emergent Issue Equipment Failure (SRO Only)** (20 min)
Radiation Control GEN 2.3.10 (2.9/3.3)	**N, R**	**Admin-303, Determine Radiation Protection Requirements for an Activity** (13 min)
Emergency Plan GEN 2.4.38 (2.2/4.0)	**D, R**	**Admin-403, Determine Emergency Classification and Protective Action Recommendations (SRO only)** (20 min)

Note: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

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Initial Submittal

Facility: **Oconee** Date of Examination: **June, 2006**

Exam Level: RO [X] SRO-I [ ] SRO-U [ ] Operating Test No.: 1

Control Room Systems@ (8 for RO); (7 for SRO-I); 2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. **CRO-105, RCS Boration From CBAST** OP/1/A/1103/004 A Encl. 4.1 [KA: 004 A4.07 (3.9/3.7)] (15 min)	N, S, L	1
b. **CRO-204, ES Recovery,** EOP Enclosure 5.41, ES Recovery [KA: 006 A4.08 (4.2/4.3)] (25 min)	N, S	2
c. **CRO-028, Align HPI/LPI Piggyback Mode** EOP, Encl. 5.12 (ECCS Suction Swap to RBES) [KA: EPE 009 EK3.21 (4.2/4.5)] (10 min)	M, A, S, E	3
d. **CRO-400, Swapping LPI Modes - LPI Series Mode to LPI Normal Mode** OP/1/A/1104/004, Encl. 4.20 (Swapping LPI Modes LPI Series Mode to LPI Normal Mode) [KA: 005 A4.01 (3.6*/3.4)] (15 min)	N, S	4P
e. **CRO-015, Establish EFDW Flow Through Startup Valves** EOP, Rule 3, Encl. 5.27 (Alternate Methods For Controlling EFDW Flow) [KA: APE-054 AA2.04 (4.2/4.3)] (10 min)	D, A, S	4S
f. **CRO-500, Restore RB Auxiliary Fan Coolers Following a Loss of LPSW** AP/24, Loss of LPSW; OP/1/A/1104/010, LPSW Encl. 4.31 (LPSW Shutdown and Return to Service RB Aux Coolers) [KA: 022 A4.04 (3.1*/3.2)] (15 min)	N, S	5
g. **CRO-010, Following Keowee Emergency Start Transfer From CT-4 To CT-1** OP/0/A/1106/019 Encl. 4.12 [KA: 062 A4.01 (3.3/3.1)] (20 min)	D, S	6
h. **CRO-100A, Place The RB Purge in Operation (PR-3 Fails to Open)** OP/0/A/1102/014, Encl. 4.1 [KA: 029 A2.03 (2.7/3.1)] (20 min)	M, S, A, L	8

DRAFT

In-Plant Systems (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. **NLO-200, Align HPI Pump Suction to BWST During a Blackout** EOP Encl. 5.7, HPI Pump Operations from ASW Pump Switchgear [KA: APE022 G2.4.35 (3.3/3.5)] (15 min)	N, R, E	2
j. **CRO-401, Aligning SSF-ASW for SG Feed** EOP Encl. 5.34, Aligning SSF-ASW for SG Feed [KA: APE 054 AA1.01 (4.5/4.4)] (10 min)	N, A, E	4S
k. **NLO-007, Start Diesel Air Compressor and Align to Service Air Header** AP/32, Encl. "Emergency Start of the Diesel Air Compressor" [KA: APE-065 AA1.04 (3.5*/3.4*)] (20 min))	D, A, E	8

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

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

Initial Submittal

Facility: **Oconee**	Date of Examination: **June, 2006**
Exam Level: RO ☐ SRO-I ☒ SRO-U ☐	Operating Test No.: 1

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b. **CRO-204, ES Recovery,** EOP Enclosure 5.41, ES Recovery [KA: 006 A4.08 (4.2/4.3)] (25 min)	N, S	2
c. **CRO-028, Align HPI/LPI Piggyback Mode** EOP, Encl. 5.12 (ECCS Suction Swap to RBES) [KA: EPE 009 EK3.21 (4.2/4.5)] (10 min)	M, A, S, E	3
d. **N/A**		
e. **CRO-015, Establish EFDW Flow Through Startup Valves** EOP, Rule 3, Encl. 5.27 (Alternate Methods For Controlling EFDW Flow) [KA: APE-054 AA2.04 (4.2/4.3)] (10 min)	D, A, S	4S
f. **CRO-500, Restore RB Auxiliary Fan Coolers Following a Loss of LPSW** AP/24, Loss of LPSW; OP/1/A/1104/010, LPSW Encl. 4.31 (LPSW Shutdown and Return to Service RB Aux Coolers) [KA: 022 A4.04 (3.1*/3.2)] (15 min)	N, S	5
g. **CRO-010, Following Keowee Emergency Start Transfer From CT-4 To CT-1** OP/0/A/1106/019 Encl. 4.12 [KA: 062 A4.01 (3.3/3.1)] (20 min)	D, S	6
h. **CRO-100A, Place The RB Purge in Operation (PR-3 Fails to Open)** OP/0/A/1102/014, Encl. 4.1 [KA: 029 A2.03 (2.7/3.1)] (20 min)	M, S, A, L	8

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i. **NLO-200, Align HPI Pump Suction to BWST During a Blackout** EOP Encl. 5.7, HPI Pump Operations from ASW Pump Switchgear [KA: APE022 G2.4.35 (3.3/3.5)] (15 min)	N, R, E	2
j. **CRO-401, Aligning SSF-ASW for SG Feed** EOP Encl. 5.34, Aligning SSF-ASW for SG Feed [KA: APE 054 AA1.01 (4.5/4.4)] (10 min)	N, A, E	4S
k. **NLO-007, Start Diesel Air Compressor and Align to Service Air Header** AP/32, Encl. "Emergency Start of the Diesel Air Compressor" [KA: APE-065 AA1.04 (3.5*/3.4*)] (20 min))	D, A, E	8

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(S)imulator	

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-115
CALCULATE AN ESTIMATED CRITICAL BORON CONCENTRATION

CANDIDATE ______________________________

EXAMINER ______________________________

START TIME: _______

STEP 1: Candidate obtains a copy of PT/1/A/1103/15, Reactivity Balance Procedure (Unit 1), Enclosure 13.5 (Computerized ECB Calculation). STANDARD: Candidate locates the control copy of PT/1/A/1103/15, Reactivity Balance Procedure (Unit 1). ***Cue: Once the procedure is located give the candidate a copy of the procedure.*** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Step 2.1 This Enclosure must be performed twice - the second is the separate verification. Circle whether this is the original or the verification: STANDARD: Candidate should circle original. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Step 2.2 **IF** returning from a forced shutdown, obtain the power history back to the last time of Xenon Equilibrium to perform the Xenon calculation from a source such as PI server, OAC Log, RO Log, etc. STANDARD: Candidate will obtain the power history form the information on the cue sheet. COMMENTS:	___ SAT ___ UNSAT

CAUTION: **IF** the power history information from the last equilibrium Xe/Sm condition is **NOT** input into the code, significant error may result. STEP 4: Step 2.3 **IF** applicable, attach actual power history (from OAC log, TMS, PI Server, etc.) to this Enclosure. STANDARD: Candidate indicates that he will attach the power history to Enclosure 13.5. ***Cue: This step is not necessary for the purposes of this JPM.*** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Step 2.4 SELECT the RhoCalc icon. STANDARD: Candidate locates the RhoCalc icon on the Control Room PC and opens the program. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Step 2.5 Choose whether to obtain data from the network or disk. Normally, the network is used unless it is down, in which case the control copy disk of the data must be obtained to run the code. STANDARD: Select the program to run from the disk. ***Cue: Inform the candidate that the program will be run from the disk.*** COMMENTS:	___ SAT ___ UNSAT

STEP 7: Step 2.6 INPUT appropriate data for the Estimated Critical Boron Calculation. STANDARD: Candidate inserts the data given to him into the program: • Name • Power history • Desired Rod Position • RCS Temperature • EFPD • Unit COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 8: Step 2.7 CALCULATE the Estimated Critical Boron Concentration. STANDARD: The "Calculate ECB" Button is pressed to run the calculation. ***Cue: Ask the candidate to print a copy of the ECB.*** COMMENTS: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
5	Step 5 is necessary because the ECB will not be calculated if the correct ICON is not selected to start the computer program.
7	Step 7 is necessary due to the fact that if the correct DATA and/or UNIT is not input the ECB will not be correct.
8	Step 8 is necessary for the completion of the calculation. Calculate the ECB must agree within ± 10 ppmb with attached example.

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

INITIAL CONDITIONS:

Unit 1
DATE: 5/18/06
TIME: 1500 Power = 80% CPL
TIME: 1501- Reactor trip occurs

PRESENT CONDITIONS:
DATE: 5/22/06
TIME: 1500 Unit 1 Reactor startup in progress

- Cycle burnup is 150 EFPD
- RCS Temperature is 532°F
- Desired critical rod position - 0% withdrawn on Group 7
- Group 8 is at 35 % withdrawn
- Boron Concentration 1350 PPM

INITIATING CUES:

The Control Room SRO directs you to perform the Estimated Critical Boron Concentration calculation for startup one-hour from present time per PT/1/A/1103/15, Reactivity Balance Procedure.

1. Purpose

1.1 The purpose of this enclosure is to calculate an estimated critical boron concentration to be used during unit start up.

2. Procedure

Calculation Performed by:____________________

_____ 2.1 This Enclosure must be performed twice - the second is the separate verification. Circle whether this is the original or the verification:

Original - Must be performed by a Licensed Operator

Separate Verification - Must be performed by a Qualified Reactor Engineer (N/A steps 2.8-2.9 for Separate Verification)

_____ 2.2 **IF** returning from a forced shutdown, obtain the power history back to the last time of Xenon Equilibrium to perform the Xenon calculation from a source such as PI server, OAC Log, RO Log, etc.

CAUTION:	**IF** the power history information from the last equilibrium Xe/Sm condition is **NOT** input into the code, significant error may result.

_____ 2.3 **IF** applicable, attach actual power history (from OAC log, TMS, PI Server, etc.) to this Enclosure.

_____ 2.4 Select the RhoCalc Icon.

_____ 2.5 Choose whether to obtain data from the network or disk. Normally, the network is used unless it is down, in which case the control copy disk of the data must be obtained to run the code.

_____ 2.6 Input appropriate data for the estimated critical boron calculation.

NOTE:	The target ECP is normally ~Group 7 at 0%. This can be adjusted to plant conditions at the discretion of the SRO. **IF** deviating from this position significantly, model the power increase using PT/0/A/1103/020, Power Maneuvering Predictions to ensure no problems will be encountered.

_____ 2.7 Verify Separate Verifications agree on the ECB within 10 ppmB.

_____ 2.8 Discuss the results of ECB with the unit supervisor. (N/A this step on separate verification calculation).

_______________________________ Unit Supervisor

_____ 2.9 Attach results of ECB to the procedure **AND** turn the package over to the unit supervisor. (N/A this step on separate verification calculation).

Unit 1
ECB

Oconee Nuclear Station
Reactivity Balance Procedure
RhoCalc.EXE, Version 4.0

Estimated Critical Boron Calculation

To be used ONLY with Enclosure 13.5 from PT/1/A/1103/15

Performed by: k at 10:17:55 PM on 5/2/2006

CRITICAL CONDITIONS:	
Core EFPD	150.0
RCS Temperature:	532.0
CRD Group 5 Posn, %wd:	100.0
CRD Group 6 Posn, %wd:	75.0
CRD Group 7 Posn, %wd:	0.0
CRD Group 8 Posn, %wd:	35.0

CALCULATION INFORMATION:	
Core Excess Reactivity:	12.5
Differential Boron Worth:	-0.00816

TIME DEPENDENT ECB TABLE

Date/Time		Power % FP	ECB ppmB	Xenon Worth %Dk/k	Xe + Sm Worth %Dk/k
05/18/06	14:00	80.0		-2.415	-2.415
05/18/06	15:00	80.0		-2.415	-2.416
05/18/06	15:01	0.0	1080	-2.417	-2.419
05/18/06	16:00	0.0	1034	-2.786	-2.792
05/18/06	17:00	0.0	1004	-3.025	-3.036
05/18/06	18:00	0.0	982	-3.203	-3.219
05/18/06	19:00	0.0	966	-3.328	-3.349
05/18/06	20:00	0.0	956	-3.408	-3.433
05/18/06	21:00	0.0	950	-3.450	-3.480
05/18/06	22:00	0.0	948	-3.460	-3.495
05/18/06	23:00	0.0	950	-3.443	-3.482
05/19/06	0:00	0.0	954	-3.404	-3.448
05/19/06	1:00	0.0	961	-3.347	-3.394
05/19/06	2:00	0.0	969	-3.275	-3.327
05/19/06	3:00	0.0	979	-3.191	-3.247
05/19/06	4:00	0.0	990	-3.097	-3.157
05/19/06	5:00	0.0	1001	-2.997	-3.061
05/19/06	6:00	0.0	1014	-2.891	-2.960
05/19/06	7:00	0.0	1027	-2.782	-2.854
05/19/06	8:00	0.0	1040	-2.670	-2.747

Date/Time		Power % FP	ECB ppmB	Xenon Worth %Dk/k	Xe + Sm Worth %Dk/k
05/19/06	9:00	0.0	1053	-2.558	-2.638
05/19/06	10:00	0.0	1066	-2.446	-2.530
05/19/06	11:00	0.0	1080	-2.334	-2.422
05/19/06	12:00	0.0	1093	-2.224	-2.316
05/19/06	13:00	0.0	1105	-2.116	-2.212
05/19/06	14:00	0.0	1118	-2.010	-2.110
05/19/06	15:00	0.0	1146	-1.908	-2.011
05/19/06	16:00	0.0	1158	-1.808	-1.914
05/19/06	17:00	0.0	1169	-1.712	-1.822
05/19/06	18:00	0.0	1180	-1.619	-1.732
05/19/06	19:00	0.0	1191	-1.530	-1.647
05/19/06	20:00	0.0	1201	-1.444	-1.564
05/19/06	21:00	0.0	1211	-1.362	-1.486
05/19/06	22:00	0.0	1220	-1.284	-1.411
05/19/06	23:00	0.0	1229	-1.209	-1.339
05/20/06	0:00	0.0	1237	-1.138	-1.272
05/20/06	1:00	0.0	1245	-1.070	-1.207
05/20/06	2:00	0.0	1252	-1.006	-1.146
05/20/06	3:00	0.0	1259	-0.945	-1.088
05/20/06	4:00	0.0	1266	-0.887	-1.034
05/20/06	5:00	0.0	1272	-0.833	-0.982
05/20/06	6:00	0.0	1278	-0.781	-0.933
05/20/06	7:00	0.0	1284	-0.732	-0.888
05/20/06	8:00	0.0	1289	-0.686	-0.844
05/20/06	9:00	0.0	1294	-0.643	-0.804
05/20/06	10:00	0.0	1299	-0.602	-0.766
05/20/06	11:00	0.0	1303	-0.564	-0.730
05/20/06	12:00	0.0	1307	-0.527	-0.697
05/20/06	13:00	0.0	1311	-0.493	-0.665
05/20/06	14:00	0.0	1315	-0.461	-0.636
05/20/06	15:00	0.0	1318	-0.431	-0.608
05/20/06	16:00	0.0	1321	-0.403	-0.583
05/20/06	17:00	0.0	1324	-0.376	-0.559

Oconee Nuclear Station
Reactivity Balance Procedure

Date/Time		Power % FP	ECB ppmB	Xenon Worth %Dk/k	Xe + Sm Worth %Dk/k
05/20/06	18:00	0.0	1327	-0.351	-0.537
05/20/06	19:00	0.0	1329	-0.328	-0.516
05/20/06	20:00	0.0	1332	-0.306	-0.496
05/20/06	21:00	0.0	1334	-0.286	-0.478
05/20/06	22:00	0.0	1336	-0.267	-0.462
05/20/06	23:00	0.0	1338	-0.249	-0.446
05/21/06	0:00	0.0	1340	-0.232	-0.432
05/21/06	1:00	0.0	1341	-0.216	-0.418
05/21/06	2:00	0.0	1343	-0.202	-0.406
05/21/06	3:00	0.0	1344	-0.188	-0.395
05/21/06	4:00	0.0	1346	-0.175	-0.384
05/21/06	5:00	0.0	1347	-0.163	-0.374
05/21/06	6:00	0.0	1348	-0.152	-0.365
05/21/06	7:00	0.0	1349	-0.142	-0.357
05/21/06	8:00	0.0	1350	-0.132	-0.349
05/21/06	9:00	0.0	1351	-0.123	-0.343
05/21/06	10:00	0.0	1351	-0.114	-0.336
05/21/06	11:00	0.0	1352	-0.106	-0.330
05/21/06	12:00	0.0	1353	-0.099	-0.325
05/21/06	13:00	0.0	1353	-0.092	-0.320
05/21/06	14:00	0.0	1354	-0.086	-0.316
05/21/06	15:00	0.0	1354	-0.080	-0.312
05/21/06	16:00	0.0	1355	-0.074	-0.308
05/21/06	17:00	0.0	1355	-0.069	-0.305
05/21/06	18:00	0.0	1356	-0.064	-0.302
05/21/06	19:00	0.0	1356	-0.060	-0.299
05/21/06	20:00	0.0	1356	-0.056	-0.297
05/21/06	21:00	0.0	1357	-0.052	-0.295
05/21/06	22:00	0.0	1357	-0.048	-0.293
05/21/06	23:00	0.0	1357	-0.045	-0.291
05/22/06	0:00	0.0	1357	-0.042	-0.290
05/22/06	1:00	0.0	1357	-0.039	-0.288
05/22/06	2:00	0.0	1357	-0.036	-0.287
05/22/06	3:00	0.0	1358	-0.033	-0.286

Oconee Nuclear Station
Reactivity Balance Procedure

Date/Time		Power % FP	ECB ppmB	Xenon Worth %Dk/k	Xe + Sm Worth %Dk/k
05/22/06	4:00	0.0	1358	-0.031	-0.286
05/22/06	5:00	0.0	1358	-0.029	-0.285
05/22/06	6:00	0.0	1358	-0.027	-0.285
05/22/06	7:00	0.0	1358	-0.025	-0.284
05/22/06	8:00	0.0	1358	-0.023	-0.284
05/22/06	9:00	0.0	1358	-0.021	-0.284
05/22/06	10:00	0.0	1358	-0.020	-0.284
05/22/06	11:00	0.0	1358	-0.019	-0.284
05/22/06	12:00	0.0	1358	-0.017	-0.284
05/22/06	13:00	0.0	1358	-0.016	-0.285
05/22/06	14:00	0.0	1358	-0.015	-0.285
05/22/06	15:00	0.0	1358	-0.014	-0.285
05/22/06	16:00	0.0	1358	-0.013	-0.286

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

ADMIN-114

MODE CHANGE VERIFICATION

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Mode Change Verification

Alternate Path:

No

Facility JPM #:

NEW

K/A Rating(s):
System: Generic
K/A: 2.1.10
Rating: 2.7/3.9

Task Standard:

Perform Mode change verification and identify any component(s) that does not meet its required conditions.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:
PT/1/A/0600/001 B, Enclosure 13.23

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 ADMIN-114
3. Go to **RUN**

Tools/Equipment/Procedures Needed:

Enclosure 4.17 of OP/1/A/1102/001

PT/1/A/0600/001 B (Instrument Surveillance Prior To Mode Change) Enclosure 13.23, Entering Modes 1 & 2 From Mode 3

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 startup in progress

Unit 1 in MODE 3

Enclosure 4.17 (Unit Startup From 532°F And 2155 PSIG) of OP/1/A/1102/001 (Controlling Procedure For Unit Startup) in progress and complete up to step 2.17

INITIATING CUES:

As the CR SRO, perform step 2.17 of Enclosure 4.17.

START TIME: _______

STEP 1:	**RPS Instrumentation RC Temperature TH (A Loop)** Verify computer readouts agree within 3°F (5°F in RPS Cab).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Determine computer points **DO NOT** agree within 3°F by calling points up on the OAC.	
COMMENTS:		
STEP 2:	**RPS Instrumentation RC Temperature TH (B Loop)** Verify computer readouts agree within 3°F (5°F in RPS Cab).	___ SAT ___ UNSAT
STANDARD:	Determine computer points **DO** agree within 3°F by calling points up on the OAC.	
COMMENTS:		
STEP 3:	**RPS Instrumentation RC Flow** Verify total flow agrees within 4800 klbm/hr **AND** Verify **NO** computer alarms for high flow present.	___ SAT ___ UNSAT
STANDARD:	Determine computer points **DO** agree within 4800 klbm/hr by calling points up on the OAC. Determine **NO** computer alarms for high flow present by observing the OAC alarm screen.	
COMMENTS:		

STEP 4: **APSR Alignment Limits** Verify position of each APSR within 6.5% of group average. STANDARD: Determine the position of each APSR is within 6.5% of group average by observing APSR position on either the OAC or the PI panel. COMMENTS:	___ SAT ___ UNSAT
STEP 5: **Regulating Rod Position Limits** Verify regulating rod groups within sequence and overlap limits in COLR. STANDARD: Determine regulating groups are inserted by observing rod position on the PI panel. COMMENTS:	___ SAT ___ UNSAT
STEP 6: **Regulating Rod Position Limits** Verify regulating rod groups within position limits on curve in COLR. STANDARD: Determine regulating groups are inserted by observing rod position on the PI panel. COMMENTS:	___ SAT ___ UNSAT

STEP 7:	**Control Rod Group Alignment Limits** Verify all Control Rods in each Group agree within ±3.5% of group average.	___ SAT
STANDARD:	Determine Group 1 rods agree within ±3.5% of group by observing rod position on either the OAC or the PI panel.	___ UNSAT
COMMENTS:		
STEP 8:	**Safety Rod Position Limits** Verify each safety rod fully withdrawn.	___ SAT
STANDARD:	Determine step is not required because of the exception noted in Step 2.17 of Enclosure 4.17.	___ UNSAT
COMMENTS:		
STEP 9:	**CBAST** Verify equivalency of 1100 ft3 of 11,000 ppm boron per OP/0/A/1108/001 (Curves And General Information).	**CRITICAL STEP** ___ SAT
STANDARD:	Obtain CBAST level and boron concentration from the OAC or from Boron Board and CBAST level gauge. (**66 inches and 10620 ppmB**) Determine CBAST is in the inoperable range of Enclosure 3.15 (CBAST Concentration Vs. Level Curve)	___ UNSAT
COMMENTS:		

STEP 10:	**RPS Instrumentation RP RCP/Flux Trip** Verify no Dummy Bistable installed. Verify no trips present. Verify status annunciators operable (lamp test).	___ SAT ___ UNSAT
STANDARD:	Verify no Dummy Bistable installed observing Statalarms 1SA-5/1-4 are not illuminated. Verify no trips present by observing Statalarms on 1SA-1. Verify status annunciators operable by performing an annunciators lamp test.	
COMMENTS:		
STEP 11:	**Position Indicator Channels PI Panel** Verify all Relative Rod Position indications agree within 5% of Absolute Rod Position indications.	___ SAT ___ UNSAT
STANDARD:	Determine all Relative Rod Position indications agree within 5% of Absolute Rod Position indications by observing rod position indication after selecting relative indication with the toggle switch on the PI panel.	
COMMENTS:		
STEP 12:	**RCS Loops** Verify required RCPs (3 or 4) in operation with RCS flow indicated.	___ SAT ___ UNSAT
STANDARD:	Determine 4 RCPs are in operation by observing red on lights lit and normal pump amps. Determine RCS flow is indicated on RC Flow gauge on 1UB1.	
COMMENTS:		

STEP 13: Determine the disposition of Step 2.17. STANDARD: Candidate should determine that Step 2.17 cannot be signed off because of the following: • SR 3.3.1.1 for RPS Instrumentation RC Temperature TH (A Loop) is not met. • SR 16.5.13.1 for the CBAST is not met. ***Cue: Ask candidate about the disposition of Step 2.17 if not addressed.*** COMMENTS: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	This step is required to determine the condition is not met.
9	This step is required to determine the condition is not met.
13	This step is required to determine Step 2.17 cannot be signed off.

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

INITIAL CONDITIONS:

Unit startup in progress

Unit 1 in MODE 3

Enclosure 4.17 (Unit Startup From 532°F And 2155 PSIG) of OP/1/A/1102/001 (Controlling Procedure For Unit Startup) in progress and complete up to step 2.17

INITIATING CUES:

As the CR SRO, perform step 2.17 of Enclosure 4.17.

Enclosure 13.23

Entering Mode 1 & 2 From Mode 3

	COMPONENT	INITIALS	COMPUTER	REQUIRED CONDITIONS
SR 3.3.1.1	RPS Instrumentation RC Temperature T_H (A Loop)		O1A1692 O1A1693	Verify computer readouts agree within 3°F (5°F in RPS Cab). **<u>IF</u>** any of CR RCS temperature selectors are changed, notify Rx Engineering to evaluate and update Enclosure "Loop ΔT Vs. Reactor Power" of PT/1/A/0600/001 (Periodic Instrument Surveillance) for new selected inputs.
SR 3.3.1.1	RPS Instrumentation RC Temperature T_H (B Loop)		O1A1694 O1A1695	Verify computer readouts agree within 3°F (5°F in RPS Cab). **<u>IF</u>** any of CR RCS temperature selectors are changed, notify Rx Engineering to evaluate and update Enclosure "Loop ΔT Vs. Reactor Power" of PT/1/A/0600/001 (Periodic Instrument Surveillance) for new selected inputs.
SR 3.3.1.1	RPS Instrumentation RC Flow		O1A1549 O1A0877 O1A1420 O1A1712	Verify total flow agrees within 4800 klbm/hr **<u>AND</u>** Verify **<u>NO</u>** computer alarms for high flow present.
SR 3.1.6.1	APSR Alignment Limits		GD REG	Verify position of each APSR within 6.5% of group average.
SR 3.2.1.1	Regulating Rod Position Limits		GD REG	Verify regulating rod groups within sequence and overlap limits in COLR.
SR 3.2.1.2	Regulating Rod Position Limits		GD REG	Verify regulating rod groups within position limits on curve in COLR.

Enclosure 13.23

Entering Mode 1 & 2 From Mode 3

1. Initial Conditions

_____ 1.1 Unit is in Mode 3.

_____ 1.2 Review Limits And Precautions.

NOTE:	SRs are only valid for ≤ 12 hours once enclosure is started. When > 12 hours from start time, a new enclosure is required.

_____ 1.3 Date and Time Enclosure started __________/__________.

2. Procedure

2.1 Perform instrument checks as specified.

Enclosure 13.23

Entering Mode 1 & 2 From Mode 3

	COMPONENT	INITIALS	COMPUTER	REQUIRED CONDITIONS
SR 3.1.4.1	Control Rod Group Alignment Limits		GD REG GD SAFETY	Verify all Control Rods in each Group agree within ± 3.5% of group average. **<u>IF</u>** a Control Rod is > ± 3.5% of its Group average, refer to OP/1/A/1105/019 (Control Rod Drive System).
SR 3.1.5.1	Safety Rod Position Limits		GD SAFETY PI Panel	Verify each safety rod fully withdrawn.
SR 16.5.13.1	CBAST		O1A0797	Verify equivalency of 1100 ft^3 of 11,000 ppm boron per OP/0/A/1108/001 (Curves And General Information).
SR 3.3.1.1	RPS Instrumentation RP RCP/Flux Trip			Verify no Dummy Bistable installed. Verify no trips present. Verify status annunciators operable (lamp test).
SR 3.1.7.1	Position Indicator Channels PI Panel			Verify all Relative Rod Position indications agree within 5% of Absolute Rod Position indications. **<u>IF NOT</u>**, notify Duty Rx Engineer for evaluation of core parameters and recommended actions.
SR 3.4.4.1	RCS Loops			Verify required RCPs (3 or 4) in operation with RCS flow indicated.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

ADMIN-205

EVALUATE AN EMERGENT ISSUE
EQUIPMENT FAILURE

CANDIDATE ____

EXAMINER ____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Evaluate an emergent issue equipment failure

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):

System: Generic
K/A: 2.2.17
Rating: 2.3/3.5

Task Standard:

Performs a tech spec evaluation for the equipment failures and state the actions and times required as listed in the body of the JPM.

Preferred Evaluation Location:

Simulator ______ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:

Validation Time: 20 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:

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 is in MODE 1 at 100% power

TIME 1 - 0430 on 04/02/06

1A Reactor Building Spray Pump is declared inoperable due to loss of ALL oil

TIME 2 - 1800 on 04/08/06

1B Reactor Building Spray Pump is declared inoperable due to high vibration

TIME 3 - 1845 on 04/08/06

1A Reactor Building Spray Pump is restored to operable status

INITIATING CUES:

As the WCC SRO perform the following evaluation and make determinations for the following issue:

State which Technical Specification action(s) apply and when the action(s) must be completed for **each** time listed above.

START TIME: _______

STEP 1:	Step 1 State which Technical Specification action(s) apply and when the action(s) must be completed for Time 1.	**CRITICAL STEP** ___ SAT
STANDARD:	Candidate determines that at time one; TS 3.6.5 Condition A applies. With a required Completion time of 7 days. TS 3.6.5 Condition A completion time of 0430 on 4/9/2006.	___ UNSAT
COMMENTS:		
STEP 2:	Step 2 State which Technical Specification action(s) apply and when the action(s) must be completed for Time 2.	**CRITICAL STEP** ___ SAT
STANDARD:	Candidate determines that at time two; TS 3.6.5 Condition H applies, requiring entry into TS 3.0.3 immediately. TS 3.0.3 Mode 3 in 12 hours - Completion Time of 0600 on 4/8/2006	___ UNSAT
COMMENTS:		

STEP 3:	Step 3 State which Technical Specification action(s) apply and when the action(s) must be completed for Time 3.	**CRITICAL STEP** ___ SAT
STANDARD:	Candidate determines that at time three: Condition TS 3.6.5 Condition H no longer applies. **Action must be taken by 4/10/2006 @ 0430 to meet TS Condition 3.6.5 (A)** *Per TS 1.3:* *The total Completion Time allowed for completing Required Action to address subsequent inoperability shall be limited to the more restrictive of either:* *The Stated Completion Time, as measured from the initial entry into the Condition, plus an additional 24 hours; or* *The Stated Completion Time as measured form the discovery of the subsequent inoperability.* 7 days from original entry plus 24 hours - 4/10/06 @ 0430 (more restrictive) **OR** 7 days form subsequent entry - 4/15/06 @ 1800	___ UNSAT
COMMENTS:		

END TASK

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	This step is required to determine which Technical Specification action(s) apply and when the action(s) must be completed.
2	This step is required to determine which Technical Specification action(s) apply and when the action(s) must be completed.
3	This step is required to determine which Technical Specification action(s) apply and when the action(s) must be completed.

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

INITIAL CONDITIONS:

Unit is in MODE 1 at 100% power

TIME 1 - 0430 on 04/02/06

1A Reactor Building Spray Pump is declared inoperable due to loss of ALL oil

TIME 2 - 1800 on 04/08/06

1B Reactor Building Spray Pump is declared inoperable due to high vibration

TIME 3 - 1845 on 04/08/06

1A Reactor Building Spray Pump is restored to operable status

INITIATING CUES:

As the WCC SRO perform the following evaluation and make determinations for the following issue:

State which Technical Specification action(s) apply and when the action(s) must be completed for **each** time listed above.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Admin-403

Determine Emergency Classification and Protective Action Recommendations

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Determine Emergency Classification and Protective Action Recommendations

Alternate Path:

NO

Facility JPM #:

Admin-403

K/A Rating(s):

System: Generic
K/A: 2.4.38
Rating: 2.2/4.0

Task Standard:

Appropriate classification is determined and associated Protective Action Recommendations are made.

Preferred Evaluation Location:

Simulator ______ In-Plant _______

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

RP/0/B/1000/01
RP/0/B/1000/02
BASIS Document (Volume "A", Section "D" of the Emergency Plan)

Validation Time: 20 min.

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:

RP/0/B/1000/01
RP/0/B/1000/02
BASIS Document (Volume "A", Section "D" of the Emergency Plan)

READ TO OPERATOR

DIRECTIONS TO STUDENT:

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:

0800: Civil demonstration occurring at the World of Energy by anti-nuke activists.

0900: Security reports to the OSM that, one or more persons has been observed cutting their way through the double security fences. RP/0/B/1000/007 (Security Event) is being used in conjunction with the Emergency Plan.

0905: Intruders have been seen entering the SSF. Security has isolated the area around the SSF.

0910: Security reports that an explosion has occurred on the Keowee Dam and that water is gushing through the dam in several places.

0930: Security reports that no additional bombs were found and that no additional intruders have been located.

NOTE: All three Oconee Units remain in MODE 1 at 100% power during this event.

INITIATING CUE:

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/B/1000/01, Emergency Classification and determining the emergency classification and any Protective Action Recommendations.

START TIME: _______

STEP 1:	Classify the Event	**CRITICAL STEP**
STANDARD:	Refer to RP/0/B/1000/01 (Emergency Classification) Enclosure 4.6 (Fires/Explosions and Security Actions. Classify the event as a "**Site Area Emergency**" due to following: Bomb detonated in Keowee Dam	___ SAT ___ UNSAT
COMMENTS:		
STEP 2:	Determine Protective Action Recommendations	
STANDARD:	Refer to RP/0/B/1000/002 (Control Room Emergency Coordinator Procedure) and GO TO Enclosure 4.2 (Site Emergency)	___ SAT ___ UNSAT
COMMENTS:		
STEP 3:	**IF** It has been determined that an Emergency Action Level for an Initiating Conditions has been met, **THEN** Declare a Site Area Emergency Time of Declaration: _____	
STANDARD:	Determine Initiating Conditions have been met and Declare a Site Area Emergency due to: • Bomb detonated in Keowee Dam **OR** • Imminent /actual failure of the Keowee Hydro dam Determine Time of Declaration is present time.	___ SAT ___ UNSAT
COMMENTS:		

STEP 4: Appoint a person to maintain the Emergency Coordinator Log OR maintain the log yourself. STANDARD: A person is appointed to maintain the Emergency Coordinator Log or indicate that you will maintain the log. ***Cue: If asked, indicate someone is maintaining the Emergency Coordinator Log.*** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Appoint Control Room Offsite Communicator(s). STANDARD: A Control Room Offsite Communicator is appointed. ***Cue: If asked, indicate a Control Room Offsite Communicator has been appointed.*** COMMENTS:	___ SAT ___ UNSAT
STEP 6: **IF** Condition A, Imminent or Actual; Dam Failure (Keowee or Jocassee) exists, **THEN REFER TO** Enclosure 4.7 (Condition A / Condition B Response actions) Step 1.0 and provide protective Action Recommendations to the offsite communicator. STANDARD: Enclosure 4.7, (Condition A / Condition B Response Action) is used to determine that the following protective action recommendations are given to Oconee and Pickens County: 1. Provide the following recommendation for Emergency Notification Form Section 5 (B) Evacuate: • Move residents living downstream of the Keowee Hydro Project dams to higher ground. 2. Provide the following recommendation for Emergency Notification Form Section 5 (E) Other: • Prohibit traffic flow across bridges identified on your inundation maps until the danger has passed. ***Cue: If asked, inform the candidate that Keowee Dam failure is imminent.*** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: ________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	The candidate needs to be able to utilize the procedure and determine that a Site Area Emergency needs to be declared.
6	The candidate must be able to make recommendations to the local agencies as to what actions are necessary to protect the health and safety of the public.

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

I INITIAL CONDITIONS:

0800: Civil demonstration occurring at the World of Energy by anti-nuke activists.

0900: Security reports to the OSM that, one or more persons has been observed cutting their way through the double security fences. RP/0/B/1000/007 (Security Event) is being used in conjunction with the Emergency Plan.

0905: Intruders have been seen entering the SSF. Security has isolated the area around the SSF.

0910: Security reports that an explosion has occurred on the Keowee Dam and that water is gushing through the dam in several places.

0930: Security reports that no additional bombs were found and that no additional intruders have been located.

NOTE: All three Oconee Units remain in MODE 1 at 100% power during this event.

INITIATING CUE:

You are to perform the required actions of the Emergency Coordinator by referring to RP/0/B/1000/01, Emergency Classification and determining the emergency classification and any Protective Action Recommendations.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

ADMIN-116

REACTOR POWER IMBALANCE VERIFICATION
(Technical Specifications/COLR)

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Reactor Power Imbalance Verification

Alternate Path:

NO

Facility JPM #:

Admin-116

K/A Rating(s):

System: Generic
K/A: 2.1.33
Rating: 3.4/4.0

Task Standard:

Student calculates imbalance and determines it is NOT within the COLR limits for 3 RCP operation.

Preferred Evaluation Location:

Simulator ______ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

PT/1/A/0600/001, Periodic Instrument Surveillance

Core Operating Limits Report

Validation Time: 12 min.

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:

PT/1/A/0600/001, Periodic Instrument Surveillance
Core Operating Limits Report

READ TO OPERATOR

DIRECTIONS TO STUDENT:

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:

1. Unit 1 has been operating at 100% power for 2 weeks.
2. 1B1 RCP has high vibration
3. A rapid power reduction is made and the 1B1 RCP is secured
4. Reactor power is now at 68% and stable
5. The Reactor Calculation Package is NOT running.
6. Backup Incore Chart "B" OOS
7. All other equipment operable
8. PT/1/A/0600/001, Periodic Instrument Surveillance, Enclosures 13.1 has been completed up to page 8.

INITIATING CUE:

1. The SRO directs you to perform the Axial Power Imbalance Operating Limits verification.
2. Only Imbalance Surveillance is required for this JPM.
3. Do NOT perform Quadrant Power Tilt check.

START TIME: _______

STEP 1:	Verify power imbalance within operational alarm limits in COLR when > 40% RTP. IF Reactor calculation package is **NOT** running on computer, refer to Section 12.3.	___ SAT ___ UNSAT
STANDARD:	Determine Reactor calculation package is NOT running per Initial Conditions and refer to Section 12.3.	
COMMENTS:		
STEP 2:	Review step 12.3.1, which states: Axial Imbalance shall **NOT** exceed appropriate limit curve in COLR. IF axial imbalance limit is exceeded, enter TS 3.2.2 Condition A. IF an acceptable imbalance is **NOT** achieved within 2 hours, enter TS 3.2.2. Condition B.	___ SAT ___ UNSAT
STANDARD:	Candidate obtains the correct limit in COLR. This limit can be located the curve on page 14 of 33 or in a table on page 11 of 33. (Oconee 1 Cycle 23) (**± 26.53**)	
COMMENTS:		

STEP 3 Review step 12.3.2, which states: Quadrant Power Tilt (QPT) shall NOT exceed appropriate positive (+) limit in COLR. STANDARD: Determine step does not apply due to initiating cue. ***Cue: If candidate attempts to perform step, indicate that Quadrant Power Tilt NOT required for this JPM.*** COMMENTS:	___ SAT ___ UNSAT
STEP 4 Review step 12.3.3: Order of preference of measurement systems to determine axial imbalance is as follows: A. Incore Detectors (Computer Reactor Calculation Package). B. Outcore Detectors (Power Range Outcore Detectors). C. Backup Incore Detectors. Refer to PT/0/A/1103/019 (Backup Incore Detector System). STANDARD: Candidate refers to step 12.3.6. ***Cue: If candidate indicates he will use the Backup Incore Detectors to determine imbalance, give him Backup Incore Chart Data sheet.*** **Note: If candidate indicates he will use the Backup Incore Detectors to determine imbalance refer to step 5 below.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5: Refer to PT/0/A/1103/019 (Backup Incore Detector System). STANDARD: Candidate refers to PT/0/A/1103/019 (Backup Incore Detector System) and determines that the Minimum Incore Detectors are not available and that out of cores should be used. **Note: This step will not be completed if candidate uses out of cores to begin with.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Review Step 12.3.6 **IF** Outcore Detectors (Power Range Outcore Detectors) are needed for imbalance calculations, refer to the alternate method for determining (%) Reactor Power Axial Imbalance: $\frac{NI\text{-}5^* + NI6^* + NI7^* + NI8^*}{4}$ = % Imbalance (Avg.) * Use Imbalance CR gauges reading for each NI STANDARD: Determine that the use of Outcore Detectors (Power Range Outcore Detectors) is required. Locate NI imbalance indications on UB1 and calculate the % Imbalance (Avg.) $\frac{(-28.8) + (-27.6) + (-26.4) + (-25.2)}{4} = -27.0\%$ ***Cue:*** ***If not performed on the simulator , after the candidate indicates where to read NI imbalance, indicate that they read the following:*** ***NI-5 ------ - 28.8*** ***NI-6 ------ - 27.6*** ***NI-7 ------ - 26.4*** ***NI-8 ------ - 25.2*** ***OR*** ***Give candidate NI imbalance handout.*** **Note: If JPM conducted as a group, NI imbalance handout should be provided to candidates when requested.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 7: Verify the calculated axial imbalance does not exceed the incore limits per the COLR. STANDARD: The candidate verifies the calculated axial imbalance (- 27.0) exceeds the "Out of Core Alarm" limits for the current Core Operating Limits Report (COLR) for 3 RCPs at 68%. (-26.53 / +26.53) This places imbalance above the 3 RCP alarm limit and the required condition of the surveillance is not met. Notify the SRO that TS 3.2.2 Condition A should be entered. **Note: If candidate goes to step 12.3.7 to verify minimum incore detector operability, stop the JPM.** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: ________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Step is necessary, because must determine the proper step to use to use the Outcore detectors to determine imbalance.
5	Step is necessary if candidate incorrectly decides to use out of core detectors to determine imbalance.
6	Step is necessary, because calculation is needed to determine imbalance.
7	Step is necessary, because imbalance must be compared to COLR and verified it exceeds the limit and also recognize that TS entry conditions are met.

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

INITIAL CONDITIONS:

1. Unit 1 has been operating at 100% power for 2 weeks.
2. 1B1 RCP has high vibration
3. A rapid power reduction is made and the 1B1 RCP is secured
4. Reactor power is now at 68% and stable
5. The Reactor Calculation Package is NOT running.
6. Backup Incore Chart "B" OOS
7. All other equipment operable
8. PT/1/A/0600/001, Periodic Instrument Surveillance, Enclosures 13.1 has been completed up to page 8.

INITIATING CUE:

1. The SRO directs you to perform the Axial Power Imbalance Operating Limits verification.
2. Only Imbalance Surveillance is required for this JPM.
3. Do NOT perform Quadrant Power Tilt check.

BACKUP INCORE CHART "A"

Point #	%	Location
1	132.7	G09-L2
2	138.0	G09-L4
3	133.3	G09-L6
4	145.6	E09-L2
5	154.1	E09-L4
6	142.5	E09-L6
7	128.8	L06-L4
8	133.8	L06-L6
9	126.3	M09-L2
10	122.9	K05-L2
11	127.5	G11-L2
12	122.2	E07-L2
13	144.4	F13-L2
14	145.0	D05-L2
15	143.1	F13-L4
16	142.5	F03-L6
17	144.5	N04-L2
18	*Off scale high	F13-L6
19	133.8	N04-L6
20	135.5	O06-L2
21	136.1	O06-L4
22	135.6	O06-L6
23	133.8	D05-L6
24	*Off scale high	D05-L4

* Work Request written

OUTCORE NI IMBALANCE READINGS

OUTCORE NI	IMBALANCE (%)
5	- 28.8
6	- 27.6
7	- 26.4
8	- 25.2

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

ADMIN-204

PERFORM WEEKLY SURVEILLANCE TEST TO DETERMINE RIA-40 SETPOINT

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform weekly surveillance test to determine RIA-40 setpoint

Alternate Path:

No

Facility JPM #:

CRO-204

K/A Rating(s):

System: Generic
K/A: 2.2.12
Rating: 3.0/3.4

Task Standard:

Correctly determine new RIA-40 setpoint within ± 5 cpm by procedure.

Preferred Evaluation Location:

Simulator ______ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

PT/0/A/0230/01, Encl. 13.4 (1RIA-40 Setpoints and SG Tube Leak Calculations)

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:

None

Tools/Equipment/Procedures Needed:

PT/0/A/0230/01, Encl. 13.4 (1RIA-40 Setpoints and SG Tube Leak Calculations)

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 unit has been continuously operating at 100% for 9 months.

The weekly performance of PT/0/A/230/01 (Radiation Monitor Check) is in progress. Enclosure 13.3 (1RIA-40 Setpoints) is being performed.

AP/31 (Primary to Secondary Leakage) not in effect

CSAE offgas Xe 133 μCi/ml concentration is greater than MDA (Minimum Detectable Activity).

CURRENT DATA

Unit 1 RCS Xe 133 Equivalent Corrected = 1.562 E-3 μci/ml

Unit 1 CSAE Off Gas Total Xenon 133 Equivalent Activity = 4.431 E-8 μci/ml

1A CSAE Flow = 4 scfm
1B CSAE Flow = 5 scfm
1C CSAE Flow = 4 scfm

1RIA-40 = 120 CPM

INITIATING CUES:

The SRO directs you to perform PT/0/A/0230/01, Encl. 13.4 (1RIA-40 Setpoints and SG Tube Leak Calculations) to determine 1RIA-40 setpoints.

START TIME: ______

STEP 1:	Step 1.1 Verify one of the following: • CSAEs are in service. • CSAEs are ready to be placed in service.	___ SAT ___ UNSAT
STANDARD:	Determine CSAEs are in service and proceed to Step 1.2.	
COMMENTS:		
STEP 2:	Step 1.2 1RIA-40 available.	
STANDARD:	Determine 1RIA-40 is operable and proceed to Step 1.3.	___ SAT ___ UNSAT
COMMENTS:		
STEP 3:	Step 1.3 AP/31 (Primary To Secondary Leakage) **NOT** in effect.	
STANDARD:	Determine AP/31 is not in effect from information on cue sheet.	___ SAT ___ UNSAT
COMMENTS:		

STEP 4:	Step 1.4 Enclosure 13.3 (1RIA-40 Setpoints) in progress.	___ SAT ___ UNSAT
STANDARD:	Determine Enclosure 13.3 (1RIA-40 Setpoints) in progress from information on cue sheet.	
COMMENTS:		
STEP 5:	Step 2.1 **IF** RP reports **NO** reportable activity present in CSAE offgas:	___ SAT ___ UNSAT
STANDARD:	Determine activity is present in CSAE offgas from information on cue sheet.	
COMMENTS:		
STEP 6:	Step 2.2 **IF** RP reports reportable activity present in CSAE offgas:	___ SAT ___ UNSAT
STANDARD:	Determine activity is present in CSAE offgas from information on cue sheet and continue to Step 2.2.1.	
COMMENTS:		

STEP 7:	Step 2.2.1 Record current RCS and CSAE sample results: • From Primary Chemistry: RCS XE-133 EQUIVALENT CORRECTED: **1.562 E-3** µCi/ml • From RP: TOTAL XENON 133 EQUIVALENT ACTIVITY: **4.431 E-8** µCi/ml	___ SAT ___ UNSAT
STANDARD:		
COMMENTS:		
STEP 8:	Step 2.2.2 Determine CSAE flow rates: • Obtain 1A, 1B, and 1C CSAE flow rates. • **IF** any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine CSAE flow rate. • Calculate CSAE flow rate: CSAE flow rate = (1A CSAE flow) + (1B CSAE flow) + (1C CSAE flow) CSAE flow rate = (___**4**___) + (___**5**___) + (___**4**___) CSAE flow rate = **13**	___ SAT ___ UNSAT
STANDARD:	Determine that the CSAE flow rate is equal to **13 CFM** by adding flow rates from the cue sheet.	
COMMENTS:		

STEP 9:	Step 2.2.3 Identify 1RIA-40 current value count rate from view node: **120** CPM	___ SAT ___ UNSAT
STANDARD:	Determine that 1RIA-40 is **120** CPM by looking at cue sheet.	
COMMENTS:		
STEP 10:	Step 2.2.4 Perform the following calculations: • 1RIA-40 Setpoints per Section 3. • SG tube leak rate per Section 4. ***Cue: Inform candidate that calculating the tube leak is NOT required fo this JPM***	___ SAT ___ UNSAT
STANDARD:	Candidate proceeds to Section 3 to calculate the 1RIA-40 setpoints.	
COMMENTS:		

STEP 3: Step 3.1	CRITICAL STEP
Perform the following equations:	___ SAT
Alert Setpoint = $\dfrac{\text{(1RIA-40 CPM) (RCS Xe-133 Equivalnt Corrected µCi/ml) (4.61 E-4 ft}^3\text{/min)}}{\text{(CSAE Flow ft}^3\text{/min) (Total Xenon 133 Equivalent Activity µCi/ml)}}$	
Alert Setpoint = $\dfrac{(\_\_\_\_\_\_)\text{ CPM} \times (\_\_\_\_\_\_)\mu\text{Ci/ml}_{\text{(RCS Xe-133 Equivalent Corrected}}\ 4.61\text{ E-4 ft}^3\text{/min}}{(\qquad)\text{ ft}^3\text{/min)}\ (\qquad)\mu\text{Ci/ml}_{\text{(Total Xenon133 Equivalent Activity)}}}$	___ UNSAT
Alert Setpoint = ________	
High Setpoint = $\dfrac{\text{(1RIA-40 CPM) (RCS Xe-133 Equivalnt Corrected µCi/ml) (2.77 E-4 ft}^3\text{/min)}}{\text{(CSAE Flow ft}^3\text{/min) (Total Xenon 133 Equivalent Activity µCi/ml)}}$	
High Setpoint = $\dfrac{(\_\_\_\_\_\_)\text{ CPM} \times (\_\_\_\_\_\_)\mu\text{Ci/ml}_{\text{(RCS Xe-133 Equivalent Corrected}}\ 2.77\text{ E-4 ft}^3\text{/min}}{(\qquad)\text{ ft}^3\text{/min)}\ (\qquad)\mu\text{Ci/ml}_{\text{(Total Xenon133 Equivalent Activity)}}}$	
High Setpoint = ________ CPM	
STANDARD: Calculate the Alert and High Setpoints using data from Cue Sheet:	
Alert Setpoint = $\dfrac{(\ 120\ )\text{ CPM} \times (\ \mathbf{1.562\text{ E-3}}\ )\mu\text{Ci/ml}_{\text{(RCS Xe-133 Equivalent Corrected}}\ 4.61\text{ E-4 ft}^3\text{/min}}{(\ 13\ )\text{ ft}^3\text{/min)}\ (\ \mathbf{4.431\text{ E-8}}\ )\mu\text{Ci/ml}_{\text{(Total Xenon133 Equivalent Activity)}}}$	
Alert Setpoint = 150 CPM	
High Setpoint = $\dfrac{(\ 120\ )\text{ CPM} \times (\mathbf{1.562\text{ E-3}})\mu\text{Ci/ml}_{\text{(RCS Xe-133 Equivalent Corrected}}\ 2.77\text{ E-3 ft}^3\text{/min}}{(\ 13\ )\text{ ft}^3\text{/min)}\ (\mathbf{4.431\text{ E-8}})\mu\text{Ci/ml}_{\text{(Total Xenon133 Equivalent Activity)}}}$	
High Setpoint = 901 CPM	
(± 5 cpm)	
COMMENTS:	
END TASK	

STOP TIME: ____________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
3	This step required to calculate Alert and High Setpoints.

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

INITIAL CONDITIONS:

The unit has been continuously operating at 100% for 9 months.

The weekly performance of PT/0/A/230/01 (Radiation Monitor Check) is in progress. Enclosure 13.3 (1RIA-40 Setpoints) is being performed.

AP/31 (Primary to Secondary Leakage) not in effect

CSAE offgas Xe 133 µCi/ml concentration is greater than MDA (Minimum Detectable Activity).

CURRENT DATA

Unit 1 RCS Xe 133 Equivalent Corrected = 1.562 E-3 µci/ml

Unit 1 CSAE Off Gas Total Xenon 133 Equivalent Activity = 4.431 E-8 µci/ml

1A CSAE Flow = 4 scfm
1B CSAE Flow = 5 scfm
1C CSAE Flow = 4 scfm

1RIA-40 = 120 CPM

INITIATING CUES:

The SRO directs you to perform PT/0/A/0230/01, Encl. 13.4 (1RIA-40 Setpoints and SG Tube Leak Calculations) to determine 1RIA-40 setpoints.

1. Initial Conditions

None.

2. Procedure

2.1 Determine 1RIA-40 High and Alert setpoints from one of the following:

_____ 2.1.1 Enclosure 13.4 (1RIA-40 Setpoints and SG Tube Leak Calculations)

_____ 2.1.2 AP/1/A/1700/031 (Primary To Secondary Leakage)

_____ 2.2 Record 1RIA-40 High and Alert setpoints:

- 1RIA-40 Alert setpoint: _______________ CPM
- 1RIA-40 High setpoint: _______________ CPM

_____ SRO 2.3 Approve calculated Alert setpoint. {14}

_____ SRO 2.4 Approve calculated High setpoint. {14}

_____ 2.5 Record 1RIA-40 Alert as found setpoint: _______________ CPM {15}

_____ 2.6 Insert 1RIA-40 Alert setpoint recorded in Step 2.2.

_____ 2.7 Record 1RIA-40 High as found setpoint: _______________ CPM {15}

_____ 2.8 Insert 1RIA-40 High setpoint recorded in Step 2.2.

_____ 2.9 Perform a manual source check.

1. Initial Conditions

_____ 1.1 Verify one of the following:

- ☐ CSAEs are in service.
- ☐ CSAEs are ready to be placed in service.

_____ 1.2 1RIA-40 available.

_____ 1.3 AP/1/A/1700/031 (Primary To Secondary Leakage) **NOT** in effect. {8}

_____ 1.4 Enclosure 13.3 (1RIA-40 Setpoints) in progress.

2. Procedure

2.1 **IF** RP reports **NO** reportable activity present in CSAE offgas: {11}

_____ 2.1.1 Use the following values for 1RIA-40 setpoints:

- Alert: 100 CPM
- High: 100 CPM

_____ 2.1.2 Record the following information in Unit Log: **NO** reportable activity present in CSAE offgas.

_____ 2.1.3 Notify Secondary Chemistry that U1 SG tube leak size is zero gpd.

_______________________ _____/_____
Chemist Contacted Date Time

NOTE:	Steps 2.2.1 and 2.2.2 may be performed in any sequence.

2.2 <u>**IF**</u> RP reports reportable activity present in CSAE offgas:

_____ 2.2.1 Record current RCS and CSAE sample results:

From Primary Chemistry:

RCS XE-133 EQUIVALENT CORRECTED: __________ µCi/ml

From RP:

TOTAL XENON 133 EQUIVALENT ACTIVITY: __________ µCi/ml

2.2.2 Determine CSAE flow rates:

_____ A. Obtain 1A, 1B, and 1C CSAE flow rates.

_____ B. <u>**IF**</u> any CSAE flow meter(s) are off scale, refer to OP/0/A/1106/031 (Primary to Secondary Leak Rate Monitoring and Instrumentation) to determine CSAE flow rate.

_____ C. Calculate CSAE flow rate:

CSAE flow rate = (1A CSAE flow) + (1B CSAE flow) + (1C CSAE flow)

CSAE flow rate = (__________) + (__________) + (__________)

CSAE flow rate = ____________

_____ 2.2.3 Identify 1RIA-40 current value count rate from view node: ________ CPM {18}

_____ 2.2.4 Perform the following calculations:

- 1RIA-40 Setpoints per Section 3.
- SG tube leak rate per Section 4.

3. 1RIA-40 Setpoint Calculation

_____ 3.1 Perform the following equations:

$$\text{Alert Setpoint} = \frac{(\text{1RIA-40 CPM})\ (\text{RCS Xe-133 Equivalent Corrected } \mu\text{Ci/ml})\ (4.61\text{ E-4 ft}^3\text{/min})}{(\text{CSAE flow ft}^3\text{/min})\ (\text{Total Xenon 133 Equivalent Activity } \mu\text{Ci/ml})}$$

$$\text{Alert Setpoint} = \frac{(\_\_\_\_\_\_\_\_)\ \text{CPM}}{(\qquad)\ \text{ft}^3\text{/min}} \times \frac{(\_\_\_\_\_\_\_\_)\ \mu\text{Ci/ml}_{\text{(RCS Xe-133 Equivalent Corrected)}}}{(\qquad)\ \mu\text{Ci/ml}_{\text{(Total Xenon 133 Equivalent Activity)}}} \times \underline{4.61\text{ E-4 ft}^3\text{/min}}$$

Alert Setpoint = _________ CPM

$$\text{High Setpoint} = \frac{(\text{1RIA-40 CPM})\ (\text{RCS Xe-133 Equivalent Corrected } \mu\text{Ci/ml})\ (2.77\text{ E-3 ft}^3\text{/min})}{(\text{CSAE flow ft}^3\text{/min})\ (\text{Total Xenon 133 Equivalent Activity } \mu\text{Ci/ml})}$$

$$\text{High Setpoint} = \frac{(\_\_\_\_\_\_\_\_)\ \text{CPM}}{(\qquad)\ \text{ft}^3\text{/min}} \times \frac{(\_\_\_\_\_\_\_\_)\ \mu\text{Ci/ml}_{\text{(RCS Xe-133 Equivalent Corrected)}}}{(\qquad)\ \mu\text{Ci/ml}_{\text{(Total Xenon 133 Equivalent Activity)}}} \times \underline{2.77\text{ E-3 ft}^3\text{/min}}$$

High Setpoint = _________ CPM

_____ 3.2 Record 1RIA-40 setpoints on Enclosure 13.3 (1RIA-40 Setpoints).

4. Calculation Of SG Tube Leak Rate

_____ 4.1 Perform the following equation:

$$\text{Leak Rate} = (\text{CSAE flow ft}^3/\text{min}) \times \frac{(\text{Total Xenon 133 Equivalent Activity } \mu\text{Ci/ml})}{(\text{RCS Xe-133 Equivalent Corrected } \mu\text{Ci/ml})} \times \frac{(10{,}800 \text{ gal min})}{\text{ft}^3 \text{ day}}$$

$$\text{Leak Rate} = (\_\_\_\_\_)\ \text{ft}^3/\text{min} \times \frac{(\_\_\_\_\_\_\_)\ \mu\text{Ci/ml}_{\text{(Total Xenon 133 Equivalent Activity)}}}{(\qquad\quad)\ \mu\text{Ci/ml}_{\text{(RCS Xe-133 Equivalent Corrected)}}} \times \frac{(10{,}800 \text{ gal min})}{\text{ft}^3 \text{ day}}$$

Leak Rate = ________ gpd

_____ 4.2 Record SG leak rate in Unit Log.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

ADMIN-303

DETERMINE RADIATION PROTECTION REQUIREMENTS FOR AN ACTIVITY

CANDIDATE ____

EXAMINER ____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Determine radiation protection requirements for an activity

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):
System: G
K/A: 2.3.10
Rating: 2.9/3.3

Task Standard:

Correctly determine that total dose received for the job is 3.9 mR and maximum clock time to complete venting without exceeding RWP dose limits is 42.5 minutes.

Preferred Evaluation Location:

Simulator ____ In-Plant _____

Preferred Evaluation Method:

Perform __X___ Simulate ____

References:

GET Manual

Validation Time: 13 minutes

Time Critical: NO

===

Candidate: ________________________________ NAME

Time Start: _________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______

Performance Time: _________

Examiner: ________________________ NAME ______________________________ SIGNATURE /________ DATE

===

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:

Radiation Work Permit # 23

Survey Map

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 is in AP/26, Loss of Residual Heat Removal and you are to:

- Stage yourself inside Room 61 where you can minimize your dose while waiting
- Vent 1A LPI pump when directed

0800 – You enter Room 61

0830 – You are directed to vent 1A LPI pump

0842 – Venting is completed. You immediately exit the Room and report back to the Control Room.

INITIATING CUES:

Based on the time line, RWP 23, and Room 61 survey map provided:

1. State the amount of dose that was received for the duration of this task.
2. Assuming you entered the room and began venting at the stated times, determine the maximum time that venting could occur without exceeding a limit imposed by the RWP.

START TIME: _______

STEP 1: **Operator answers the following questions.** 1. What dose will be received for the duration of this task? Based on a 30 minute wait at the LEWA and 12 minutes at LPI Pump and the nearest posted general area dose rates (12 mr/hr): LEWA dose: **3 mr/hr X 0.5 hr = 1.5 mR** Vent time dose Area dose is **12/60 hr X 12 mr/hr = 2.4 mR** Estimated total dose received is **1.5 + 2.4 = <u>3.9 mr</u>** 2. What is the maximum time that the pump casing could have been vented before reaching a limit imposed by the RWP? Based on the nearest general area dose rates (12mr/hr): **The RWP Dose Alarm is 10 mR.** LEWA is **3 mr/hr X 0.5 hr = 1.5 mR** Vent time dose rate is **Rad level = 12 mr/hr** Solving: **8.5 mr is allowable dose once venting starts** $\frac{\mathbf{8.5\ mr}}{\mathbf{12\ mr/hr}}$ **= 0.71 hours or 42.5 minutes** STANDARD: Calculates maximum venting time stated above. COMMENTS: **END TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Required to calculate the maximum venting time.

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

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 is in AP/26, Loss of Residual Heat Removal and you are to:

- Stage yourself inside Room 61 where you can minimize your dose while waiting
- Vent 1A LPI pump when directed

0800 – You enter Room 61

0830 – You are directed to vent 1A LPI pump

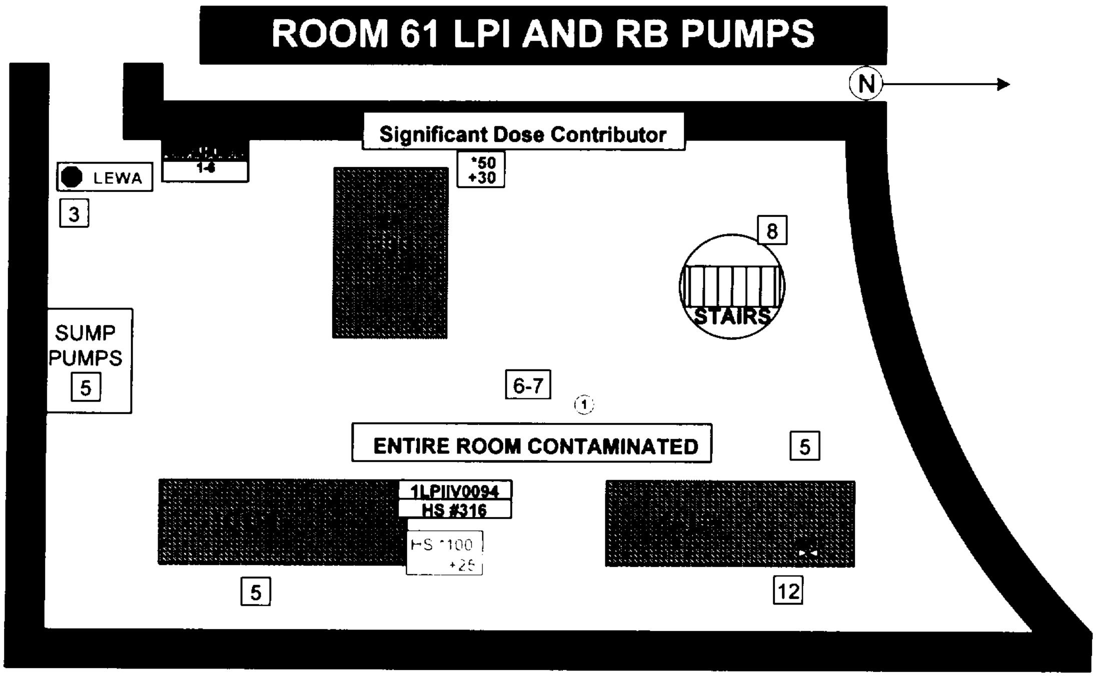
0842 – Venting is completed. You immediately exit the Room and report back to the Control Room.

INITIATING CUES:

Based on the time line, RWP 23, and Room 61 survey map provided:

1. State the amount of dose that was received for the duration of this task.
2. Assuming you entered the room and began venting at the stated times, determine the maximum time that venting could occur without exceeding a limit imposed by the RWP.

Room 61 LPI & RBS Pumps	Survey # M-021506-17	Date/Time 02/15/2006 13:06



Comments: PLANVIEW UPDATED TO SHOW ENTIRE ROOM CONTAMINATED FOR RECOATING PROJECT. ALL DOSE RATE INFO. FROM PREVIOUS SURVEY M-020706-2

Summary of Highest Readings	
Smears	Air Samples & Wipes
1) 1554 DPM/100 cm2 β/γ	

Symbol Legend (for example only)

Dose Rate
*150 —Contact Reading
+75 —30 cm Reading
20 —General Area
HS-50 Hot Spot
RCA Posting
Drip Bag
15 Smear
15 Air Sample
15 Wipe

Type: Job Coverage	
RWP: 5036	
Reactor Power = 100%	

Unless otherwise noted, dose rates in mrem/hr.

Surveyor: W. Walters	Approved by: N. Wriston, 03/07/2006

***** Important - Please Read! *****

Verify the RWP Revision number on this page with the RWP displayed on EDC or the posted hard copy at the EDC Access Station

Oconee Nuclear Station

Radiation Work Permit #: 23 Revision #:3

Job Description: ENTRY FOR ROUTINE PLANT AND SYSTEMS OPERATION (OPERATIONS)

ED(MG) Set Points

Dose Alarm: 10 mrem --> **Dose Rate Alarm: 50 mrem/hr**

Dress Category	Task Description	Special Dosimetry	Respiratory Requirements
A	NON-CONTAMINATED AREA	NONE	NONE USED
B	WORKING FROM A NON-CONTAMINATED AREA WITH CONTAMINATED MATERIAL WHERE ONLY CONTACT IS WITH HANDS & NO TEARING OF GLOVES.	NONE	NONE USED
C	WORKING FROM A NON-CONTAMINATED AREA WITH CONTAMIANTED MATERIAL WHERE THERE IS NO POTENTIAL FOR CONTACT OTHER THAN HAND.	NONE	NONE USED
D	CONTAMINATED AREA FOR SHORT DURATION WITH NO OBSTRUCTIONS TO CONTRIBUTE TO CONTAMINATION OF UNPROTECTED SKIN / CLOTHING.	NONE	NONE USED
F	LIGHT WORK IN CONTAMINATED AREA NOT REQUIRING COMPLETE PROTECTION TO THE SKIN AND CLOTHING.	NONE	NONE USED
H	WORK IN CONTAMINATED AREA.	NONE	NONE USED
I	WORK IN CONTAMINATED AREA AND HANDS ON HIGHER CONTAMINATED MATERIAL OR BETA DOSE CONCERN TO HANDS ONLY.	NONE	NONE USED
M	HEAVY WORK IN CONTAMINATED AREA REQUIRING ADDITIONAL CONTROLS FOR CONTAMINATION OR SKIN DOSE.	NONE	NONE USED
N	WORK IN CONTAMINATED AREA WHEN WET CONDITIONS OR POTENTIAL FOR WET CONDITIONS EXIST.	NONE	NONE USED

Comments/Special Insti

Comments:
EXPECTED RADIOLOGICAL CONDITIONS:
HIGHEST CONTACT DOSE RATES: 0.1 MREM/HR - 8000 MREM/HR
GENERAL AREA DOSE RATES: 0.1 MREM/HR - 999 MREM/HR
CONTAMINATION LEVELS: <1000 DPM - 300 MRAD/HR BETA-GAMMA & 1778 ALPHA.
*
RP / RWP HOLD POINTS:
ACTUAL CONTAMINATION LEVELS HIGHER THAN DOCUMENTED ON THIS RWP.
ACTUAL DOSE RATES HIGHER THAN DOCUMENTED ON THIS RWP.
UNEXPECTED WET CONDITIONS.
JOB SCOPE CHANGES.
NOTIFY RP PRIOR TO REACHING / ENTRY INTO THE OVERHEAD (8 FEET AND ABOVE).
*
MAXIMUM STAY TIME: 16 HOURS
UTILIZE MIRRORS AND / OR REMOTE SURVEILLANCE EQUIPMENT TO ELIMINATE ROOM ENTRY WHEN FEASIBLE.

MONITOR ED (MG) PERIODICALLY WHILE INSIDE THE RCA / RCZ (ONCE OR TWICE PER HOUR IN LOW DOSE RATE AREAS. IN HIGHER DOSE RATE AREAS MONITOR MORE FREQUENTLY. FOR EXAMPLE; EVERY 10 TO 15 MINUTES)
IF DRESS REQUIREMENTS PREVENT THE MONITORING OF ED (MG) AND RP IS NOT REMOTELY MONITORING VIA TELEDOSE & COMMUNICATIONS, PLACE ED (MG) EXTERNAL TO THE OUTERMOST LAYER OF PROTECTIVE CLOTHING.
ALL TOOLS AND EQUIPMENT SHOULD BE WIPED DOWN PRIOR TO REMOVAL FROM A CONTAMINATED AREA.
WORK AREA SHALL BE LEFT NO MORE CONTAMINATED AT THE END OF THE JOB THAN AT THE BEGINNING OF THE JOB.
AN AUXILIARY ALARM DEVICE IS REQUIRED IN HIGH RADIATION AREAS WHEN HEARING PROTECTION IS REQUIRED AND THE EXPECTED DOSE IS GREATER THAN OR EQUAL TO 100 MREM OR TELEDOSE MUST BE UTILIZED.
SAFETY GLASSES OR THE EQUIVALENT MUST BE WORN WHEN WORKING IN CONTAMINATED AREAS.
Special Instructions:

Activation Date & Time: 2/3/06 17:30
Approved By: HED1821
Approval Date & Time: 2/3/06 12:29

***** Important - Please Read! *****

Verify the RWP Revision number on this page with the RWP displayed on EDC or the posted hard copy at the EDC Access Station

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

ADMIN-406

PERFORM THE EMERGENCY PLAN REQUIREMENTS FOR A HAZMAT EVENT

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the emergency plan requirements for a hazmat event

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):
System: Generic
K/A: 2.4.39
Rating: 3.3/3.1

Task Standard:

Immediate action steps of RP/0/B/1000/017 and Enclosure 4.1 Steps 1 - 10 are completed to initiate a hazmat team response.

Preferred Evaluation Location:

Simulator ____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

RP/0/B/1000/017 Spill Response

Validation Time: 14 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:

RP/0/B/1000/017, Spill Response

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:

Date: 06/19/2006 Time 0800

Refueling of the Diesel Air Compressors is in progress

INITIATING CUES:

You are the Unit 1 Balance of Plant operator and receive the following 4911 emergency phone call from security. A spill of diesel fuel is being reported and the SRO has directed you to perform the immediate actions of RP/0/B/1000/017, Spill Response.

This is security officer Fred Walker. I am located at the south end of the Turbine Building. A vendor fuel truck has a ruptured fuel tank and diesel fuel is spilling onto the road. Several site workers are attempting to stop the spill and there may be as much as 100 gallons of fuel leaking from the tank. The spill is not stopped nor contained at this time. There are no injuries to anyone in the area. My call back number is 2743 and my pager number is 778-3278.

Caller is still on the phone.

START TIME: _______

<table>
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NOTE:
ALL spills or releases reported to the control room should be documented on Enclosure 4.1, Spill Report Form.
Steps 2.1 through 2.4 needs to be addressed before allowing caller to hang up the phone.

STEP 1: Step 2.1
Obtain the specifics of the spill/release from the person reporting the spill/release.
Name: **Fred Walker**
Date: **06/19/2006**
Phone Ext.: **2743**
Spill Location: **South of Turbine Building**
Material Spilled: **Diesel fuel**
Phone ext. or pager # that person can be reached at a later time (This number will entered on Line 1 of Enclosure 4.1, Spill Report Form)
Pager number is 778-3278.

STANDARD: Step 2.1 is completed using the information from the Initiating Cue sheet.

COMMENTS:
</td><td>

CRITICAL STEP

___ SAT

___ UNSAT
</td></tr>
<tr><td>

STEP 2: Step 2.2
IF the event involves a fire, explosion hazard, or a release of toxic gas such as ammonia, hydrazine or chlorine gas

STANDARD: Determine step does not apply and go to step 2.3.

COMMENTS:
</td><td>

___ SAT

___ UNSAT
</td></tr>
</table>

STEP 3: Step 2.3 **IF** the spill can be secured STANDARD: Determine the spill cannot be secure and Go TO Step 2.4. ***Cue: Inform the candidate that the spill cannot be secured.*** COMMENTS:	___ SAT ___ UNSAT
STEP 4: Step 2.4 **IF** the release is still in progress, continues to spread, or if there is no procedural guidance for handling releases of this material **THEN** • dispatch a Fire Brigade member to assess the event, • warn others of any known danger • remain in a safe area and monitor the situation until emergency personnel arrive on the scene. STANDARD: Determine the release is still in progress and: • dispatch a Fire Brigade member to assess the event, • warn others of any known danger • remain in a safe area and monitor the situation until emergency personnel arrive on the scene. COMMENTS:	___ SAT ___ UNSAT

STEP 5:	Step 2.4.1 **IF** the Fire Brigade requests site HAZMAT Team response **or** the event is a petroleum product that has reached water **or** is likely to reach water through floor drains, sumps or yard drains. **THEN** page out the ONS HAZMAT Team, by having the switchboard operator activate the HAZMAT Team pagers.	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Determine that the event is "a petroleum product that has reached water **or** is likely to reach water through floor drains, sumps or yard drains". Request the switchboard operator to page out the ONS HAZMAT Team, by activating the HAZMAT Team pagers.	
COMMENTS:		
STEP 6:	Step 2.4.1.1 Use plant P/A system and make following announcement twice (2): • If actual event: May I have your attention please, May I have your attention please, All HAZMAT team members please respond to PAP staging area. All HAZMAT team members please respond to PAP staging area.	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Candidate should access the plant P/A system and make following announcement twice (2): • May I have your attention please, May I have your attention please, All HAZMAT team members please respond to PAP staging area. All HAZMAT team members please respond to PAP staging area.	
COMMENTS:		

STEP 7: Step 2.4.1.2 Call the Security PAP and request them to post the following information in the Administrative Building hallway outside the PAP • Incident Location • Chemicals involved, if known • Any other pertinent information that may be available for the site HAZMAT Team responders STANDARD: The Security PAP is contacted and they are asked to post the following information in the Administrative Building hallway outside the PAP • Incident Location • Chemicals involved, if known • Any other pertinent information that may be available for the site HAZMAT Team responders COMMENTS:	___ SAT ___ UNSAT
NOTE: The request for offsite HAZMAT team assistance should be made simultaneous with the request for fire department assistance. Offsite HAZMAT teams will not respond unless the fire department is also responding. Request for assistance from the Oconee County HAZMAT Team must be made through the local Oconee County fire department. STEP 8: Step 2.5 **IF** conditions warrant assistance from the local county HAZMAT teams as determined by the Fire Brigade Leader or the HAZMAT Team Leader **THEN** contact the appropriate County Rural Fire Department by calling the number listed in Section 8 of the Emergency Telephone Directory and request assistance of the County HAZMAT Team and local fire department. • If the TSC is operational, the TSC Offsite Communicator can make this request. STANDARD: Determine that offsite assistance is NOT required and proceed to Step 2.6. ***Cue: HAZMAT Team Leader has determined that offsite assistance is NOT required.*** COMMENTS:	___ SAT ___ UNSAT

STEP 9: Step 2.6 **IF** the HAZMAT event is located at Keowee Hydro STANDARD: Determine step does not apply because the event is NOT located at Keowee Hydro and go to step 2.7. COMMENTS:	___ SAT ___ UNSAT
STEP 10: Step 2.7 Complete steps 1-10 of Enclosure 4.1, (Spill Report Form) for all spills reported to the Control Room. STANDARD: Steps 1-10 of Enclosure 4.1, (Spill Report Form) are completed correctly. Refer to the completed enclosure. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 11: Step 2.8 Immediately contact the EH&S Duty Person for all spills reported to the Control Room. • During normal day shift hours (0700-1730, Monday – Thursday) contact EH&S at ext. 4090. • During back shift, weekends, page EH&S Duty person. STANDARD: Locate a phone and call ext. 4090. COMMENTS:	___ SAT ___ UNSAT

STEP 12: Step 2.8.1 Provide the information from lines 2 through 10 on the Spill Report Form to the Duty Person and any other known details of the release. STANDARD: Provide the information from lines 2 through 10 on the Spill Report Form to the Duty Person. COMMENTS:	___ SAT ___ UNSAT
NOTE: The Duty Person may have to research regulations or consult with others to determine if the release is reportable. During this time, completion of this procedure will be suspended. Request that the Duty Person inform you if it appears that the time required to make a determination of reportability will be longer than originally expected. STEP 13: Step 2.9 Ask the Duty Person if the release is reportable. STANDARD: Contact the Duty Person at ext. 4090 and ask him to determine if this release is reportable. COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	This step is required to obtain spill information form caller.
5	This step is required to activate the HAZMAT Team.
6	This step is required to activate the HAZMAT Team.
10	This step is required to complete the Spill Report Form.

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

INITIAL CONDITIONS:

Date: 06/19/2006 Time 0800

Refueling of the Diesel Air Compressors is in progress

INITIATING CUES:

You are the Unit 1 Balance of Plant operator and receive the following 4911 emergency phone call from security. A spill of diesel fuel is being reported and the SRO has directed you to perform the immediate actions of RP/0/B/1000/017 Spill Response.

This is security officer Fred Walker. I am located at the south end of the Turbine Building. A vendor fuel truck has a ruptured fuel tank and diesel fuel is spilling onto the road. Several site workers are attempting to stop the spill and there may be as much as 100 gallons of fuel leaking from the tank. The spill is not stopped nor contained at this time. There are no injuries to anyone in the area. My call back number is 2743 and my pager number is 778-3278.

Caller is still on the phone

Duke Power Company Oconee Nuclear Station **Spill Response** **Reference Use**	Procedure No. **RP/ 0/B/1000/017** Revision No. **008** Electronic Reference No. **OX002WPE**

PERFORMANCE

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

(ISSUED) - PDF Format

Spill Response

NOTE:	This procedure is an Implementing Procedure to the Oconee Nuclear Site Emergency Plan and must be forwarded to Emergency Planning within seven (7) working days of approval.

1. Symptoms

1.1 An unplanned or uncontrolled release/spill of a chemical or substance in excess of normal drips and splatters has occurred or is occurring and has been reported to the Control Room.

1.1.1 A chemical or substance can include:

- Products with an MSDS or Chemical Fact Sheet
- Hazardous wastes
- Radionuclide releases in excess of Tech Spec or 10CFR20 limits
- Oil and petroleum products
- Insulation containing, or potentially containing asbestos
- Any of the above materials contained in or on plant equipment, systems or components such as RCW water, wet layup water, etc.

2. Immediate Actions

NOTE:
- **All** spills or releases reported to the control room should be documented on Enclosure 4.1, Spill Report Form.
- Steps 2.1 through 2.4 needs to be addressed before allowing caller to hang up the phone.

_____ 2.1 Obtain the specifics of the spill/release from the person reporting the spill/release.

Name ______________________________ Date _______________

Phone Ext. _____________

Spill Location ____

Material Spilled ____

Phone ext. or pager # that person can be reached at a later time (This number will be entered on Line 1 of Enclosure 4.1, Spill Report Form) ____________________

Other Pertinent Information ____________________________________

____

_____ 2.2 **IF** the event involves a fire, explosion hazard, or a release of toxic gas such as ammonia, hydrazine or chlorine gas

THEN relocate/evacuate all personnel from the spill area and downwind areas.

_____ 2.2.1 Ask the switchboard operator to contact the Environmental/Safety (EH&S) duty person for assistance in determining areas to be evacuated.

_____ 2.2.2 Notify OSM to consult RP/0/B/1000/001, (Emergency Classification) whenever flammable or toxic gasses are detected/reported within or have the potential for entering the site area boundary

2.3 **IF** the spill can be secured

THEN perform the following:

_____ instruct the caller to secure the area of the spill,

_____ warn others of any known danger,

_____ remain in a safe area and monitor the situation until emergency personnel arrive on the scene.

_____ 2.3.1 **IF** there is procedural guidance for handling a spill of this material and quantity

THEN instruct the caller to follow the procedure if it can be done safely.

_____ 2.4 **IF** the release is still in progress, continues to spread, or if there is no procedural guidance for handling releases of this material

THEN _____ dispatch a Fire Brigade member to assess the event,

_____ warn others of any known danger

_____ remain in a safe area and monitor the situation until emergency personnel arrive on the scene.

_____ 2.4.1 **IF** the Fire Brigade requests site HAZMAT Team response **or** the event is a petroleum product that has reached water **or** is likely to reach water through floor drains, sumps or yard drains.

THEN page out the ONS HAZMAT Team, by having the switchboard operator activate the HAZMAT Team pagers.

_____ 2.4.1.1 Use plant P/A system and make following announcement twice (2):

_____ If a drill: This is a drill, This is a drill, All HAZMAT Team personnel please respond to PAP staging area. All HAZMAT Team personnel please respond to PAP for staging area.

_____ If actual event: May I have your attention please, May I have your attention please, All HAZMAT team members please respond to PAP staging area. All HAZMAT team members please respond to PAP staging area.

_____ 2.4.1.2 Call the Security PAP and request them to post the following information in the Administrative Building hallway outside the PAP

- Incident Location
- Chemicals involved, if known
- Any other pertinent information that may be available for the site HAZMAT Team responders

NOTE:
- The request for offsite HAZMAT team assistance should be made simultaneous with the request for fire department assistance. Offsite HAZMAT teams will not respond unless the fire department is also responding.
- Request for assistance from the Oconee County HAZMAT Team must be made through the local Oconee County fire department.

_____ 2.5 **IF** conditions warrant assistance from the local county HAZMAT teams as determined by the Fire Brigade Leader or the HAZMAT Team Leader

THEN contact the appropriate County Rural Fire Department by calling the number listed in Section 8 of the Emergency Telephone Directory and request assistance of the County HAZMAT Team and local fire department.

- If the TSC is operational, the TSC Offsite Communicator can make this request.

_____ 2.6 **IF** the HAZMAT event is located at Keowee Hydro

THEN request assistance from the Pickens County HAZMAT Team through the local Pickens County fire department.

2.6.1 If the TSC is operational, contact the TSC Offsite Communicator and initiate the turnover of remaining procedure requirements to them.

2.6.1.1 Turnover should include information received from the caller,

- Actions taken
- Response of the Fire Brigade/HAZMAT Team
- Other known information

_____ 2.7 Complete steps 1-10 of Enclosure 4.1, (Spill Report Form) for all spills reported to the Control Room.

_____ 2.8 Immediately contact the EH&S Duty Person for all spills reported to the Control Room.

- During normal day shift hours (0700-1730, Monday – Thursday) contact EH&S at ext. 4090.
- During back shift, weekends, page EH&S Duty person.

_____ 2.8.1 Provide the information from lines 2 through 10 on the Spill Report Form to the Duty Person and any other known details of the release.

NOTE:	The Duty Person may have to research regulations or consult with others to determine if the release is reportable. During this time, completion of this procedure will be suspended. Request that the Duty Person inform you if it appears that the time required to make a determination of reportability will be longer than originally expected.

_____ 2.9 Ask the Duty Person if the release is reportable.

2.9.1 **IF** the release is not reportable

THEN perform the following:

_____ Go to the bottom of the Spill Report Form.

_____ Mark a line through "Approved for Release" and initial.

_____ Sign in the "Operations Shift Manager/Emergency Coordinator" space.

_____ Go to Section 3.0, Subsequent Actions, of this procedure.

_____ 2.10 **IF** the release is reportable

THEN perform the following:

_____ Request from the Duty Person the information that is required to complete line numbers 11 through 13 on the Spill Report Form.

_____ Have the Operations Shift Manager or Emergency Coordinator sign the "Approved For Release" space at the bottom of the form.

NOTE:	Reportable releases require notification of off-site emergency and regulatory agencies. The telephone notification to the Nuclear Regulatory Commission in Step 2.12 must be made within 4 hours after Step 2.12 has begun.

_____ 2.11 Fax the approved form to the Oconee County Emergency Preparedness Agency at the fax number listed in the Emergency Telephone Directory, Section 4.

_____ 2.12 Fax the approved form to the Oconee County Law Enforcement Center to the fax number listed in Section 5 of the Emergency Telephone Directory.

_____ 2.12.1 Contact Oconee County Law Enforcement Center at the Selective Signaling number in the Emergency Telephone Directory, Section 5.

_____ 2.12.1.1 Write the contact information for the Oconee County Law Enforcement Center in the appropriate space in the top section of Enclosure 4.1, (Spill Report Form).

_____ 2.13 **IF** the release is to Keowee River

THEN fax the form to the Pickens County Emergency Preparedness Agency at the fax terminal number listed in the Emergency Telephone Directory, Section 4.

_____ 2.13.1 Contact the Pickens County Law Enforcement Center at the Selective Signaling number in the Emergency Telephone Directory, Section 5 after Oconee County notification is made.

_____ 2.13.1.1 Write the contact information for the Pickens County Law Enforcement Center in the appropriate space in the top section of Enclosure 4.1, (Spill Report Form).

NOTE:	The 24-hour contact number for the S.C. Bureau of Solid and Hazardous Waste Management (BSHWM) is State Emergency Response Commission. It may be necessary to wait for a return call from the BSHWM duty person. The State Emergency Response Commission's normal working hours are 0830 – 1700, after this time you will reach a recording.

_____ 2.14 Contact S.C. Bureau of Solid and Hazardous Waste Management (BSHWM) at **1-803-253-6488 or 1-888-481-0125**.

_____ 2.14.1 Write the contact information for the S.C. Bureau of Solid and Hazardous Waste Management in the appropriate spaces in the top section of Enclosure 4.1, (Spill Report Form).

_____ 2.14.2 Provide the information from lines 2 through 13 on Enclosure 4.1, (Spill Response Form) to the BSHWM duty person.

_____ 2.14.3 Obtain the South Carolina Department of Health and Environmental Control file number from the BSHWM duty person and enter that file number in the appropriate space at the top of the Spill Report form.

_____ 2.15 Contact National Response Center at **1-800-424-8802**.

_____ 2.15.1 Write the contact information for the National Response Center in the 'National Response Center Contact" space in the top section of Enclosure 4.1, (Spill Report Form).

_____ 2.15.2 Provide the information from lines 2 through 13 on Enclosure 4.1, (Spill Report Form) to the National Response Center duty person.

_____ 2.15.3 Obtain the National Response Center file number and enter the number in the "National Response Center File Number" space at the top of Enclosure 4.1, (Spill Report Form).

_____ 2.16 Make a Red Phone call to the Nuclear Regulatory Commission.

2.16.1 Provide all the information from Enclosure 4.1, (Spill Report Form) including the offsite agencies that were notified.

_____ 2.17 Notify the Regulatory Compliance Duty Person that an NRC four hour Red Phone call has been made.

2.17.1 Ask the Regulatory Compliance Duty Person to notify the NRC Resident Inspector on duty that a four hour Red Phone call has been made.

_____ 2.18 Notify the World of Energy Duty Person of any releases reported to offsite agencies.

_____ 2.19 Go to Section 3. Subsequent Actions, of this procedure.

3. Subsequent Actions

_____ 3.1 Telephone the person who reported the spill/release (from Line 1 of the yellow sheet/Spill Report form) for any information regarding the department/revision that is responsible for the spill.

_____ 3.1.1 Verify that this person can be reached at a later date at the telephone number listed on Line 1 of the Spill Report form.

_____ 3.1.2 Advise the spill reporter that it is no longer necessary for him/her to remain at the phone.

_____ 3.2 Initiate the Problem Investigation Process (PIP).

_____ 3.3 Record the information from lines 3-10 of the Spill Report form in the appropriate section of the Problem Identification portion of the PIP.

_____ 3.4 Write the PIP number in the appropriate space at the top of the Spill Report form.

_____ 3.5 Send the original approved Spill Report form to EH&S (ONO3EM) along with any additional notes or information that will assist in the problem investigation.

4. Enclosures

4.1 Spill Report Form

Spill Report

Enclosure 4.1

PIP No.__________ SCDHEC File No. __________ National Response Center File No. __________

Oconee County Law Enforcement Center Contact	Telephone	Date	Time
Pickens County Law Enforcement Center Contact	Telephone	Date	Time
State Emergency Response Committee (SCBSHWM) Contact	1-888-481-0125 1-803-253-6488 Telephone	Date	Time
National Response Center Contact	1-800-424-8802 Telephone	Date	Time

1. __________ __________ __________ __________
Name of Person Reporting Release to 4911) Telephone Date Time

2. This is __________ at Duke Power Company's Oconee Nuclear Site, Seneca, SC
The telephone number is (864)885-3312.

3. A release of __________ (Name of Product) occurred at __________ (Time) on __________ (Date).

4. An estimated quantity of __________ (lbs./gal.) of the substance was released for a duration of __________ (Hours/Minutes).
The release [is, is not] continuing. **(Circle one)**

5. The material was released to the __________ (Air/Water/Soil) and covers an area of __________ (Length and Width).

6. The source of the release was __________ (Drum, Tank, Piping, etc.) located at or from __________ (Unit, Building, Vehicle #, System, etc.).

7. It was attributed to __________ (Cause of incident).

8. Corrective action being taken or planned: __________

9. There were __________ (numbers) injuries and __________ (numbers) fatalities related to the release.

10. Extent of property damage was __________.

11. List the hazardous substances in the material and their respective statutory listing:

HAZARDOUS SUBSTANCE	CERCLA OR EHS LIST

12. Health risks associated with the release: __________

13. Recommendations for the public and the emergency response personnel: __________

__________ __________ __________ __________
Environmental Health & Safety (EH&S) Telephone Date Time

APPROVED FOR RELEASE: __________ __________ __________
Operations Shift Manager/Emergency Coordinator Date Time

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

NLO-200

ALIGN HPI PUMP SUCTION TO BWST DURING A BLACKOUT

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Align HPI Pump Suction to BWST During a Blackout

Alternate Path:

No

Facility JPM #:

New

K/A Rating(s):
System: APE 022
K/A: G 2.4.35
Rating: 3.3/3.5

Task Standard:

HPI Pump suction is correctly aligned to BWST per the EOP.

Preferred Evaluation Location:

Simulator ____ In-Plant __X__

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:
EOP Encl. 5.7, HPI Pump Operations from ASW Pump Switchgear

Validation Time: 15 minutes

Time Critical: NO

==

Candidate: ______________________________
NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT _____ UNSAT _____

Performance Time: ________

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

==

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

None

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:

Blackout is in progress on Unit 2

Blackout Tab of the EOP is in progress

INITIATING CUES:

The SRO directs you to perform Enclosure 5.7 (HPI Pump Operation from ASW Pump Switchgear).

The desired suction source for the HPI pump will be Unit 2's BWST.

START TIME: _______

STEP 1: Step 1 Close 2HP-139 (RCP SEAL FLOW CONTROL OUTLET) (A-3-327, CRD Filter Rm) STANDARD: Locate 2HP-139 in Unit 2's CRD Filter Room and rotate handwheel clockwise until it reaches a hard stop. Stem will lower as the handwheel is rotated. ***Cue: Valve has reached a hard stop.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
NOTE Cooling water to HPI Motor Coolers will be supplied by the following: • HPSW via head from EWST • Station ASW Pump, if operating, via 2CCW-265 STEP 2: Step 2 Verify ≥ 1 gpm cooling water flow to HPI pump motor coolers on local indication (HPI Pump Rm): • 2A HPI Pump (2LPS-PS-1013) • 2B HPI Pump (2LPS-PS-1014) ***Cue: Indicate to the candidate that cooling water flow to the 2A and 2B HPI pumps coolers is ≈ 2 gpm.*** STANDARD: Locate the local indication of HPI pump motor coolers flow located on the west wall of the HPI Pump Room and determine that flow is ≥ 1 gpm. COMMENTS:	___ SAT ___ UNSAT

STEP 3: Step 3

GO TO applicable step based on HPI pump suction source specified by Control Room:

√	**Desired Suction Source**	**Applicable Step**
	BWST	4
	LDST	7
	SFP	9

STANDARD: Determine the suction source is the BWST based on the cue sheet and **GO TO** Step 4.

COMMENTS:

___ SAT

___ UNSAT

STEP 4: Step 4

Open the following (A-1-118, 1&2 HPI Hatch Area, East wall):

- 2HP-24 (2A HPI BWST SUCTION)
- 2HP-25 (2B HPI BWST SUCTION)

STANDARD: Proceed to the East wall of the 1&2 HPI Hatch Area and open 2HP-24 and 2HP-25 by engaging the hand wheel and turning counterclockwise until the valve reaches a hard stop. Handwheel is engaged by pushing the lever down and turning the handwheel.

Cue: Indicate that the valve has reached a hard stop.

COMMENTS:

CRITICAL STEP

___ SAT

___ UNSAT

STEP 5:	Step 5 Proceed to East Penetration Room and notify Control Room of the following: • HPI suction aligned to BWST • HPI pump cooling water status • Available to throttle 2HP-26	___ SAT ___ UNSAT
STANDARD:	Proceed to East Penetration Room, locate 2HP-26, and notify Control Room of the following: • HPI suction aligned to BWST • HPI pump cooling water status • Available to throttle 2HP-26	
COMMENTS:		
STEP 6:	Step 6 **EXIT** this enclosure.	___ SAT ___ UNSAT
STANDARD:	The candidate should indicate that he would exit the enclosure.	
COMMENTS:		
	END TASK	

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	This step is required to prevent damaging the RCP seals when the HPI pump starts.
4	This step is required to align the BWST to the HPI pump suction.

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

INITIAL CONDITIONS:

Blackout is in progress on Unit 2

Blackout Tab of the EOP is in progress

INITIATING CUES:

The SRO directs you to perform Enclosure 5.7 (HPI Pump Operation from ASW Pump Switchgear).

The desired suction source for the HPI pump will be Unit 2's BWST.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Close 2HP-139 (RCP SEAL FLOW CONTROL OUTLET) (A-3-327, CRD Filter Rm).	

NOTE

Cooling water to HPI Motor Coolers will be supplied by the following:

- HPSW via head from EWST
- Station ASW Pump, if operating, via 2CCW-265

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2. Verify ≥ 1 gpm cooling water flow to HPI pump motor coolers on local indication (HPI Pump Rm): __ 2A HPI Pump (2LPS-PS-1013) __ 2B HPI Pump (2LPS-PS-1014)	__ Notify Control Room to contact TSC for guidance.
3. **GO TO** applicable step based on HPI pump suction source specified by Control Room: (see table below)	
4. Open the following (A-1-118, 1&2 HPI Hatch Area, East wall): __ 2HP-24 (2A HPI BWST SUCTION) __ 2HP-25 (2B HPI BWST SUCTION)	
5. Proceed to East Penetration Room and notify Control Room of the following: __ HPI suction aligned to BWST __ HPI pump cooling water status __ Available to throttle 2HP-26	
6. __ **EXIT** this enclosure.	

Step 3 table:

✓	Desired Suction Source	Applicable Step
	BWST	4
	LDST	7
	SFP	9

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. Proceed to East Penetration Room and notify Control Room of the following: __ HPI pump cooling water status __ Available to throttle 2HP-26	
8. __ **EXIT** this enclosure.	

••• END •••

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. Rack out the following breakers: __ 2A LPI Pump (2TC-9) __ 2B LPI Pump (2TD-10) __ 2A RBS Pump (2TC-10) __ 2B RBS Pump (2TD-11)	
10. __ Close 2LP-28 (BWST OUTLET) (Outside, East of Unit 2 BWST).	
11. Close the following (A-1, S end of 1&2 LPI Hatch Area, East wall): __ 2LP-21 (2A LPI BWST SUCTION) __ 2LP-22 (2B LPI BWST SUCTION) {32}	
12. __ Open 2HP-24 (2A HPI BWST SUCTION) (A-1-118, 1&2 HPI Hatch Area, East wall).	
13. Perform the following (A-1-128, ASW Pump Rm): A. __ Close ASW SWGR FDR (ASW SWGR FDR FROM B1T-UNIT 10) (ASW 4160/600V SWGR ASWS-5). B. __ Close ASWS-6D (UNITS 1/2/3 SF PRIMING PUMP TRANSFORMER BKR) (ASW 4160/600V SWGR ASWS-6). C. __ Close breaker U1/2 SF PRIMING PUMP (UNIT 1&2 SF PRIMING PUMP REMOTE STARTER) (S wall).	
14. Notify Control Room to stop the following: __ BWST Recirc Pump __ All SF Cooling pumps	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. Close the following (A-2-218, Unit 1&2 SF Cooler Rm): __ SF-53 (SF PUMP SUCTION HEADER BLOCK) __ SF-55 (SUCTION FROM UNIT 1 BWST) __ SF-54 (CANAL DRAIN HDR TO RECIRC. PUMP) __ SF-15 ('A' SF COOLER OUTLET) __ SF-17 ('B' SF COOLER OUTLET) __ SF-23 (UNIT 1 & 2 SF COOLER OUTLET HEADER BLOCK) (E wall by B cooler) __ SF-49 (SF FILTER OUTLET HEADER BLOCK) __ SF-57 (BWST RECIRC PUMP SUCTION) __ SF-94 (C SF COOLER OUTLET) (over C SF Pump)	
16. Open the following (A-2-218, Unit 1&2 SF Cooler Rm): __ SF-56 (SUCTION FROM UNIT 2 BWST) __ SF-21 (1&2 SFP COOLANT SUPPLY HEADER BLOCK)(Southwest) __ SF-51 ('B' SF COOLER OUTLET TO PUMP SUCTION HEADER)	
17. __ Close SF-22 (POOL SURFACE OUTLET) (A-4-407, Pen Rm, at crossover on chain).	
18. __ Open SF-50 (SF POOL UNDERWATER SUPPLY) (A-4-407, Pen Rm, at crossover on chain).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19. Notify Control Room to dispatch operators to the following locations to establish communications and await further instruction: __ A-1-128, ASW Pump Rm __ A-4-407, E Pen Rm	
20. __ Obtain bucket and rope from EOP equipment locker U2AB5 (A-5, U2 elevator lobby).	
21. Perform the following (A-6-619, Unit 1&2 SF Pool Rm, S end): A. __ Connect SF priming pump suction hose connected to quick disconnect fitting at SF-86 (SF PRIMING PUMP SEAL WATER INLET). B. __ Connect SF priming pump suction hose to SFP fill line connection tap on SF-85 (SF PRIMING PUMP UNDERWATER SUPPLY BLOCK). C. __ Open SF-85. D. __ Place flex hose on discharge of SF priming pump into SFP. E. __ Close SF-84 (SF POOL UNDERWATER SUPPLY VENT). F. __ Fill SF Priming Pump Seal Tank to at least half full with DW or water from SFP.	
22. __ **WHEN** communication is established with operators in the following locations: __ A-1-128, ASW Pump Rm __ A-4-407, E Pen Rm **THEN** open SF-86 (SF PRIMING PUMP SEAL WATER INLET) (A-6-619, Unit 1&2 SF Pool Rm, S end).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. __ Notify operator in ASW Pump Rm to start Unit 1&2 SF Priming Pump (remote starter on S wall).	
24. __ **IAAT** seal tank level begins to rise, **THEN** close SF-86 (SF PRIMING PUMP SEAL WATER INLET).	
25. __ **WHEN** SFP fill line is primed (as indicated by a steady discharge stream from the SF priming pump), **THEN** notify Control Room of the following: __ HPI suction aligned to SFP fill line __ HPI pump cooling water status __ An operator is available in the E Pen Rm to throttle 2HP-26	
26. __ **WHEN** HPI pump is started, **THEN** close SF-85 (SF PRIMING PUMP UNDERWATER SUPPLY BLOCK).	
27. __ Notify operator in ASW Pump Rm to stop Unit 1&2 SF Priming Pump.	
28. __ Close SF-86 (SF PRIMING PUMP SEAL WATER INLET).	
29. __ **EXIT** this enclosure.	

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-401

ALIGN SSF-ASW FOR SG FEED

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Align SSF-ASW for SG Feed

Alternate Path:

Yes

Facility JPM #:

NEW

K/A Rating(s):
System: APE054
K/A: AA1.01
Rating: 4.5/4.4

Task Standard:
Align SSF-ASW for SG Feed correctly per EOP Enclosure 5.34 (Aligning SSF-ASW for SG Feed).

Preferred Evaluation Location:

Simulator ____ In-Plant __X__

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:
Unit 2 EOP Enclosure 5.34 (Aligning SSF-ASW for SG Feed)

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:

None

Tools/Equipment/Procedures Needed:

Unit 2 EOP Enclosure 5.34 (Aligning SSF-ASW for SG Feed)

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 2 is in HPI Forced Cooling

Only one HPI pump is operating

The SSF has **NOT** been activated

INITIATING CUES:

The Control Room operator directs you to perform Enclosure 5.34 (Aligning SSF-ASW for SG Feed)

START TIME: _______

<u>STEP 1</u>: Step 1 Verify SSF-ASW Pump is operating. Step 1 **RNO** **GO TO** Step 5 <u>STANDARD</u>: Determine that the SSF-ASW Pump is not operating and utilize the **RNO** step and **GO TO** Step 5. ***Cue: If asked indicate that the SSF-ASW Pump is not operating.*** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 2</u>: Step 5 Verify any of the following: • Encl 5.34 (Aligning SSF-ASW for SG Feed) of Unit 1 EOP in progress • Encl 5.34 (Aligning SSF-ASW for SG Feed) of Unit 3 EOP in progress **GO TO** Step 9. ***Cue: If asked indicate that Encl 5.34 (Aligning SSF-ASW for SG Feed for Unit 1 and 3 is NOT in progress.*** <u>STANDARD</u>: Determine that Encl 5.34 (Aligning SSF-ASW for SG Feed for Unit 1 and 3 is **NOT** in progress and utilize the **RNO** step and **GO TO** Step 9. <u>COMMENTS</u>:	___ SAT ___ UNSAT

STEP 3: Step 9 Proceed to MCC 2XSF 600 VAC in the SSF HVAC Room with the following items: • Security Medeco Key • Emergency Ingress Key • Flashlight STANDARD: Candidate proceeds to supply room and identifies the location of the dedicated flashlight and the required keys to be carried to the SSF. Candidate proceeds to the SSF with the AP. ***Cue: When the flashlight and keys are located, inform the student that he/she is NOT required to actually carry them to the SSF for the purposes of this JPM.*** ***Inform candidate that the time will stop at the Control Room door and restart at the exit of the RP building.*** **Note: Add 1:45 to the candidate's time.** COMMENTS:	___ SAT ___ UNSAT
STEP 4: Step 10 Open 2XSF NORM INCOMING FDR BKR FROM 2X8-5B (2XSF-F5A) and remove Kirk Key. STANDARD: Candidate locates 2XSF located in the SSF HVAC Room and opens NORM INCOMING FDR BKR FROM 2X8-5B (2XSF-F5A) by rotating breaker switch to the OFF position. Remove the Kirk Key. ***Cue: As operator performs the key/breaker operation, indicate to operator the appropriate component positions.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

<u>STEP 5</u>: Step 11 Using Kirk Key, close 2XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5B (2XSF-F3A). <u>STANDARD</u>: Candidate locates 2XSF located in the SSF HVAC Room, uses the Kirk Key and closes 2XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5B (2XSF-F3A) by rotating breaker switch to the ON position. ***Cue:*** ***As operator performs the key/breaker operation, indicate to operator the appropriate component positions.*** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT
<u>STEP 6</u>: Step 12 Proceed to SSF Control Room. <u>STANDARD</u>: Candidate goes to the SSF Control Room. <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 7</u>: Step 13 Verify SSF diesel is operating. **GO TO** Step 15. <u>STANDARD</u>: Determine that the SSF diesel is NOT operating by observing frequency and volts. Also the Emergency Start light will NOT be lit. ***Cue:*** ***Indicate that no frequency or volts are indicated and the Emergency Start light is NOT lit.*** <u>COMMENTS</u>:	___ SAT ___ UNSAT

STEP 8: Step 15 Depress DIESEL EMERGENCY START pushbutton. STANDARD: The SSF Control Room DIESEL EMERGENCY START pushbutton is depressed. ***Cue: Allow ≈ 12 sec for the D/G to reach rated speed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 9: Step 16 Verify SSF diesel operating. STANDARD: Determine that the SSF diesel is operating by observing frequency and volts. Also the Emergency Start light is lit. ***Cue: Indicate that normal frequency and volts are indicated. Indicate that the Emergency Start light is lit.*** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Step 17 Adjust GOVERNOR CONTROL to obtain ≈ 60 Hz D/G frequency. STANDARD: The D/G HERTZ meter is monitored to determine frequency. ***Cue: Indicate D/G frequency is 60 Hertz on the SSF Control Room D/G HERTZ meter.*** COMMENTS:	___ SAT ___ UNSAT

STEP 11: Step 18 Adjust VOLTAGE REGULATOR to obtain ≈ 4160V. STANDARD: The D/G AC VOLTS meter is monitored to determine voltage. ***Cue: Indicate D/G voltage is 4160 volts on the SSF Control Room D/G AC VOLTS meter.*** COMMENTS:	___ SAT ___ UNSAT
STEP 12: Step 19 Open OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T). STANDARD: Green TRIP pushbutton on the SSF OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T) control switch is pressed. ***Cue: Inform student that the green light for OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T) is on and the red light is off.*** **NOTE: On a loss of power to Unit 2, OTS1-1 would have already tripped open.** COMMENTS:	___ SAT ___ UNSAT
STEP 13: Step 20 After 3 seconds, close OTS1-4 (DIESEL GEN BREAKER). STANDARD: The red CLOSE pushbutton on the SSF Control Room OTS1-4 (DIESEL GEN BREAKER) switch is depressed. Verify that the red CLOSE light is illuminated. ***Cue: After student closes in diesel generator breaker, inform candidate that red light is on and green light is off.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 14: Step 21 Close OTS1-3 (SSF 600V OXSF FDR BKR CONTROL). STANDARD: Red CLOSE breaker position indicating light is observed to be on at the SSF OTS1-3 (SSF 600V OXSF FDR BKR CONTROL) switch. ***Cue: Inform student the red light is on and the green light is off.*** COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 22 Close OXSF-4B (SSF LC OXSF 600V INC BKR). STANDARD: Red CLOSE breaker position indicating light is observed to be on at the (SSF OXSF-4B SSF LC OXSF 600V INC BKR) switch. ***Cue: Inform candidate the red light is on and the green light is off.*** COMMENTS:	___ SAT ___ UNSAT
STEP 16: Step 23 Verify D/G SER WTR PMP FLOW is ≈ 500 gpm. STANDARD: Determine D/G SER WTR PMP FLOW is 0 gpm by observing the D/G SER WTR PMP FLOW gauge and then perform Step 23 **RNO**. ***Cue: Indicate to the candidate that D/G SER WTR PMP FLOW is 500 gpm.*** COMMENTS:	___ SAT ___ UNSAT

<u>STEP 17</u>: Step 23 **RNO** Start the Diesel Engine Service Water Pump. <u>STANDARD</u>: The candidate places the D/G SER WTR PUMP switch to on. ***Cue: After the D/G SERV WTR PUMP switch is placed in on, inform candidate of the following:*** • ***D/G SERV WTR PUMP DISCH FLOW meter indicates 500 gpm flow.*** • ***Red ON light at D/G SER WTR PUMP switch is on.*** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT
<u>STEP 18</u>: Step 24 **GO TO** Step 39. <u>STANDARD</u>: Candidate transfers to Step 39. <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 19</u>: Step 39 Close 2CCW-268 (SSF ASWP TO SG SUPPLY). <u>STANDARD</u>: Red CLOSED button is depressed for 2CCW-268 and verify that the red CLOSED light is illuminated. ***Cue: Inform the candidate the Red light is OFF and the Green light is ON.*** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 20: Step 40 Open 2CCW-287 (SSF ASWP TO SG SUPPLY BLOCK). STANDARD: Red OPEN button is pressed for 2CCW-287 and verify that the red OPEN light illuminates. ***Cue: After allowing ≈ 25 seconds for valve stroke time, inform the candidate the Red light is ON and the Green light is OFF.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 21: Step 41 Start SSF-ASW Pump. STANDARD: SSF AUX SERVICE WTR PUMP red ON pushbutton is pressed. **Cue: After ASW pump ON pushbutton is pressed, inform candidate of the following:** • ***ASW pump red light is on and green light is off.*** • ***SSF Control Room AUX SER WTR PUMP AMPS meter indicates on scale.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 22: Step 42 Notify Unit 2 CRO that SSF-ASW Pump is operating and ready to feed. STANDARD: Inform Unit 2 CRO that SSF-ASW Pump is operating and ready to feed using either a phone or radio. COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: ____________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Step must be performed to power the SSF from the Diesel/Generator.
5	Step must be performed to power the SSF from the Diesel/Generator.
8	Step must be performed to start the diesel and get power for the SSF.
13	Step must be performed to power the SSF from the Diesel/Generator.
17	Step is necessary to start the Diesel Engine Service Water Pump for SSF Diesel cooling.
19	Step is necessary to lineup the SSF ASW to supply the SGs.
20	Step is necessary to lineup the SSF ASW to supply the SGs.
21	Step is required to start the SSF ASWP.

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

INITIAL CONDITIONS:

Unit 2 is in HPI Forced Cooling

Only one HPI pump is operating

The SSF has **NOT** been activated

INITIATING CUES:

The Control Room operator directs you to perform Enclosure 5.34 (Aligning SSF-ASW for SG Feed)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Verify SSF-ASW Pump is operating.	__ **GO TO** Step 5.
2. __ Close 2CCW-268 (SSF ASWP TO SG SUPPLY) (SSF Control Rm).	
3. __ Open 2CCW-287 (SSF ASWP TO SG SUPPLY BLOCK) (SSF Control Rm).	
4. __ **GO TO** Step 42.	

NOTE

One or more units may be performing this enclosure for the respective unit. The first unit to begin this enclosure will take the lead in providing power to and starting the SSF-ASW Pump.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5. Verify <u>any</u> of the following: __ Encl 5.34 (Aligning SSF-ASW for SG Feed) of Unit 1 EOP is in progress __ Encl 5.34 (Aligning SSF-ASW for SG Feed) of Unit 3 EOP is in progress	__ **GO TO** Step 9.
6. __ Close 2CCW-268 (SSF ASWP TO SG SUPPLY) (SSF Control Rm).	
7. __ Open 2CCW-287 (SSF ASWP TO SG SUPPLY BLOCK) (SSF Control Rm).	
8. __ **WHEN** SSF-ASW Pump is operating, **THEN GO TO** Step 42.	
9. __ Proceed to MCC 2XSF 600 VAC in the SSF HVAC Room with the following items: • Security Medeco Key • Emergency Ingress Key • Flashlight	
10. __ Open 2XSF NORM INCOMING FDR BKR FROM 2X8-5B (2XSF-F5A) and remove Kirk Key.	
11. __ Using Kirk Key, close 2XSF ALTERNATE INCOMING FDR BKR FROM OXSF-5B (2XSF-F3A).	
12. __ Proceed to SSF Control Room.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. __ Verify SSF diesel is operating.	__ **GO TO** Step 15.
14. __ **GO TO** Step 39.	
15. __ Depress DIESEL EMERGENCY START pushbutton.	
16. __ Verify SSF diesel operating.	__ **GO TO** Step 25.
17. __ Adjust GOVERNOR CONTROL to obtain ≈ 60 Hz D/G frequency.	
18. __ Adjust VOLTAGE REGULATOR to obtain ≈ 4160V.	
19. __ Open OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T).	__ **GO TO** Step 25.
20. __ After 3 seconds, close OTS1-4 (DIESEL GEN BREAKER).	__ **GO TO** Step 25.
21. __ Close OTS1-3 (SSF 600V OXSF FDR BKR CONTROL).	
22. __ Close OXSF-4B (SSF LC OXSF 600V INC BKR).	
23. __ Verify D/G SER WTR PMP FLOW is ≈ 500 gpm.	__ Start the Diesel Engine Service Water Pump.
24. __ **GO TO** Step 39.	
25. Verify <u>both</u> of the following: __ CT-2 is aligned to two units __ Unit 2 MFB 2 (B2T) energized from CT-2	__ **GO TO** Step 28.
26. Notify the following that power is **NOT** available to SSF-ASW Pump: __ CR SRO in <u>all</u> Units __ TSC	
27. __ **EXIT** this enclosure.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28. __ Verify ES Channels 1 and 2 have actuated on <u>any</u> unit.	__ **GO TO** Step 30.
29. __ Ensure Load Shed modules for affected units are in manual: • LOAD SHED & STANDBY BKR 1 • LOAD SHED & STANDBY BKR 2	
30. __ Verify Load Shed has occurred on Unit 2.	__ **GO TO** Step 32.
31. Notify Unit 2 to simultaneously press RESET on the following switches: __ MFB UNDERVOLTAGE CHANNEL 1 RESET __ MFB UNDERVOLTAGE CHANNEL 2 RESET	
32. __ Verify Unit 2 MFB 2 (B2T) energized from CT-2.	1. __ **IF** Unit 2 MFB 2 (B2T) energized from CT-4, **THEN** notify Unit 2 of the following: __ Ensure CT-4 load is ≤ 16 MVA by reducing loads as necessary. __ Encl 5.1A (CT-4 Overload Limits) of AP/2/11 (Recovery From Loss of Power) provides guidance for load limits on CT-4. 2. __ **IF** Unit 2 MFB 2 (B2T) energized from CT-5, **THEN** notify Unit 2 of the following: __ Ensure CT-5 load is ≤ 16 MVA by reducing loads as necessary. __ Encl 5.1B (CT-5 Overload Limits) of AP/2/11 (Recovery From Loss of Power) provides guidance for load limits on CT-5. 3. __ **GO TO** Step 34.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33. Ensure Unit 2 loads as indicated on CT2 Amps 4kV are within the following initial limits:	

✓	Unit 2 MFBs Supplied By CT-2	Initial Limit (amps)
	Both MFBs	≤ 3000
	MFB 2 (B2T) only	≤ 2350

34. __ Open OTS1-4 (DIESEL GEN BREAKER).	
35. __ Notify Unit 2 to close 4KV FDR BKR B2T-4 SSF 4KV SWGR OTS1-1.	
36. __ Close OTS1-1 (SSF NORMAL POWER SUPPLY BREAKER B2T).	
37. __ Close OTS1-3 (SSF 600V OXSF FDR BKR CONTROL).	

38. Notify Unit 2 to maintain load on transformer supplying power within the following limits:

	Power Supply	Unit 2 Busses Supplied	Limit
	CT-2	Both MFBs	≤ 3650 amps on CT2 Amps 4kV
	CT-2	MFB 2 (B2T) only	≤ 3000 amps on CT2 Amps 4kV
	CT-4	N/A	Per Encl 5.1A (CT-4 Overload Limits) of AP/2/11 (Recovery From Loss of Power)
	CT-5	N/A	Per Encl 5.1B (CT-5 Overload Limits) of AP/2/11 (Recovery From Loss of Power)

39. __ Close 2CCW-268 (SSF ASWP TO SG SUPPLY).	
40. __ Open 2CCW-287 (SSF ASWP TO SG SUPPLY BLOCK).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
41. __ Start SSF-ASW Pump.	
42. __ Notify Unit 2 CRO that SSF-ASW Pump is operating and ready to feed.	
43. __ **IAAT** the CRO directs feeding, (including verifying ability to feed via 2CCW-268), **THEN** perform Steps 44 - 47.	__ **GO TO** Step 48.
44. __ Verify feeding 2A SG is desired.	__ **GO TO** Step 46.
45. __ Open 2CCW-269 (A STEAM GEN FDW CONTROL).	
46. __ Verify feeding 2B SG is desired.	__ Close 2FDW-347 (B STEAM GEN FDW CONTROL).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- The Control Room will specify flow rate. Once initiated, a continuous flow should be maintained to avoid unnecessary thermal cycling of EFDW nozzles.
- 2CCW-268 (SSF ASWP TO SG SUPPLY) **CANNOT** be throttled closed <13%. When throttling closed, a limit switch closes the valve when it reaches 13% open. 2CCW-268 will initially open to 15% before throttling can occur through 100%.

47. Throttle the following as required to obtain the specified flow **NOT** to exceed total flow limit for all three units per Table 1 below:
    - __ 2CCW-268 (SSF ASWP TO SG SUPPLY)
    - __ 2CCW-410 (SSF ASW PUMP TO S/G SUPPLY BYPASS) (SSF basement catwalk)

Table 1

Total SSF-ASW Flow Limits

- Time since Rx shutdown ≤ 1 hr: ≤ 1275 total SSF-ASW flow to all three units
- Time since Rx shutdown > 1 hr: ≤ 1000 total SSF-ASW flow to all three units

48. __ **IAAT** both SGs are being fed,
    AND balancing flow between SGs is desired,
    THEN adjust the following as required:
    - __ 2CCW-269 (A STEAM GEN FDW CONTROL)
    - __ 2FDW-347 (B STEAM GEN FDW CONTROL)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
49. __ **IAAT** SSF-ASW feed is no longer required, **THEN** close the following: __ 2CCW-268 (SSF ASWP TO SG SUPPLY) __ 2CCW-410 (SSF ASW PUMP TO S/G SUPPLY BYPASS) __ 2CCW-287 (SSF ASWP TO SG SUPPLY BLOCK) __ 2CCW-269 (A STEAM GEN FDW CONTROL)	

NOTE

Remaining plant actions need only be performed by one unit. Each unit has this enclosure in their EOP and remaining actions are identical in all enclosures. Determination of which unit should take the lead in performing these actions should be based on the number of units performing this enclosure and manpower availability.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
50. __ Determine which unit will perform the remaining actions of this enclosure.	
51. __ Verify Unit 1 or 3 will perform remaining actions.	__ **GO TO** Step 53.
52. __ **WHEN** Station Management approves, **THEN EXIT** this enclosure.	

• END •

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status Unit 2 has taken the lead to perform the remaining steps in this enclosure.	
53. __ **IAAT** SSF Control Room temperature exceeds 85°F, **THEN** notify TSC to install portable spot coolers.	
54. __ Notify I&E and Maintenance to **PREPARE** the dedicated submersible pump for installation in Unit 2 CCW piping per AM/0/A/1300/059 (Pump-Submersible- Emergency SSF Water Supply-Installation).	
55. __ **IAAT** both of the following are lost in Unit 2: __ CCW forced flow __ CCW gravity/siphon flow **THEN GO TO** Step 57.	
56. __ **WHEN** Station Management approves, **THEN EXIT** this enclosure.	

••• END •••

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Unit Status

CCW forced flow and CCW gravity/siphon flow has been lost.

57. __ Record time of loss of CCW forced and gravity/siphon flow: ____________	

NOTE

The Dedicated Submersible Pump must be installed and started within 3 hours and 20 minutes of loss of both forced and gravity/siphon flow on the Unit 2 CCW System.

58. __ Notify I&E and Maintenance to install dedicated submersible pump in Unit 2 CCW piping per AM/0/A/1300/059 (Pump-Submersible- Emergency SSF Water Supply-Installation).	

NOTE

Actions in the following step must be completed between 1 hour and 45 minutes and 2 hours of the loss of CCW flow.

59. __ **IAAT** 1 hour and 45 minutes have elapsed since CCW flow was lost (See Step 57), **THEN** perform the following: A. __ Open CCW-384 (JACKET COOLING WATER TO YARD DRAIN ISOLATION) (SSF D/G Rm, SW of B Diesel). B. __ Close CCW-286 (SSF DIESEL COOLING JACKET RETURN) (D/G Pump Rm). C. __ Throttle CCW-285 (SSF DIESEL SERVICE WATER PUMP DISCHARGE) to maintain 500 gpm through D/G (D/G Pump Rm).	
60. __ **IAAT** I&E and Maintenance have completed installation of dedicated submersible pump, **THEN** perform Steps 61 - 63.	__ **GO TO** Step 64.
61. __ Rack in and close OXSF-4D (SUBMERSIBLE PUMP BKR) (SSF Electrical Equipment Rm).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
62. __ Close CCW-RS-0010 (SUBMERSIBLE PUMP REMOTE STARTER BKR) (Outside SSF CR).	
63. __ Start dedicated submersible pump using switch on remote starter breaker (Outside SSF CR).	
64. __ **IAAT** dedicated submersible pump is installed, **AND CANNOT** be operated, **THEN** notify Control Room to perform Steps 65 and 66.	__ **GO TO** Step 67.
65. __ Verify Unit 2 CCW piping intact.	1. __ Notify TSC to determine method of supplying suction to SSF-ASW. 2. __ **GO TO** Step 67.
66. __ Dispatch an operator to perform Encl 5.5 (Supply of Water To SSF) of AP/0/25 (Standby Shutdown Facility Emergency Operating Procedure).	
67. __ **WHEN** Station Management approves, **THEN EXIT** this enclosure.	

END

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

NLO-007

START DIESEL AIR COMPRESSOR AND ALIGN TO SERVICE AIR HEADER

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Start Diesel Air Compressor and Align to Service Air Header

Alternate Path:

Yes

Facility JPM #:

NLO-007

K/A Rating(s):

System: APE065
K/A: AA1.04
Rating: 3.5/3.4

Task Standard:

The Diesel Air Compressor NOT operating is started and aligned to the Service Air Header correctly per procedure.

Preferred Evaluation Location:

Simulator _____ In-Plant __X__

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

AP/2/A/1700/22, Enclosure 5.4 (Emergency Start of the Diesel Air Compressor)
AP/2/A/1700/22, Enclosure 5.7 (Manual Start of Diesel Air Compressors)

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:

None

Tools/Equipment/Procedures Needed:

AP/2/A/1700/22, Enclosure 5.4 (Emergency Start of the Diesel Air Compressor)

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:

Units 1, 2, and 3 are operating at 100% power.

The Unit 1 Control Room Operator receives the "INSTRUMENT AIR SYSTEM TROUBLE" Statalarm and observes that Instrument Air pressure is decreasing on the Control Room IA pressure gauge.

INITIATING CUES:

The Unit 2 Control Room Operator directs you to perform Encl. 5.4 (Emergency Start of the Diesel Air Compressor) of AP/2/A/1700/22 (Loss Of Instrument Air).

START TIME: _______

Note: The procedure is pre-staged at the Diesel Air Compressor. After the candidate locates the procedure, hand him a copy of the procedure to use.

NOTE Ingersoll-Rand Diesel Air Compressor SNs 340574, 339718 and 339713 have Auto Start capability. <u>STEP 1</u>: Encl. 5.4 Step 1 Verify all Diesel Air Compressors with Auto / Manual switches in Auto are running. <u>STANDARD</u>: Determine that Ingersoll-Rand Diesel Air Compressor SN 340574 is in AUTO and NOT operating and perform RNO step. ***Cue:*** ***Indicate to the operator that Ingersoll-Rand Diesel Air Compressor SN 340574 is in AUTO and NOT operating. (No noise, RPMs, or discharge pressure) and the other two compressors are in AUTO and operating.*** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 2</u>: Encl. 5.4 Step 1 **RNO** Perform one manual start on each Diesel Air Compressor that did **NOT** Auto start using Encl 5.7 (Manual Start of Diesel Air Compressors). <u>STANDARD</u>: Perform a manual start on Ingersoll-Rand Diesel Air Compressor SN 340574 using Encl 5.7 (Manual Start of Diesel Air Compressors). <u>COMMENTS</u>:	___ SAT ___ UNSAT

STEP 3: Encl. 5.7 Step 1 **GO TO** applicable step to manually start Diesel Air Compressor: √ | Compressor | Step | Ingersoll-Rand (Auto start capability) SNs 340574, 339718 and 339713 | 2 | Ingersoll-Rand (5421) | 9 | Any other Diesel Air Compressor | 17 STANDARD: Note the compressor that did not start from the table and **GO TO** Step 2. COMMENTS:	___ SAT ___ UNSAT
STEP 4: Encl. 5.7 Step 2 Position Auto / Manual toggle switch to Manual. STANDARD: Locate and position Auto / Manual toggle switch to Manual. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Encl. 5.7 Step 3 Ensure Battery Switch is in ON position (Behind panel door on West side of Diesel Air Compressor). STANDARD: Open panel door on West side of compressor and ensure the battery Switch is in ON position. COMMENTS:	___ SAT ___ UNSAT

NOTE Engine ignition switch has 3 positions, STOP, ON, and ENGINE START. The engine ignition switch must be ON to have panel indication. All warning lamps will illuminate briefly to test the lamps: the Low Engine Oil Pressure light and the Low Battery Voltage light will remain flashing until the engine is started. Control panel display will display 1.70 when engine ignition switch is turned to the ON position and then clear, if no fault is present. The (LAMPS) switch may be used to illuminate the panel for night operation. STEP 6: Encl. 5.7 Step 4 Position engine ignition switch to ON. STANDARD: Position engine ignition switch to ON (already ON). COMMENTS:	___ SAT ___ UNSAT
CAUTION The engine starter motor should **NOT** be operated continuously for more than 10 seconds. STEP 7: Encl. 5.7 Step 5 Position engine ignition switch to ENGINE START position until engine starts, then release. STANDARD: Position engine ignition switch to ENGINE START position after verifying that engine start release switch. ***Cue:*** ***Indicate that the compressor starts when engine ignition switch is placed in the ENGINE START position*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

<u>STEP 8</u>: Encl. 5.7 Step 6 Depress PRESSURE CONTROL button to allow compressor to load fully. <u>STANDARD</u>: Locate and depress PRESSURE CONTROL pushbutton. ***Cue: Indicate to the candidate that the compressor is loaded by the change in the sound.*** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT
<u>STEP 9</u>: Encl. 5.7 Step 7 Open SA-2955; SERVICE AIR VALVE (South end of compressor at discharge hose). <u>STANDARD</u>: Locate and verify SA-2955 is open by observing the handle parallel with the hose. <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 10</u>: Encl. 5.7 Step 8 Locate check valve at end of compressor discharge hose and open associated block valve per table below:	___ SAT ___ UNSAT

√	**Check Valve**	**Block Valve**
	SA-2944	SA-2797
	SA-2947	SA-2945
	SA-2950	SA-2948

<u>STANDARD</u>: Verify SA-2948 is open by observing the handle parallel with the hose and then **GO TO** Encl. 5.4 Step 2.

<u>COMMENTS</u>:

STEP 11: Encl. 5.4 Step 2 Position Auto / Manual toggle switches to Manual for all running Diesel Air Compressors. STANDARD: Position Auto / Manual toggle switches to Manual for ALL Ingersoll-Rand Diesel Air Compressors. COMMENTS:	___ SAT ___ UNSAT
STEP 12: Encl. 5.4 Step 3 Verify any Diesel Air Compressor running. STANDARD: Determine that ALL Diesel Air Compressors are running by observing RPMs, discharge pressure, etc. ***Cue: Indicate that the compressors have normal RPMs and discharge pressure.*** COMMENTS:	___ SAT ___ UNSAT
STEP 13: Encl. 5.4 Step 4 Open SA-339 (DIESEL AIR COMPRESSOR STOP) (T-3/F/G-56) STANDARD: Verify SA-339 (Diesel Air Compressor Stop) is open by observing the T-handle is parallel with pipe. COMMENTS:	___ SAT ___ UNSAT

<u>STEP 14</u>: Encl. 5.4 Step 5 Close the following: • SA-12 (B SULLAIR AUTO DRAIN BYPASS) (T-3/K-56) • SA-6 (A SULLAIR AUTO DRAIN BYPASS) (T-3/J-56) <u>STANDARD</u>: Valves are located behind the Sullair Compressors and manually closed by rotating handwheel clockwise until each valve reaches a hard stop. ***Cue: Indicate to the operator that the valves have reached a hard stop.*** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT
<u>NOTE</u> SA-141 (SA TO IA CONTROLLER) automatically regulates IA header pressure to 85 psig. Opening SA-143 will bypass SA-141 and allow SA header to pressurize the IA header greater than 85 psig. <u>STEP 15</u>: Encl. 5.4 Step 6 OPEN SA-143 (SA TO IA CONTROLLER BYPASS) (T-1/L-33, 15' E) <u>STANDARD</u>: Valve is located in the Turbine Building basement and the chain pulled to rotate the valve counter clockwise until it reaches a hard stop. ***Cue: After the operator indicates that he will open SA-143, inform operator that valve is open*** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 11</u>: Encl. 5.4 Step 7 Notify Unit 2 CR of Diesel Air Compressor status. <u>STANDARD</u>: Unit 2 CR is notified that ALL Diesel Air Compressors are operating using a phone or radio. <u>COMMENTS</u>: **END TASK**	___ SAT ___ UNSAT

STOP TIME: ____________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Required to manually start compressor
7	Required to manually start compressor
8	Required to manually start compressor
14	Closed to reduce air loss.

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

INITIAL CONDITIONS:

Units 1, 2, and 3 are operating at 100% power.

The Unit 1 Control Room Operator receives the "INSTRUMENT AIR SYSTEM TROUBLE" Statalarm and observes that Instrument Air pressure is decreasing on the Control Room IA pressure gauge.

INITIATING CUES:

The Unit 2 Control Room Operator directs you to perform Encl. 5.4 (Emergency Start of the Diesel Air Compressor) of AP/2/A/1700/22 (Loss Of Instrument Air).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Ingersoll-Rand Diesel Air Compressors SNs 340574, 339718 and 339713 have Auto Start capability.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ Verify all Diesel Air Compressors with Auto / Manual switches in Auto are running.	__ Perform one manual start on each Diesel Air Compressor that did **NOT** Auto start using Encl 5.7 (Manual Start of Diesel Air Compressors).
2. __ Position Auto / Manual toggle switches to Manual for all running Diesel Air Compressors.	
3. __ Verify any Diesel Air Compressor running.	__ Start any available Diesel Air Compressor using Encl 5.7 (Manual Start of Diesel Air Compressors).
4. __ Open SA-339 (DIESEL AIR COMPRESSOR STOP) (T-3/F/G-56).	
5. Close the following: __ SA-12 (B SULLAIR AUTO DRAIN BYPASS) (T-3/K-56) __ SA-6 (A SULLAIR AUTO DRAIN BYPASS) (T-3/J-56)	

NOTE

SA-141 (SA TO IA CONTROLLER) automatically regulates IA header pressure to 85 psig. Opening SA-143 will bypass SA-141 and allow the SA header to pressurize the IA header greater than 85 psig.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. __ Open SA-143 (SERVICE AIR TO INSTRUMENT AIR CONTROLLER BYPASS) (T-1/L-33, 5' E on chain).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. __ Notify Unit 2 CR of Diesel Air Compressor status.	

NOTE

OP/0/A/1106/027 (Compressed Air System) provides needed monitoring and shutdown guidance.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. __ Notify WCC SRO to initiate Encl 4.31 (Ingersoll-Rand HP1600WCU Diesel Air Compressor Operation, SNs 340574, 339718 and 339713) of OP/0/A/1106/027 (Compressed Air System) to assure periodic monitoring requirements are met.	
9. __ **WHEN** it is desired to secure running Diesel Air Compressors, **THEN** close SA-143 (SERVICE AIR TO INSTRUMENT AIR CONTROLLER BYPASS) (T-1/L-33, 5' E on chain).	
10. __ Shutdown and align running Diesel Air Compressors per OP/0/A/1106/027 (Compressed Air System).	
11. __ Throttle the following per Encl 4.3 (Operation Of Service Air Compressors) of OP/0/A/1106/027 (Compressed Air System): • SA-6 (A SULLAIR AUTO DRAIN BYPASS) (T-3/J-56) • SA-12 (B SULLAIR AUTO DRAIN BYPASS) (T-3/K-56)	

[redacted]

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. **GO TO** applicable step to manually start Diesel Air Compressor:	

	Compressor	Step
	Ingersoll-Rand (Auto start capability) SNs 340574, 339718 and 339713	2
	Ingersoll-Rand (5421)	9
	Any other Diesel Air Compressor	17

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2. __ Position Auto / Manual toggle switch to Manual.	
3. __ Ensure Battery Switch is in ON position (Behind panel door on West side of Diesel Air Compressor).	

NOTE

- Engine ignition switch has 3 positions, STOP, ON, and ENGINE START.
- The engine ignition switch must be ON to have panel indication. All warning lamps will illuminate briefly to test the lamps: the Low Engine Oil Pressure light and the Low Battery Voltage light will remain flashing until the engine is started.
- Control panel display will display 1.70 when engine ignition switch is turned to the ON position and then clear, if no fault is present.
- The (LAMPS) switch may be used to illuminate the panel for night operation.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4. __ Position engine ignition switch to ON.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION The engine starter motor should **NOT** be operated continuously for more than 10 seconds.	
5. __ Position engine ignition switch to ENGINE START position until engine starts, then release.	__ **GO TO** Encl 5.4 (Emergency Start of the Diesel Air Compressor) Step 1.
6. __ Depress PRESSURE CONTROL button to allow compressor to load fully.	
7. __ Open SERVICE AIR VALVE (South end of compressor at discharge hose) using table below:	
8. __ Locate check valve at end of compressor discharge hose <u>and</u> <u>open</u> associated block valve per table below:	

Table for step 7:

	Diesel Air Compressor SN	Valve
	340574	SA-2955
	339713	SA-2963
	339718	SERVICE AIR VALVE

Table for step 8:

	Check Valve	Block Valve
	SA-2944	SA-2797
	SA-2947	SA-2945
	SA-2950	SA-2948

[redacted]

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The POWER toggle switch must be ON to have panel indication. All warning lamps will illuminate briefly to test the lamps. The Low Engine Oil Pressure light and the Alternator Not Charging light will stay on until the engine is started.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. __ Position the POWER toggle switch to ON.	
10. __ Verify outside air temperature is above freezing.	1.__ Place the HEATERS toggle switch to ON. 2.__ **WHEN** a minimum of 60 seconds has passed since placing heaters on, **THEN** continue this enclosure.
11. __ Depress and <u>hold</u> BYPASS button for 10 - 15 seconds.	
12. __ Depress START button <u>and</u> release when engine starts.	
13. __ **WHEN** engine speed is $\geq$ 1000 rpm, release BYPASS button.	
14. __ Push the SERVICE AIR button to allow the compressor to fully load.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. __ Open SERVICE AIR VALVE (located at discharge of Diesel Air Compressor).	
16. __ Locate check valve at end of compressor discharge hose and open associated block valve per table below:	

	Check Valve	Block Valve
	SA-2944	SA-2797
	SA-2947	SA-2945
	SA-2950	SA-2948

[redacted]

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17. __ Use starting instructions at Diesel Air Compressor control panel to start diesel air compressor.	
18. __ Open isolation valve on Diesel Air Compressor discharge.	
19. __ Locate check valve at end of compressor discharge hose <u>and</u> <u>open</u> associated block valve per table below:	

	Check Valve	Block Valve
	SA-2944	SA-2797
	SA-2947	SA-2945
	SA-2950	SA-2948

[redacted]

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-105

RCS BORATION FROM CBAST

CANDIDATE ______________________________

EXAMINER ______________________________

DATE

Tools/Equipment/Procedures Needed:

OP/1/A/1103/004 A Encl. 4.1

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 shutdown in progress

RCS Boration is desired

INITIATING CUES:

The SRO directs you to add a 50 gallon batch of CBAST to the RCS using OP/1/A/1103/004 A Encl. 4.1.

Begin at Step 1.3.

START TIME: _______

<u>STEP 1</u>: Step 1.3 Review Limits and Precautions <u>STANDARD</u>: Candidate reviews Limits and Precautions. <u>COMMENTS</u>:	___ SAT ___ UNSAT
NOTE: Placing an idle Letdown Filter in service can change RCS boron by adding ≈60 gals of water to RCS at different boron (negligible for RCS boration). (R.M.) <u>STEP 2</u>: Step 2.3 **IF** two Letdown Filters are available: • 1HP-17 (1A LETDOWN FILTER INLET) switch to "OPEN" • 1HP-18 (1B LETDOWN FILTER INLET) switch to "OPEN" <u>STANDARD</u>: Determine 1HP-17 is open by observing the red open light is lit on 1UB1. Open 1HP-18 (on 1UB1) by placing the switch in the open position and verify the red open light illuminates. <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 3</u>: Step 2.4 Ensure open 1CS-64 (CBAST OUTLET). <u>STANDARD</u>: Locate 1CS-64 on 1AB1 and verify 1CS-64 is open by the observing the red open light is lit. <u>COMMENTS</u>:	___ SAT ___ UNSAT

STEP 4: Step 2.5 Open 1CS-72 (CBAST Header to Letdown Filter Inlet). (A-2 LDST Hatch area) STANDARD: Contact an NEO by phone or radio and direct the NEO to open 1CS-72 (CBAST Header to Letdown Filter Inlet). (A-2 LDST Hatch area). ***Cue: Simulator instructor will indicate that time compression has been used and 1CS-72 is open.*** ***Simulator Operator: Open 1CS-72 by using the Valve Program.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Step 2.6 Ensure 1HP-15 Controller reset for Normal Operations. STANDARD: Verify 1HP-15 Controller located on 1UB1 is reset for Normal Operations by: • Push Stop/Start • Ensure mode selector set to MANUAL • Ensure Controller display set to "P" • Ensure Controller valve position set to 100% open. • Ensure Controller Start-Stop set to "START" COMMENTS:	___ SAT ___ UNSAT
STEP 6: Step 2.7 Ensure 1HP-15 batch reset by selecting "STOP" / "START". STANDARD: 1HP-15 batch is reset by selecting "STOP" / "START" on the controller located on 1UB1. COMMENTS:	___ SAT ___ UNSAT

STEP 7: Step 2.8 **IF** desired, operate the 1A CBAST pump in manual per Section 3 "Make-Up With 1A CBAST Pump In Manual" STANDARD: Determine makeup in manual is NOT desired. ***Cue: If asked as the SRO, inform the candidate that manual operation of the CBAST pump is NOT desired.*** COMMENTS:	___ SAT ___ UNSAT
NOTE: If a Deborating IX is in service the CBAST pump must be operated in manual. STEP 8: Step 2.9 **IF** desired, operate the 1A CBAST pump in auto per Section 4 "Make-Up With 1A CBAST Pump In Auto" STANDARD: Determine makeup in auto is desired and perform Section 4 "Make-Up With 1A CBAST Pump In Auto". COMMENTS:	___ SAT ___ UNSAT
NOTE: If a Deborating IX is in service the CBAST pump should be operated in manual. STEP 9: Step 4.1 Verify a Deborating IX is **NOT** in service. STANDARD: Verify a Deborating IX is **NOT** in service by the following: • Observe 1CS-27 (DEBOR IX INLET) and 1CS-32/37 (SPARE DBOR IX INLET & OUTLET) located on 1AB1 is closed. COMMENTS:	___ SAT ___ UNSAT

STEP 10:	Step 4.2 Verify open 1CS-64 (CBAST OUTLET).	___ SAT ___ UNSAT
STANDARD:	Locate 1CS-64 on 1AB1 and verify 1CS-64 is open by the observing the red open light is lit.	
COMMENTS:		
STEP 11:	Step 4.3 Ensure open 1HP-16 (LDST MAKEUP ISOLATION).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Open 1HP-16 located on 1UB1 by placing the switch to the open position and verifying the red open light illuminates.	
COMMENTS:		
STEP 12:	Step 4.4 Select "S" on 1HP-15 Controller and enter batch size. (R.M.)	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Depress the "D" button until "S" appears in the window. Enter 50 gallons as the batch size by rotating the input knob until 50 is in the window.	
COMMENTS:		
STEP 13:	Step 4.5 Select "P" on 1HP-15 Controller.	___ SAT ___ UNSAT
STANDARD:	Depress the "D" button until "P" appears in the window.	
COMMENTS:		

STEP 14: Step 4.6 Place 1A CBAST pump to "AUTO". STANDARD: Place 1A CBAST pump to "AUTO" by placing HAND/AUTO switch in the AUTO position. COMMENTS:	___ SAT ___ UNSAT
NOTE: LDST temperature may increase from adding CBAST because of CBAST temperature. STEP 15: Step 4.7 Place 1A CBAST pump to "ON". STANDARD: Start the 1A CBAST pump to "ON" by placing the start switch to the "ON" position and verify the red on light illuminates. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
NOTE: CBAST should **NOT** be pumped < 6" using 1A CBAST pump. STEP 16: Step 4.8 **WHEN** desired volume is added, verify 1A CBAST pump off. (R.M.) STANDARD: Observe the display on 1HP-15. As CBAST is added the number will increase and LDST level will increase. When the display reaches 50, verify that the CBAST pumps stops by observing the green stop light is illuminated and the red "on" light is off. COMMENTS:	___ SAT ___ UNSAT

STEP 17: Step 4.9 Place 1A CBAST pump to "MAN". STANDARD: Place 1A CBAST pump switch located on 1UB1 to "MAN". COMMENTS:	___ SAT ___ UNSAT
STEP 18: Step 4.10 Ensure 1HP-15 batch reset by selecting "STOP" / "START". STANDARD: 1HP-15 batch is reset by selecting "STOP" / "START" on the controller located on 1UB1. COMMENTS:	___ SAT ___ UNSAT
STEP 19: Step 4.11 Close 1HP-16 (LDST MAKEUP ISOLATION). (R.M.) STANDARD: Close 1HP-16 located on 1UB1 by placing the switch to the close position and verifying the green close light illuminates. COMMENTS:	___ SAT ___ UNSAT

NOTE: 50 gal flush must be performed to ensure calculated volume of CBAST is added to LDST. (R.M.) STEP 20: Step 4.12 Perform flush to LDST per Section 6 "Flush From CBAST To LDST" STANDARD: Indicate the Section 6 "Flush From CBAST To LDST" should be performed. ***Cue: Inform candidate that the flush is complete.*** COMMENTS:	___ SAT ___ UNSAT
STEP 21: Step 2.10 **IF** a Deborating IX is **NOT** in service, verify closed 1HP-16 (LDST MAKEUP ISOLATION) (R.M.) STANDARD: Verify 1HP-16 is closed by observing that the green closed light on 1UB1 is lit. COMMENTS:	___ SAT ___ UNSAT
NOTE: If during RCS makeup the wrong volume is added an SRO should evaluate effect on reactivity and take action to minimize reactivity management events. (R.M.) STEP 22: Step 2.11 Perform one of the following: (R.M.) • Verify correct volume added Or • Notify appropriate SRO STANDARD: Verify correct volume is added by the number on 1HP-15 controller display and the level increase in the LDST. COMMENTS:	___ SAT ___ UNSAT

STEP 23: Step 2.12 Reset 1HP-15 Controller for Normal Operation STANDARD: Reset 1HP-15 Controller located on 1UB1 for Normal Operations by: • Push Stop/Start • Ensure mode selector set to MANUAL • Ensure Controller display set to "P" • Ensure Controller valve position set to 100% open. • Ensure Controller Start-Stop set to "START" COMMENTS:	___ SAT ___ UNSAT
STEP 24: Step 2.13 Close 1CS-72 (CBAST to Letdown Filter Inlet). (A-2 LDST Hatch area) (R.M.) STANDARD: The candidate should dispatch an NEO to close 1CS-72 (CBAST to Letdown Filter Inlet). ***Cue: Inform the candidate that using Time compression 1CS-72 is closed.*** COMMENTS:	___ SAT ___ UNSAT
STEP 25: Step 2.14 Record RCS make-up volume in Auto Log. STANDARD: The candidate should indicate that they would record RCS make-up volume in Auto Log. ***Cue: If Auto Log entries indicated, Auto Log not modeled on simulator. Appropriate log entries have been made.*** COMMENTS:	___ SAT ___ UNSAT

STEP 26:	Step 2.15 **IF** desired, request RCS and Pzr sample for boron. (R.M.)	___ SAT
STANDARD:	**IF** desired, the candidate can indicate that they would submit a sample request for RCS and Pzr boron.	___ UNSAT
COMMENTS:		
	END TASK	

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Step is required to align boration flow path.
11	Step is required to align boration flow path.
12	Step is required to enter batch size so pump will auto stop.
15	Step is required for starting the CBAST pump.

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

INITIAL CONDITIONS:

Unit shutdown in progress

RCS Boration is desired

INITIATING CUES:

The SRO directs you to add a 50 gallon batch of CBAST to the RCS using OP/1/A/1103/004 A Encl. 4.1.

Begin at Step 1.3.

1. Initial Conditions

1.1 Ensure one of the following:

_____ • HPI system operating

Or

_____ • LPI makeup path through 1HP-363 aligned

_____ 1.2 **IF** U1 is in Mode 1 or 2 ensure R2 reactivity management controls established in the Control Room per SOMP 01-02 (Reactivity Management). {17} (R.M.)

_____ 1.3 Review Limits and Precautions.

NOTE:	This procedure affects reactivity management by changing RCS boron. (R.M.)

2. Procedure

NOTE:

- OP/1/A/1103/004 (Soluble Poison Control) provides guidance for RCS boron change calculation or computer calculation for determining required volumes. (R.M.)
- LDST temperature may increase from adding CBAST because of CBAST temperature.
- 50 gal flush must be performed to ensure calculated volume of CBAST is added to LDST.
- Main process piping between CBAST and LDST contains ≈ 25 gallons of DW. {16}

_____ 2.1 Determine required volume of CBAST needed for desired RCS boron changes. (R.M.)

- 50 gal of DW added due to flushing must be included in determination

☐ Volume required ___________gallons.

_____ 2.2 CBAST required volume approved. (R.M.)
SRO

NOTE:	Placing an idle Letdown Filter in service can change RCS boron by adding ≈ 60 gals of water to RCS at different boron (negligible for RCS boration). {10} (R.M.)

_____ 2.3 **IF** two Letdown Filters are available:

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

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

_____ 2.4 Ensure open 1CS-64 (CBAST OUTLET).

_____ 2.5 Open 1CS-72 (CBAST Header to Letdown Filter Inlet). (A-2 LDST Hatch area)

_____ 2.6 Ensure 1HP-15 Controller reset for Normal Operations.

_____ 2.7 Ensure 1HP-15 batch reset by selecting "STOP" / "START".

_____ 2.8 **IF** desired, operate the 1A CBAST pump in manual per Section 3 "Make-Up With 1A CBAST Pump In Manual"

NOTE:	If a Deborating IX is in service the CBAST pump must be operated in manual.

_____ 2.9 **IF** desired, operate the 1A CBAST pump in auto per Section 4 "Make-Up With 1A CBAST Pump In Auto"

_____ _____ 2.10 **IF** a Deborating IX is **NOT** in service, verify closed 1HP-16 (LDST MAKEUP ISOLATION) (R.M.)

NOTE:	If during RCS makeup the wrong volume is added an SRO should evaluate effect on reactivity and take action to minimize reactivity management events. (R.M.)

_____ 2.11 Perform one of the following: (R.M.)

☐ Verify correct volume added

Or

☐ Notify appropriate SRO

_____ 2.12 Reset 1HP-15 Controller for Normal Operation

_____ _____ 2.13 Close 1CS-72 (CBAST to Letdown Filter Inlet). (A-2 LDST Hatch area) (R.M.)

_____ 2.14 Record RCS make-up volume in Auto Log.

_____ 2.15 **IF** desired, request RCS and Pzr sample for boron. (R.M.)

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 LDST makeup was secured. {7} (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 current RCS boron in Component Boron Log for OOS Letdown Filter. {10} (R.M.)

NOTE:	Section 3 may be performed as many times as required for RCS boration.

3. Make-Up With 1A CBAST Pump In Manual

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

☐ 3.2 Verify open 1CS-64 (CBAST OUTLET).

☐ 3.3 Ensure 1A CBAST pump to "MAN".

NOTE:	LDST temperature may increase from adding CBAST because of CBAST temperature.

☐ 3.4 Place 1A CBAST pump to "ON". (R.M.)

NOTE:	Increased makeup flow may be required during RCS boration, ZPPT, etc. {9}

☐ 3.5 **IF** increased makeup flow is required, perform Section 5 "Throttling 1CS-70 For Increased Make-up Flow". {9}

NOTE:	Selecting STOP / "START" on 1HP-15 Controller will reset 1HP-15 batch.

3.6 **IF** volume of > 5500 gallons is desired, reset 1HP-15 batch size between 5000-5500 gallons by selecting "STOP" / "START".

NOTE:	CBAST should **NOT** be pumped < 6" using 1A CBAST pump. {6}

☐ 3.7 **WHEN** desired volume is added, position 1A CBAST pump to "OFF". (R.M.)

☐ 3.8 Ensure 1HP-15 batch reset by selecting "STOP" / "START".

☐ 3.9 **IF** a Deborating IX is **NOT** in service, close 1HP-16 (LDST MAKEUP ISOLATION). (R.M.)

NOTE:	50 gal flush must be performed to ensure calculated volume of CBAST is added to LDST. (R.M.)

☐ 3.10 Perform flush to LDST per Section 6 "Flush From CBAST To LDST"

NOTE:	Section 4 may be performed as many times as required for RCS boration.

4. Make-Up With 1A CBAST Pump In Auto

NOTE:	If a Deborating IX is in service the CBAST pump should be operated in manual.

☐ 4.1 Verify a Deborating IX is **NOT** in service.

☐ 4.2 Verify open 1CS-64 (CBAST OUTLET).

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

☐ 4.4 Select "S" on 1HP-15 Controller and enter batch size. (R.M.)

☐ 4.5 Select "P" on 1HP-15 Controller.

☐ 4.6 Place 1A CBAST pump to "AUTO".

NOTE:	LDST temperature may increase from adding CBAST because of CBAST temperature.

☐ 4.7 Place 1A CBAST pump to "ON".

NOTE:	CBAST should **NOT** be pumped < 6" using 1A CBAST pump. {6}

☐ 4.8 **WHEN** desired volume is added, verify 1A CBAST pump off. (R.M.)

☐ 4.9 Place 1A CBAST pump to "MAN".

☐ 4.10 Ensure 1HP-15 batch reset by selecting "STOP" / "START".

☐ 4.11 Close 1HP-16 (LDST MAKEUP ISOLATION). (R.M.)

NOTE:	50 gal flush must be performed to ensure calculated volume of CBAST is added to LDST. (R.M.)

☐ 4.12 Perform flush to LDST per Section 6 "Flush From CBAST To LDST"

5. Throttling 1CS-70 For Increased Make-up Flow

5.1 **IF** increased makeup flow is required with 1A CBAST pump, perform the following: {9}

5.1.1 Valve in 1CS-PG-1002 as follows: (U#1 CBAST Rm)

_____ A. Open 1CS-IV-0097 (CBAST Recirculation Flow) Low Side isolation valve.

_____ B. Close 1CS-IV-0097 (CBAST Recirculation Flow) Equalization valve.

_____ C. Open 1CS-IV-0097 (CBAST Recirculation Flow) High Side isolation valve.

_____ 5.1.2 Throttle 1CS-70 (CBAST Recirc) for 15 to 20 gpm recirc flow. (U#1 CBAST Rm)

5.1.3 Valve out 1CS-PG-1002 as follows: (U#1 CBAST Rm)

_____ A. Close 1CS-IV-0097 (CBAST Recirculation Flow) High Side isolation valve.

_____ B. Open 1CS-IV-0097 (CBAST Recirculation Flow) Equalization valve.

_____ C. Close 1CS-IV-0097 (CBAST Recirculation Flow) Low Side isolation valve.

6. Flush from CBAST To LDST

NOTE:	• Flush prevents boron from crystallizing in piping if heat tracing fails. • 50 gal flush must be performed to ensure calculated volume of CBAST is added to LDST. (R.M.) • Failure to properly position valves could affect CBAST boron. (R.M.)

6.1 After CBAST make-up flush header:

☐ 6.1.1 Ensure 1A CBAST pump is "OFF".

☐ 6.1.2 Ensure DW make-up stopped to all units UST(s) (ensures adequate DW pressure).

☐ 6.1.3 Close 1CS-64 (CBAST OUTLET). (R.M.)

☐ 6.1.4 Ensure closed 1CS-70 (CBAST Recirc). (U#1 CBAST Rm) (R.M.)

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

☐ 6.1.6 Throttle 1DW-87 (DW To 1A CBAST Pump Suction) to establish flow to LDST. (U#1 CBAST Rm)

☐ 6.1.7 Flush ≥ 50 gallons into LDST. (R.M.)

☐ 6.1.8 Close 1DW-87 (DW To 1A CBAST Pump Suction). (U#1 CBAST Rm) (R.M.)

☐ 6.1.9 Open 1CS-70 (CBAST Recirc). (U#1 CBAST Rm) (R.M.)

☐ 6.1.10 Open 1CS-64 (CBAST OUTLET).

☐ 6.1.11 **IF** a Deborating IX is **NOT** in service, close 1HP-16 (LDST MAKEUP ISOLATION). (R.M.)

_____ 6.2 **IF** make-up from CBAST is no longer needed, continue with Step 2.10 for normal alignment.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-204

ES RECOVERY

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

ES Recovery

Alternate Path:

No

Facility JPM #:

NEW

K/A Rating(s):

System: 006
K/A: A4.08
Rating: 4.2/4.3

Task Standard:

ES Channels 1 and 2 are returned to normal using EOP Enclosure 5.41 (ES Recovery).

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:

EOP Enclosure 5.41 (ES Recovery)

Validation Time: 25 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 204
2. Go to **RUN**

Tools/Equipment/Procedures Needed:

EOP Enclosure 5.41 (ES Recovery)

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 transient has occurred.

The Reactor has tripped

ES Channels 1 and 2 have actuated on low RCS pressure.

EOP Enclosure 5.1 (ES Actuation) is in progress.

INITIATING CUES:

The SRO directs you to perform EOP Enclosure 5.41 (ES Recovery).

START TIME: _______

NOTE
Technical Specification 3.3.7 entry is required when any ES component is in Manual while ES signal is present.

___ SAT

___ UNSAT

STEP 1: Step 1

WHEN all the following exist:

- ES Channels have actuated
- Condition causing ES Channel actuation has cleared
- ES Channel reset is desired
- OSM concurs

THEN continue.

STANDARD: Determine ES Channels 1 and 2 have actuated by observing the White and Blue lights of Channels 1 and 2 on the RZ modules. Also Statalarms 1SA-1/A-10 (ES CHANNEL 1 TRIP and 1SA-1/B-10 (ES CHANNEL 1 TRIP) will be illuminated.

Determine that RCS pressure is now above ES Channel 1 and 2 actuation setpoint (1600 psig).

Determine the OSM concurs.

Continue to Step 2.

Cue: If asked as the SRO, inform candidate that ES Channel reset is desired and that the OSM concurs.

COMMENTS:

STEP 2:	Step 2 Reset desired tripped bistables for the following: • ES Analog Channel A • ES Analog Channel B • ES Analog Channel C	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Reset the tripped Analog bistables in the ES cabinet by: Depressing the "Output State" and the "Output Memory" toggle switch for each ES Analog Channel. Verify that the "Output State" and the "Output Memory" lights dim. (**output memory toggle switch is not critical**)	
COMMENTS:		
STEP 3:	Step 3 **IAAT** 4KV FDR BKR B2T-4 SSF 4KV SWGR OTS1-1 breaker closed (2AB1), **AND** ES Digital Channel 1 & 2 reset, **THEN** perform Step 4.	___ SAT ___ UNSAT
STANDARD:	Call Unit 2 Control Room and determine that 4KV FDR BKR B2T-4 SSF 4KV SWGR OTS1-1 breaker is open and perform the **RNO** step and **GO TO** Step 5.	
Simulator Operator cue:	***4KV FDR BKR B2T-4 SSF 4KV SWGR OTS1-1 breaker (2AB1) is open.***	
COMMENTS:		

STEP 4:	Step 5 Verify reset of ES Channels 1 & 2 is desired.	___ SAT ___ UNSAT
STANDARD:	Determine reset of ES Channels 1 & 2 is desired by data on the cue sheet.	
COMMENTS:		
STEP 5:	Step 6 Verify the following Stat Alarms have cleared: • 1SA-7/A-1 (ES HP INJECTION CHANNEL A TRIP) • 1SA-7/B-1 (ES HP INJECTION CHANNEL B TRIP) • 1SA-7/C-1 (ES HP INJECTION CHANNEL C TRIP) • 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) • 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) • 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP)	___ SAT ___ UNSAT
STANDARD:	Determine that the above Statalarms located on 1SA-7 are not illuminated.	
COMMENTS:		
STEP 6:	Step 7 Depress digital channel RESET pushbuttons for the following: (1UB1) • Ch 1 • Ch 2	**CRTICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Depress digital channel RESET pushbuttons for the Channels 1 and 2 located on 1UB1.	
COMMENTS:		

STEP 7:	Step 8 Verify the following digital channel TRIPPED lights clear: (1UB1) • Ch 1 • Ch 2	___ SAT ___ UNSAT
STANDARD:	Verify the digital channel TRIPPED lights located on 1UB1 for ES channels 1 and 2 clear.	
COMMENTS:		
STEP 8:	Step 9 Verify both the following exist: • Keowee Hydro shutdown is desired. • OSM concurs	___ SAT ___ UNSAT
STANDARD:	Determine Keowee Hydro shutdown is desired and the OSM concurs.	
Cue: Keowee Hydro shutdown is desired and the OSM concurs.		
COMMENTS:		

STEP 9: Step 10 Verify Keowee Hydro supplying any Unit Main Feeder Bus: • Unit 1 • Unit 2 • Unit 3 STANDARD: Determine that Keowee is NOT supplying Unit 1's Main Feeder Bus by: • Observing power being supplied to the MFBs by CT-1. • Candidate should call Unit 2 and 3 to determine that they are NOT receiving power from a Keowee unit. ***Simulator Operator: When called inform candidate that Units 2 and 3 are NOT receiving power for a Keowee unit.*** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Step 12 Verify any of the following are closed: • SK1 CT4 STBY BUS 1 FEEDER • SK2 CT4 STBY BUS 2 FEEDER STANDARD: Determine that SK1 and SK2 are closed by observing the red closed indication on 2AB3 for each breaker. COMMENTS:	___ SAT ___ UNSAT
STEP 11: Step 13 Enter T.S.3.8.1 Condition D for the underground power path. STANDARD: Candidate should indicate that T.S.3.8.1 Condition D for the underground power path should be entered. COMMENTS:	___ SAT ___ UNSAT

STEP 12: Step 14 Place the following transfer switches in MAN: • CT4 BUS 1 AUTO/MAN • CT4 BUS 2 AUTO/MAN STANDARD: Place CT4 BUS 1 AUTO/MAN and CT4 BUS 2 AUTO/MAN transfer switches located on 2AB3 in MAN. COMMENTS:	___ SAT ___ UNSAT
STEP 13: Step 15 Open the following breakers: • SK1 CT4 STBY BUS 1 FEEDER • SK2 CT4 STBY BUS 2 FEEDER STANDARD: Open SK1 by placing the breaker switch to the "trip" position and verifying the red close light goes out and the white open light illuminates. Open SK2 by placing the breaker switch to the "trip" position and verifying the red close light goes out and the white open light illuminates. COMMENTS:	___ SAT ___ UNSAT
STEP 14: Step 16 Place the following transfer switches in AUTO: • CT4 BUS 1 AUTO/MAN • CT4 BUS 2 AUTO/MAN STANDARD: Place CT4 BUS 1 AUTO/MAN and CT4 BUS 2 AUTO/MAN transfer switches located on 2AB3 in AUTO. COMMENTS:	___ SAT ___ UNSAT

STEP 15: Step 17 Exit T.S.3.8.1 Condition D for the underground power path. **STANDARD:** Candidate should indicate that T.S.3.8.1 Condition D for the underground power path should be exited. **COMMENTS:**	___ SAT ___ UNSAT
NOTE Keowee Units will parallel to the grid when the ES signal is removed. **STEP 16:** Step 18 Depress the following on Unit 1: (1UB1) • CH 1 KEOWEE LOGIC RESET (PUSH TO RET TO NORMAL AFT ES RESET) • CH 2 KEOWEE LOGIC RESET (PUSH TO RET TO NORMAL AFT ES RESET) **STANDARD:** Depress the CH 1 KEOWEE LOGIC RESET pushbutton located on 1UB1. Depress the CH 2 KEOWEE LOGIC RESET pushbutton located on 1UB1. **COMMENTS:**	___ SAT ___ UNSAT
STEP 17: Step 19 Notify Keowee Hydro operator to shutdown both KHUs per OP/0/A/2000/041 (Keowee Modes of Operations). **STANDARD:** Candidate should call the Keowee Hydro operator and request that they shutdown both KHUs by using OP/0/A/2000/041 (Keowee Modes of Operations). **COMMENTS:**	___ SAT ___ UNSAT

STEP 18:	Step 20 Stop the 1C HPI Pump.	___ SAT ___ UNSAT
STANDARD:	Verify that 1C HPI Pump is NOT operating by observing the red ON light not illuminated and no amps are indicated.	
COMMENTS:		
STEP 19:	Step 21 Open 1HP-27.	___ SAT ___ UNSAT
STANDARD:	Verify 1HP-27 located on 1UB1 is open by observing the red open light is lit.	
COMMENTS:		
STEP 20:	Step 22 Close 1HP-409.	___ SAT ___ UNSAT
STANDARD:	Verify 1HP-409 located on 1UB1 is closed by observing the green closed light is lit.	
COMMENTS:		

NOTE The following steps will reset HPI pump ES logic. STEP 21: Step 23 Ensure only one HPI pump operating. STANDARD: Determine that only the 1A HPI pump is operating by observing the red on light is lit and normal amps are indicated. COMMENTS:	___ SAT ___ UNSAT
STEP 22: Step 24 Ensure standby HPI pump in AUTO. STANDARD: Determine that the 1B HPI pump is in AUTO by observing the pump switch. COMMENTS:	___ SAT ___ UNSAT
STEP 23: Step 25 Verify 1A HPI PUMP operating with switch in ON position. STANDARD: Verify 1A HPI PUMP operating with switch in ON position by observing the pump switch. COMMENTS:	___ SAT ___ UNSAT

STEP 24:	Step 26 Perform the following: • Place 1A HPI PUMP switch to AUTO. • Place 1A HPI PUMP switch to ON.	___ SAT ___ UNSAT
STANDARD:	Place 1A HPI PUMP switch located on 1UB1 to AUTO and then place 1A HPI PUMP switch to ON.	
COMMENTS:		
STEP 25:	Step 27 Verify 1B HPI PUMP operating with switch in ON position.	___ SAT ___ UNSAT
STANDARD:	Determine that the 1B HPI PUMP in NOT operating and the switch is in AUTO. Perform the **RNO** step.	
COMMENTS:		
STEP 26:	Step 27 **RNO** • Place 1B HPI PUMP switch to OFF. • Place 1B HPI PUMP switch to AUTO. • **GO TO** Step 29.	___ SAT ___ UNSAT
STANDARD:	Place 1B HPI PUMP switch located on 1UB1 to OFF and then place 1B HPI PUMP switch to AUTO. **GO TO** Step 29.	
COMMENTS:		

STEP 27:	Step 29 Verify both of the following breakers open: • SL-1 • SL-2	___ SAT ___ UNSAT
STANDARD:	Verify SL-1 and SL-2 located on 2AB3 are open by observing the green open light is illuminated.	
COMMENTS:		
STEP 28:	Step 30 Perform the following: • Open the following to restore RB RIAs: ES Channel 1 ○ 1PR-7 ○ 1PR-9 ES Channel 2 ○ 1PR-8 ○ 1PR-10 • Start the RB RIA sample pump from the ENABLE CONTROLS screen on the RIA View Node. (**not critical**)	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Open 1PR-7 and 1PR-9 on ES Channel 1 RZ Module by depressing the red open push button. Verify the red open light illuminates. Open 1PR-8 and 1PR-10 on ES Channel 2 RZ Module by depressing the red open push button. Verify the red open light illuminates. Select ENABLE CONTROLS screen on the RIA View Node and verify that the RB RIA sample pump is operating.	
COMMENTS:		

STEP 29: Step 31 Verify reset of ES Channels 3 & 4 is desired. STANDARD: Determine ES Channels 3 & 4 have not actuated by observing that the RED tripped lights on 1UB1 are NOT illuminated. COMMENTS:	___ SAT ___ UNSAT
STEP 30: Step 36 Verify reset of ES Channels 5 & 6 is desired. STANDARD: Determine ES Channels 5 & 6 have not actuated by observing the RED tripped light on 1UB1 are NOT illuminated. COMMENTS:	___ SAT ___ UNSAT
STEP 31: Step 47 Verify reset of ES Channels 7 & 8 is desired. STANDARD: Determine ES Channels 7 & 8 have not actuated by observing the RED tripped light on 1UB1 are NOT illuminated. COMMENTS:	___ SAT ___ UNSAT

STEP 32:	Step 53 Close the following: • 1LPSW-4 • 1LPSW-5	___ SAT
STANDARD:	Close 1LPSW-4 and 1LPSW-5 located 1VB2 by rotating the switch to the closed position and verifying the red OPEN light goes out and the green CLOSED light illuminates.	___ UNSAT
COMMENTS:		
STEP 33:	Step 54 Ensure ≤ two LPSW pumps operating, as required.	
STANDARD:	Determine 2 LPSW pumps are operating by observing the red ON lights located on 1AB3.	___ SAT
COMMENTS:		___ UNSAT
STEP 34:	Step 55 Verify Unit 2 on decay heat removal.	
STANDARD:	Determine Unit 2 in NOT on decay heat removal.	___ SAT
Cue: Unit 2 in NOT on decay heat removal.		
COMMENTS:		___ UNSAT

STEP 35:	Step 57 Place the following in NORMAL: • 1LPSW-251 FAIL SWITCH • 1LPSW-252 FAIL SWITCH	___ SAT
STANDARD:	Place the 1LPSW-251 FAIL SWITCH and 1LPSW-252 FAIL SWITCH located on 1VB2 in NORMAL.	___ UNSAT
COMMENTS:		
STEP 36:	Step 58 Place 1LPSW-51 in HAND.	
STANDARD:	Place 1LPSW-51 Bailey controller located on 1VB1 in HAND by placing the auto/manual select switch in HAND.	___ SAT
COMMENTS:		___ UNSAT
STEP 37:	Step 59 Close 1LPSW-51.	
STANDARD:	Close 1LPSW-51 by rotating the manual knob counter clockwise on the Bailey controller until the controller indicates closed.	___ SAT
COMMENTS:		___ UNSAT

<u>STEP 38</u>:	Step 60 Open 1LPSW-139.	**CRITICAL STEP**
<u>STANDARD</u>:	Open 1LPSW-139 located on 1VB2 by taking the switch to the open position and verify the red open light illuminates.	___ SAT
<u>COMMENTS</u>:		___ UNSAT
<u>STEP 39</u>:	Step 61 Position 1LPSW-51, as desired to maintain MTOT temperature.	
<u>STANDARD</u>:	1LPSW-51 is adjusted to control MTOT temperature.	___ SAT
<u>COMMENTS</u>:		___ UNSAT
<u>STEP 40</u>:	Step 62 Verify 2LPSW-139 was closed by Encl 5.1 (ES Actuation).	
<u>STANDARD</u>:	Determine that 2LPSW-139 was **NOT** closed by Encl 5.1 (ES Actuation).	___ SAT
Cue: 2LPSW-139 was NOT closed by Encl 5.1 (ES Actuation).		
<u>COMMENTS</u>:		___ UNSAT
<u>STEP 41</u>:	Step 67 Verify SGTR in progress.	
<u>STANDARD</u>:	Determine a SGTR does not exist by observing RIAs and perform the **RNO** step.	___ SAT
<u>COMMENTS</u>:		___ UNSAT

STEP 41:	Step 67 RNO Stop the following: • A OUTSIDE AIR BOOSTER FAN • B OUTSIDE AIR BOOSTER FAN Notify Unit 3 to stop the following: • 3A OUTSIDE AIR BOOSTER FAN • 3B OUTSIDE AIR BOOSTER FAN	___ SAT ___ UNSAT
STANDARD:	Stop the A and B OUTSIDE AIR BOOSTER FAN by placing the switch located on 1AB3 to OFF and verify the red ON light goes off and the white OFF light illuminates. Call Unit 3's Control Room and request that they stop 3A and 3B OUTSIDE AIR BOOSTER FANs.	
COMMENTS:		
STEP 42:	Step 68 Dispatch an operator to place both RB Hydrogen Analyzer trains in Standby Mode per OP/1/A/1102/022 (RB Hydrogen Analyzer System).	___ SAT ___ UNSAT
STANDARD:	Candidate should dispatch an operator to place both RB Hydrogen Analyzer trains in Standby Mode per OP/1/A/1102/022 (RB Hydrogen Analyzer System).	
COMMENTS:		
STEP 43:	Step 69 Verify LPI in operation.	___ SAT ___ UNSAT
STANDARD:	Determine LPI is NOT in operation by observing the LPI pumps are not operating and perform the **RNO** step.	
COMMENTS:		

<u>STEP 44</u>: Step 69 **RNO** Select DECAY HEAT LOW FLOW ALARM SELECT switch to BLOCK. <u>STANDARD</u>: Select DECAY HEAT LOW FLOW ALARM SELECT switch located on 1UB2 to BLOCK <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 45</u>: Step 70 **EXIT** this enclosure. <u>STANDARD</u>: The candidate should indicate that they would exit the enclosure. <u>COMMENTS</u>: **END TASK**	___ SAT ___ UNSAT

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
2	This step is required to reset the ES channels.
6	This step is required to reset the ES channels.
28	This step is required to return the RB RIAs to service.
38	This step is required to line up LPSW to the non-essential LPSW header.

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

INITIAL CONDITIONS:

A transient has occurred.

The Reactor has tripped

ES Channels 1 and 2 have actuated on low RCS pressure.

EOP Enclosure 5.1 (ES Actuation) is in progress.

INITIATING CUES:

The SRO directs you to perform EOP Enclosure 5.41 (ES Recovery).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Technical Specification 3.3.7 entry is required when any ES component is in Manual while ES signal is present.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. __ **WHEN** <u>all</u> the following exist: __ ES Channels have actuated __ Condition causing ES Channel actuation has cleared __ ES Channel reset is desired __ OSM concurs **THEN** continue.	
2. Reset desired tripped bistables for the following: __ ES Analog Channel A __ ES Analog Channel B __ ES Analog Channel C	
3. __ **IAAT** 4KV FDR BKR B2T-4 SSF 4KV SWGR OTS1-1 breaker closed (2AB1), **AND** ES Digital Channel 1 & 2 reset, **THEN** perform Step 4.	__ **GO TO** Step 5.

NOTE

- Low SSF battery voltage may prevent OTS1-1 closure.
- Closing OTS1-1 will allow the battery chargers to recharge the SSF batteries.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4. __ Locally close OTS1-1 (SSF Control Room).	__ **IF** OTS1-1 will not close, **AND** OSM concurs, **THEN** close OTS1-1 manually per Manual Operation of 4160V Bus Breakers enclosure from OP/0/A/1102/024 (Plant Assessment and Alignment Following Major Site Damage).
5. __ Verify reset of ES Channels 1 & 2 is desired.	__ **GO TO** Step 31.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. Verify the following Stat Alarms have cleared: __ 1SA-7/A-1 (ES HP INJECTION CHANNEL A TRIP) __ 1SA-7/B-1 (ES HP INJECTION CHANNEL B TRIP) __ 1SA-7/C-1 (ES HP INJECTION CHANNEL C TRIP) __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP)	1.__ Ensure analog channel bistables are reset. 2.__ **IF** required, **THEN** notify SPOC for assistance. 3.__ **WHEN** the following have cleared, __ 1SA-7/A-1 (ES HP INJECTION CHANNEL A TRIP) __ 1SA-7/B-1 (ES HP INJECTION CHANNEL B TRIP) __ 1SA-7/C-1 (ES HP INJECTION CHANNEL C TRIP) __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP) **THEN** continue.
7. Depress digital channel RESET pushbuttons for the following: (1UB1) __ Ch 1 __ Ch 2	
8. Verify the following digital channel TRIPPED lights clear: (1UB1) __ Ch 1 __ Ch 2	1.__ Notify SPOC for assistance. 2.__ **WHEN** the ES digital channels 1 & 2 are reset, **THEN** continue.
9. Verify <u>both</u> the following exist: __ Keowee Hydro shutdown is desired. __ OSM concurs	__ **GO TO** Step 20.
10. Verify Keowee Hydro supplying <u>any</u> Unit Main Feeder Bus: __ Unit 1 __ Unit 2 __ Unit 3	__ **GO TO** Step 12.
11. __ **GO TO** Step 20.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. Verify any of the following are closed: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STBY BUS 2 FEEDER	__ GO TO Step 18.
13. __ Enter T.S.3.8.1 Condition D for the underground power path.	
14. Place the following transfer switches in MAN: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN	
15. Open the following breakers: __ SK1 CT4 STBY BUS 1 FEEDER __ SK2 CT4 STBY BUS 2 FEEDER	
16. Place the following transfer switches in AUTO: __ CT4 BUS 1 AUTO/MAN __ CT4 BUS 2 AUTO/MAN	
17. __ Exit T.S.3.8.1 Condition D for the underground power path.	

NOTE

Keowee Units will parallel to the grid when the ES signal is removed.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18. Depress the following on Unit 1: (1UB1) __ CH 1 KEOWEE LOGIC RESET (PUSH TO RET TO NORMAL AFT ES RESET) __ CH 2 KEOWEE LOGIC RESET (PUSH TO RET TO NORMAL AFT ES RESET)	
19. __ Notify Keowee Hydro operator to shutdown both KHUs per OP/0/A/2000/041 (Keowee Modes of Operations).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20. __ Stop the 1C HPI Pump.	
21. __ Open 1HP-27.	
22. __ Close 1HP-409.	

NOTE

The following steps will reset HPI pump ES logic.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. __ Ensure only one HPI pump operating.	
24. __ Ensure standby HPI pump in AUTO.	
25. __ Verify 1A HPI PUMP operating with switch in ON position.	1. __ Place 1A HPI PUMP switch to OFF. 2. __ Place 1A HPI PUMP switch to AUTO. 3. __ **GO TO** Step 27.
26. Perform the following: A. __ Place 1A HPI PUMP switch to AUTO. B. __ Place 1A HPI PUMP switch to ON.	
27. __ Verify 1B HPI PUMP operating with switch in ON position.	1. __ Place 1B HPI PUMP switch to OFF. 2. __ Place 1B HPI PUMP switch to AUTO. 3. __ **GO TO** Step 29.
28. Perform the following: A. __ Place 1B HPI PUMP switch to AUTO. B. __ Place 1B HPI PUMP switch to ON.	
29. Verify both of the following breakers open: __ SL-1 __ SL-2	__ **IF** in-progress procedures require one HPI pump to be in the OFF position, **THEN** position the standby HPI pump switch to OFF.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. Perform the following: A. Open the following to restore RB RIAs: ES Channel 1 __ 1PR-7 __ 1PR-9 ES Channel 2 __ 1PR-8 __ 1PR-10 B. __ Start the RB RIA sample pump from the ENABLE CONTROLS screen on the RIA View Node.	
31. __ Verify reset of ES Channels 3 & 4 is desired.	__ **GO TO** Step 36.
32. Verify the following Stat Alarms have cleared: __ 1SA-7/A-2 (ES LP INJECTION CHANNEL A TRIP) __ 1SA-7/B-2 (ES LP INJECTION CHANNEL B TRIP) __ 1SA-7/C-2 (ES LP INJECTION CHANNEL C TRIP) __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP)	1. __ Ensure analog channel bistables are reset. 2. __ **IF** required, **THEN** notify SPOC for assistance. 3. __ **WHEN** the following have cleared, __ 1SA-7/A-2 (ES LP INJECTION CHANNEL A TRIP) __ 1SA-7/B-2 (ES LP INJECTION CHANNEL B TRIP) __ 1SA-7/C-2 (ES LP INJECTION CHANNEL C TRIP) __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP) **THEN** continue.
33. Depress digital channel RESET pushbuttons for the following: (1UB1) __ Ch 3 __ Ch 4	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34. Verify the following digital channel TRIPPED lights clear: (1UB1) __ Ch 3 __ Ch 4	1.__ Notify SPOC for assistance. 2.__ **WHEN** the ES digital channels 3 & 4 are reset, **THEN** continue.
35. Close the following: __ 1LP-17 __ 1LP-18	
36. __ Verify reset of ES Channels 5 & 6 is desired.	__ **GO TO** Step 47.
37. Verify the following Stat Alarms have cleared: __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP)	1.__ Ensure analog channel bistables are reset. 2.__ **IF** required, **THEN** notify SPOC for assistance. 3.__ **WHEN** the following have cleared, __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP) **THEN** continue.
38. Depress digital channel RESET pushbuttons for the following: (1UB1) __ Ch 5 __ Ch 6	
39. Verify the following digital channel TRIPPED lights clear: (1UB1) __ Ch 5 __ Ch 6	1.__ Notify SPOC for assistance. 2.__ **WHEN** the ES digital channels 5 & 6 are reset, **THEN** continue.
40. __ Verify any CC pump operating.	__ **GO TO** Step 42.
41. Perform the following: A. __ Ensure <u>one</u> CC pump in ON. B. __ Ensure <u>one</u> CC pump off <u>and</u> in AUTO.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
42. Position the following switches to LOW: __ 1A RBCU __ 1B RBCU __ 1C RBCU	
43. Depress the following PUSH TO RET TO NORMAL AFT ES RESET pushbuttons: __ 1A RBCU ES RESET __ 1B RBCU ES RESET __ 1C RBCU ES RESET	

NOTE

The Turnover Checklist may be used to determine condition of the RBCUs before ES actuation.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44. Initiate OP/1/A/1104/015 (Reactor Building Cooling System) to place the following in normal alignment: __ RBCUs __ 1LPSW-18 __ 1LPSW-21 __ 1LPSW-24	
45. __ Initiate OP/1/A/1104/010 (Low Pressure Service Water) to restore RB Auxiliary Fan Coolers to service using "Startup of RB Aux Coolers" portion of Encl (LPSW Shutdown and Return to Service of RB Aux Coolers).	
46. Secure the Penetration Room Ventilation fans from RZ Module: __ PR FAN-1A __ PR FAN-1B	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. __ Verify reset of ES Channels 7 & 8 is desired.	__ GO TO Step 53.
48. Verify the following Stat Alarms have cleared: __ 1SA-7/A-4 (ES RB SPRAY CHANNEL A TRIP) __ 1SA-7/B-4 (ES RB SPRAY CHANNEL B TRIP) __ 1SA-7/C-4 (ES RB SPRAY CHANNEL C TRIP)	1.__ **IF** required, **THEN** notify SPOC for assistance. 2.__ **WHEN** the following have cleared, __ 1SA-7/A-4 (ES RB SPRAY CHANNEL A TRIP) __ 1SA-7/B-4 (ES RB SPRAY CHANNEL B TRIP) __ 1SA-7/C-4 (ES RB SPRAY CHANNEL C TRIP) **THEN** continue.
49. Depress digital channel RESET pushbuttons for the following: (1UB1) __ Ch 7 __ Ch 8	
50. Verify the following digital channel TRIPPED lights clear: (1UB1) __ Ch 7 __ Ch 8	1.__ Notify SPOC for assistance. 2.__ **WHEN** the ES digital channels 7 & 8 are reset, **THEN** continue.
51. Stop the following: __ 1A RBS Pump __ 1B RBS Pump	
52. Close the following: __ 1BS-1 __ 1BS-2	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
53. Close the following: __ 1LPSW-4 __ 1LPSW-5	
54. __ Ensure ≤ two LPSW pumps operating, as required.	
55. __ Verify Unit 2 on decay heat removal.	__ **GO TO** Step 57.
56. __ Notify Unit 2 to control LPI cooler outlet temperature, as required.	
57. Place the following in NORMAL: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
58. __ Place 1LPSW-51 in HAND.	
59. __ Close 1LPSW-51.	
60. __ Open 1LPSW-139.	
61. __ Position 1LPSW-51, as desired to maintain MTOT temperature.	
62. __ Verify 2LPSW-139 was closed by Encl 5.1 (ES Actuation).	__ **GO TO** Step 67.
63. __ Place 2LPSW-51 in HAND.	
64. __ Close 2LPSW-51.	
65. __ Open 2LPSW-139.	
66. __ Position 2LPSW-51, as desired to maintain MTOT temperature.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
67. __ Verify SGTR in progress.	1. Stop the following: __ A OUTSIDE AIR BOOSTER FAN __ B OUTSIDE AIR BOOSTER FAN 2. Notify Unit 3 to stop the following: __ 3A OUTSIDE AIR BOOSTER FAN __ 3B OUTSIDE AIR BOOSTER FAN
68. __ Dispatch an operator to place both RB Hydrogen Analyzer trains in Standby Mode per OP/1/A/1102/022 (RB Hydrogen Analyzer System).	
69. __ Verify LPI in operation.	__ Select DECAY HEAT LOW FLOW ALARM SELECT switch to BLOCK.
70. __ **EXIT** this enclosure.	

••• END •••

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-028
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-028

K/A Rating(s):
System: EPE-009
K/A: EK 3.21
Rating: 4.2/4.5

Task Standard:

Steps of EOP are properly completed by the candidate to align HPI/LPI piggyback mode.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:
EOP Enclosure 5.12, ECCS Suction Swap to RBES

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 207
2. **Import** files for CRO-028
3. Go to **RUN**

Tools/Equipment/Procedures Needed:
EOP Enclosure 5.12, ECCS Suction Swap to RBES

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 EOP is in progress.

Step 96 of LOSCM directs the initiation of Enclosure 5.12, ECCS Suction Swap to RBES.

INITIATING CUES:

The Control Room SRO directs you to perform Enclosure 5.12, ECCS Suction Swap to RBES to align HPI/LPI piggyback mode.

START TIME: _______

STEP 1:	Step 1 Start both of the following: • 1A LPI PUMP • 1B LPI PUMP	**CRITICAL STEP** ___ SAT
STANDARD:	Candidate locates the controls for 1A and 1B LPI pumps on 1UB2 and determines that 1A and 1B LPI pumps are off, white OPEN lights are illuminated. Rotates control switch to the CLOSE position for 1A and 1B LPI pump. The red CLOSE lights are observed to be on and the white OPEN lights are observed to be off. LPI Pump Amps are observed to be steady and in the proper range	___ UNSAT
COMMENTS:		
STEP 2:	Step 2 Verify either of the following: • 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	___ SAT
STANDARD:	Candidate locates LPI Flow Train A and B flow meters on 1UB1. Observes flow in both headers to be 0 gpm. Perform **RNO** Step and **GO TO** Step 4.	___ UNSAT
COMMENTS:		
STEP 3:	Step 4 Verify three HPI pumps operating.	
STANDARD:	Locate HPI pump controls on 1UB1 and determine that all three HPI pumps are operating by observing the red on light illuminated and normal motor amps are indicated.	___ SAT
COMMENTS:		___ UNSAT

STEP 4:	Step 5 Stop 1B HPI PUMP.	___ SAT ___ UNSAT
STANDARD:	Locate the pump switch for the 1B HPI Pump. Stop the pump by rotating the switch to the off position. Verify the red on light goes out and the green off light is illuminated. Verify motor amps go to zero.	
COMMENTS:		
STEP 5:	Step 6 Notify Control Room personnel that the 170 gpm/pump minimum HPI flow requirement is in effect.	___ SAT ___ UNSAT
STANDARD:	Candidate should indicate that they would inform the Control Room personnel that the 170 gpm/pump minimum HPI flow requirement is in effect.	
COMMENTS:		
STEP 6:	Step 7 Simultaneously open the following: • 1LP-15 • 1LP-16	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Locate 1LP-15 and 1LP-16 on 1UB2 and open them simultaneously by taking each switch to the open position. Verify that the closed green light goes off and the red open light illuminates for each valve.	
COMMENTS:		

<u>STEP 7</u>:	Step 8 Verify two LPI pumps operating.	___ SAT
<u>STANDARD</u>:	Verify two LPI pumps located on 1UB2 are operating by observing the red on lights are lit and each pump has normal lamps indicated.	
<u>COMMENTS</u>:		___ UNSAT
<u>STEP 8</u>:	Step 9 Verify total HPI flow including seal injection is > 500 gpm.	___ SAT
<u>STANDARD</u>:	Determine that total HPI flow including seal injection is > 500 gpm by adding the flow indicated on the A and B HPI Header flow gauges plus the RCP Seal Injection flow gauge.	
<u>COMMENTS</u>:		___ UNSAT
<u>STEP 9</u>:	Step 10 **GO TO** Step 13.	___ SAT
<u>STANDARD</u>:	**GO TO** Step 13	
<u>COMMENTS</u>:		___ UNSAT
<u>STEP 10</u>:	Step 13 Place LDST LEVEL INTERLOCK switch to DISABLE.	___ SAT
<u>STANDARD</u>:	Place LDST LEVEL INTERLOCK switch located on 1UB1 to DISABLE by taking the switch to the DISABLE position.	
<u>COMMENTS</u>:		___ UNSAT

STEP 11:	Step 14 Position the following valve switches to close until valve travel is initiated: • 1HP-23 • 1HP-24 • 1HP-25	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Position the following valve switches located on 1UB1 to close until valve travel is initiated: • 1HP-23 • 1HP-24 • 1HP-25 Recognize valve travel has started when the green close light illuminates.	
COMMENTS:		
STEP 12:	Step 15 Simultaneously position the following valve switches to open until valve travel is initiated: • 1HP-939 • 1HP-940	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Simultaneously position the following valve switches located on 1UB2 to open until valve travel is initiated: • 1HP-939 • 1HP-940 Recognize valve travel has started when the red open light illuminates.	
COMMENTS:		

STEP 13: Step 16 Verify any of the following are fully open: • 1LPSW-4 • 1LPSW-5 STANDARD: Locate 1LPSW-4 and 1LPSW-5 on 1VB2 and determine that ONLY 1LPSW-5 is fully open by observing the red open light lit. **NOTE: LPSW-4 has failed in the closed position.** COMMENTS:	___ SAT ___ UNSAT
STEP 15: Step 17 Verify both of the following are open: • 1LPSW-4 • 1LPSW-5 STANDARD: Locate 1LPSW-4 and 1LPSW-5 on 1VB2 and determine that ONLY 1LPSW-5 is fully open by observing the red open light lit. Perform **RNO** step. COMMENTS:	___ SAT ___ UNSAT

STEP 16:	Step 17 **RNO** **If** 1LPSW-4 is closed, **AND** 1LP-16 is open, **THEN** perform the following: • Open 1LPSW-5 (**not critical**) • Limit total HPI flow < 750 gpm including seal injection • Stop 1A LPI PUMP • **GO TO** Step 24	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Determine 1LPSW-4 is closed by observing the green closed light is lit on 1VB2. Determine 1LP-16 is open by observing the red open light is lit on 1UB2. Determine 1LPSW-5 is open by observing the red open light is lit on 1VB2. Throttle 1HP-26 and 1HP-27 to limit total HPI flow < 750 gpm including seal injection. Total HPI flow will be determined by adding A and B HPI header flow plus RCP Seal Injection flow. Stop 1A LPI PUMP by rotating the pumps switch located on 1UB2 to the off position and verifying that the red on light goes off and the green off light is illuminated.	
COMMENTS:		

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

STEP 17:	Step 24 Maximize total LPI flow < 3100 gpm by throttling HPI flow.	___ SAT ___ UNSAT
STANDARD:	Determine HPI flow should not be increased due to the 750 gpm limit.	
COMMENTS:		

END TASK

STOP TIME: ____________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Step is required to start LPI pump so they can supply suction to the HPI pumps.
6	Step is required to align a flow path from LPI pump discharge to HPI pump suction.
11	Step is required to isolate the suction flow path to the LPI pumps from the BWST and the LDST.
12	Step is required to prevent over pressurizing the LDST.
16	Required to take compensatory actions for 1LPSW failed closed.

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 EOP is in progress.

Step 96 of LOSCM directs the initiation of Enclosure 5.12, ECCS Suction Swap to RBES.

INITIATING CUES:

The Control Room SRO directs you to perform Enclosure 5.12, ECCS Suction Swap to RBES to align HPI/LPI piggyback mode.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Start both of the following: __ 1A LPI PUMP __ 1B LPI PUMP	1. __ **IF** either of the following 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 of the following: __ 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 53.	
4. __ Verify three HPI pumps operating.	__ **GO TO** Step 6.
5. __ Stop 1B HPI PUMP.	
6. __ Notify Control Room personnel that the 170 gpm/pump minimum HPI flow requirement is in effect.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. Simultaneously open the following: __ 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 11. B. __ **GO TO** Step 12. 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 11. B. __ **GO TO** Step 12.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. __ Verify two LPI pumps operating.	__ **GO TO** Step 11.
9. __ Verify total HPI flow including seal injection is > 500 gpm.	__ **IF** <u>both</u> of the following 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 11. B. __ **IF** 1LPSW-5 is open, **THEN** perform the following: 1. __ Secure 1A LPI PUMP. 2. __ **GO TO** Step 11. C. __ **IF** <u>both</u> of the following exist: __ 1LPSW-4 power available __ 'A' LPI cooler <u>LPSW flow</u> 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 11. D. __ **IF** <u>both</u> of the following exist: __ 1LPSW-5 power available __ 'B' LPI cooler <u>LPSW flow</u> 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 11.
10. __ **GO TO** Step 13.	

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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. Verify any of the following are fully open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 19.
17. Verify both of the following 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. __ Stop 1A LPI PUMP. D. __ **GO TO** Step 24. 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 24.
18. __ **GO TO** Step 25.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The DIXON LPSW flow indicators must be used when determining post accident flow readings.	
19. Verify both of the following: __ '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 24.
20. Verify both of the following: __ 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 24.
21. __ 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 24.
22. __ 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 24.
23. __ **GO TO** Step 25.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Total LPI flow = LPI header flow + HPI header flow + seal injection.	
24. __ Maximize total LPI flow < 3100 gpm by throttling HPI flow.	
25. Verify both of the following: __ Step 9 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 27.
26. __ **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'.	
27. __ **WHEN** BWST level is ≤ 9', **AND** RB level is rising, **THEN** continue in this enclosure. {4}	
28. Simultaneously open the following: __ 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.
29. __ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 30 - 34.	__ **GO TO** Step 34.
30. __ Verify 1LP-19 open.	__ Stop 1A LPI PUMP.
31. __ Verify 1LP-20 open.	__ Stop 1B LPI PUMP.
32. Simultaneously close the following: __ 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.

<table>
<tr><th>ACTION/EXPECTED RESPONSE</th><th>RESPONSE NOT OBTAINED</th></tr>
<tr><td>33. __ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).</td><td></td></tr>
<tr><td>34. __ Verify two LPI pumps operating.</td><td>1. __ Maximize <u>total</u> LPI flow < 3100 gpm by throttling HPI flow.

2. __ Limit <u>total</u> HPI flow to ≤ 750 gpm including seal injection.</td></tr>
<tr><td>35. __ IAAT an <u>operating</u> LPI Pump (1A OR 1B) fails,
THEN perform Steps 36 - 43.</td><td>__ GO TO Step 44.</td></tr>
<tr><td>36. __ Verify <u>any</u> LPI pump operating.</td><td>1. __ IF 1A LPI PUMP <u>or</u> 1B LPI PUMP is available,
THEN attempt to start the available LPI pump.

2. __ IF <u>any</u> LPI pump is operating,
THEN GO TO Step 37.

3. __ GO TO Step 39.</td></tr>
<tr><td>37. Open the following for the running LPI pump:
<table>
<tr><th></th><th>1A LPI Pump</th><th></th><th>1B LPI Pump</th></tr>
<tr><td></td><td>1LP-15</td><td></td><td>1LP-16</td></tr>
<tr><td></td><td>1LP-17</td><td></td><td>1LP-18</td></tr>
<tr><td></td><td>1LPSW-4</td><td></td><td>1LPSW-5</td></tr>
</table></td><td>1. Open the following:
__ 1LP-9
__ 1LP-10

2. <u>Open</u> the following for the running LPI pump:
<table>
<tr><th></th><th>1A LPI Pump</th><th></th><th>1B LPI Pump</th></tr>
<tr><td></td><td>1LP-16</td><td></td><td>1LP-15</td></tr>
<tr><td></td><td>1LP-18</td><td></td><td>1LP-17</td></tr>
<tr><td></td><td>1LPSW-5</td><td></td><td>1LPSW-4</td></tr>
</table>
3. <u>Close</u> the following for the running LPI pump:
<table>
<tr><th></th><th>1A LPI Pump</th><th></th><th>1B LPI Pump</th></tr>
<tr><td></td><td>1LP-15</td><td></td><td>1LP-16</td></tr>
<tr><td></td><td>1LP-17</td><td></td><td>1LP-18</td></tr>
<tr><td></td><td>1LPSW-4</td><td></td><td>1LPSW-5</td></tr>
</table></td></tr>
<tr><td>38. __ GO TO Step 43.</td><td></td></tr>
</table>

ACTION/EXPECTED RESPONSE	**RESPONSE NOT OBTAINED**
39. Verify the following: __ 1LP-19 open __ 1LP-21 closed **OR** 1LP-28 closed	1.__ Open 1LP-7. 2.__ **GO TO** Step 41.
40. __ Open 1LP-6.	
41. Open the following to align 1C LPI PUMP to <u>all</u> headers with LPSW aligned: (see table below)	
42. __ Start 1C LPI PUMP.	
43. 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.	

Step 41 table:

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

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

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.	
53. __ **WHEN** BWST level is ≤ 15', **THEN** stop all HPI pumps.	
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'.	
54. __ **WHEN** BWST level ≤ 9', **AND** RB level is rising, **THEN** continue procedure.	
55. Simultaneously open the following: __ 1LP-19 __ 1LP-20 {4}	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.
56. __ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 57 - 60.	__ **GO TO** Step 61.
57. __ Verify 1LP-19 open.	__ Stop the 1A LPI PUMP.
58. __ Verify 1LP-20 open.	__ Stop the 1B LPI PUMP.
59. Simultaneously close the following: __ 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.
60. __ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
61. __ **IAAT** an operating LPI Pump (1A **OR** 1B) fails, **THEN** perform Steps 62 - 68.	__ **GO TO** Step 69.
62. __ Verify <u>any</u> LPI pump operating.	__ **GO TO** Step 65.
63. Perform the following for the running LPI pump: (see table A below)	1. Open the following: __ 1LP-9 __ 1LP-10 2. Perform the following for the running LPI pump: (see table B below)
64. __ **GO TO** Step 69.	
65. Verify the following: __ 1LP-19 open __ 1LP-21 closed **OR** 1LP-28 closed	1.__ Open 1LP-7. 2.__ **GO TO** Step 67.
66. __ Open 1LP-6.	
67. Perform the following to align 1C LPI pump to the A LPI header: __ Open 1LP-9 __ Open 1LP-17 __ Close 1LP-18 __ Close 1LPSW-5 __ Open 1LPSW-4	1. Close the following: __ 1LP-9 __ 1LP-17 __ 1LPSW-4 2. Open the following: __ 1LP-10 __ 1LP-18 __ 1LPSW-5
68. __ Start 1C LPI PUMP.	

Table A (Step 63):

	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

Table B (Step 63 RNO 2):

	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

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
69. __ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
70. Verify any of the following are open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 73.
71. Verify both of the following 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. __ **IF** 1A LPI PUMP is **NOT** being used to supply the B LPI header, **THEN** stop 1A LPI PUMP. C. __ Close 1LP-17. D. __ **GO TO** Step 77. 2.__ **IF** 1LPSW-5 is closed, **AND** flow exists on LPI FLOW TRAIN A, **THEN** perform the following: A. __ Open 1LPSW-4. B. __ **IF** 1B LPI PUMP is **NOT** being used to supply the A LPI header, **THEN** stop 1B LPI PUMP. C. __ Close 1LP-18. D. __ **GO TO** Step 77.
72. __ **GO TO** Step 77.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The DIXON LPSW flow indicators must be used when determining post accident flow readings.	
73. __ 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. __ **IF** 1A LPI PUMP is **NOT** being used to supply the B LPI header, **THEN** stop 1A LPI PUMP. C. __ Close 1LP-17. D. __ **GO TO** Step 77.
74. __ 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. __ **IF** 1B LPI PUMP is **NOT** being used to supply the A LPI header, **THEN** stop 1B LPI PUMP. C. __ Close 1LP-18. D. __ **GO TO** Step 77.
75. __ 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. __ **IF** 1A LPI PUMP is **NOT** being used to supply the B LPI header, **THEN** stop 1A LPI PUMP. D. __ Close 1LP-17. E. __ **GO TO** Step 77.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
76. __ 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. __ **IF** 1B LPI PUMP is **NOT** being used to supply the A LPI header, **THEN** stop 1B LPI PUMP. D. __ Close 1LP-18.
77. Open the following: __ 1HP-939 __ 1HP-940	
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.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
85. Open the following: __ 1LP-6 __ 1LP-7 __ 1LP-9 __ 1LP-10 __ 1LP-17 __ 1LP-18	
86. __ Start 1C LPI PUMP.	
87. Verify <u>either</u> of the following: __ LPI FLOW TRAIN A <u>plus</u> LPI FLOW TRAIN B ≥ 3400 gpm __ <u>Only one</u> LPI header is operating, **AND** flow in that header is ≥ 2900 gpm	__ **GO TO** Step 89.
88. __ **GO TO** Step 122.	
89. __ Verify three HPI pumps operating.	__ **GO TO** Step 91.
90. __ Stop 1B HPI PUMP.	
91. __ Notify Control Room personnel that the 170 gpm/pump minimum HPI flow requirement is in effect.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
92. Simultaneously open the following: __ 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 93. 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.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
93. __ Maximize total LPI flow < 3100 gpm by throttling HPI flow.	
94. __ Limit total HPI flow to ≤ 750 gpm including seal injection.	
95. __ Place LDST LEVEL INTERLOCK switch in DISABLE.	
96. Position the following valve switches to close until valve travel is initiated: __ 1HP-23 __ 1HP-24 __ 1HP-25 {3}	__ Continue procedure.
97. Simultaneously position the following valve switches to open until valve travel is initiated: __ 1HP-939 __ 1HP-940	__ Continue procedure.
98. Verify any of the following are open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 101.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
99. Verify both of the following 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 106. 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 106.
100.__ **GO TO** Step 107.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The DIXON LPSW flow indicators must be used when determining post accident flow readings.	
101. Verify both of the following: __ '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 106.
102. Verify both of the following: __ '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 106.
103. __ 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 106.
104. __ 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 106.
105. __ **GO TO** Step 107.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Total LPI flow = LPI header flow + HPI header flow + seal injection.	
106.__ Maximize total LPI flow < 3100 gpm by throttling HPI flow.	
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'.	
107.__ **WHEN** BWST level is ≤ 9', **AND** RB level is rising, **THEN** continue in this enclosure. {4}	
108. Simultaneously open the following: __ 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.
109.__ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 110 - 112.	__ **GO TO** Step 112.
110. Simultaneously close the following: __ 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.
111.__ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
112. Perform the following: A. __ Maximize total LPI flow < 3100 gpm by throttling HPI flow. B. __ Limit total HPI flow to ≤ 750 gpm including seal injection.	
113.__ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
114.__ **IAAT** the TSC is operational, **THEN** notify TSC to provide guidance for recovery of LPI pumps.	
115.__ **WHEN** 1LP-28 is closed, **THEN** continue in this enclosure.	
116.__ Verify 1LP-19 open.	__ **GO TO** Step 120.
117.__ Verify 1LP-6 open.	__ **IF** TSC approves, **THEN** perform the following: A. __ Open 1LP-6. B. __ **GO TO** Step 120.
118.__ Verify 1LP-20 open.	__ **GO TO** Step 120.
119.__ Verify 1LP-7 open.	__ **IF** TSC approves, **THEN** open 1LP-7.
120.__ Initiate Encl 5.4 (Makeup to the BWST) to replenish inventory for subsequent use if needed.	
121.__ **WHEN** directed by CR SRO, **THEN EXIT** this enclosure.	

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.	
122.__ **WHEN** BWST level is ≤ 15', **THEN** stop all HPI pumps.	
NOTE RB level of ≥ 2' is expected when BWST level reaches 9'.	
123.__ **WHEN** BWST level ≤ 9', **AND** RB level is rising, **THEN** continue procedure.	
124. Simultaneously open the following: __ 1LP-19 __ 1LP-20 (4)	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.
125.__ **IAAT** BWST level is ≤ 6', **THEN** perform Steps 126 - 127.	__ **GO TO** Step 128.
126. Simultaneously close the following: __ 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
127.__ Dispatch an operator to close 1LP-28 (BWST OUTLET) (East of Unit 1 BWST).	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
128.__ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
129. Verify any of the following are open: __ 1LPSW-4 __ 1LPSW-5	__ **GO TO** Step 132.
130. Verify both of the following 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 136. 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 136.
131.__ **GO TO** Step 136.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE
The DIXON LPSW flow indicators must be used when determining post accident flow readings.

132.__ Verify 'A' LPI cooler <u>LPSW flow</u> 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 136.
133.__ Verify 'B' LPI cooler <u>LPSW flow</u> 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 136.
134.__ 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 136.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
135.__ 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.
136. Open the following: __ 1HP-939 __ 1HP-940	
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.	

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-400

SWAPPING LPI MODES
LPI SERIES MODE TO LPI NORMAL MODE

CANDIDATE ____________________

EXAMINER ____________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Swapping LPI Modes - LPI Series Mode to LPI Normal Mode

Alternate Path:

No

Facility JPM #:

NEW

K/A Rating(s):
System: 005
K/A: A4.01
Rating: 3.6*/3.4

Task Standard:
Swap LPI for Series Mode to Normal Mode by procedure.

Preferred Evaluation Location:

Simulator __X__ In-Plant ____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:
OP/1/A/1104/004, Enclosure 4.20 (Swapping LPI Modes - Series Mode to LPI Normal Mode)
OP/1/A/1104/004, Enclosure 4.45 (Controlling LPI Cooler Outlet Temperature)

Validation Time: 15 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 208
2. Place simulator to **RUN**
3. **Ensure** 1450 gpm LPSW flow to BOTH LPI Coolers

Tools/Equipment/Procedures Needed:

OP/1/A/1104/004, Enclosure 4.20 (Swapping LPI Modes - Series Mode to LPI Normal Mode)

OP/1/A/1104/004, Enclosure 4.45 (Controlling LPI Cooler Outlet Temperature)

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 shutdown in progress

INITIATING CUES:

The Control Room operator directs you to perform OP/1/A/1104/004, Enclosure 4.20 (Swapping LPI Modes - Series Mode to LPI Normal Mode) beginning at Step 2.2.

START TIME: _______

STEP 1:	Step 2.2 Position: • Open 1LP-5 (1A LPI PUMP SUCTION). • Open 1LP-6 (1C LPI PUMP SUCTION (A HDR). • Open 1LP-7 (1C LPI PUMP SUCTION (B HDR). • Open 1LP-8 (1B LPI PUMP SUCTION).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Remove the cover from the switches for the following valves and OPEN them by placing their respective switches in the open position. • 1LP-5 (1A LPI PUMP SUCTION) • 1LP-6 (1C LPI PUMP SUCTION (A HDR) • 1LP-7 (1C LPI PUMP SUCTION (B HDR) • 1LP-8 (1B LPI PUMP SUCTION)	
COMMENTS:		
STEP 2:	Step 2.3 Position: • Open 1LP-4 (Return Manual Block). (A-61) • Open 1LP-139 (1A & 1C LPIP Suct X-Conn Supply). (A-61)	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Dispatch an NEO to open 1LP-4 and 1LP-139.	
Simulator operator:	**Open 1LP-4 and 1LP-139 by using the Valve program and using time compression inform the candidate that the valves are open.**	
COMMENTS:		

STEP 3: Step 2.4 Position: • Close 1LP-73 (1B LPI Cooler Switchover Disch Block). (A-1-108) • Close 1LP-74 (B Clr Disch Blk To A Pmp). (A-61) • Close 1LP-75 (1B LPI Cooler Disch Block To 1C LPI Pump). (A-61) • Close 1LP-68 (1B LPI Cooler Decay Heat Inlet). (A-2-208) STANDARD: Dispatch an NEO to CLOSE: • 1LP-73 (1B LPI Cooler Switchover Disch Block). (A-1-108) • 1LP-74 (B Clr Disch Blk To A Pmp). (A-61) • 1LP-75 (1B LPI Cooler Disch Block To 1C LPI Pump). (A-61) • 1LP-68 (1B LPI Cooler Decay Heat Inlet). (A-2-208) **Simulator operator: CLOSE 1LP-73, 1LP-74, 1LP-75 and 1LP-68 by using the Valve program and using time compression inform the candidate that the valves are CLOSED.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Step 2.5 Vent 1B LPI Pump: • Close 1LWD-12 (LPI Pump 1B Base Drain). (A-62) • Open 1LWD-373 (LPI Pump 1B Vent). (A-62) • **WHEN** solid stream of water issues, close 1LWD-373 (LPI Pump 1B Vent). (A-62) • Open 1LWD-12 (LPI Pump 1B Base Drain). (A-62) STANDARD: Dispatch and NEO to vent the 1B LPI Pump. **Simulator operator: Using time compression inform the candidate that the 1B LPI Pump has been vented.** COMMENTS:	___ SAT ___ UNSAT

STEP 5:	Step 2.6 Record 1A LPI cooler outlet temperature ________ °F.	___ SAT ___ UNSAT
STANDARD:	Located the 1A LPI cooler outlet temperature indicator located on 1UB2 and record 1A LPI cooler outlet temperature on the procedure.	
COMMENTS:		
STEP 6:	Step 2.7 Open 1LP-10 (1C LPIP DISCH TO 1B LPI HDR).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Open 1LP-10 located on 1UB2 by taking the switch to the OPEN position and verifying the red OPEN light illuminates and the green CLOSE light goes out.	
COMMENTS:		
STEP 7:	Step 2.8 Open 1LP-14 (1B LPI COOLER OUTLET).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Open 1LP-14 located on 1UB2 by taking the switch to the OPEN position and verifying the red OPEN light illuminates and the green CLOSE light goes out.	
COMMENTS:		

NOTE: Do **NOT** exceed 6000 gpm LPSW flow per cooler. Maintain 1A and 1B LPI cooler outlet temperature the same during cooldown. STEP 8: Step 2.9 Adjust LPSW flow to 1A & 1B LPI Coolers per Enclosure 4.45 "Controlling LPI Cooler Outlet Temperature" to establish desired cooldown rate per OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown). STANDARD: Refer to Enclosure 4.45 "Controlling LPI Cooler Outlet Temperature" and adjust LPSW flow to 1A & 1B LPI Coolers by positioning 1LPSW-251 and 1LPSW-252 Controller Setpoint to establish 120°F - 125°F LPI outlet temperature. ***Cue: Inform the candidate as the SRO to maintain LPI outlet temperature in a 120°F - 125 °F band.*** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Step 2.10 Remove note on Turnover Sheet & Plant Configuration Sheet. STANDARD: Candidate should indicate that they would remove the note on the Turnover Sheet & Plant Configuration Sheet. COMMENTS: **END TASK**	___ SAT ___ UNSAT

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Step is required to complete the required valve lineup.
2	Step is required to complete the required valve lineup.
3	Step is required to complete the required valve lineup.
6	Step is required to complete the required valve lineup.
7	Step is required to complete the required valve lineup.

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

INITIAL CONDITIONS:

Unit shutdown in progress

INITIATING CUES:

The Control Room operator directs you to perform OP/1/A/1104/004, Enclosure 4.20 (Swapping LPI Modes - Series Mode to LPI Normal Mode) beginning at Step 2.2

Enclosure 4.20

Swapping LPI Modes LPI Series Mode To LPI Normal Mode {16}

1. Initial Conditions

_____ 1.1 LR C/D RC PRESSURE is below 125 psig.

_____ 1.2 LPI System in LPI SERIES MODE.

_____ 1.3 Ensure RBS Trains removed from ES Standby Mode per OP/1/A/1104/005 (Reactor Building Spray System).

_____ 1.4 Review Limits and Precautions.

2. Procedure

2.1 Remove White Tags:

_____ • 1LP-5 Switch (1A LPI PUMP SUCTION).

_____ • 1LP-6 Switch (1C LPI PUMP SUCTION (A HDR).

_____ • 1LP-7 Switch (1C LPI PUMP SUCTION (B HDR).

_____ • 1LP-8 Switch (1B LPI PUMP SUCTION).

_____ • 1LP-10 Switch (1C LPI PUMP DISCH TO 1B LPI HDR).

_____ • 1LP-17 Switch (1A LP INJECTION).

_____ • 1B LPI PUMP Switch.

2.2 Position:

_____ _____ • Open 1LP-5 (1A LPI PUMP SUCTION).

_____ _____ • Open 1LP-6 (1C LPI PUMP SUCTION (A HDR).

_____ _____ • Open 1LP-7 (1C LPI PUMP SUCTION (B HDR).

_____ _____ • Open 1LP-8 (1B LPI PUMP SUCTION).

2.3 Position:

_____ _____ • Open 1LP-4 (Return Manual Block). (A-61)

_____ _____ • Open 1LP-139 (1A & 1C LPIP Suct X-Conn Supply). (A-61)

2.4 Position:

____ ____ • Close 1LP-73 (1B LPI Cooler Switchover Disch Block). (A-1-108)

____ ____ • Close 1LP-74 (B Clr Disch Blk To A Pmp). (A-61)

____ ____ • Close 1LP-75 (1B LPI Cooler Disch Block To 1C LPI Pump). (A-61)

____ ____ • Close 1LP-68 (1B LPI Cooler Decay Heat Inlet). (A-2-208)

2.5 Vent 1B LPI Pump:

____ 2.5.1 Close 1LWD-12 (LPI Pump 1B Base Drain). (A-62)

____ 2.5.2 Open 1LWD-373 (LPI Pump 1B Vent). (A-62)

____ 2.5.3 **WHEN** solid stream of water issues, close 1LWD-373 (LPI Pump 1B Vent). (A-62)

____ 2.5.4 Open 1LWD-12 (LPI Pump 1B Base Drain). (A-62)

____ 2.6 Record 1A LPI cooler outlet temperature ________ °F.

____ ____ 2.7 Open 1LP-10 (1C LPIP DISCH TO 1B LPI HDR).

____ 2.8 Open 1LP-14 (1B LPI COOLER OUTLET).

NOTE:
- Do **NOT** exceed 6000 gpm LPSW flow per cooler.
- Maintain 1A and 1B LPI cooler outlet temperature the same during cooldown.

____ 2.9 Adjust LPSW flow to 1A & 1B LPI Coolers per Enclosure 4.45 "Controlling LPI Cooler Outlet Temperature" to establish desired cooldown rate per OP/1/A/1102/010 (Controlling Procedure for Unit Shutdown).

____ 2.10 Remove note on Turnover Sheet & Plant Configuration Sheet.

Reference Use

1. Initial Conditions

1.1 None

NOTE:	
	• If in LPI is in Series Mode, LPSW flow should be established to both LPI coolers
	• The following steps may be performed as many times as required.
	• Main steps in this enclosure can be performed in any sequence.
	• Use of 1LPSW-251 & 1LPSW-252 in automatic is preferred.

2. Procedure

<u>LPSW to 1A LPI Cooler</u>

2.1 **<u>IF</u>** 1LPSW-251 (1A LPI COOLER LPSW CONTROL) is in "AUTO", position 1LPSW-251 Controller <u>Setpoint</u> as required.

2.2 **<u>IF</u>** 1LPSW-251 (1A LPI COOLER LPSW CONTROL) is in "MANUAL", position 1LPSW-251 (1A LPI COOLER LPSW CONTROL) as required.

NOTE:	
	If Units 1 **<u>AND</u>** Unit 2 are on LPI, the following apply to prevent exceeding LPSW pump flow limits: {28}
	• Limit <u>total</u> LPSW flow to Unit 1 LPI coolers to < 6500 gpm using 1LPSW 4 & 1LPSW-5 with 1LPSW-251 & 1LPSW-252 failed open.
	• Limit <u>total</u> LPSW flow to Unit 2 LPI coolers to < 6500 gpm using 2LPSW 4 & 2LPSW-5 with 2LPSW-251 & 2LPSW-252 failed open.

2.3 **<u>IF</u>** LPSW flow control with 1LPSW-4 is required, perform the following:

2.3.1 **<u>IF</u>** 1LPSW-251 FAIL SWITCH is **<u>NOT</u>** in "FAIL OPEN", reduce LPSW flow with 1LPSW-4 (1A LPI COOLER SHELL OUTLET).

2.3.2 Ensure 1LPSW-251 FAIL SWITCH in "FAIL OPEN".

2.3.3 Position 1LPSW-4 (1A LPI COOLER SHELL OUTLET) as required.

2.4 **IF** LPSW flow control with 1LPSW-4 is no longer required, perform the following:

2.4.1 Ensure 1LPSW-251 (1A LPI COOLER LPSW CONTROL) is in "MANUAL".

2.4.2 Ensure 1LPSW-251 FAIL SWITCH in "NORMAL".

2.4.3 Adjust 1LPSW-251 (1A LPI COOLER LPSW CONTROL) as required.

2.4.4 Ensure Open 1LPSW-4 (1A LPI COOLER SHELL OUTLET).

2.4.5 Adjust 1LPSW-251 (1A LPI COOLER LPSW CONTROL) as required.

2.4.6 Adjust 1LPSW-251 Controller Setpoint as required.

2.4.7 Ensure 1LPSW-251 (1A LPI COOLER LPSW CONTROL) is in "AUTO".

2.4.8 Adjust 1LPSW-251 Controller Setpoint as required.

LPSW to 1B LPI Cooler

2.5 **IF** 1LPSW-252 (1B LPI COOLER LPSW CONTROL) is in "AUTO", position 1LPSW-252 Controller Setpoint as required.

2.6 **IF** 1LPSW-252 (1B LPI COOLER LPSW CONTROL) is in "MANUAL", position 1LPSW-252 (1B LPI COOLER LPSW CONTROL) as required.

NOTE: If Units 1 **AND** Unit 2 are on LPI, the following apply to prevent exceeding LPSW pump flow limits: {28}

- Limit total LPSW flow to Unit 1 LPI coolers to < 6500 gpm using 1LPSW 4 & 1LPSW-5 with 1LPSW-251 & 1LPSW-252 failed open.
- Limit total LPSW flow to Unit 2 LPI coolers to < 6500 gpm using 2LPSW 4 & 2LPSW-5 with 2LPSW-251 & 2LPSW-252 failed open.

2.7 **IF** LPSW flow control with 1LPSW-5 is required, perform the following:

2.7.1 **IF** 1LPSW-252 FAIL SWITCH is **NOT** in "FAIL OPEN", reduce LPSW flow with 1LPSW-5 (1B LPI COOLER SHELL OUTLET).

2.7.2 Ensure 1LPSW-252 FAIL SWITCH in "FAIL OPEN".

2.7.3 Position 1LPSW-5 (1B LPI COOLER SHELL OUTLET) as required.

2.8 **<u>IF</u>** LPSW flow control with 1LPSW-5 is no longer required, perform the following:

2.8.1 Ensure 1LPSW-252 (1B LPI COOLER LPSW CONTROL) is in "MANUAL".

2.8.2 Ensure 1LPSW-252 FAIL SWITCH in "NORMAL".

2.8.3 Adjust 1LPSW-252 (1B LPI COOLER LPSW CONTROL) as required.

2.8.4 Ensure Open 1LPSW-5 (1B LPI COOLER SHELL OUTLET).

2.8.5 Adjust 1LPSW-252 (1B LPI COOLER LPSW CONTROL) as required.

2.8.6 Adjust 1LPSW-252 Controller <u>Setpoint</u> as required.

2.8.7 Ensure 1LPSW-252 (1B LPI COOLER LPSW CONTROL) is in "AUTO".

2.8.8 Adjust 1LPSW-252 Controller <u>Setpoint</u> as required.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-015

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 216
2. **Import** files for CRO-015
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	___ SAT ___ UNSAT
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:		
STEP 2:	Rule 3: Step 3 Verifies that any Emergency Feedwater Pumps are operating.	___ SAT ___ UNSAT
STANDARD:	Checks MD EFDWP & TD EFDWP switch lights are on and Pumps have discharge pressure. Candidate will perform step and **GO TO** step 33.	
COMMENTS:		
STEP 3:	Rule 3: Step 33 **IAAT** any EFDW control valve will NOT control (in AUTO or MANUAL), **THEN** perform Steps 34 & 35.	___ SAT ___ UNSAT
STANDARD:	Determines that 1FDW-315 is NOT controlling properly (1A SG level is < 30" and decreasing). Attempts to take MANUAL control of 1FDW 315 (**which will not work**). Concludes that 1FDW-315 has failed closed Performs Steps 34 & 35	
COMMENTS:		

STEP 4:	Rule 3: Step 35 Initiates Enclosure 5.27	___ SAT ___ UNSAT
STANDARD:	Removes Encl. 5.27 from EOP and initiates.	
COMMENTS:		
STEP 5:	Encl 5.27: Step 1 Identify the failure: 1FDW-315 has Failed Closed [GO TO Step 2]	___ SAT ___ UNSAT
STANDARD:	Candidate determines the next procedural step from table in Step 1. Proceeds to step 2.	
COMMENTS:		
STEP 6:	Encl 5.27: Steps 2 & 3 Verify 1A MD EFDWP is operating Stop 1A MD EFDWP	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Candidate verifies 1A MD EFDWP is operating and places switch to OFF.	
COMMENTS:		
STEP 7:	Encl 5.27: Step 4 Place 1 TD EFDW Pump in PULL TO LOCK	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Candidate places the U1 TD EFDW Pump in PULL to LOCK	
COMMENTS:		

STEP 8: Encl 5.27: Step 5 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:	___ SAT ___ UNSAT
STEP 9: Encl 5.27: Step 6 Close 1FDW-33 STANDARD: Candidate closes SU Control Block Valve (1FDW-33) COMMENTS:	___ SAT ___ UNSAT
STEP 10: Encl 5.27: Step 8 Open 1FDW-374 STANDARD: Candidate locates and opens 1FDW-374 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 11: Encl 5.27: Step 9 Verify 1FDW-36 closed Verify 1FDW-38 open STANDARD: Candidate locates valves on Control Board 1VB3 Verifies 1FDW-36 closed Verifies 1FDW-38 open COMMENTS:	___ SAT ___ UNSAT

STEP 12: Encl 5.27: Step 10 Start 1A MD EFDWP STANDARD: Candidate places 1A MD EFDWP switch to RUN 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. STEP 13: Encl 5.27: Step 11 Verify that Neither HPI Forced Cooling or CBP Feed are NOT in progress STANDARD: Candidate goes to RNO. COMMENTS:	___ SAT ___ UNSAT

STEP 14:	Encl 5.27: Step 11 **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**)	**CRITICAL STEP** ___ SAT ___ UNSAT
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, just understand the level which they are to feed to.**	
COMMENTS:		

END TASK

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.

Rule 3
Loss of Main or Emergency FDW

<table>
<tr><th>ACTION/EXPECTED RESPONSE</th><th>RESPONSE NOT OBTAINED</th></tr>
<tr><td colspan="2"><u>NOTE</u>
This rule is NOT applicable if loss of Main FDW is due to Turbine Building flooding.</td></tr>
<tr><td>1. __ IAAT 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]
THEN PERFORM Rule 4 (Initiation of HPI Forced Cooling).</td><td></td></tr>
<tr><td>2. __ Start EFDW pumps to feed <u>all</u> <u>intact</u> SGs.</td><td></td></tr>
<tr><td>3. __ Verify <u>any</u> EFDW pump operating.</td><td>__ GO TO Step 5.</td></tr>
<tr><td>4. __ GO TO Step 33.</td><td></td></tr>
<tr><td>5. Place the following in MANUAL and close:
__ 1FDW-315
__ 1FDW-316</td><td></td></tr>
<tr><td>6. Verify <u>both</u> of the following:
__ <u>Any</u> CBP operating
__ TBVs available on an <u>intact</u> SG</td><td>__ GO TO Step 14.</td></tr>
<tr><td>7. __ Select OFF for <u>both</u> digital channels on AFIS HEADER A.</td><td></td></tr>
<tr><td>8. __ Select OFF for <u>both</u> digital channels on AFIS HEADER B.</td><td></td></tr>
<tr><td>9. Place Startup Block valve control switch for <u>all</u> <u>intact</u> SGs in OPEN:
<table><tr><th></th><th>1A SG</th><th></th><th>1B SG</th></tr><tr><td></td><td>1FDW-33</td><td></td><td>1FDW-42</td></tr></table></td><td></td></tr>
<tr><td>10. Simultaneously position Startup Control valves 10 - 20% open on <u>all</u> <u>intact</u> SGs:
<table><tr><th></th><th>1A SG</th><th></th><th>1B SG</th></tr><tr><td></td><td>1FDW-35</td><td></td><td>1FDW-44</td></tr></table></td><td></td></tr>
</table>

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11. Close the following: __ 1FDW-32 __ 1FDW-41 __ 1FDW-31 __ 1FDW-40	
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 <u>available</u> 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	
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)	

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 another 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)	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19. __ **WHEN** <u>either</u> of the following exists: __ Alternate unit EFW cross connects are open __ 1 TD EFDW PUMP is operating **THEN** continue.	
20. __ Verify 1 TD EFDW PUMP is operating.	__ **WHEN** the following are open: __ 1FDW-313 __ 1FDW-314 **THEN GO TO** Step 22.
21. __ **GO TO** Step 23.	
22. 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.
23. Verify <u>either</u> of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1.__ Establish 100 gpm to each <u>intact</u> SG. 2.__ **IF** $T_c > 550°F$, **THEN** <u>initiate</u> cool down to $\leq 550°F$ by feeding <u>and</u> steaming <u>intact</u> SGs at a rate that prevents RCS saturation using <u>either</u> of the following: __ TBVs __ ADVs 3.__ **IF** $T_c \leq 550°F$, **THEN** feed <u>and</u> steam <u>intact</u> SGs to stabilize $T_c \leq 550°F$ using <u>either</u> of the following: __ TBVs __ ADVs 4.__ Notify CR SRO of SG feed status. 5.__ **GO TO** Step 25.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. Notify CR SRO that EFDW is available from one of the following: __ 1 TD EFDW PUMP __ SG feed is aligned from an alternate unit. {22}	
25. __ **IAAT** any EFDW control valve will **NOT** control (in AUTO or 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. __ Verify EFDW is aligned from an alternate unit.	__ **GO TO** Step 31.
30. Notify the alternate unit to perform the following: __ Monitor EFDWP parameters. __ Maintain UST level > 7'. __ Enter appropriate TS/SLC for EFDW valves closed in manual.	
31. __ **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation).	
32. __ **WHEN** directed by CR SRO, **THEN EXIT** this rule.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33. __ **IAAT** <u>any</u> EFDW control valve will **NOT** control (in AUTO or MANUAL), **THEN** perform Steps 34 and 35.	__ **GO TO** Step 36.
34. __ Notify CR SRO that Encl 5.27 (Alternate Methods for Controlling EFDW Flow) is being initiated. {22}	
35. __ Initiate Encl 5.27 (Alternate Methods for Controlling EFDW Flow).	
36. __ Verify <u>any</u> SCM ≤ 0°F.	__ **IF** overcooling, **OR** exceeding limits in Rule 7 (SG Feed Control), **THEN** throttle EFDW, as necessary.
37. __ **IAAT** Unit 1 EFDW is in operation, **THEN** initiate Encl 5.9 (Extended EFDW Operation).	
38. __ **WHEN** directed by CR SRO, **THEN EXIT** this rule.	

Enclosure 5.27

Alternate Methods for Controlling EFDW Flow

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Identify the failure: | | Valve | Failed Position | GO TO Step | | | 1FDW-315 | Closed | 2 | | | 1FDW-315 | Open | 15 | | | 1FDW-316 | Closed | 38 | | | 1FDW-316 | Open | 51 |	
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. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
5. __ 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.
6. __ Close 1FDW-33.	1.__ Notify SRO that the startup path **CANNOT** be used. 2.__ **EXIT** this enclosure.
7. __ Verify 1A MD EFDWP will be used.	__ **GO TO** Step 9.
8. __ Open 1FDW-374.	__ **GO TO** Step 2 to use the TDEFDWP.
9. Verify the following: __ 1FDW-36 closed __ 1FDW-38 open	Position control switch for the following: __ 1FDW-36 to CLOSE __ 1FDW-38 to OPEN

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. __ 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.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11. Verify <u>either</u> of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1.__ **IF** <u>any</u> 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. __ <u>Initiate</u> cool down to ≤ 550°F by feeding with 1FDW-35 <u>and</u> steaming <u>intact</u> 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 <u>and</u> steam <u>intact</u> SGs to stabilize $T_c \leq 550°F$. 4.__ Notify CR SRO of SG feed status. 5.__ **GO TO** Step 13.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. __ Notify CR SRO that EFDW is available.	
13. __ **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.	
14. __ **EXIT** this enclosure.	

[redacted]

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. __ 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 18. 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 28.
16. __ Stop 1A MD EFDWP.	
17. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
18. __ 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 28.
19. __ Close 1FDW-33.	1. __ Notify SRO that the startup path **CANNOT** be used. 2. __ **GO TO** Step 28.
20. __ Verify 1A MD EFDWP will be used.	__ **GO TO** Step 22.
21. Perform the following: __ Close 1FDW-372 __ Open 1FDW-374	__ **GO TO** Step 15 to use the TDEFDWP.
22. Verify the following: __ 1FDW-36 closed __ 1FDW-38 open	Position control switch for the following: __ 1FDW-36 to CLOSE __ 1FDW-38 to OPEN

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. __ 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.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. Verify <u>either</u> of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1.__ **IF** <u>any</u> 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. __ <u>Initiate</u> cool down to $\leq 550°F$ by feeding with 1FDW-35 <u>and</u> steaming <u>intact</u> 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 <u>and</u> steam <u>intact</u> SGs to stabilize $T_c \leq 550°F$. 4.__ Notify CR SRO of SG feed status. 5.__ **GO TO** Step 26.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25. __ Notify CR SRO that EFDW is available.	
26. __ **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.	
27. __ **EXIT** this enclosure.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28. 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.	
29. __ 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 <u>close</u> 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 32.
30. __ Open 1FDW-372.	
31. __ Close 1FDW-374.	
32. __ **WHEN** 1FDW-315 has been locally closed, **THEN** continue in this enclosure.	
33. __ 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 34. 2.__ **WHEN** 1FDW-94 is locally closed, **THEN** start 1 TD EFDW PUMP.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34. Verify <u>either</u> of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1.__ **IF** <u>any</u> 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. __ <u>Initiate</u> cool down to ≤ 550°F by feeding with 1FDW-315 <u>and</u> steaming <u>intact</u> 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 <u>and</u> steam <u>intact</u> SGs to stabilize $T_c \leq 550°F$. 4.__ Notify CR SRO of SG feed status. 5.__ **GO TO** Step 36.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35. __ Notify CR SRO that EFDW is available.	
36. __ **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.	
37. __ **EXIT** this enclosure.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38. __ 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.
39. __ Stop 1B MD EFDWP.	
40. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
41. __ 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.
42. __ Close 1FDW-42.	1.__ Notify SRO that the startup path **CANNOT** be used. 2.__ **EXIT** this enclosure.
43. __ Verify 1B MD EFDWP will be used.	__ **GO TO** Step 45.
44. __ Open 1FDW-384.	__ **GO TO** Step 38 to use the TDEDFWP.
45. Verify the following: __ 1FDW-45 closed __ 1FDW-47 open	Position control switch for the following: __ 1FDW-45 to CLOSE __ 1FDW-47 to OPEN

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
46. __ 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.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. Verify <u>either</u> of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1.__ **IF** <u>any</u> 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. __ <u>Initiate</u> cool down to $\leq 550°F$ by feeding with 1FDW-44 <u>and</u> steaming <u>intact</u> 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 <u>and</u> steam <u>intact</u> SGs to stabilize $T_c \leq 550°F$. 4.__ Notify CR SRO of SG feed status. 5.__ **GO TO** Step 49.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
48. __ Notify CR SRO that EFDW is available.	
49. __ **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.	
50. __ **EXIT** this enclosure.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
51. __ 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 54. 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 64.
52. __ Stop 1B MD EFDWP.	
53. __ Place 1 TD EFDW PUMP in PULL TO LOCK.	
54. __ Place 1FDW-44 in HAND and set demand to 0%.	1.__ Notify SRO that the startup path **CANNOT** be used. 2.__ **GO TO** Step 64.
55. __ Close 1FDW-42.	1.__ Notify SRO that the startup path **CANNOT** be used. 2.__ **GO TO** Step 64.
56. __ Verify 1B MD EFDWP will be used.	__ **GO TO** Step 58.
57. Perform the following: __ Close 1FDW-382 __ Open 1FDW-384	__ **GO TO** Step 51 to use the TDEFDWP.
58. Verify the following: __ 1FDW-45 closed __ 1FDW-47 open	Position control switch for the following: __ 1FDW-45 to CLOSE __ 1FDW-47 to OPEN

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
59. __ 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.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
60. Verify <u>either</u> of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1.__ **IF** <u>any</u> 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. __ <u>Initiate</u> cool down to $\leq 550°F$ by feeding with 1FDW-44 <u>and</u> steaming <u>intact</u> 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 <u>and</u> steam <u>intact</u> SGs to stabilize $T_c \leq 550°F$. 4.__ Notify CR SRO of SG feed status. 5.__ **GO TO** Step 62.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
61. __ Notify CR SRO that EFDW is available.	
62. __ **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.	
63. __ **EXIT** this enclosure.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
64. 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.	
65. __ 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 <u>close</u> 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 68.
66. __ Open 1FDW-382.	
67. __ Close 1FDW-384.	
68. __ **WHEN** 1FDW-316 has been locally closed, **THEN** continue in this enclosure.	
69. __ 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 70. 2. __ **WHEN** 1FDW-96 is locally closed, **THEN** start 1 TD EFDW PUMP.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
70. Verify <u>either</u> of the following exists: __ HPI Forced Cooling is maintaining core cooling __ CBP feed providing SG feed	1. __ **IF** <u>any</u> 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. __ <u>Initiate</u> cool down to ≤ 550°F by feeding with 1FDW-316 <u>and</u> steaming <u>intact</u> 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 <u>and</u> steam <u>intact</u> SGs to stabilize $T_c \leq 550°F$. 4. __ Notify CR SRO of SG feed status. 5. __ **GO TO** Step 72.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
71. __ Notify CR SRO that EFDW is available.	
72. __ **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.	
73. __ **EXIT** this enclosure.	

Table 1 Maximum Feed Rates When <u>All</u> SCMs are > 0°F		
SG Condition	**Flow Instrument**	**Maximum Feed Rate**
Dry SG w/o Heat Transfer	EFDW flow indicator	100 gpm to <u>affected</u> SG
	S/U FDW flow indicator	0.05 x 10^6 lbm/hr to <u>affected</u> SG
	SSF ASW flow indicator	100 gpm <u>total</u> to Unit 1
Non-dry SG **<u>OR</u>** Dry SG with Heat Transfer	EFDW flow indicator	1000 gpm per header
	S/U FDW flow indicator	0.5 x 10^6 lbm/hr per header
	SSF ASW flow indicator	500 gpm <u>total</u> to Unit 1

Table 2 Feed Rates To Be Established When <u>Any</u> SCM is = 0°F and Rapid Cooldown NOT in Progress			
<u>NOTE</u> After initial feed rates are established, flow should be throttled to maintain cooldown rate within Tech Spec limits but SG levels must continue to increase until LOSCM setpoint is reached.			
FDW source	**Flow Instrument**	**Initial Feed Rates**	
Emergency FDW	EFDW total flow indicator	1 SG	450 gpm
		2 SGs	300 gpm each
	S/U FDW flow indicator	1 SG	0.23 x 10^6 lbm/hr
		2 SGs	0.15 x 10^6 lbm/hr each
Main FDW	S/U FDW flow indicator	1 SG	0.33 x 10^6 lbm/hr
		2 SGs	0.22 x 10^6 lbm/hr each
SSF ASW **AND NO** SSF Event *	SSF ASW flow indicator	400 gpm <u>total</u> to Unit 1	
SSF ASW **AND SSF** Event *	SSF ASW flow indicator	AP/25 controls feed rate	

*SSF activated per AP/25 with <u>both</u> SSF RC Makeup <u>and</u> SSF Aux Service Water systems required. {31}

Table 3 Emergency FDW Pump and Header Maximum Flow Limits			
		EFDW flow indicator	**S/U FDW flow indicator**
MDEFDWP	**(suction from HW)**	440 gpm/pump	0.22×10^6 lbm/hr
	(suction from UST)	600 gpm/pump	0.30×10^6 lbm/hr
TDEFDWP (any suction source)		950 gpm	0.45×10^6 lbm/hr
Emergency FDW Header Flow		1000 gpm	0.5×10^6 lbm/hr

Table 4 SG Level Control Points			
Plant Condition	**Main FDW Pump**	**EFDW Pump**	**SSF ASW Pump**
<u>All</u> SCMs > 0°F **AND** <u>any</u> RCP on	25″ [55″ acc] S/U level	30″ [60″ acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	30″ [60″ acc] XSUR
<u>All</u> SCMs > 0°F **AND** <u>all</u> RCPs off	50% [50% acc] Operating Range	240″ [270″ acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	240″ [270″ acc] XSUR
<u>Any</u> SCM = 0°F **AND NO** SSF Event *	95% [95% acc] Operating Range	LOSCM setpoint (Turn-on code "EFW" <u>or</u> Per Table 5)	LOSCM setpoint (Turn-on code "EFW" <u>or</u> Per Table 5)
<u>Any</u> SCM = 0°F **AND** SSF Event *	N/A	N/A	Per AP/25
Superheated with CETCs ≤ 1200°F	95% [95% acc] Operating Range	LOSCM setpoint (Turn-on code "EFW" <u>or</u> Per Table 5)	LOSCM setpoint (Turn-on code "EFW" <u>or</u> Per Table 5)
Superheated with CETCs > 1200°F	Per Encl 5.15 (ICC Full Range SG Level)	Per Encl 5.15 (ICC Full Range SG Level)	Per Encl 5.15 (ICC Full Range SG Level)

* SSF activated per AP/25 with <u>both</u> SSF RC Makeup <u>and</u> SSF Aux Service Water systems required. {31}

NOTE

If RB Temperature indication is unavailable, utilize RB pressure on the bottom row to calculate LOSCM setpoint.

Table 5
Desired Indicated XSUR Level (inches) To Establish For LOSCM

	RB Press < 3 psig	**RB Press ≥ 3 psig**					
SG Press (psig) ↓ / RB Temp (°F) →	N/A	> 100 to 150	> 150 to 200	> 200 to 250	> 250 to 300	> 300 to 350	> 350
[illegible]	[illegible]	370	375	385	388	388	[illegible]
50 to < 100	345	355	360	370	380	388	388
100 to < 150	[illegible]	[illegible]	350	360	370	380	[illegible]
150 to < 200	330	340	345	355	365	375	385
200 to < 300	[illegible]	[illegible]	340	350	360	370	380
300 to < 400	320	325	335	340	350	360	375
400 to < 500	310	320	325	335	345	355	365
500 to < 600	305	310	320	325	335	350	360
600 to < 700	300	305	315	320	330	345	355
700 to < 800	295	300	310	315	325	335	350
800 to < 900	[illegible]	295	305	310	320	330	345
900 to < 1000	285	290	300	305	315	325	340
[illegible]	[illegible]	[illegible]	295	300	310	[illegible]	[illegible]
≥ 1100	275	280	290	295	305	320	330
SG Press (psig) ↑ / RB Press (psig) →	N/A	3.0 to 5.0	> 5.0 to 15.0	> 15.0 to 35.0	> 35.0 to 72.5	> 72.5 to 140.0	> 140.0

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-500

Restore RB Auxiliary Fan Coolers Following a Loss of LPSW

CANDIDATE ______________________________

EXAMINER ______________________________

**REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE**

Task:

Restore RB Auxiliary Fan Coolers Following a Loss of LPSW

Alternate Path:

No

Facility JPM #:

NEW

K/A Rating(s):
System: 022
K/A: A4.04
Rating: 3.1*/3.2

Task Standard:

Restore RB Auxiliary Fan Coolers Following a Loss of LPSW per OP/1/A/1104/010 (LPSW) Encl. 4.31 (LPSW Shutdown and Return to Service RB Aux Coolers)

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:

OP/1/A/1104/010 (LPSW) Encl. 4.31 (LPSW Shutdown and Return to Service RB Aux Coolers)

Validation Time: 15 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 210
2. **Import** files for CRO-500
3. Go to **RUN**
4. At step 7 FREEZE the simulator and recall SNAP 214.
5. Go to **RUN**
6. At step 8 FREEZE the simulator and recall SNAP 215.
7. Go to **RUN**

Tools/Equipment/Procedures Needed:

AP/24, Loss of LPSW

OP/1/A/1104/010 (LPSW) Encl. 4.31 (LPSW Shutdown and Return to Service RB Aux Coolers)

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 Loss of LPSW has occurred

AP/24 is in progress

LPSW has been restored

INITIATING CUES:

The SRO directs you to OP/1/A/1104/010 Encl. 4.31 (LPSW Shutdown and Return to Service RB Aux Coolers) to return the RB Aux Coolers to service beginning at step 1.4.

START TIME: _______

STEP 1: Step 1.4 Review Limits and Precautions. STANDARD: Candidate reviews Limits and Precautions. COMMENTS:	___ SAT ___ UNSAT

STEP 3:	Step 5.1 Perform the following: • Ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller in Manual/Closed. • Position 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Remote/Closed switch to Close. • Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Controller in Manual/Closed. • Position 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Remote/Closed switch to Close. • Ensure closed 1LPSW-1061 (RB AUX COOLERS RETURN BLOCK). • Ensure closed 1LPSW-1055 (RB AUX COOLERS SUPPLY BLOCK).	___ SAT ___ UNSAT
STANDARD:	Candidate performs the following (valves located on 1VB2): • Determine 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller in Manual/Closed. • Position 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Remote/Closed switch to Close. • Determine 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Controller in Manual/Closed. • Position 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Remote/Closed switch to Close. • Determine 1LPSW-1061 (RB AUX COOLERS RETURN BLOCK) is closed by observing green closed light illuminated. • Determine 1LPSW-1055 (RB AUX COOLERS SUPPLY BLOCK) is closed by observing green closed light illuminated.	
COMMENTS:		

STEP 4: Step 5.2 **IF** required, perform the following: • **IF** required, ensure hydraulic restoration of system has been performed. • **IF** required, ensure Section 6 (Startup Alignment Of RB Aux Coolers) has been performed. STANDARD: Determines that the hydraulic restoration of system and Section 6 (Startup Alignment Of RB Aux Coolers) has been performed. ***Cue: If asked as the SRO, inform candidate that the hydraulic restoration of system and Section 6 (Startup Alignment Of RB Aux Coolers) has been performed.*** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Step 5.3 Perform the following: • Depress LPSW LOW PRESS DIG CH1 RESET. • Depress LPSW LOW PRESS DIG CH2 RESET. STANDARD: Depress the LPSW LOW PRESS DIG CH1 RESET and CH 2 RESET pushbuttons located on 1VB2. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 6:	Step 5.4 Perform the following: • Ensure open 1LPSW-1061 (RB AUX COOLERS RETURN BLOCK). • Ensure open 1LPSW-1055 (RB AUX COOLERS SUPPLY BLOCK).	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Open 1LPSW-1061 located on 1VB2 by taking the switch to the open position and verify the red open light illuminates and the green closed light goes off. Open 1LPSW-1055 located on 1VB2 by taking the switch to the open position and verify the red open light illuminates and the green closed light goes off.	
COMMENTS:		

NOTE: When placed in AUTO, 1LPSW-1054 begins ramping open slowly. 1LPSW-1054 will be full open in 16 minutes.	**CRITICAL STEP**

STEP 7: Step 5.5

Perform the following to fill/pressurize RB Aux Coolers:

- Position 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Remote/Closed switch to Remote.
- Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Controller setpoint at 100%.
- Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Controller in Automatic.
- Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) begins to ramp open.
- **WHEN** > 16 minutes have elapsed, ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) fully open.

___ SAT

___ UNSAT

STANDARD: Candidate will perform the following to fill/pressurize RB Aux Coolers (valves located on 1VB2):

- Position 1LPSW-1054 (RB AUX COOLERS RETURN CONTROL) Remote/Closed switch to Remote.
- Determine 1LPSW-1054 (RB AUX COOLERS RETURN CONTROL) Controller setpoint at 100% by selecting "S" on controller and verifying readout is 100%.
- Place 1LPSW-1054 (RB AUX COOLERS RETURN CONTROL) Controller in Automatic depressing "A" on the controller.
- **WHEN** > 16 minutes have elapsed, ensure 1LPSW-1054 (RB AUX COOLERS RETURN CONTROL) fully open by observing the red open light illuminated and green closed light extinguished.

Cue: After valve begins to ramp open, inform the candidate that time compression is being used and the simulator will be recalled 16 minutes later.

COMMENTS:

NOTE: When placed in AUTO, 1LPSW-1062 will have a two minute time delay then begin ramping open slowly. 1LPSW-1062 will be full open in 18 minutes (including time delay).	**CRITICAL STEP**

STEP 8: Step 5.6

Perform the following to establish flow through RB Aux Coolers:

- Position 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Remote/Closed switch to Remote.
- Ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller setpoint at 100%.
- Ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller in Automatic.
- **WHEN** > 2 minutes have elapsed, ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) begins to ramp open.
- **WHEN** > 16 minutes have elapsed, ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) fully open.

___ SAT

___ UNSAT

STANDARD: Candidate will perform the following to establish flow through RB Aux Coolers (valves located on 1VB2):

- Position 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Remote/Closed switch to Remote.
- Determine 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller setpoint at 100% by selecting "S" on controller and verifying readout is 100%.
- Place 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller in Automatic depressing "A" on the controller.
- **WHEN** > 2 minutes have elapsed, ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) begins to ramp open by observing "ramping" flashing in display and red open light illuminated.
- **WHEN** > 16 minutes have elapsed, ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) fully open by observing the red open light illuminated and green closed light extinguished.

Cue: After valve begins to ramp open, inform the candidate that time compression is being used and the simulator will be recalled 16 minutes later.

COMMENTS:

STEP 9:	Step 5.7 Verify flow has been established to RB Aux Coolers.	___ SAT ___ UNSAT
STANDARD:	Verify flow has been established to RB Aux Coolers by selecting "P" on 1LPSW-1054 or 1LPSW-1062 and observing flow indicated.	
COMMENTS:		
STEP 10:	Step 5.8 **IF** desired, start desired RB Aux Fans: • 1A RB AUX FAN • 1B RB AUX FAN • 1C RB AUX FAN • 1D RB AUX FAN	___ SAT ___ UNSAT
STANDARD:	Determine that ALL Aux Fans located on 1AB3 are operating by observing their red on lights illuminated.	
COMMENTS:		
	END TASK	

STOP TIME: ___________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
5	This step is required to allow the LPSW valves to be reset.
6	This step is required to complete the LPSW flow path.
7	This step is required to establish flow through the controller.
8	This step is required to establish flow through the controller.

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

INITIAL CONDITIONS:

A Loss of LPSW has occurred

AP/24 is in progress

LPSW has been restored

INITIATING CUES:

The SRO directs you to OP/1/A/1104/010 Encl. 4.31 (LPSW Shutdown and Return to Service RB Aux Coolers) to return the RB Aux Coolers to service.

1. Initial Conditions

_____ 1.1 **IF** required, ensure appropriate conditions of SD 1.3.5 (Shutdown Protection Plan) are met.

_____ 1.2 **IF** in operation to RB Aux Coolers, ensure temporary RB chiller shutdown.

_____ 1.3 **IF** in MODE 1, 2, 3, or 4, refer to SLC 16.9.12 (Additional Low Pressure Service Water And Siphon Seal Water System Operability Requirements).

_____ 1.4 Review Limits and Precautions.

2. Procedure

2.1 As required, refer to Section 7 (RB Aux Coolers Information).

2.2 As required, performed desired sections.

3. Reset of RBAC LPSW Low Pressure Isolation Circuit

3.1 Perform the following:

_____ • Depress LPSW LOW PRESS DIG CH1 RESET.

_____ • Depress LPSW LOW PRESS DIG CH2 RESET.

4. Shutdown of RB Aux Coolers

_____ 4.1 **IF** required, ensure desired RB Aux Fans shutdown:

- ☐ 1A RB AUX FAN
- ☐ 1B RB AUX FAN
- ☐ 1C RB AUX FAN
- ☐ 1D RB AUX FAN

_____ 4.2 Ensure Controller for 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) in Manual/Closed.

_____ 4.3 Ensure Controller for 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) in Manual/Closed.

_____ 4.4 **IF** required, tagout RB Aux Fans.

5. Startup of RB Aux Coolers

5.1 Perform the following:

_____ • Ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller in Manual/Closed.

_____ • Position 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Remote/Closed switch to Close.

_____ • Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Controller in Manual/Closed.

_____ • Position 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Remote/Closed switch to Close.

_____ • Ensure closed 1LPSW-1061 (RB AUX COOLERS RETURN BLOCK).

_____ • Ensure closed 1LPSW-1055 (RB AUX COOLERS SUPPLY BLOCK).

5.2 **IF** required, perform the following:

_____ • **IF** required, ensure hydraulic restoration of system has been performed.

_____ • **IF** required, ensure Section 6 (Startup Alignment Of RB Aux Coolers) has been performed.

5.3 Perform the following:

_____ • Depress LPSW LOW PRESS DIG CH1 RESET.

_____ • Depress LPSW LOW PRESS DIG CH2 RESET.

5.4 Perform the following:

_____ • Ensure open 1LPSW-1061 (RB AUX COOLERS RETURN BLOCK).

_____ • Ensure open 1LPSW-1055 (RB AUX COOLERS SUPPLY BLOCK).

NOTE:	When placed in AUTO, 1LPSW-1054 begins ramping open slowly. 1LPSW-1054 will be full open in 16 minutes.

5.5 Perform the following to fill/pressurize RB Aux Coolers:

_____ 5.5.1 Position 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Remote/Closed switch to Remote.

_____ 5.5.2 Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Controller setpoint at 100%.

_____ 5.5.3 Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) Controller in Automatic.

_____ 5.5.4 Ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) begins to ramp open.

_____ 5.5.5 **WHEN** > 16 minutes have elapsed, ensure 1LPSW-1054 (RB AUX COOLERS SUPPLY CONTROL) fully open.

NOTE:	When placed in AUTO, 1LPSW-1062 will have a two minute time delay then begin ramping open slowly. 1LPSW-1062 will be full open in 18 minutes (including time delay).

5.6 Perform the following to establish flow through RB Aux Coolers:

_____ 5.6.1 Position 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Remote/Closed switch to Remote.

_____ 5.6.2 Ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller setpoint at 100%.

_____ 5.6.3 Ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) Controller in Automatic.

_____ 5.6.4 **WHEN** > 2 minutes have elapsed, ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) begins to ramp open.

_____ 5.6.5 **WHEN** > 16 minutes have elapsed, ensure 1LPSW-1062 (RB AUX COOLERS RETURN CONTROL) fully open.

_____ 5.7 Verify flow has been established to RB Aux Coolers.

____ 5.8 **IF** desired, start desired RB Aux Fans:

- ☐ 1A RB AUX FAN
- ☐ 1B RB AUX FAN
- ☐ 1C RB AUX FAN
- ☐ 1D RB AUX FAN

6. Startup Alignment of RB Aux Coolers

_____ 6.1 Ensure Section 5 (Startup Of RB Aux Coolers) in progress.

NOTE:	Steps can be performed in any order. No sequence required.

6.2 Align RB Aux Fans:

6.2.1 Ensure locked closed:

- _____ 1LPSW-1056 (RB Aux Coolers LPSW Supply Pene (#63) Test Drain) (A-4-402)
- _____ 1LPSW-1060 (RB Aux Coolers LPSW Return Pene (#64) Test Drain) (A-4-402)

6.2.2 Ensure closed:

- _____ 1LPSW-1052 (RB Aux Coolers Temporary Chilled Water Supply Block) (A-4-402)
- _____ 1LPSW-1053 (RB Aux Coolers LPSW Supply Drain) (A-4-402)
- _____ 1LPSW-1063 (RB Aux Coolers LPSW Return Vent) (A-4-402)
- _____ 1LPSW-1064 (RB Aux Coolers Temporary Chilled Water Return Block) (A-4-402)
- _____ 1LPSW-1066 (RB Aux Coolers LPSW Supply Vent) (A-4-402)
- _____ 1LPSW-1093 (RB Aux Coolers LPSW Supply Drain) (A-4-402)
- _____ 1LPSW-1094 (RB Aux Coolers LPSW Return Drain) (A-4-402)

6.2.3 Ensure open:

- _____ 1LPSW-1051 (RB Aux Coolers LPSW Block) (A-4-402)
- _____ 1LPSW-1065 (RB Aux Coolers LPSW Return Block) (A-4-402)

NOTE: Steps can be performed in any order. No sequence required.

6.2.4 Ensure closed:

- ____ • 1LPSW-1067 (RB Aux Coolers LPSW Supply Drain) (R-2)
- ____ • 1LPSW-1068 (RB Aux Coolers LPSW Return Drain) (R-2)
- ____ • 1LPSW-1088 (RB Aux Coolers RB Washdown LPSW Supply) (R-2)
- ____ • 1LPSW-1090 (RB Aux Coolers RB Washdown LPSW Supply) (R-2)

NOTE: Steps can be performed in any order. No sequence required.

6.2.5 Ensure open:

- ____ • 1LPSW-1058 (RB Aux Coolers LPSW Supply Pene (#63) Block) (R-2F)
- ____ • 1LPSW-1059 (RB Aux Coolers LPSW Return Pene (#64) Block) (R-2F)

NOTE: Steps can be performed in any order. No sequence required.

6.2.6 Ensure closed:

- ____ • 1LPSW-569 (LPSW Supply to RB Aux Cooling Hi Pt Vent) (R-3)
- ____ • 1LPSW-570 (1A/1B RB Aux Fan Cooler Supply Lo Pt Drn) (R-3)
- ____ • 1LPSW-571 (1C/1D RB Aux Fan Cooler Supply Lo Pt Drn) (R-3)
- ____ • 1LPSW-572 (1C/1D RB Aux Fan Cooler Supply Lo Pt Drn) (R-3)
- ____ • 1LPSW-573 (1C/1D RB Aux Fan Cooler Return Hi Pt Vent) (R-2)
- ____ • 1LPSW-575 (1C/1D RB Aux Fan Cooler Return Lo Pt Drn) (R-2)
- ____ • 1LPSW-657 (1C & 1D RB Aux Fan Cooler Inlet Vent) (R-3)

NOTE:	Steps can be performed in any order. No sequence required.

6.2.7 Ensure closed:

_____ • 1LPSW-579 (RB Vent 1A1 Clng Coil Inlet Drn) (R-3)

_____ • 1LPSW-578 (RB Vent 1A1 Clng Coil Inlet Px) (R-3)

_____ • 1LPSW-580 (RB Vent 1A1 Clng Coil Outlet Px) (R-3)

_____ • 1LPSW-584 (RB Vent 1A2 Clng Coil Inlet Drn) (R-3)

_____ • 1LPSW-583 (RB Vent 1A2 Clng Coil Inlet Px) (R-3)

_____ • 1LPSW-585 (RB Vent 1A2 Clng Coil Outlet Px) (R-3)

_____ • 1LPSW-589 (RB Vent 1A3 Clng Coil Inlet Drain) (R-3)

_____ • 1LPSW-588 (RB Vent 1A3 Clng Coil Inlet Px) (R-3)

_____ • 1LPSW-590 (RB Vent 1A3 Clng Coil Outlet Px) (R-3)

_____ • 1LPSW-594 (RB Vent 1A4 Clng Coil Inlet Drain) (R-3)

_____ • 1LPSW-593 (RB Vent 1A4 Clng Coil Inlet Px) (R-3)

_____ • 1LPSW-595 (RB Vent 1A4 Clng Coil Outlet Px) (R-3)

NOTE:	Steps can be performed in any order. No sequence required.

6.2.8 Ensure open:

- ____ • 1LPSW-577 (RB Vent 1A1 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-581 (RB Vent 1A1 Clng Coil Outlet) (R-3)
- ____ • 1LPSW-582 (RB Vent 1A2 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-586 (RB Vent 1A2 Clng Coil Outlet) (R-3)
- ____ • 1LPSW-587 (RB Vent 1A3 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-591 (RB Vent 1A3 Clng Coil Outlet) (R-3)
- ____ • 1LPSW-592 (RB Vent 1A4 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-596 (RB Vent 1A4 Clng Coil Outlet) (R-3)

NOTE:	Steps can be performed in any order. No sequence required.

6.2.9 Ensure closed:

- ____ • 1LPSW-639 (RB Vent 1B1 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-638 (RB Vent 1B1 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-640 (RB Vent 1B1 Clng Coil Outlet Px) (R-3)
- ____ • 1LPSW-644 (RB Vent 1B2 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-643 (RB Vent 1B2 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-645 (RB Vent 1B2 Clng Coil Outlet Px) (R-3)
- ____ • 1LPSW-649 (RB Vent 1B3 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-648 (RB Vent 1B3 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-650 (RB Vent 1B3 Clng Coil Outlet Px) (R-3)
- ____ • 1LPSW-654 (RB Vent 1B4 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-653 (RB Vent 1B4 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-655 (RB Vent 1B4 Clng Coil Outlet Px) (R-3)

NOTE:	Steps can be performed in any order. No sequence required.

6.2.10 Ensure open:

- ____ • 1LPSW-637 (RB Vent 1B1 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-641 (RB Vent 1B1 Clng Coil Outlet) (R-3)
- ____ • 1LPSW-642 (RB Vent 1B2 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-646 (RB Vent 1B2 Clng Coil Outlet) (R-3)
- ____ • 1LPSW-647 (RB Vent 1B3 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-651 (RB Vent 1B3 Clng Coil Outlet) (R-3)
- ____ • 1LPSW-652 (RB Vent 1B4 Clng Coil Inlet) (R-3)
- ____ • 1LPSW-656 (RB Vent 1B4 Clng Coil Outlet) (R-3)

NOTE:	Steps can be performed in any order. No sequence required.

6.2.11 Ensure closed:

____ • 1LPSW-614 (RB Vent 1C1 Clng Coil Inlet Drain) (R-3)

____ • 1LPSW-613 (RB Vent 1C1 Clng Coil Inlet Px) (R-3)

____ • 1LPSW-615 (RB Vent 1C1 Clng Coil Outlet Px) (R-3)

____ • 1LPSW-609 (RB Vent 1C2 Clng Coil Inlet Drain) (R-3)

____ • 1LPSW-608 (RB Vent 1C2 Clng Coil Inlet Px) (R-3)

____ • 1LPSW-610 (RB Vent 1C2 Clng Coil Outlet Px) (R-3)

____ • 1LPSW-604 (RB Vent 1C3 Clng Coil Inlet Drain) (R-3)

____ • 1LPSW-603 (RB Vent 1C3 Clng Coil Inlet Px) (R-3)

____ • 1LPSW-605 (RB Vent 1C3 Clng Coil Outlet Px) (R-3)

____ • 1LPSW-599 (RB Vent 1C4 Clng Coil Inlet Drain) (R-3)

____ • 1LPSW-598 (RB Vent 1C4 Clng Coil Inlet Px) (R-3)

____ • 1LPSW-600 (RB Vent 1C4 Clng Coil Outlet Px) (R-3)

NOTE: Steps can be performed in any order. No sequence required.

6.2.12 Ensure open:

_____ • 1LPSW-612 (RB Vent 1C1 Clng Coil Inlet) (R-3)

_____ • 1LPSW-616 (RB Vent 1C1 Clng Coil Outlet) (R-3)

_____ • 1LPSW-607 (RB Vent 1C2 Clng Coil Inlet) (R-3)

_____ • 1LPSW-611 (RB Vent 1C2 Clng Coil Outlet) (R-3)

_____ • 1LPSW-602 (RB Vent 1C3 Clng Coil Inlet) (R-3)

_____ • 1LPSW-606 (RB Vent 1C3 Clng Coil Outlet) (R-3)

_____ • 1LPSW-597 (RB Vent 1C4 Clng Coil Inlet) (R-3)

_____ • 1LPSW-601 (RB Vent 1C4 Clng Coil Outlet) (R-3)

NOTE:	Steps can be performed in any order. No sequence required.

6.2.13 Ensure closed:

- ____ • 1LPSW-634 (RB Vent 1D1 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-633 (RB Vent 1D1 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-635 (RB Vent 1D1 Clng Coil Outlet Px) (R-3)
- ____ • 1LPSW-629 (RB Vent 1D2 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-628 (RB Vent 1D2 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-630 (RB Vent 1D2 Clng Coil Outlet Px) (R-3)
- ____ • 1LPSW-624 (RB Vent 1D3 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-623 (RB Vent 1D3 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-625 (RB Vent 1D3 Clng Coil Outlet Px) (R-3)
- ____ • 1LPSW-619 (RB Vent 1D4 Clng Coil Inlet Drain) (R-3)
- ____ • 1LPSW-618 (RB Vent 1D4 Clng Coil Inlet Px) (R-3)
- ____ • 1LPSW-620 (RB Vent 1D4 Clng Coil Outlet Px) (R-3)

NOTE:	Steps can be performed in any order. No sequence required.

6.2.14 Ensure open:

_____ • 1LPSW-632 (RB Vent 1D1 Clng Coil Inlet) (R-3)

_____ • 1LPSW-636 (RB Vent 1D1 Clng Coil Outlet) (R-3)

_____ • 1LPSW-627 (RB Vent 1D2 Clng Coil Inlet) (R-3)

_____ • 1LPSW-631 (RB Vent 1D2 Clng Coil Outlet) (R-3)

_____ • 1LPSW-622 (RB Vent 1D3 Clng Coil Inlet) (R-3)

_____ • 1LPSW-626 (RB Vent 1D3 Clng Coil Outlet) (R-3)

_____ • 1LPSW-617 (RB Vent 1D4 Clng Coil Inlet) (R-3

_____ • 1LPSW-621 (RB Vent 1D4 Clng Coil Outlet) (R-3)

7. RB Aux Coolers Information

7.1 Two air operated valves (AOVs) per penetration (supply and return) will be provided (outside the RB):

- 1LPSW-1054 (RB Aux Coolers Supply Control)
- 1LPSW-1055 (RB Aux Coolers Supply Block)
- 1LPSW-1061 (RB Aux Coolers Return Block)
- 1LPSW-1062 (RB Aux Coolers Supply Control)

7.1.1 The AOVs will serve as containment isolation valves (CIVs) for the RBACs piping that penetrate the reactor building, to ensure that the integrity of the containment is maintained following a design basis accident.

7.1.2 The AOVs will fail closed on loss of air (IA).

7.2 In addition, valves, flow measurement orifices, instrumentation, test connections and flanges will also be provided.

7.2.1 Four new analog pressure monitoring channels (located in the East Pen Room) monitor LPSW header pressure supply from 'A' and 'B' LPSW headers to the RBCU/ RBAC supply header. The analog instruments are powered from 1KVIA, 1KVIB, 1KVIC, and 1KVID.

7.2.2 The four analog channels feed two redundant digital isolation channels (RBAC LPSW Low Press Isolation channels powered from 1KVIA and 1KVIB). Digital channel 1 will close 1LPSW-1055 and 1061. Digital channel 2 will close 1LPSW-1054 and 1062.

7.2.3 Analog Channel test and trip switches will be located in the Cable Room. Digital Channel Reset pushbuttons will be located on the Unit 1 vertical board.

7.3 RBAC LPSW Low Pressure Isolation circuit:

7.3.1 Waterhammer prevention circuitry will be provided that closes the CIVs on low LPSW supply pressure to prevent a column closure waterhammer prior to LPSW system repressurization.

7.3.2 To mitigate the effect of the waterhammer (column separation and rejoining waterhammer) that could be caused by the filling of voided line following the restart of the LPSW pump (following an LOOP or LOCA/LOOP event), the AOVs (1LPSW-1054, 1055, 1061, and 1062) will close if low LPSW header pressure (23 psig) on 2/4 of the analog pressure channels.

7.3.3 Statalarm 1SA9-C9 (LPSW Low Press RB Aux Cooler Isolation) will actuate if the RBAC Isolation Circuitry actuates.

7.3.4 Closing of the valves is accomplished by de-energizing solenoid valves that will port air off the valve actuators (to atmosphere).

7.4 The AOVs will also close if either ONE of the following occurs:

7.4.1 The respective valves receive an ES signal (ES 5 will close 1LPSW-1055 & 1061, ES 6 will close 1LPSW-1054 & 1062).

7.4.2 The respective valve control switch is placed in the closed position.

7.4.3 Power is lost to the solenoid for the associated valve control circuit (1KVIA supplies 1LPSW-1055 & 1061, 1KVIB supplies 1LPSW-1054 & 1062).

7.4.4 Closing of the valves is accomplished by de-energizing solenoid valves that will port air off the valve actuators (to atmosphere).

7.5 The supply and return control AOVs (1LPSW-1054 and 1062) will be provided with Controllers for throttling to minimize transient during startup or shutdown.

7.5.1 When placed in AUTO, 1LPSW-1054 begins ramping open slowly. The valve will be full open in 16 minutes. The valve will ramp full open or to the setpoint selected on the controller.

7.5.2 When placed in AUTO, 1LPSW-1062 will have a two minute time delay then begin ramping open slowly. The valve will be full open in 18 minutes (including time delay). The valve will ramp full open or to the setpoint selected on the controller.

7.5.3 If during the ramp open the operator places the controller in MANUAL, the ramp stops at that point and the valve remains at that position. While in MANUAL, the AUTO signal will track the MANUAL demand. If the operator then places the controller in AUTO, the ramp will continue at the point where the valve was previously positioned. A message 'RAMPING' is displayed on the controller until the ramp is complete.

7.6 If 1KVIA power is lost:

7.6.1 1LPSW-1055 and 1061 will close (de-energizes solenoid valves).

7.6.2 1LPSW-1054 and 1062 controllers would then go to MANUAL and 0% demand due to 1LPSW-1055 & 1061 going closed.

7.7 If 1KVIB power is lost:

7.7.1 1LPSW-1054 and 1062 will close (de-energizes solenoid valves)

7.7.2 1LPSW-1054 and 1062 controllers will go to MANUAL and 0% demand

7.8 AOV operation / controller auto runback function:

7.8.1 If the switch for 1LPSW-1054 or 1055 is taken to CLOSE (de-energizes associated solenoid), 1LPSW-1054 controller will go to MANUAL and 0% demand (runback to 0% demand).

7.8.2 If the switch for 1LPSW-1061 or 1062 is taken to CLOSE (de-energizes solenoid), 1LPSW-1062 controller will go to MANUAL and 0% demand.

7.9 If ES Channel 5 actuates:

7.9.1 1LPSW-1055 and 1061 will close (de-energizes solenoid valves).

7.9.2 1LPSW-1054 and 1062 controllers would then go to MANUAL and 0% demand due to 1LPSW-1055 & 1061 going closed.

7.10 If ES Channel 6 actuates:

7.10.1 1LPSW-1054 and 1062 will close (de-energizes solenoid valves).

7.10.2 1LPSW-1054 and 1062 controllers will go to MANUAL and 0% demand.

7.11 If RBAC Isolation Circuit actuates:

7.11.1 1LPSW-1054, 1055, 1061, and 1062 will close (de-energizes solenoid valves).

7.11.2 1LPSW-1054 and 1062 controllers will go to MANUAL and 0% demand.

7.12 'STANDBY' will be displayed on the controller when the controller receives the signal to runback to 0% and go to MANUAL. The valve will remain in MANUAL until the operator takes action to re-align the system. This ensures the AOVs are closed prior to LPSW pump restart.

7.13 If IA is lost, the AOVs will close. When IA pressure returns, the valves will go to the last position selected on the switches / controllers. Operator action will be required to close the AOVs prior to regaining IA pressure.

7.14 The following information is available on the controller variable window:

7.14.1 If 'X' selected, gpm flow (0 to 1200 gpm) is indicated:

A. Supply flow on 1LPSW-1054 controller.

B. Return flow on 1LPSW-1062 controller.

NOTE:	The typical controller displays the process parameter when 'P' is selected. It is a characteristic of controllers that the setpoint units will dictate what the 'P' variable units will be. In this particular application we are using a setpoint of % valve demand, so the 'P' variable must be in %, also.

7.14.2 If 'P' selected, % flow (0 to 1200 gpm) is indicated.

7.14.3 If 'V' selected, % valve demand is indicated.

7.14.4 If 'S' selected, % valve position desired (selected by setpoint) is indicated (final valve position when ramp is complete).

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-010

FOLLOWING KEOWEE EMERGENCY START TRANSFER MFB POWER FROM CT-4 TO CT-1

CANDIDATE ______________________________

EXAMINER ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Following Keowee Emergency Start, Transfer MFB Power From CT-4 TO CT-1

Alternate Path:

No

Facility JPM #:

CRO-10

K/A Rating(s):

System: 062
K/A: A4.01
Rating: 3.3/3.1

Task Standard:

Auxiliary power is swapped from CT-4 to CT-1 correctly using a "dead bus transfer" per procedure.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate ____

References:

OP/0/A/1106/19 Encl. 4.12

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 211
2. Go to **RUN**

Tools/Equipment/Procedures Needed:

OP/0/A/1106/19 Encl. 4.12 (Dead Bus Transfer Of MFB Power Supply From CT 4 to CT 1)

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 Switchyard Isolation has occurred along with a CT-1 lockout

Unit 1's Main Feeder Busses are being supplied from CT-4 via the Standby Busses.

Transmission Department personnel have replaced faulty relays on CT-1 and it has been reenergized.

Keowee personnel have requested that the Keowee units be shutdown.

The switchyard isolation has been cleared. OP/0/A/1106/19, Keowee Hydro at Oconee, Enclosure 4.12 has been completed through 2.4.

INITIATING CUES:

The Control Room SRO directs you to utilize Enclosure 4.12 of OP/0/A/1106/19, Keowee Hydro at Oconee, to transfer MFB power from CT-4 to CT-1 beginning at Step 2.5.

START TIME: _______

STEP 1:	Step 2.5 Place the following transfer switches in "MAN": • MFB1 AUTO/MAN transfer switch • MFB2 AUTO/MAN transfer switch. • STBY BUS 1 AUTO/MAN transfer switch. • STBY BUS 2 AUTO/MAN transfer switch.	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Locate the following transfer switches on 1AB1 and place in "MAN": • MFB1 AUTO/MAN transfer switch • MFB2 AUTO/MAN transfer switch. • STBY BUS 1 AUTO/MAN transfer switch. • STBY BUS 2 AUTO/MAN transfer switch.	
COMMENTS:		
STEP 2:	Step 2.6 Ensure the following breakers are closed: • 1TC INCOMING FDR BUS 2 • 1TD INCOMING FDR BUS 2 • 1TE INCOMING FDR BUS 2	___ SAT ___ UNSAT
STANDARD:	The following breakers are located on 1AB1 are verified closed by observing their red closed lights are illuminated. • 1TC INCOMING FDR BUS 2 • 1TD INCOMING FDR BUS 2 • 1TE INCOMING FDR BUS 2	
COMMENTS:		

STEP 3: Step 2.7 Open the following breakers: • 1TC INCOMING FDR BUS 1 • 1TD INCOMING FDR BUS 1 • 1TE INCOMING FDR BUS 1 STANDARD: The following breakers located on 1AB1 are opened by taking each switch to the trip position and verify that the red close lights go out and the white open light is illuminated • 1TC INCOMING FDR BUS 1 • 1TD INCOMING FDR BUS 1 • 1TE INCOMING FDR BUS 1 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
CAUTION: Transfer should be made within 5 seconds to prevent picking up the MFB undervoltage timer. STEP 4: Step 2.8 De-energize Main Feeder Bus 1 by opening $S1_1$ STANDBY BUS 1 TO MFB1 breaker. STANDARD: $S1_1$ STANDBY BUS 1 TO MFB1 breaker located on 1AB1 is opened by rotating the switch to the trip position and verifying that the red close light goes out and the white open light illuminates. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

<u>STEP 5</u>: Step 2.9 Close $E1_1$ MFB1 STARTUP FDR breaker. <u>STANDARD</u>: $E1_1$ MFB1 STARTUP FDR breaker located on 1AB1 is closed by rotating the switch to the close position and verifying that the red close light illuminates and the white open light goes out. <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT
NOTE: The following list of major loads 1TC, 1TD and1TE is **NOT** complete. However, it can be used to determine major loads lost during a Dead Bus transfer of MFB power. Depending on Unit MODE, evaluation of loss of TS equipment should be performed to determine proper TS LCO Condition entries. Evaluation of possible TS LCO Condition entries for the other Units should be performed. <u>STEP 6</u>: Step 2.10 Review the following list for loads that may be lost during transfers: <u>STANDARD</u>: The candidate should indicate that they would review the list for loads that may be lost during transfers. **Cue:** ***Inform the candidate that another operator will take care of swapping and starting any loads during and after the transfers.*** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 7</u>: Step 2.10.1 Make entry in Unit Log of applicable Technical Specifications Conditions being entered. <u>STANDARD</u>: The candidate should indicate that they would make entries in the Unit Log of applicable Technical Specifications Conditions. ***Cue: Inform candidate that making log entries is not required for this JPM.*** <u>COMMENTS</u>:	___ SAT ___ UNSAT

<table>
<tr>
<td>

STEP 8: Step 2.10.2

IF possible, start redundant equipment prior to performing Dead Bus transfers to prevent loss of system function.

STANDARD: Determine that this step is not required for this JPM.

Cue: ***Inform the candidate that another operator will take care of swapping and starting any loads during and after the transfers.***

COMMENTS:

</td>
<td>

___ SAT

___ UNSAT

</td>
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STEP 9: Step 2.11

Perform Dead Bus transfers as follows:

- Open 1TC INCOMING FDR BUS 2 breaker.

  WAIT ≥ 3 seconds, close 1TC INCOMING FDR
- Open 1TD INCOMING FDR BUS 2 breaker.

  WAIT ≥ 3 seconds, close 1TD INCOMING FDR
- Open 1TE INCOMING FDR BUS 2 breaker.

  WAIT ≥ 3 seconds, close 1TE INCOMING FDR
- Recover any equipment that may have tripped during
  - Restore AHU-22 **AND** AHU-34 as soon as possible.
  - **IF** previously operating, restore AHU-11 **AND** AHU-12 **AND** 'B' Chiller operating.

STANDARD: Candidate will perform a Dead Bus transfer as follows (**breakers located on 1AB1**):

- Open 1TC INCOMING FDR BUS 2 breaker.

  WAIT ≥ 3 seconds, close 1TC INCOMING FDR
- Open 1TD INCOMING FDR BUS 2 breaker.

  WAIT ≥ 3 seconds, close 1TD INCOMING FDR
- Open 1TE INCOMING FDR BUS 2 breaker.

  WAIT ≥ 3 seconds, close 1TE INCOMING FDR
- Dispatch an NEO to restore AHU-22 **AND** AHU-34 and AHU-11 **AND** AHU-12 **AND** 'B' Chiller to operation. (**not critical**)

COMMENTS:

</td>
<td>

CRITICAL STEP

___ SAT

___ UNSAT

</td>
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</table>

CAUTION: Transfer should be made within 5 seconds to prevent picking up the MFB under voltage timer STEP 10: Step 2.12 De-energize Main Feeder Bus 2 by opening $S2_1$ STBY BUS 2 TO MFB 2 breaker. STANDARD: Open S21 STBY BUS 2 TO MFB 2 breaker located on 1AB1 by rotating the switch to the trip position and verifying that the red closed light goes out and the white open light illuminates. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 11: Step 2.13 Close $E2_1$ MFB2 STARTUP FDR. STANDARD: Close $E2_1$ MFB2 STARTUP FDR breaker located on $1AB_1$ by rotating the switch to the close position and verifying that the red closed light illuminates and the white open light goes out. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: Step 2.14 Close the following breakers from the MFB 2 to load centers: • 1TC INCOMING FEEDER BUS 2 • 1TD INCOMING FEEDER BUS 2 • 1TE INCOMING FEEDER BUS 2 STANDARD: Close the following breakers located on 1AB1 by rotating each switch to the close position and verify that the red close light illuminates and the white open light goes out. • 1TC INCOMING FDR BUS 1 • 1TD INCOMING FDR BUS 1 • 1TE INCOMING FDR BUS 1 COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 13:	Step 2.15 Place AUTO/MAN transfer switches in "AUTO" position on the following Load Centers as required per OP/1/A/1107/002 (Normal Power): • 1X1 • 1X2 • 1X3 • 1X4 • 1X5 • 1X6 • 1X7	___ SAT ___ UNSAT
STANDARD:	Dispatch an NEO to place AUTO/MAN transfer switches in "AUTO" position on the following Load Centers as required per OP/1/A/1107/002 (Normal Power): • 1X1 • 1X2 • 1X3 • 1X4 • 1X5 • 1X6 • 1X7	
Cue:	***The AUTO/MAN transfer switches have been placed in "AUTO" for the above Load Centers.***	
COMMENTS:		

STEP 14:	Step 2.16 Return the following transfer switches to "AUTO": • STANDBY 1 AUTO/MAN • STANDBY 2 AUTO/MAN	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Place the following transfer switches located on 1AB1 in "AUTO" by rotating the selector switch to the "AUTO" position: • STANDBY 1 AUTO/MAN • STANDBY 2 AUTO/MAN	
COMMENTS:		
STEP 15:	Step 2.17 Ensure the following transfer switches are in "AUTO": • CT4 BUS 1 AUTO/MAN. • CT4 BUS 2 AUTO/MAN.	___ SAT ___ UNSAT
STANDARD:	Determine that the following transfer switches located on 1AB1 are in "AUTO" by observing the selector switches in the "AUTO" position: • CT4 BUS 1 AUTO/MAN. • CT4 BUS 2 AUTO/MAN.	
COMMENTS:		
	END TASK	

STOP TIME: ____________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	This step is required to be able to swap the associated breakers.
3	This step is required to complete the electrical lineup.
4	This step is required to complete the electrical lineup.
5	This step is required to complete the electrical lineup.
9	This step is required to complete the electrical lineup.
10	This step is required to complete the electrical lineup.
11	This step is required to complete the electrical lineup.
12	This step is required to complete the electrical lineup.
14	This step is required to return the electrical lineup to normal.

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

INITIAL CONDITIONS:

A Switchyard Isolation has occurred along with a CT-1 lockout

Unit 1's Main Feeder Busses are being supplied from CT-4 via the Standby Busses.

Transmission Department personnel have replaced faulty relays on CT-1 and it has been reenergized.

Keowee personnel have requested that the Keowee units be shutdown.

The switchyard isolation has been cleared. OP/0/A/1106/19, Keowee Hydro at Oconee, Enclosure 4.12 has been completed through 2.4.

INITIATING CUES:

The Control Room SRO directs you to utilize Enclosure 4.12 of OP/0/A/1106/19, Keowee Hydro at Oconee, to transfer MFB power from CT-4 to CT-1 beginning at Step 2.5.

1. Initial Conditions

_____ 1.1 KHUs have been started by emergency actuation **AND** it is desired to shut down the KHUs using a Dead Bus transfer.

_____ 1.2 Review Limits and Precautions.

2. Procedure

2.1 Prior to performing a Dead Bus transfer, notify the following

- _____ Security Force
- _____ Chemistry Department
- _____ Group Heads
- _____ Keowee Operator (One or Both Keowee auxiliaries could be powered from CX)

_____ 2.2 **IF** 'B' LPSW Pump powered from 1TD, swap 'B' LPSW Pump to 2TD per OP/1/A/1104/010 (Low Pressure Service Water System).

NOTE:	Placing all 600 volt Load Center AUTO/MAN selector switches in "MAN", prior to performing a Dead Bus transfer, will prevent unsynchronized load transferring that may blow supply breaker fuses in the Motor Control Centers.

2.3 Prior to performing a Dead Bus transfer, place **ALL** AUTO/MAN transfer switches in "MAN" position for all Motor Control Center normal **AND** alternate feeder breakers:

- _____ _____ 1X1
- _____ _____ 1X2
- _____ _____ 1X3
- _____ _____ 1X4
- _____ _____ 1X5
- _____ _____ 1X6
- _____ _____ 1X7

_____ 2.4 Ensure **Unit 2** has its NORMAL CRD power supply in service. (2X9-5A)

2.5 Place the following transfer switches in "MAN":

_____ _____ • MFB1 AUTO/MAN transfer switch

_____ _____ • MFB2 AUTO/MAN transfer switch.

_____ _____ • STBY BUS 1 AUTO/MAN transfer switch.

_____ _____ • STBY BUS 2 AUTO/MAN transfer switch.

2.6 Ensure the following breakers are closed:

_____ • 1TC INCOMING FDR BUS 2

_____ • 1TD INCOMING FDR BUS 2

_____ • 1TE INCOMING FDR BUS 2

2.7 Open the following breakers:

_____ _____ • 1TC INCOMING FDR BUS 1

_____ _____ • 1TD INCOMING FDR BUS 1

_____ _____ • 1TE INCOMING FDR BUS 1

CAUTION:	Transfer should be made within 5 seconds to prevent picking up the MFB undervoltage timer.

_____ _____ 2.8 Deenergize Main Feeder Bus 1 by opening $S1_1$ STANDBY BUS 1 TO MFB1 breaker.

_____ _____ 2.9 Close $E1_1$ MFB1 STARTUP FDR breaker.

NOTE:
- The following list of major loads 1TC, 1TD and1TE is **NOT** complete. However, it can be used to determine major loads lost during a Dead Bus transfer of MFB power.
- Depending on Unit MODE, evaluation of loss of TS equipment should be performed to determine proper TS LCO Condition entries.
- Evaluation of possible TS LCO Condition entries for the other Units should be performed.

2.10 Review the following list for loads that may be lost during transfers:

1TC	**1TD**	**1TE**
Keowee CX Transformer. De-energized $\geq$ 34 sec Keowee auxiliaries transfer.	1B CCW PUMP	1B MDEFDWP
1A CCWP	1B CBP	1C CCW Pump
1D CCWP	1B Hotwell Pump	1C CBP
1A Hotwell Pump	1D2 Heater Drain Pump	1C Hotwell Pump
1A CBP	1E2 Heater Drain Pump	1D1 Heater Drain Pump
1A HPI pump	1C HPI Pump	1E1 Heater Drain Pump
1A LPI pump	1B LPI Pump	1B HPI Pump
1A RBS pump	1B RBS Pump	1C LPI Pump
1A LPSW pump	B LPSW Pump	1X3 Load Center
1X1 Load Center	1A MDEFDWP	1X4 Load Center
Unit 2 CRD Supply Breaker	1X2 Load Center	1X6 Load Center
1X7 Load Center	1X5 Load Center	1X10 Load Center
1X8 Load Center	1X9 Load Center	A Switchyard Feeder
AHU-34	AHU-22	A Chiller Motor

_____ 2.10.1 Make entry in Unit Log of applicable Technical Specifications Conditions being entered.

_____ 2.10.2 **IF** possible, start redundant equipment prior to performing Dead Bus transfers to prevent loss of system function.

CAUTION:	• The ≥ 3 seconds delay will prevent synchronism problems caused by previously running motors which tend to maintain the original voltage waveform on a bus immediately after the original source is removed. • Certain loads will be lost while the Dead Bus transfers take place and some loads may **NOT** return when the buses are re-energized.

2.11 Perform Dead Bus transfers as follows:

_____ _____ 2.11.1 Open 1TC INCOMING FDR BUS 2 breaker.

_____ _____ 2.11.2 **WAIT** ≥ 3 seconds, close 1TC INCOMING FDR BUS 1 breaker.

_____ _____ 2.11.3 Open 1TD INCOMING FDR BUS 2 breaker.

_____ _____ 2.11.4 **WAIT** ≥ 3 seconds, close 1TD INCOMING FDR BUS 1 breaker.

_____ _____ 2.11.5 Open 1TE INCOMING FDR BUS 2 breaker.

_____ _____ 2.11.6 **WAIT** ≥ 3 seconds, close 1TE INCOMING FDR BUS 1 breaker.

_____ _____ 2.11.7 Recover any equipment that may have tripped during transfer.

_____ _____ • Restore AHU-22 **AND** AHU-34 as soon as possible.

_____ _____ • **IF** previously operating, restore AHU-11 **AND** 'A' Chiller, **OR** ensure AHU-12 **AND** 'B' Chiller operating.

CAUTION:	Transfer should be made within 5 seconds to prevent picking up the MFB under voltage timer.

_____ _____ 2.12 Deenergize Main Feeder Bus 2 by opening $S2_1$ STBY BUS 2 TO MFB 2 breaker.

_____ _____ 2.13 Close $E2_1$ MFB2 STARTUP FDR.

2.14 Close the following breakers from the MFB 2 to load centers:

_____ _____ • 1TC INCOMING FEEDER BUS 2

_____ _____ • 1TD INCOMING FEEDER BUS 2

_____ _____ • 1TE INCOMING FEEDER BUS 2

2.15 Place AUTO/MAN transfer switches in "AUTO" position on the following Load Centers as required per OP/1/A/1107/002 (Normal Power):

_____ _____ • 1X1

_____ _____ • 1X2

_____ _____ • 1X3

_____ _____ • 1X4

_____ _____ • 1X5

_____ _____ • 1X6

_____ _____ • 1X7

2.16 Return the following transfer switches to "AUTO":

_____ _____ • STANDBY 1 AUTO/MAN

_____ _____ • STANDBY 2 AUTO/MAN

2.17 Ensure the following transfer switches are in "AUTO":

_____ _____ • CT4 BUS 1 AUTO/MAN.

_____ _____ • CT4 BUS 2 AUTO/MAN.

CAUTION:	• **IF ANY** KHU is supplying power to an Oconee Unit (either through Overhead **OR** Underground power path) **AND** that KHU has a Normal Lockout, that KHU will shutdown when the Keowee Emergency Start signal is reset. • **IF** a Normal Lockout does exist on a KHU supplying any Oconee Unit, stop use of this procedure until the Normal Lockout is cleared **OR** the KHU is **NO** longer required.

NOTE:	**IF** KHU(s) are generating with Overhead ACB closed prior to an Emergency Start Actuation, that KHU(s) will shutdown when ES Channel has been reset unless ACB is currently closed.

2.18 **WHEN** Underground Power Path is **NOT** required, shut down KHU tied to the Underground by:

2.18.1 **IF** ES 1 **OR** 2 has actuated, either reset ES 1 **AND** 2 channels **OR** press "MANUAL" on the following ES 1 **AND** 2 modules:

_____ _____ • Keowee Emer Start Ch A

_____ _____ • Keowee Emer Start Ch B

_____ _____ • Load Shed and STBY Bkr 1

_____ _____ • Load Shed and STBY Bkr 2

2.18.2 **IF** a manual Keowee Emergency start has been performed from any Oconee Unit, return both (Keowee Emergency Start Channel) switches on the affected Unit to the "OFF" position.

_____ _____ • Keowee Emergency Start Channel A

_____ _____ • Keowee Emergency Start Channel B

_____ _____ 2.18.3 Ensure reset Main Feeder Bus Monitor Panels.

2.18.4 Reset External Grid Trouble Protection System by depressing the following buttons. **(Unit 1/2)**:

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.V. CHANNEL 1 RESET

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.V. CHANNEL 2 RESET

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.F. CHANNEL 1 RESET

_____ _____ • GRID TROUBLE PROTECTIVE SYSTEM U.F. CHANNEL 2 RESET

2.18.5 Ensure External Grid Trouble Protection has been reset. **(Unit 1/2)**:

_____ • SA-15, A-2 Channel #1 Underfrequency

_____ • SA-15, A-4 Channel #2 Underfrequency

_____ • SA-15, C-1 Channel #1 Undervoltage

_____ • SA-15, C-3 Channel #2 Undervoltage

NOTE:	Switchyard Isolation causes emergency start of both KHUs from Oconee **Unit 1** Emergency Start circuitry.

2.18.6 Depress Keowee "PUSH TO RET TO NORMAL AFT ES RESET" pushbutton on <u>**ALL**</u> Oconee Units which have generated a Keowee Emergency Start signal:

A. **Unit 1**

_____ _____ • KEOWEE LOGIC RESET CHANNEL 1

_____ _____ • KEOWEE LOGIC RESET CHANNEL 2

B. **Unit 2**

_____ _____ • KEOWEE LOGIC RESET CHANNEL 1

_____ _____ • KEOWEE LOGIC RESET CHANNEL 2

C. **Unit 3**

_____ _____ • KEOWEE ES CHANNEL A

_____ _____ • KEOWEE ES CHANNEL B

_____ _____ 2.18.7 Place CT4 BUS 1 AUTO/MAN in "MAN".

_____ _____ 2.18.8 Place CT4 BUS 2 AUTO/MAN in "MAN".

_____ _____ 2.18.9 Open SK1 CT4 STBY BUS 1 FEEDER breaker.

_____ _____ 2.18.10 Open SK2 CT4 STBY BUS 2 FEEDER breaker.

_____ _____ 2.18.11 Place CT4 BUS 1 AUTO/MAN in "AUTO".

_____ _____ 2.18.12 Place CT4 BUS 2 AUTO/MAN in "AUTO".

2.19 Shutdown the operating KHU:

_____ A. **<u>IF</u>** the KHU was started at Oconee, shutdown operating KHU per Enclosure "KHU-1 Shutdown." **<u>OR</u>** "KHU-2 Shutdown".

_____ B. **<u>IF</u>** desired, notify Keowee Operator to shutdown the operating KHU per OP/0/A/2000/041 (KHS - Modes of Operation).

_____ 2.20 Make appropriate Unit Log entries for exiting Technical Specifications Conditions.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

CRO-100a

PLACE THE REACTOR BUILDING PURGE IN OPERATION

CANDIDATE ____

EXAMINER ____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Place the Reactor Building Purge in Operation

Alternate Path:

Yes

Facility JPM #:

CRO-100a

K/A Rating(s):
System: 029
K/A: A2.03
Rating: 2.7/3.1

Task Standard:

RB Purge is placed in operation and take appropriate actions when the Main Purge Fan trips.

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

OP/0/A/1102/14

Validation Time: 20 min

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 212
2. Place simulator in **RUN**

Tools/Equipment/Procedures Needed:

OP/0/A/1102/14, Enclosure 4.1 (RB Purge Release)

READ TO OPERATOR

DIRECTION TO TRAINEE:

When I tell you to begin, you are to **PLACE THE REACTOR BUILDING PURGE IN OPERATION.** Before you start, I will describe the general plant conditions, state the initiating cues, and answer any questions. Perform procedure steps and make notifications as if you were actually performing the task.

INITIAL CONDITIONS:

1. Unit 1 is in MODE 5
2. Equipment hatch is closed
3. No GWRs or LWRs are in progress.
4. OP/0/A/1102/14, Enclosure 4.1 (RB Purge Release) has been completed through steps 2.11.
5. Purge will be made per Attached "RB Purge Sample Request".

INITIATING CUES:

The Control Room SRO directs you to place the RB Purge in operation using OP/0/A/1102/14, Encl. 4.1 starting at step 2.12.

START TIME: _______

<table>
<tr>
<td>STEP 1:</td>
<td>Step 2.12
• Ensure one of the following:
1A RB AUX FAN is Off.
OR
1B RB AUX FAN is Off.
• Ensure "T/O Sheet" CR Tag on appropriate RB AUX FAN. (not critical)
• Ensure note on Turnover sheet: "If RB Main Purge Fan is operating, 1A RB Aux Fan or 1B RB Aux Fan should be off." (not critical)</td>
<td rowspan="3">CRITICAL STEP

____ SAT

____ UNSAT</td>
</tr>
<tr>
<td>STANDARD:</td>
<td>Candidate secures either the 1A or 1B RB AUX FAN located on 1AB3 and places a "T/O Sheet" CR Tag on the secured RB AUX FAN.
Candidate should indicate that they would place the following note on the Turnover sheet: "If RB Main Purge Fan is operating, 1A RB Aux Fan or 1B RB Aux Fan should be off."</td>
</tr>
<tr>
<td>COMMENTS:</td>
<td></td>
</tr>
</table>

STEP 2: Step 2.13 **IF** required, Vent RB pressure to Unit Vent: • Open 1PR-1 (RB PURGE OUTLET (RB)). • Open 1PR-2 (RB PURGE OUTLET (PR)). • Ensure closed 1PR-3 (RB PURGE CONTROL). • Push "OPEN" for 1PR-3 (RB PURGE CONTROL) on RZ module (ES Channel 2). **NOTE:** Opening 1PR-3 (RB PURGE CONTROL) as much as 60% may be required. • Throttle > 25% open 1PR-3 (RB PURGE CONTROL). • Check 1PR-3 (RB PURGE CONTROL) indication on ES Channel 2. ***Cue: Inform candidate that venting RB pressure to the Unit Vent is required.*** STANDARD: The following valves, located on 1AB3, are OPENED by rotating the control switch to the open position: • 1PR-1 (RB PURGE OUTLET (RB)) • 1PR-2 (RB PURGE OUTLET (PR)) • Verify Red OPEN light comes ON and Green CLOSED light goes OFF. • 1PR-3 (RB PURGE CONTROL) bailey is THROTTLED CLOSED. (**Not Critical)** • Push "OPEN" for 1PR-3 (RB PURGE CONTROL) on RZ module (ES Channel 2). • 1PR-3 (RB PURGE CONTROL) bailey is THROTTLED OPEN > 25%. • 1PR-3 (RB PURGE CONTROL) indication on ES Channel 2 is verified throttled by both the green CLOSED and red OPEN lights lit. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 3:	Step 2.14 **IF** required, Perform one of the following: Ensure: • Open 1PR-4 (RB PURGE INLET) • Open 1PR-5 (RB PURGE INLET (PR)) • Open 1PR-6 (RB PURGE INLET (RB))	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	The following valves, located on 1AB3, are OPENED by rotating the control switch to the open position: • Open 1PR-4 (RB PURGE INLET) • Open 1PR-5 (RB PURGE INLET (PR)) • Open 1PR-6 (RB PURGE INLET (RB)) • Verify Red OPEN light comes ON and Green CLOSED light goes OFF for each valve above. • Determine steam is aligned to RB Purge heating coils per OP/0/B/1104/037 (Plant Heating). **(not critical)**	
Cue:	***Inform candidate that steam is aligned to RB Purge heating coils per OP/0/B/1104/037 (Plant Heating).***	
COMMENTS:		
STEP 4:	Step 2.15 **IF** required, Start RB Main Purge Fan.	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	The RB Purge Fan is STARTED by rotating the control switch, located on 1AB3, to the START position. The Red ON light comes ON and the green OFF light goes OFF.	
NOTE:	**There is a time delay of 20 seconds between the switch operation and the actual fan start.**	
COMMENTS:		

STEP 5:	Step 2.16 **IF** required, Adjust 1PR-3 (RB PURGE CONTROL) to desired purge rate.	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	Adjust 1PR-3 controller to establish < 25,000 cfm of RB Purge flow.	
COMMENTS:		
STEP 6:	Step 2.17 Perform the following: • Record "Begin GWR ________" in Unit Log. • Record GWR start information on Enclosure 4.3 (RB Purge Sample Request).	____ SAT ____ UNSAT
STANDARD:	Indicate that "Begin GWR ________" would be recorded in the Unit Log. Record GWR start information on Enclosure 4.3 (RB Purge Sample Request).	
Simulator operator: Trip RB Main Purge fan.		
COMMENTS:		
STEP 7:	Step 2.18 During RB Purge operation: • Monitor unit vent radiation monitors. (**not critical**) • **IF** RB Main Purge fan automatically trips, refer to Section 3 (Compensatory Actions).	____ SAT ____ UNSAT
STANDARD:	Unit vent RIAs (1RIA-43, 44, 45, and 46), on 1VB3 are monitored to prevent exceeding limits. Determine that the RB Main Purge fan has tripped by observing the green OFF light is lit and purge flow decreases to zero cfm and refer to Section 3 (Compensatory Actions).	
COMMENTS:		

<table>
<tr><td>

STEP 8: Compensatory Actions
Step 3.3.1
Ensure closed the following:
- 1PR-1 (RB PURGE OUTLET (RB))
- 1PR-2 (RB PURGE OUTLET (PR))
- 1PR-3 (RB PURGE CONTROL)
- 1PR-4 (RB PURGE INLET)
- 1PR-5 (RB PURGE INLET (PR))
- 1PR-6 (RB PURGE INLET (RB))

STANDARD: The following valves, located on 1AB3, are CLOSED by rotating the control switch to the close position:
- 1PR-1 (RB PURGE OUTLET (RB))
- 1PR-2 (RB PURGE OUTLET (PR))
- 1PR-4 (RB PURGE INLET)
- 1PR-5 (RB PURGE INLET (PR))
- 1PR-6 (RB PURGE INLET (RB))
- Verify Red OPEN light goes OFF and Green CLOSED light goes ON.
- 1PR-3 (RB PURGE CONTROL) is closed by using the knob on the Bailey controller. Closed should be verified on the ES Channel 2 RZ Module.

COMMENTS:

</td><td>

CRITICAL STEP

____ SAT

____ UNSAT

</td></tr>
<tr><td>

STEP 9: Step 3.3.2
Investigate cause of termination.

STANDARD: Notify SPOC to Investigate cause of termination.

COMMENTS:

</td><td>

____ SAT

____ UNSAT

</td></tr>
</table>

NOTE: Independent analysis is required. STEP 10: Step 3.3.3 Initiate Enclosure 4.3 (RB Purge Sample Request). STANDARD: Candidate indicates that he would Initiate Enclosure 4.3 (RB Purge Sample Request). ***Cue: Inform the candidate that initiating a sample request is not required for this JPM.*** COMMENTS:	____ SAT ____ UNSAT
STEP 11: Step 3.3.4 **IF** open, close RB Equipment Hatch. STANDARD: Determine equipment hatch is closed by using information on the cue sheet. COMMENTS:	____ SAT ____ UNSAT
STEP 12: Step 3.3.5 Record maximum reading on 1RIA-45: __________ cpm STANDARD: Candidate should record maximum reading on 1RIA-45 on the enclosure. COMMENTS:	____ SAT ____ UNSAT

STEP 13:	Step 3.3.6 Terminate release.	____ SAT ____ UNSAT
STANDARD:	Candidate states the release should be terminated.	
COMMENTS:		

END TASK

TIME STOP: ________

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	This step is necessary to prevent overloading MCC 1XR.
2	This step is necessary to vent RB pressure to the Unit Vent and align the RB Purge flow path.
3	This step is necessary align the RB Purge flow path.
4	This step is necessary to place the RB purge in operation.
5	This step is necessary to prevent exceeding release rates allowed by the sample request.
8	This step is necessary to secure the purge lineup after the fan trips.

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

INITIAL CONDITIONS:

1. Unit 1 is in MODE 5
2. Equipment hatch is closed
3. No GWRs or LWRs are in progress.
4. OP/0/A/1102/14, Enclosure 4.1 (RB Purge Release) has been completed through steps 2.11.
5. Purge will be made per Attached "RB Purge Sample Request".

INITIATING CUES:

The Control Room SRO directs you to place the RB Purge in operation using OP/0/A/1102/14, Encl. 4.1 starting at step 2.12.

Duke Power Company Oconee Nuclear Station	Procedure No. OP/ 1/A/1102/014
	Revision No. 021
RB PURGE SYSTEM	
Continuous Use	Electronic Reference No. OX002VLG

PERFORMANCE

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

(ISSUED) - PDF Format

RB Purge System

1. Purpose

To provide procedural guidance for operating RB Purge System.

2. Limits and Precautions

2.1 RB Purge filters should be changed:

- When radiation level exceeds 20 mR/hr at 1 ft.

  or

- When filter ΔP reaches alarm setpoint at ≈ 10,000 cfm flow. {8}

2.2 Operation of RB purge valves only allowed in Mode 5, 6 or No Mode.

2.3 When RB Equipment Hatch is open:

- RB Purge flow should be > 10,000 cfm.
- RB Mini Purge Fan should **NOT** be operated.

NOTE:
- Proper venting through vent stack reduces potential for an unmonitored release with RB Equipment Hatch removed.
- Enclosure 4.1 (RB Purge Release) is available to vent RB.

2.4 If RB Equipment Hatch removal is required while RB Main Purge is **NOT** available, RB should be vented to vent stack prior/during removal.

NOTE: Enclosure 4.1 (RB Purge Release) is available to vent RB.

2.5 During refueling operations with 1SF-1 and 1SF-2 open and RB Equipment Hatch installed, RB Purge provides vent for compressed air used inside RB.

- If RB Main Purge stopped, RB pressure may increase resulting in changes to FTC level and SFP level.

2.6 Refer to Selected Licensee Commitments (SLC) 16.11.3.

2.7 RB pressure should be ≤ 0.6 psig. If pressure > 0.6 psig, RB should be depressurized prior to exceeding 0.8 psig.

2.8 The following approval levels are required for releases:

All Releases at Station in Progress (including this one)	Required Level of Approval
1/3 Station Limit - 1 GWR in progress	SRO
1/3 Station Limit - 2 GWRs in progress	OSM
1/3 Station Limit - 3 GWRs in progress	OSM
2/3 Station Limit - 1 GWR in progress	OSM
1/3 Station Limit on 1 GWR and 2/3 Station Limit on Another GWR	OPS Superintendent

2.9 Continuous releases should be terminated if RB Purge is shutdown for ≥ 24 hours.

2.10 If Statalarm 1SA-9/B-3 (RB Purge Inlet Temperature Low) alarms and Purge Inlet Piping is in service, stop RB Main/Mini Purge Fan.

2.11 If RB Equipment Hatch is open with RB Main Purge Fan operating at outside air temperatures < 40°F, compensatory actions must be taken to ensure RB temperature remains ≥ 40°F. {2}

2.12 Normal position of 1XR-3E (U1 RB MAIN PURGE FAN BKR) is "closed". {6}

3. Procedure

3.1 Perform appropriate enclosures to operate RB Purge system.

4. Enclosures

4.1 RB Purge Release

4.2 RB Mini Purge Release

4.3 RB Purge Sample Request

4.4 RB Equipment Hatch Removal With Purge Release In Progress

4.5 RB Equipment Hatch Replacement With Purge Release In Progress

4.6 RB Equipment Hatch Removal With Purge Release **NOT** In Progress

4.7 RB Equipment Hatch Replacement With Purge Release **NOT** In Progress

4.8 RB Purge System Reference Valve Checklist

4.9 RB Continuous Release

4.10 RB Depressurization

4.11 RB Depressurization Sample Request

4.12 RB Pressurization

* Appendix *

1. Initial Conditions

_____ 1.1 Initiate Enclosure 4.3 (RB Purge Sample Request).

_____ 1.2 Review Limits and Precautions.

_____ 1.3 Verify the following operable:

- ☐ 1RIA-43 Particulate
- ☐ 1RIA-44 Iodine
- ☐ 1RIA-45 Gaseous (Normal)
- ☐ 1RIA-46 Gaseous (High)
- ☐ Unit vent flow instrument
- ☐ Containment purge flow instrument

1.4 Ensure closed:

_____ _____ • 1PR-21 (RB Purge Supply Line Bleed). (A-4-409)

_____ _____ • 1PR-22 (RB Purge Exhaust Line Bleed). (A-4-402)

NOTE:	Temporary Alarms are set per OP/0/A/1103/020A (Operator Aid Computer Use).

_____ 1.5 Set OAC Temporary low alarms at 40°F on the following: {2}

- ☐ O1A0005 (RB Lower temperature (basement))
- ☐ O1A0006 (RB CRD Area temperature)
- ☐ O1A0021 (RBCU 1C Inlet temperature)
- ☐ O1A0026 (RB Vessel Cavity temperature)
- ☐ O1A0027 (RB SG 1A Cavity Air temperature)
- ☐ O1A0043 (RB Dome temperature)
- ☐ O1A1259 (CRD Service Structure Air temperature 3)

_____ 1.5.1 __IF__ any of the RB temperature points are unavailable, contact Systems Engineering for required actions. {2}

2. Procedure

_____ 2.1 Sample results are received.

_____ 2.2 **IF** sample results allow release, continue this enclosure.

2.3 **IF** sample results are too high in activity for release:

_____ 2.3.1 Complete Enclosure 4.3 (RB Purge Sample Request).

_____ 2.3.2 Return Enclosure 4.3 (RB Purge Sample Request) to RP.

_____ 2.3.3 Stop this Enclosure.

_____ 2.4 Determine if other GWRs are in progress at station.

	Releases in Progress ☑		Release Rate of Station Limit
Unit 1	☐ Yes	☐ No	________________
Unit 2	☐ Yes	☐ No	________________
Unit 3	☐ Yes	☐ No	________________

_____ 2.5 Ensure RIA-45 and RIA-46 setpoints adjusted for U1 RB Purge operation per PT/0/A/0230/001 (Radiation Monitor Check).

2.6 Perform the following:

_____ • Notify U2 CR to place note on Turnover Sheet: "If 2RIA-45 alarms, notify U1 CR."

_____ • Notify U3 CR to place note on Turnover Sheet: "If 3RIA-45 alarms, notify U1 CR."

NOTE:
- Station Limit release rates per SLC 16.11, will **NOT** be exceeded if recommended release rates of Enclosure 4.3 (RB Purge Sample Request) are followed.
- L&P has required approval levels for release.

_____ 2.7 Approval granted for release: ________________________ ______/______
Required Approval Level Date Time

_____ 2.8 Recommended Release Rate ______________ cfm.

NOTE:	During RB purge, vent stack radiation monitors should be operable.

_____ 2.9 __IF__ Unit Vent Stack RIA(s) are inoperable, refer to SLC 16.11.3.

_____ 2.10 Verify RB Mini Purge Fan __NOT__ in operation.

_____ 2.11 Ensure PURGE-BYPASS switch "OFF". (A-6-Purge Fan Room)

2.12 Ensure the following: {9}

_____ 2.12.1 Ensure <u>one</u> of the following:

- ☐ 1A RB AUX FAN is Off.

  __OR__

- ☐ 1B RB AUX FAN is Off.

_____ 2.12.2 Ensure "T/O Sheet" CR Tag on appropriate RB AUX FAN.

_____ 2.12.3 Ensure note on Turnover sheet: "If RB Main Purge Fan is operating, 1A RB Aux Fan or 1B RB Aux Fan should be off."

2.13 __IF__ required, Vent RB pressure to Unit Vent:

_____ _____ 2.13.1 Open 1PR-1 (RB PURGE OUTLET (RB)).

_____ _____ 2.13.2 Open 1PR-2 (RB PURGE OUTLET (PR)).

_____ 2.13.3 Ensure closed 1PR-3 (RB PURGE CONTROL).

_____ 2.13.4 Push "OPEN" for 1PR-3 (RB PURGE CONTROL) on RZ module (ES Channel 2).

NOTE:	Opening 1PR-3 (RB PURGE CONTROL) as much as 60% may be required.

_____ _____ 2.13.5 Throttle > 25% open 1PR-3 (RB PURGE CONTROL).

_____ _____ 2.13.6 Check 1PR-3 (RB PURGE CONTROL) indication on ES Channel 2.

2.14 **IF** required, Perform one of the following:

2.14.1 Ensure:

_____ _____ • Open 1PR-4 (RB PURGE INLET)

_____ _____ • Open 1PR-5 (RB PURGE INLET (PR))

_____ _____ • Open 1PR-6 (RB PURGE INLET (RB))

_____ • Steam is aligned to RB Purge heating coils per OP/0/B/1104/037 (Plant Heating).

Or

2.14.2 Ensure:

_____ _____ • 1PR-4 (RB PURGE INLET) interlock jumpered by I&E

_____ _____ • 1PR-5 (RB PURGE INLET (PR)) interlock jumpered by I&E

_____ _____ • 1PR-6 (RB PURGE INLET (RB)) interlock jumpered by I&E

_____ _____ • Open RB Equipment Hatch

_____ 2.15 **IF** required, Start RB Main Purge Fan.

_____ 2.16 **IF** required, Adjust 1PR-3 (RB PURGE CONTROL) to desired purge rate.

2.17 Perform the following:

_____ • Record "Begin GWR ________" in Unit Log.

_____ • Record GWR start information on Enclosure 4.3 (RB Purge Sample Request).

2.18 During RB Purge operation:

_____ • Monitor unit vent radiation monitors.

• **IF** low flow (≈ 10,000 cfm) through filters: {8}

_____ • Notify Systems Engineering.

_________________________ _____/_____
Person Contacted Date Time

_____ • Issue work request to replace filters.

_____ • **IF** notified by RP that Continuous Release is desired, perform Enclosure 4.9 (RB Continuous Release).

_____ • **IF** alarms are received on RB temperature, refer to Section 3 (Compensatory Actions).

_____ • **IF** required, refer to appropriate enclosures for RB Equipment Hatch removal/replacement.

NOTE:	If 1RIA-45 High Alarm is received, RB Main Purge fan should automatically trip.

_____ • **IF** RB Main Purge fan automatically trips, refer to Section 3 (Compensatory Actions).

NOTE:	• This step is normally used to change GWRs without stopping purge. • This step can be repeated as required.

• **IF** requested by RP:

_____ • Record in Unit Log termination of previous GWR with "Stop GWR".

_____ • Record in Unit Log beginning of current GWR with "Begin GWR".

_____ • Record GWR start information on current Enclosure 4.3 (RB Purge Sample Request).

_____ • Complete CRO Section of previous GWR Enclosure 4.3 (RB Purge Sample Request).

_____ • Return Enclosure 4.3 (RB Purge Sample Request) to RP.

NOTE:	Major steps within this Section may be performed in any sequence.

3. Compensatory Actions

3.1 **IF** 1PR-3 (RB PURGE CONTROL) will **NOT** open, perform the following:

_____ 3.1.1 Close 1PR-3 (RB PURGE CONTROL) Bailey Control.

_____ 3.1.2 Push "OPEN" for 1PR-3 (RB PURGE CONTROL) on RZ module (ES Channel 2).

NOTE:	Opening 1PR-3 (RB PURGE CONTROL) as much as 60% may be required.

_____ 3.1.3 Throttle > 25% open 1PR-3 (RB PURGE CONTROL).

3.2 **IF** any RB temperatures are < 40°F, perform the following:

_____ 3.2.1 **IF** RB Main Purge Fan is operating, stop RB Main Purge Fan.

_____ 3.2.2 **IF** RB Equipment Hatch is open, evaluate closing RB Equipment Hatch.

3.3 **IF** RB Purge automatically trips, perform the following:

3.3.1 Ensure closed the following:

_____ • 1PR-1 (RB PURGE OUTLET (RB))

_____ • 1PR-2 (RB PURGE OUTLET (PR))

_____ • 1PR-3 (RB PURGE CONTROL)

_____ • 1PR-4 (RB PURGE INLET)

_____ • 1PR-5 (RB PURGE INLET (PR))

_____ • 1PR-6 (RB PURGE INLET (RB))

_____ 3.3.2 Investigate cause of termination.

NOTE: Independent analysis is required.

_____ 3.3.3 Initiate Enclosure 4.3 (RB Purge Sample Request).

_____ 3.3.4 **IF** open, close RB Equipment Hatch.

_____ 3.3.5 Record maximum reading on 1RIA-45: __________ cpm

_____ 3.3.6 Terminate release.

4. RB Purge Termination

_____ 4.1 **IF** RB Equipment Hatch will remain open, obtain RP concurrence prior to stopping RB Main Purge Fan. {5}

_________________________ _____/_____
Person Contacted Date Time

_____ 4.2 Ensure stopped RB Main Purge Fan.

NOTE:
- During refueling operations with 1SF-1 and 1SF-2 open and RB Equipment Hatch installed, RB Main Purge provides vent for compressed air used inside RB.
- If RB Purge is isolated, RB pressure may increase resulting in changes to FTC level and SFP level.

4.3 Ensure closed the following valves:

_____ _____ • 1PR-1 (RB PURGE OUTLET (RB))

_____ _____ • 1PR-2 (RB PURGE OUTLET (PR))

_____ _____ • 1PR-3 (RB PURGE CONTROL)

_____ _____ • 1PR-4 (RB PURGE INLET)

_____ _____ • 1PR-5 (RB PURGE INLET (PR))

_____ _____ • 1PR-6 (RB PURGE INLET (RB))

_____ 4.4 **IF** desired, perform the following: {9}

☐ Remove "T/O Sheet" CR Tag from appropriate RB AUX FAN.

☐ Remove note from Turnover sheet: "If RB Main Purge Fan is operating, 1A RB Aux Fan or 1B RB Aux Fan should be off."

☐ **IF** desired, Start appropriate RB AUX FAN.

_____ 4.5 **IF** required, ensure RB Equipment Hatch installed. {5}

_____ 4.6 Record "Stop GWR _________" in Unit Log.

_____ 4.7 Complete CRO Section of Enclosure 4.3 (RB Purge Sample Request).

_____ 4.8 Return Enclosure 4.3 (RB Purge Sample Request) to RP.

4.9 Perform the following:

_____ • Notify U2 CR to remove note from Turnover Sheet: "If 2RIA-45 alarms, notify U1 CR."

_____ • Notify U3 CR to remove note from Turnover Sheet: "If 3RIA-45 alarms, notify U1 CR."

_____ 4.10 Ensure complete RIA-45 and RIA-46 setpoints adjustment for U1 RB Purge operation per PT/0/A/0230/001 (Radiation Monitor Check).

_____ 4.11 **IF** required, ensure removed Temporary Alarms for RB Temperature. {2}

_____ 4.12 **IF** required, notify I&E to remove Interlock Jumpers installed on 1PR-4, 1PR-5, and 1PR-6. {2}

_____ 4.13 Ensure tag(s) removed from 1XR-3D (U-1 RB Mini Purge Fan Bkr). (A-6-602) {3}

_____ 4.13.1 Ensure open 1XR-3D (U-1 RB Mini Purge Fan Bkr). {3}

Enclosure 4.3

RB Purge Sample Request

GWR # 06-17

GWR for Unit ONE Reactor Building

SAMPLE SECTION

NOTE: RP: If RB RIAs are isolated, an alternate sample point must be used.

RB RIAs Isolated ☑: ☐ Yes ☐ No (RB Purge Only)

Independent Sample Analysis Required ☑: ☐ Yes ☐ No

CR Operator ____________________

RP Representative ____________________ Date/Time ____________

Sample Analysis Results

Iodine ____________________

Gaseous ____________________

RP Representative ____________________ Date/Time ____________

Independent Sample Analysis Results

Iodine ____________________

Gaseous ____________________

RP Representative ____________________ Date/Time ____________

Independent sample agrees with initial sample ____________________
RP Representative

Release Rates

☐ 1/3 Station Limit ________cfm

☐ 2/3 Station Limit ________cfm

Enclosure 4.3

RB Purge Sample Request

GASEOUS RELEASE VOLUME UPDATE

CRO SECTION

GWR was from Unit ONE Reactor Building

Start: Date ____________ Time __________

Termination: Date ____________ Time __________

RIA Equilibrium Readings during release:

1RIA-45 ______________

Return this enclosure to Radiation Protection.

______________________ _____/_____
CRO Date Time

COMMENTS

____

____

____

____