a. JPM

TITLE: Ramp Down To 540 MW at 4 MW/Min And Perform Corrective Actions In Response To A Malfunction Of The Rod Control System For A Continuous Rod Insertion.

TASK STANDARD: Commence a ramp down in power, recognize a continuous rod insertion, trip the Reactor by opening CRDM MG set breakers within 30 seconds of receiving a reactor trip first out alarm, and manually trip the Main Turbine by securing the EH pumps.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR ___ CONTROL ROOM ___ PLANT

PROJECTED TIME: _10 MIN_ SIMULATOR IC NUMBER: _IC-212

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA

Examinee:	
Overall JPM Performance:	**Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)	

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to RAMP DOWN TO 540 MW AT 4 MW/MIN. The conditions under which this task is to be performed are:

a. The Plant is at 74% power.
b. There has been a report of an abnormal noise coming from the 1B SGFP turbine.
c. The Unit Operator is enroute to the control room from the Service Water Intake Structure, but has not arrived yet.
d. The Shift Supervisor has directed you to ramp down to remove 1B SGFP from service for maintenance per the following:
   - ramp down per UOP-3.1, step 8.3 using RODS ONLY
   - ramp to 540 MW at 4 MW/min
e. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____ START TIME		
EXAMINER'S NOTE:	• **ELEMENT 1 MAY BE PERFORMED AFTER INSERTING RODS. THE SEQUENCE OF ELEMENTS 1 AND 2 IS NOT CRITICAL.** • **IF A BORATION IS ATTEMPTED, IT WILL NOT WORK (FCV-113A IS FAILED IN THE CLOSED POSITION).** • **EXAMINER'S CUE IF NECESSARY:** **"THE SHIFT SUPERVISOR DIRECTS YOU TO USE RODS TO RAMP DOWN AS STATED IN THE INITIAL CONDITIONS".**	
*1. Commences ramp to 540 MW at 4 MW/Min per the instructions on the DEH computer Screen. UOP-3.1, Step 8.3	Inputs 540 MW target, 4 MW/Min ramp rate, depresses select, and depresses GO pushbutton (GO pushbutton lights up).	S / U
2. Takes CONTROL ROD MOTION switch to RODS IN position as needed to maintain Tavg within ± 1.5°F of Tref. UOP-3.1, Step 2.3.	WHEN inward rod movement is demanded, recognizes rod movement is inward and continuous.	S / U
3. Verifies NO load change in progress. AOP-19.0 Step 1	Depresses Main Turbine HOLD pushbutton. Observes Turbine HOLD pushbutton lights up.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
4. Places rods in Auto and observes rods continue to step inward. AOP-19.0 Step 2.1	Places rods in Auto and observes rods continue to step inward.	S / U
5. Attempts to trip the reactor using both Reactor Trip handswitches. AOP-19.0 Step 2.2	Attempts to trip the reactor using both MCB Reactor Trip handswitches. Observes reactor does not trip.	S / U
*6. Trips the reactor within 30 seconds of receiving a reactor trip first out alarm by placing both CRDM MG set breaker handswitches to open. EEP-0.0 Step 1.1.3 RNO	Trips the reactor placing both CRDM MG set breaker handswitches to open. Observes all DRPI rod bottom lights lit.	S / U
7. Attempts to trip the Main Turbine using MAIN TURB EMERG TRIP handswitch. EEP-0.0 Step 2.1 RNO	Attempts to trip the Main Turbine by placing the MCB MAIN TURB EMERG TRIP handswitch to TRIP for at least 5 seconds. Observes all Throttle valves open by TSLB2 14-1,2,3,4 NOT lit.	S / U
*8. Trips the Main Turbine by placing both EH handswitches to STOP. EEP-0.0 Step 2.2 RNO	Attempts to trip the Main Turbine by placing the MCB MAIN TURB EMERG TRIP handswitch to TRIP for at least 5 seconds. Observes all Throttle valves closed by TSLB2 14-1,2,3,4 LIT.	S / U
9. Checks power to all 4160V ESF busses. EEP-0.0 Step 3	Checks EPB AC power available lights lit for 4160V busses F, K, G, L. Observes they are all lit.	S / U

NOTE: IN THE FOLLOWING ELEMENT, AN SI WILL OCCUR. (This is due to the Main Turbine manual trip being blocked and the applicant does not have a Unit Operator to help)

10.	Checks SI status and observes SI has occurred and continues on in EEP-0.0 to Step 5 AFTER verifying immediate actions with the procedure. EEP-0.0 Step 4	Checks SI status and Observes SI has occurred and continues on in EEP-0.0 to Step 5. Observes MLB 1 "1-1" and 11-1" lights are lit, and BYPASS AND PERMISSIVE panel SI ACTUATED light is lit.	S / U

EXAMINER'S CUE IF NECESSARY: **"THE SHIFT SUPERVISOR DIRECTS YOU TO VERIFY IMMEDIATE ACTIONS WITH THE PROCEDURE"**

11.	Verifies Immediate actions in EEP-0.0. EEP-0.0 Step 1-4	Opens EEP-0.0, Reactor Trip or Safety Injection, and verifies steps 1-4 are complete.	S / U

____ STOP TIME

Terminate when immediate actions of EEP-0 have been verified (steps 1-4).

CRITICAL ELEMENTS: Critical Elements are denoted with an asterisk (*) preceding the element number.

GENERAL REFERENCES

1. FNP-1-UOP-3.1, Version 96
2. FNP-1-AOP-19.0, Version 23.0
2. K/As: 001 A2.11 RO-4.4 SRO-4.7

GENERAL TOOLS AND EQUIPMENT

None

COMMENTS

HANDOUT

CONDITIONS

When I tell you to begin, you are to RAMP DOWN TO 540 MW AT 4 MW/MIN. The conditions under which this task is to be performed are:

a. The Plant is at 74% power.
b. There has been a report of an abnormal noise coming from the 1B SGFP turbine.
c. The Unit Operator is enroute to the Control room from the Service Water Intake Structure, but has not arrived yet.
d. The Shift Supervisor has directed you to ramp down to remove 1B SGFP from service for maintenance per the following:
    - ramp down per UOP-3.1, step 8.3 using RODS ONLY
    - ramp to 540 MW at 4 MW/min
e. A pre-job brief is not required.

JPM a. HO reactivity sheet.pdf

Unit One Reactivity Briefing Sheet

RCS Temp		*565.5 °F*
PWR		*74.0 %*
Current Xenon Concentration		*2726 PCM*
Burnup		*10000 MWD/MTU*
As of (Date & Time)		*9/18/2008 13:46*
Calculated Burnup		10000 MWD/MTU
	As Of	*9/18/08 1346*
	Assumes constant power since Last Power history update	
RCS Boron		1142
BAT Concentration		*7350 PPM*
Current Bank Delta Rod Position:		*200.5 Steps*

Current RCS Borations / Dilutions:

	Borate	Dilute
	13 Gal.	*20 Gal.*
Reactivity Additions:	-13.11	3.71 PCM
Total Reactivity Addition:		-9.40 PCM
Net RCS Temperature Effect:		-1.01 °F
Net Rx Power Effect:		-0.59 %

Boron Worth	-8.07 PCM/PPM
Power Defect	1,170 PCM
MTC	-9.34 PCM/°F

Rod Worth

Steps Out

One	9 PCM
Two	17 PCM
Five	44 PCM
Ten	84 PCM
Twenty	143 PCM
Fifty	*

Steps In

One	**-9 PCM**
Two	**-18 PCM**
Five	**-45 PCM**
Ten	**-89 PCM**
Twenty	**-168 PCM**
Fifty	**-341 PCM**

Boric Acid Required for Power reduction
With no Control rod movement

DeltaPower	Delta Power Defect (PCM)	Delta PPM	Acid Required (Gallons)
1.00%	15	1.81	15
2.00%	29	3.63	29
5.00%	73	9.07	73
10.00%	146	18.13	145
20.00%	293	36.27	291
25.00%	368	45.55	366
50.00%	777	96.27	776
75.00%	N/A	N/A	N/A
100.00%	N/A	N/A	N/A

RCS Blended Flow Makeup Requirements

	Acid to Borate 1 PPM (Gal.)	RMW to dilute 1 PPM(Gal.)	Required Acid flow Rate (GPM)	FK-113 Pot Setting
Values for Normal Auto M/U (Bat-100 ppm boron)	8.1 Gal.	43.5 Gal.	18.9 GPM	4.71
Values based on Actual Bat Concentration	8.0 Gal.	43.5 Gal.	18.7 GPM	4.63

Valid For Unit One cycle 22
Core Physics Curves:

Curve 5	Rev 25
Curve 27	Rev 24
Curve 34	Rev 42
Curve 57	Rev 31
Curve 57A	Rev 21

Printed by 10/27/2008 @ 1:47 AM

b. JPM

TITLE: Evaluate The RHR System sample results and EITHER borate the RHR system or place the RHR System in Standby for RCS Cooldown.

TASK STANDARD: Evaluate the boron concentration of the RHR system, and determine that it needs to be borated to increase RHR System boron concentration above the CSD boron concentration, then borate the 'A' Train RHR system.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR ___ CONTROL ROOM ___ PLANT

PROJECTED TIME: _25 MIN_ SIMULATOR IC NUMBER: _IC-213

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA

Examinee:	
Overall JPM Performance:	**Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)	

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to EVALUATE THE RHR SYSTEM SAMPLE RESULTS AND EITHER BORATE THE RHR SYSTEM OR PLACE THE RHR SYSTEM IN STANDBY FOR RCS COOLDOWN. The conditions under which this task is to be performed are:

a. The Plant is in Mode 3.
b. The CCW system is in operation and aligned per SOP-23.0.
c. The RCS has been borated to 2000 ppm in preparation for a refueling outage.
d. FNP-1-SOP-7.0, Residual Heat Removal System, section 4.1 up to step 4.1.10 is complete.
e. 'A' Train RHR system boron sample results have just been reported to the Control Room: 805 ppm.
f. Fuel Burnup is 16,000 MWD/MTU.
g. You are directed to continue in SOP-7.0, at step 4.1.11 OR 4.1.12 as applicable.

EXAMINER NOTE:	**PREJOB BRIEF IS EXPECTED FOR THIS TASK. STARTING THIS TASK IN A ROOM OUTSIDE OF THE SIMULATOR WITH PROCEDURES AVAILABLE (SOP-2.1, SOP-7.0, AND CORE PHYSICS CURVES 61 AND 61A) SHOULD PROVIDE EFFICIENT USE OF THE SIMULATOR WHICH IS NOT NEEDED UNTIL E.EMENT 2.**

EVALUATION CHECKLIST

ELEMENTS:	**STANDARDS:**	**RESULTS: (CIRCLE)**
____ START TIME		
1. Evaluates Boron Sample results with CSD boron concentration per curve 60 & 61A and determines that the 'A' Train RHR system must be borated. SOP-7.0 Step 4.1.12	Evaluates Boron Sample results with CSD boron concentration per curve 60 & 61A and determines that the 'A' Train RHR system must be borated.	S / U
2. Verify closed 'B' train RHR to CVCS letdown isolation RHR-V-8720B (V013B). SOP-7.0 Step 4.1.12.1	Call the S. O. to verify the position of V013B. (CUE: The S. O. reports that V013B is closed.)	S / U
3. Open 'A' train RHR to CVCS letdown isolation RHR-V-8720A (V013A). SOP-7.0 Step 4.1.12.2	Ask the S. O. to open V013A. (CUE: The S. O. reports that V013A is open.)	S / U

CUE: THE SHIFT SUPERVISOR DOES NOT DESIRE EXCESS LETDOWN IN SERVICE.
SOP-7.0 Step 4.1.12.3

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
4. Compare LETDOWN PRESSURE and 'A' RHR pump discharge pressure. SOP-7.0 Step 4.1.12.4	Check letdown PI-145 and RHR pump discharge PI-600A. Observes PI-145 > PI-600A.	S / U
5. Directs Chemistry to secure the Zinc Addition System. SOP-2.1 Step 4.3.1	Directs Chemistry to secure the Zinc Addition System. (CUE: The Zinc Addition System is secured.)	S / U
6. Place LP LTDN PRESS PK 145 in Manual and demand at approximately 50%. SOP-2.1 Step 4.3.2 & 3	PK 145 Manual Pushbutton is depressed and is backlit at ≈ 50% demand.	S / U
*7. Close the LTDN ORIF Isolation valves Q1E21HV8149A, B, & C. SOP-2.1 Step 4.3.4	The handswitches for HV-8149A, B, & C taken to close. Observes: HV-8149A, B, & C green lights are lit, red lights are NOT lit.	S / U
8. If desired, close both LTDN LINE Isolation Valves Q1E21V459 & 460. SOP-2.1 Step 4.3.5	V459 & V460 may be closed or left open. Observes red light lit for open valves and green light lit for closed valves.	S / U
9. Place CHG FLOW FK 122 in MANUAL and adjust demand to 0% (closed). SOP-2.1 Step 4.3.6 & 7	FK 122 Manual pushbutton is depressed and is backlit. Demand is lowered to 0%.	S / U
10. Adjust Seal Injection Flow as needed. SOP-2.1 Step 4.3.8	HIK 186 is adjusted as needed to maintain ≈ 8 gpm flow to each RCP.	S / U

EXAMINER'S CUE: "ANOTHER OPERATOR WILL PERFORM STP-8.0 PER STEP 4.3.10".

*11. Diverts letdown to VCT. SOP-7.0 Step 4.1.12.5	Places handswitch for LTDN HI TEMP DIVERT VLV TCV-143 to the VCT position. Observes the The VCT light is lit, the Demin light is NOT lit.	S / U
*12. Diverts letdown to the RHT's. SOP-7.0 Step 4.1.12.6	VCT HI LEVEL DIVERT VLV LCV-115A placed to the RHT position. Observes the VCT light is NOT lit, the RHT light is lit.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*13. Slowly open RHR TO LTDN HX HIK-142. SOP-7.0 Step 4.1.12.7	HIK-142 turned clockwise to open.	S / U
*14. Adjust LP LTDN PRESS PK-145 as necessary to provide maximum letdown flow. SOP-7.0 Step 4.1.12.8	LP LTDN PRESS PK-145 adjusted not to exceed 135-gpm flow on FI-150.	S / U
EXAMINER'S CUE: FIVE MINUTES HAVE ELAPSED.		
*15. Closes RHR to LTDN Hx HIK-142. SOP-7.0 Step 4.1.12.9	HIK-142 turned counterclockwise to close.	S / U
16. Requests chemistry sample 'A' train RHR. SOP-7.0 Step 4.1.12.9	Chemistry called to sample 'A' train RHR. (CUE: Chemistry acknowledges the request for a sample of 'A' train RHR.)	S / U
EXAMINER'S CUE: ANOTHER OPERATOR WILL CONTINUE WITH THIS PROCEDURE AFTER THE SAMPLE RESULTS ARE OBTAINED.		

_____ STOP TIME

Terminate JPM when Boron sample has been requested.

CRITICAL ELEMENTS: Critical Elements are denoted with an asterisk (*) before the element number.

GENERAL REFERENCES

1. FNP-1-SOP-7.0, Version 78.0
2. FNP-1-SOP-2.1, Version 96.0
3. Curve 61 & 61A, Unit 1 Cycle 22 (Rev. 22)
3. K/As: 004 A2.10 RO-3.9 SRO-4.2
   005K5.09 RO-3.2 SRO-3.4

GENERAL TOOLS AND EQUIPMENT

Provide: Entire "Unit 1 Physics Curves" book
OR
Curve 61 AND 61A, cycle 22

COMMENTS

HANDOUT

CONDITIONS

When I tell you to begin, you are to EVALUATE THE RHR SYSTEM SAMPLE RESULTS AND EITHER BORATE THE RHR SYSTEM OR PLACE THE RHR SYSTEM IN STANDBY FOR RCS COOLDOWN. The conditions under which this task is to be performed are:

a. The Plant is in Mode 3.
b. The CCW system is in operation and aligned per SOP-23.0.
c. The RCS has been borated to 2000 ppm in preparation for a refueling outage.
d. FNP-1-SOP-7.0, Residual Heat Removal System, section 4.1 up to step 4.1.10 is complete.
e. 'A' Train RHR system boron sample results have just been reported to the Control Room: 805 ppm.
f. Fuel Burnup is 16,000 MWD/MTU.
g. You are directed to continue in SOP-7.0, at step 4.1.11 OR 4.1.12 as applicable.

UNIT 1 CYCLE 22 CURVE 61
Minimum Boron Concentration to Assure 1.00% and 1.77% ΔK/K
Shutdown Margin at Various Moderator Temperatures and Core Burnups
(Assumes All Rods In with the Most Reactive Rod Stuck Out and Xenon-Free Conditions)

REV. 34

APPROVED: Kassandra Moore 10/17/07
ENGINEERING SUPPORT MANAGER DATE

Vessel Average Moderator Temperature (°F)

	(1.00% SDM)		(1.77% SDM)				
Burnup (MWD/MTU)	**68**	**200**	**200**	**300**	**400**	**500**	**547**
0	1301	1285	1360	1340	1304	1226	1130
150	1296	1280	1355	1338	1306	1230	1136
1000	1300	1285	1359	1343	1310	1235	1141
2000	1339	1320	1396	1372	1335	1260	1168
3000	1373	1354	1429	1406	1360	1274	1179
4000	1390	1372	1447	1423	1375	1278	1177
6000	1387	1366	1440	1413	1359	1251	1135
8000	1344	1319	1392	1361	1299	1179	1056
10000	1274	1245	1316	1279	1210	1074	946
12000	1184	1150	1219	1176	1098	950	810
14000	1069	1031	1098	1051	965	802	658
16000	940	897	962	909	814	639	487
18000	798	750	813	754	653	466	307
20250	626	571	632	569	458	257	100

Note: All cases were run with ARI and the most reactive rod withdrawn, no Xenon. BOL has peak Sm, then Sm depleted through end of life. All concentrations are in ppm (100 ppm allowance included). Additional boron may be required to satisfy boron dilution concerns at hot and cold shutdown (See Curve 61A). Information includes B^{10} depletion considerations.

ARO Critical Boron Concentration = 1659 ppm (BOL, HZP, Xenon-free conditions for Cycle 22)

JPM b. HO curves 27 & 28.pdf

PCB-1-VOL1-CRV61A

UNIT 1 CYCLE 22 CURVE 61A

Minimum Boron Concentration for Hot and Cold Shutdown

To Satisfy Inadvertent Boron Dilution Accident Requirements (RHR Flowrate ≥ 1000 gpm)

REV. 22

APPROVED: Konrad Moore 10/17/07

ENGINEERING SUPPORT MANAGER DATE

Burnup (MWD/MTU)	Mode 4	Mode 5
0	1451	1530
150	1449	1525
1000	1454	1530
2000	1494	1578
3000	1536	1621
4000	1560	1646
6000	1554	1643
8000	1497	1588
10000	1406	1498
12000	1292	1386
14000	1150	1246
16000	990	1084
18000	812	905
20250	597	692

Notes:

1) This curve is applicable only when RHR is in service.
2) Interpolation between 1000 gpm curve and 2300 gpm curve should not be performed for intermediate flow rates.
3) This data bounds all RHR flow rates ≥ 1000 gpm and < 2300 gpm.
4) Dilution rate is assumed to be 150 gpm.
5) Information includes B-10 depletion considerations.

c. JPM

TITLE: Perform The Required Actions For Cold Leg Recirculation

TASK STANDARD: Perform The Required Actions For Cold Leg Recirculation, for the 'B' train only.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR ___ CONTROL ROOM ___ PLANT

PROJECTED TIME: _15 MIN_ SIMULATOR IC NUMBER: _IC-214

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA ___

Examinee:	
Overall JPM Performance:	**Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)	

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to **PERFORM THE REQUIRED ACTIONS FOR COLD LEG RECIRCULATION**. The conditions under which this task is to be performed are:

a. A LBLOCA has occurred.
b. ESP-1.3, Transfer to Cold Leg Recirc, has been entered and all steps through Step 6 have been completed.
c. 1B Charging pump is aligned to 'A' Train.
d. Containment pressure is 7 psig.
e. Recirc. Disconnects are Closed.
f. You are directed by the Shift Supervisor to transfer to cold leg recirculation performing Step 7 ONLY of ESP-1.3.
g. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
____ START TIME		
1. Checks containment sump level greater than 3.0 ft. Step 7.1	LI-3594A or LR-3594B checked. Observes sump level greater than 3.0 ft.	S / U
2. Verifies recirculation valve disconnects CLOSED. Step 7.2	Attachment 1 referenced to verify recirculation valve disconnects closed. Observes all white lights lit.	S / U
*3. Stops both RHR pumps. Step 7.3	1A and 1B RHR pump handswitches taken to stop. Observes 1A & 1B RHR pump Amps indicate '0', Both pumps green lights lit and red lights NOT lit.	S / U

NOTE: THE FOLLOWING ELEMENT IS THE START OF THE ALTERNATE PATH IN THE RNO COLUMN.

4. Aligns 'A' Train RHR for cold leg recirculation. Step 7.4	MOV-8809A handswitch taken to closed. Observes both valve position indicators red AND green lights are NOT lit.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*5. Stops the running 'A' train CHG PUMP (AND proceed to step 7.9). Step 7.4 RNO	Stop the running 'A' train CHG PUMP. Observes 1A CHG pump Amps indicate '0', pump green light lit and red light NOT lit.	S / U
*6. Aligns 'B' Train RHR for cold leg recirculation. Step 7.9	Handswitches for RWST TO 1B1 RHR PMP MOV-8809B taken to closed. Observes valve position indicator, green light lit, red light NOT lit.	S / U
*7. Opens CTMT SUMP TO 1B RHR PMP MOV-8811B and MOV-8812B. Step 7.10	Handswitches for CTMT SUMP TO 1B RHR PMP MOV-8811B and MOV-8812B, taken to open. Observes valve position indicators, red lights lit, green lights NOT lit.	S / U
*8. Closes RHR TO RCS HOT LEGS XCON MOV-8887B. Step 7.11	Handswitch for RHR TO RCS HOT LEGS XCON MOV-8887B taken to closed. Observes valve position indicator, green light lit, red light NOT lit.	S / U
*9. Starts 1B RHR pump. Step 7.12	Handswitch for 1B RHR PMP taken to start. Observes pump Amp meter indicates amps, pump breaker red light lit, green light NOT lit.	S / U
10. Verifies 'B' train LHSI flow is stable. Step 7.13	FI-605B checked. Observes FI-605B stable.	S / U
11. Verifies charging pump miniflow valves CLOSED. Step 7.14	Indications for MOVs 8109A/B/C and 8106 checked. Observes charging pump miniflow valves green lights are lit and red lights are NOT lit.	S / U
12. Verifies seal return flow valves CLOSED. Step 7.15	Indications for seal return flow valves MOV 8100 and 8112 checked. Observes MOV 8100 and 8112 indications green lights lit, red lights NOT lit.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
13. Verifies the 'A' train CHG PUMP stopped based on 1A RHR PUMP NOT started (and proceed to step 7.20). Step 7.16 RNO	Verifies the 'A' train CHG PUMPs stopped. Observes breaker position indicators green lights lit, red lights NOT lit.	S / U
14. Checks MOV-8130A and B 'B' Charging Pump Suction Hdr Iso valves from 'A' Train OPEN. Step 7.20	Checks position indication for CHG PMP SUCT HDR ISO VLV MOV-8130A and B. Observes valve position indicators red lights lit, green lights NOT lit.	S / U
*15. Closes MOV-8131A and B 'B' Charging Pump Suction Hdr Iso valves from 'B' Train. Step 7.20	Handswitch for CHG PMP SUCT HDR ISO VLV MOV-8131A and B taken to close. Observes valve position indicators green lights lit, red lights NOT lit.	S / U
*16. Opens MOV-8706B 1B RHR Supply to 'B' Train Charging Pump Suction. Step 7.21	Handswitch for RHR HX B TO CHG PMP SUCT MOV-8706B taken to open. Observes valve position indicator red light lit, green light NOT lit.	S / U
17. Verifies VCT level is > 5%. Step 7.22	LI-112 and LI-115 are checked. Observes LI-115/112 indicates > 5% level.	S / U
*18. Closes LCV-115D 'B' Train RWST to charging header valves. Step 7.23	Handswitch for RWST TO CHG PMP HDR LCV-115D taken to close. Observes valve position indicator, green light lit.	S / U
19. Checks 1C charging pump ONLY running. Step 7.24 RNO	Checks 1C Charging pump indications. Observes 1C pump Amps > 0, red light is lit, green light NOT lit.	S / U
*20. Opens MOV-8885 charging pump recirc to RCS cold legs. 7.24.1 RNO	Handswitch for CHG PMP RECIRC TO COLD LEG MOV-8885 handswitch taken to open. Observes valve position indicator red light lit, green light NOT lit, FI-940 HAS flow and FI-943 does NOT have flow.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*21. Closes MOV-8803A & B HHSI TO RCS CL ISO valves (and proceeds to step 26). 7.24.2 RNO	Handswitches for HHSI TO RCS CL ISO valves, MOV-8803A and MOV-8803B taken to close. Observes valve position indicator green lights lit, red lights NOT lit.	S / U
22. Checks open 1B charging pump to 'A' train discharge valves. Step 7.26	Checks open CHG PMP DISCH HDR MOV-8132A and B. Observes valve position indicators red lights lit, green lights NOT lit.	S / U
23. Checks closed 1B Charging Pump Discharge Hdr to 'B' Train valves. Step 7.26	Checks closed CHG PMP DISCH HDR MOV-8133A and B. Observes valve position indicators green lights lit, red light NOT lit.	S / U
24. Verifies SI flow is stable. Step 7.27	Flow is checked. Observes flow indicated on FI-940, 'B' TRAIN RECIRC FLOW and FI-605B 'B' train RHR HDR flow. NO flow indicated on FI-943, A TRAIN RECIRC FLOW and FI-605A, 'A' train RHR HDR flow.	S / U

_____ STOP TIME

Terminate when STEP 7 is complete: SI flow is determined to be stable.

*** CRITICAL ELEMENTS:** Critical Elements are denoted with an Asterisk (*) preceding the element number.

GENERAL REFERENCES:

1. FNP-1-ESP-1.3, Rev. 19
2. K/As: 011EA1.11 RO-4.2 SRO-4.2

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

CONDITIONS

When I tell you to begin, you are to **PERFORM THE REQUIRED ACTIONS FOR COLD LEG RECIRCULATION**. The conditions under which this task is to be performed are:

a. A LBLOCA has occurred.
b. ESP-1.3, Transfer to Cold Leg Recirc, has been entered and all steps through Step 6 have been completed.
c. 1B Charging pump is aligned to 'A' Train.
d. Containment pressure is 7 psig.
e. Recirc. Disconnects are Closed.
f. You are directed by the Shift Supervisor to transfer to cold leg recirculation performing Step 7 ONLY of ESP-1.3.
g. A pre-job brief is not required.

d. JPM

TITLE: Place 1A SGFP On Service to establish flow to all Steam Generators (SGs).

TASK STANDARD: Place 1A SGFP On Service IAW Steps 7.12 through 7.21 of FRP-H.1 to establish flow to all Steam Generators (SGs).

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: X__ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: __X__ SIMULATOR ___ CONTROL ROOM ___ PLANT

PROJECTED TIME: __16 MIN__ SIMULATOR IC NUMBER: __IC-215

ALTERNATE PATH ___ TIME CRITICAL ___ PRA

Examinee:	
Overall JPM Performance:	**Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)	

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to **PLACE 1A SGFP ON SERVICE TO ESTABLISH FLOW TO ALL STEAM GENERATORS (SGs)**. The conditions under which this task is to be performed are:

a. FRP-H.1, Response To Loss Of Secondary Heat Sink, is in effect due to a loss of heat sink event.
b. FRP-H.1 Feed and Bleed criteria are being monitored by other team members.
c. You are directed by the Shift Supervisor to perform Steps 7.12 through 8.1 of FRP-H.1 for 1A SGFP.
d. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
____ START TIME		
*1. Verifies SGFP speed control in manual AND adjusted to 0% demand. Step 7.12	SGFP MASTER CONT SK-509A manual pushbutton depressed AND demand verified at 0%.	S / U
2. Verifies 1A SGFP speed control manually adjusted to 0% demand. Step 7.12	1A SGFP SPEED CONT SK-509B manual pushbutton depressed AND demand verified at 0%.	S / U
3. Verifies 1B SGFP speed control manually adjusted to 0% demand. Step 7.12	1B SGFP SPEED CONT SK-509C manual pushbutton depressed AND demand verified at 0%.	S / U
*4. Latches 1A SGFP turbine. Step 7.13	1A SGFP TURBINE LATCH pushbutton depressed. Observes TURBINE TRIPPED light off, TURBINE LATCH pushbutton lit.	S / U
*5 Opens 1A SGFP LOW PRESS STOP VALVE. Step 7.14	1A SGFP LOW PRESS STOP VALVE OPEN pushbutton depressed. Observes Pushbutton lit.	S / U
*6. Opens 1A SGFP HIGH PRESS STOP VALVE. Step 7.15	1A SGFP HIGH PRESS STOP VALVE OPEN pushbutton depressed. Observes Pushbutton lit.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*7. Raises 1A SGFP to minimum speed. Step 7.16	1A SGFP INCREASE SPEED PUSHBUTTON depressed. Observes 1A SGFP RPM indicator increase to 3200 rpm, BOILER CONTROL light lit, and INCREASE SPEED pushbutton lit.	S / U
*8. Opens 1A SGFP discharge valve N1N21V503A. Step 7.17	1A SGFP DISCH N1N21V503A handswitch placed to open. Observes valve position indicator red light lit, green light is NOT lit.	S / U
*9. Opens all intact steam generators main feedwater to SGs stop valves. Q1N21MOV3232A Q1N21MOV3232B Q1N21MOV3232C Step 7.18	Main FW TO 1A, 1B and 1C S/Gs STOP VLVs Q1N21MOV3232A, B and C Handswitches taken to open. Observes for each valve operated valve position indicator red light lit, green light is NOT lit.	S / U
*10. Places 1A SGFP speed controller in AUTO. Step 7.19	1A SGFP SPEED CONT, SK-509B AUTO pushbutton depressed. Observes AUTO pushbutton lit.	S / U
11. Adjusts master SGFP speed controller to raise feedwater discharge header pressure to 50 psig greater than steam header pressure. Step 7.20	SK-509A increase button depressed until feedwater header pressure 50 psig greater than steam header pressure. Observes FW HDR PRESS (PI-508) increases to 50 psig > PI-464, STM HDR PRESS.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
12. Controls feedwater regulating BYPASS valves to supply main feedwater to intact SGs, by adjusting FK-479, FK-489, and FK-499 open. Step 7.21	1A, 1B and 1C SG FW BYP FLOW FK-479, 489, 499 adjusted slightly open (1-10%). For each controller adjusted, observes demand increase and associated valve position indicator green and red light lit. Observes Main Feed Flow to each steam generator by obtaining an increase of at least 0.3 MPPH total for each of the MCB recorders for Feed Flow OR Plant Computer shows feed flow of at least a total of 395 gpm for all 3 SGs.	S / U
13. WHEN P-12 light is lit, THEN • Blocks low steam line pressure SI by positioning STM LINE PRESS SI BLOCK – RESET A TRN and B TRN handswitches to BLOCK AND • verifies BYP & PERMISSIVE STM LINE ISOL. SAFETY INJ. TRAIN A & B BLOCKED lights are lit. Step 7.22	WHEN P-12 light is lit, THEN • Blocks low steam line pressure SI by positioning STM LINE PRESS SI BLOCK – RESET A TRN and B TRN handswitches to BLOCK AND • verifies BYP & PERMISSIVE STM LINE ISOL. SAFETY INJ. TRAIN A & B BLOCKED lights are lit.	S / U S / U
*14. Controls feedwater regulating BYPASS valves until feed flow to at least one SG Wide Range level is rising OR CORE EXIT T/C temperature is falling. Step 8.1	Controls feedwater regulating BYPASS valves until feed flow to at least one SG Wide Range level is rising OR CORE EXIT T/C temperature is falling.	S / U

____ STOP TIME

Terminate when at least one SG Wide Range level is rising OR CORE EXIT T/C temperature is falling.

CRITICAL ELEMENTS: Critical Elements are denoted with an Asterisk (*) before the element number.

GENERAL REFERENCES:

1. FNP-1-FRP-H.1 Revision 26.0
2. K/As: W/E05EA1.1 RO-4.1 SRO-4.0

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

HANDOUT

CONDITIONS

When I tell you to begin, you are to **PLACE 1A SGFP ON SERVICE TO ESTABLISH FLOW TO ALL STEAM GENERATORS (SGs)**. The conditions under which this task is to be performed are:

a. FRP-H.1, Response To Loss Of Secondary Heat Sink, is in effect due to a loss of heat sink event.
b. FRP-H.1 Feed and Bleed criteria are being monitored by other team members.
c. You are directed by the Shift Supervisor to perform Steps 7.12 through 8.1 of FRP-H.1 for 1A SGFP.
d. A pre-job brief is not required.

e. JPM

TITLE: Two Train Verification Of ECCS Equipment

TASK STANDARD: While verifying two trains of ECCS equipment aligned per EEP-0, Attachment 4, must determine that the 1B DG is running without sufficient cooling, and secure the DG with the emergency shutdown procedure.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR __ CONTROL ROOM ___ PLANT

PROJECTED TIME: _5 MIN_ SIMULATOR IC NUMBER: _IC-216*

ALTERNATE PATH _X_ TIME CRITICAL ____ PRA

Examinee:		
Overall JPM Performance:	**Satisfactory** ☐	**Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)		

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to perform **TWO TRAIN VERIFICATION OF ECCS EQUIPMENT**. The conditions under which this task is to be performed are:

a. A safety injection has occurred due to a LBLOCA in containment.
b. You are the extra operator and the shift supervisor has directed you to verify two trains of ECCS equipment aligned per EEP-0, Attachment 4.
c. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
____ START TIME		
SIMULATOR BOOTH OPERATOR NOTE: **DO NOT GO TO RUN ON SIMULATOR UNTIL NRC direction.** **(This is to prevent the diesel from overheating and tripping when the diesel emerg start reset pushbutton is depressed).**		
1. Checks breaker DF01 closed.	Checks DF01 closed. Observes DF01 red light lit. White power available lights lit for 'F' 4160V bus.	S / U
2. Verifies breaker DF02 closed.	Verifies DF02 closed. Observes DF02 red light lit. White power available lights lit for 'K' 4160V bus.	S / U
3. Checks breaker DG15 closed.	Checks DG15 closed. Observes DG15 red light lit. White power available lights lit for 'G' 4160V bus.	S / U
4. Attempts to verify breaker DG02 closed, and goes to Attachment 1 per Att. 4 step 1.2 RNO.	Observes DG02 NOT closed: red light NOT lit, green and amber lights lit. White power available lights not lit for 'L' 4160V bus. (Examinee may take breaker DG02 to reset then to close, but it still won't close). Observes the following EPB annunciators are in alarm: VE1, VE4, and VF1.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
NOTE: • Either EEP-0.0, Attachment 1, or the posted operator aid on the EPB may be used for the following elements. • IF EXAMINEE REQUESTS SHIFT SUPERVISOR PERMISSION TO RESET SI PROVIDE THE FOLLOWING CUE. o CUE: THE SHIFT SUPERVISOR GIVES PERMISSION TO RESET SI.		
*5. Verifies SI is RESET.	Depresses Train A and B SI reset pushbutton. Observes MLB-1 1-1 and MLB1 11-1 are NOT lit.	S / U
*6. Places the 1B diesel generator MODE SELECTOR SWITCH to MODE 2.	Places 1B diesel generator MODE SELECTOR SWITCH in MODE 2 position. Observes the MSS is in MODE 2.	S / U
*7. Depresses the 1B diesel generator DIESEL EMERG START RESET pushbutton.	Depresses 1B diesel generator EMERG START RESET pushbutton. Observes the DG EMERG START light goes out.	S / U
NOTE: IF the diesel has been running for more than 3 minutes 45 seconds without cooling, the diesel will shutdown and the stop light will be lit prior to depressing the stop pushbutton. This is due to a non essential trip caused by high temperature which is reinstated in element 7.		
*8. Depresses the 1B diesel generator STOP pushbutton.	Depresses 1B diesel generator STOP pushbutton. Observes DIESEL STOP light lit.	S / U
*9. Places the 1B diesel generator MODE SELECTOR SWITCH to MODE 3.	Places 1B diesel generator MODE SELECTOR SWITCH to MODE 3. Observes the MSS is in MODE 3. EPB annunciator VB1 alarms.	S / U
10. Depresses the 1B diesel generator DIESEL EMERG START RESET pushbutton.	Depresses 1B diesel generator DIESEL EMERG START RESET button. Observes DG EMERG START light remains off.	S / U

____ STOP TIME

Terminate when DIESEL EMERG START RESET pushbutton has been depressed.
CUE: ANOTHER OPERATOR WILL COMPLETE ATTACHMENT 4.

CRITICAL ELEMENTS: Critical Elements are denoted by an asterisk (*) before the element number.

GENERAL REFERENCES:

1. FNP-1-EEP-0, Version 36.0
2. K/As: 064A4.06 RO-3.9 SRO-3.9

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

HANDOUT

CONDITIONS

When I tell you to begin, you are to perform **TWO TRAIN VERIFICATION OF ECCS EQUIPMENT**. The conditions under which this task is to be performed are:

a. A safety injection has occurred due to a LBLOCA in containment.
b. You are the extra operator and the shift supervisor has directed you to verify two trains of ECCS equipment aligned per EEP-0, Attachment 4.
c. A pre-job brief is not required.

f. JPM

TITLE: Restore Instrument Air To Containment

TASK STANDARD: While performing procedure to restore instrument air using ESP-1.2, Attachment 1 starting at Step 1.11 to align 1C air compressor for service, observes that 1C will not start, and performs EPB breaker alignment and starts 1A air compressor per step 1.11 RNO.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

PROJECTED TIME: _10 MIN_ SIMULATOR IC NUMBER: _JPM IC-217

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA

Examinee:	
Overall JPM Performance:	**Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)	

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to RESTORE INSTRUMENT AIR TO CONTAINMENT. The conditions under which this task is to be performed are:

a. A loss of site power and a small break LOCA have occurred on Unit 1.
b. Both turbine building buses are de-energized.
c. You are directed by the Unit 1 Shift Supervisor to restore instrument air using ESP-1.2, Attachment 1 starting at Step 1.11 to align 1C air compressor for service.
d. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
____ START TIME			
1.	Verifies the 1C air compressor handswitch in AUTO after START/RUN.	Observes 1C air compressor indication. Observes Green indicating light is lit. Places 1C air compressor handswitch in RUN/START then Back to Auto. Observes 1C air compressor handswitch in AUTO after being placed in RUN/START.	S / U
2.	Verifies 1C air compressor started.	Verifies 1C air compressor started. Observes 1C air compressor indication did NOT change: Green light still lit.	S / U

NOTE: BOOTH RESPONSE: If examinee directs the TB SO to check 1C air compressor then report: "1C AIR COMPRESSOR MOTOR VERY WARM TO THE TOUCH."

3.	Verifies 1C air compressor handswitch in OFF.	Verifies 1C air compressor handswitch placed in OFF position. Observes 1C air compressor handswitch in OFF.	S / U
4.	Verifies SI is reset.	Checks MLB1 1-1 and 11-1. Observes MLB1 1-1 and 11-1 are not lit.	S / U

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
5.	Directs resetting B1F sequencer.	Directs the SO to reset the sequencer. Observes SEQ B1F or B2F SIAS annunciator WE5 goes from a solid condition to a flashing condition. (CUE: SO reports that the B1F sequencer has been reset).	S / U
*6.	Places Breaker DF13 Sync Switch in manual.	Places DF13 SYNC SWITCH in the MANUAL POSITION. Observes Red lights under each 'A' train synchroscope is lit.	S / U
*7.	Closes Breaker DF13.	Closes Breaker DF13 handswitch. Observes breaker position indicator red light lit, green light NOT lit. 1H 4160 bus AC potential lights lit.	S / U
*8.	Closes breaker DH01.	Closes Breaker DH01 handswitch. Observes Breaker position indicator red light is lit, green light is NOT lit.	S / U
9.	Verifies breaker EG02-1 closed.	Verifies Breaker EG02-1 position. Observes Breaker position indicator red light is lit, green light is NOT lit.	S / U
10.	Verifies start of 1A air compressor.	Verifies 1A air compressor running (auto starts). Observes Breaker position indicator red light is lit, green light is NOT lit.	S / U
11.	Checks IA pressure > 85 psig.	Checks INST AIR PI-4004B indication. Observes PI-4004B indicates ~90-100 psig.	S / U
12.	Checks instrument air to containment.	Checks MLB-3 1-2 NOT lit and Annunciator KD1 clear. Observes MLB-3 1-2 IS lit and Annunciator KD1 is in alarm.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*13.	Opens IA to PENE RM valve HV-3825.	Opens HV-3825. Observes HV-3825 is red light is lit, green light is NOT lit.	S / U
*14	Opens IA to PENE RM valve HV-3885.	Opens HV-3885. Observes HV-3885 is red light is lit, green light is NOT lit.	S / U
*15	Opens instrument air supply to CTMT HV-3611.	Opens HV-3611. Observes HV-3611 red light is lit, green light is NOT lit.	S / U
16.	Informs Shift Supervisor that instrument air is aligned to containment	Shift supervisor informed air is aligned to containment. (CUE: Shift supervisor acknowledges.)	S / U

____ STOP TIME

Terminate when SS informed.

CRITICAL ELEMENTS: Critical elements are denoted by an asterisk (*) in front of the element number.

GENERAL REFERENCES:

1. FNP-1-ESP-1.2, Version 23.0
2. K/A: 065AA1.03 RO-2.9 SRO-3.1

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

HANDOUT

CONDITIONS

When I tell you to begin, you are to RESTORE INSTRUMENT AIR TO CONTAINMENT. The conditions under which this task is to be performed are:

a. A loss of site power and a small break LOCA have occurred on Unit 1.
b. Both turbine building buses are de-energized.
c. You are directed by the Unit 1 Shift Supervisor to restore instrument air using ESP-1.2, Attachment 1 starting at Step 1.11 to align 1C air compressor for service.
d. A pre-job brief is not required.

g. JPM

TITLE: Respond to a FH5, SFP AREA RE25A OR B HI RAD, alarm.

TASK STANDARD: Responds to FH5, SFP AREA RE25A OR B HI RAD, alarm per FNP-1-ARP-1.6, Main Control Board Annunciator Panel F, to verify automatic actions occur. Secures SFP AHU SUPP FAN and 1A SFP EXH FAN. Starts 1A PRF EXH FAN and 1A PRF RECIRC FAN OR 1B PRF EXH FAN and 1B PRF RECIRC FAN.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR ___ CONTROL ROOM ___ PLANT

PROJECTED TIME: _20 MIN_ SIMULATOR IC NUMBER: _IC-218_

ALTERNATE PATH ___ TIME CRITICAL ___ PRA

Examinee:		
Overall JPM Performance:	**Satisfactory** ☐	**Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)		

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to RESPOND TO A FH5, SFP AREA RE25A OR B HI RAD, ALARM. The conditions under which this task is to be performed are:

a. Unit 1 is at 100% power.
b. FH5, SFP AREA RE25A OR B HI RAD, has just come into alarm.
c. The Unit Two Unit Operator reports that both Unit 1 RE25 A and B meters are up-scaled and both red alarm lights are lit.
d. The Integrated Plant Computer (IPC) is not available due to troubleshooting in progress.
e. The Shift Supervisor directs you to respond to the FH5, SFP AREA RE25 A OR B HI RAD, alarm.
f. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____ START TIME		
NOTE: ELEMENTS 1-7 ARE PERFORMED AT THE BALANCE OF THE PLANT PANEL (BOP) BEHIND THE MCB.		
*1. Secures SFP AHU SUPP FAN.	Secures SFP AHU SUPP FAN. Observes green light lit, red light NOT lit.	S / U
2. Verifies damper SFP AHU DAMPER, SFP-HV-3416, closed.	Verifies damper SFP AHU DAMPER, SFP-HV-3416, closed. Observes green light lit, red light NOT lit.	S / U
*3. Secures 1A SFP EXH FAN.	Secures 1A SFP EXH FAN. Observes green light lit, red light NOT lit.	S / U
4. Verifies damper SFP EXH FAN DMPR, N1V48HV3417A, closed.	Verifies damper SFP EXH FAN DMPR, N1V48HV3417A, closed. Observes green light lit, red light NOT lit.	S / U

NOTE: ELEMENTS 5 & 6 ARE AUTOMATIC ACTIONS WHICH OCCUR, BUT ARE NOT LISTED IN THE ANNUNCIATOR RESPONSE PROCEDURE (ARP). THEY ARE LISTED IN THE SYSTEM OPERATING PROCEDURE (SOP) ONLY.

5.	Verifies A train SFP Vent dampers closed: • SFP EXH FAN SUCT DMPER Q1V48HV3990A • SFP AHU DISCH TO SFP Q1V48HV3991A	Verifies A train dampers closed. Observes green light lit, red light NOT lit: • SFP EXH FAN SUCT DMPER Q1V48HV3990A • SFP AHU DISCH TO SFP Q1V48HV3991A	S / U S / U
6.	Verifies B train SFP Vent dampers closed: • SFP EXH FAN SUCT DMPER Q1V48HV3990B • SFP AHU DISCH TO SFP Q1V48HV3991B	Verifies B train dampers closed. Observes green light lit, red light NOT lit: • SFP EXH FAN SUCT DMPER Q1V48HV3990B • SFP AHU DISCH TO SFP Q1V48HV3991B	S / U S / U

NOTE:
- **GUIDANCE FOR STARTING THE PRF SYSTEM AND ALIGNING IT TO THE SFP ROOM IS ONLY FOUND IN SOP-58, AUXILIARY BUILDING HVAC SYSTEM, AS STATED IN A NOTE PRIOR TO THE FIRST STEP IN SOP-60.0, PENETRATION ROOM FILTRATION SYSTEM.**
- **ELEMENT 7 MAY NOT BE DONE UNLESS SOP-58 IS USED FOR GUIDANCE.**

7.	Closes HV-3538A, SFP TO 1A PRF SUPPLY DAMPER, **OR** Closes HV-3538B, SFP TO 1B PRF SUPPLY DAMPER **BUT NOT BOTH.**	Closes HV-3538A, SFP TO 1A PRF SUPPLY DAMPER, **OR** Closes HV-3538B, SFP TO 1B PRF SUPPLY DAMPER **BUT NOT BOTH.**	S / U

Per SOP-58.0

NOTE:
- **ELEMENTS 8-10 ARE PERFOMED AT THE MCB. ONLY ONE TRAIN OF PRF IS REQUIRED TO BE OPERATING WHEN THE TASK IS COMPLETE. SEE ELEMENT 12.**

8.	Start 1A PRF EXH FAN.	Starts 1A PRF EXH FAN. Observes red light lit, green light NOT lit.	S / U
9.	Start 1A PRF RECIRC FAN.	Starts 1A PRF RECIRC FAN. Observes red light lit, green light NOT lit.	S / U

AND/OR

10.	Start 1B PRF EXH FAN.	Starts 1B PRF EXH FAN. Observes red light lit, green light NOT lit.	S / U
11.	Start 1B PRF RECIRC FAN.	Starts 1B PRF RECIRC FAN. Observes red light lit, green light NOT lit.	S / U
*12.	Must have at least one train, A **OR** B Train, of PRF EXH & RECIRC fans running with the associated train suction damper from the SFP, HV-3538A OR B, OPEN.	A **OR** B Train PRF EXH & RECIRC fans running with the associated train suction damper from the SFP, HV-3538A OR B, OPEN.	S / U

____ STOP TIME

Terminate when all Automatic actions which should have occurred have been verified (elements 1-11).
CUE: ANOTHER OPERATOR WILL PERFORM ANY ADDITIONAL ACTIONS.

CRITICAL ELEMENTS: Critical elements are denoted by an asterisk (*) in front of the element number.

GENERAL REFERENCES:

1. FNP-1-ARP-1.6 Version 58
2. FNP-1-SOP-58 Version 66
3. K/As: 060AA1.02 RO-2.9 RO-3.1

GENERAL TOOLS AND EQUIPMENT:

None.

COMMENTS:

AUXILIARY BUILDING HVAC

OpsHva019

EXAMINER'S KEY ONLY

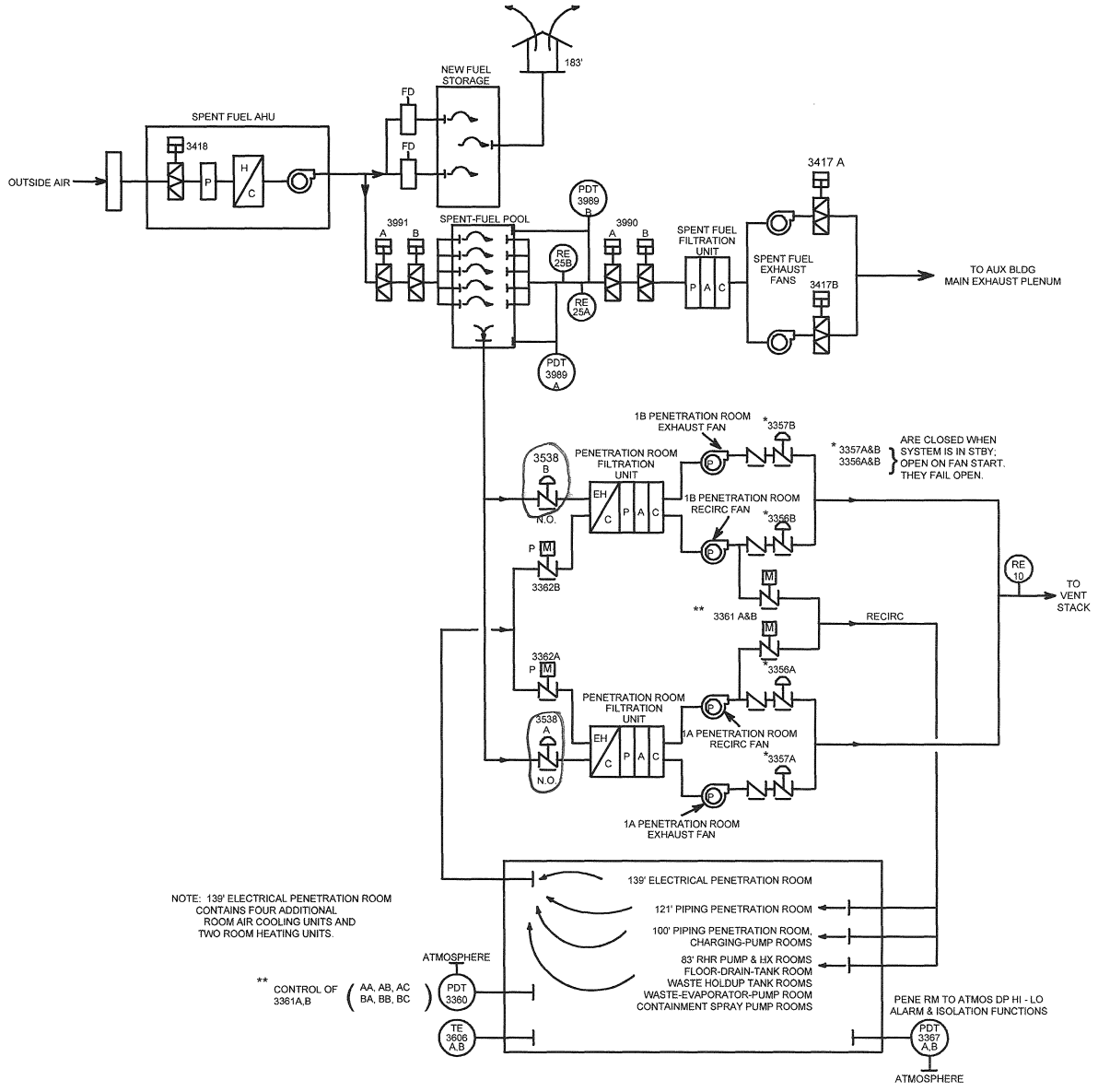

FIGURE 7 - Fuel Handling Area And Penetration Room HVAC

HANDOUT

CONDITIONS

When I tell you to begin, you are to RESPOND TO A FH5, SFP AREA RE25A OR B HI RAD, ALARM. The conditions under which this task is to be performed are:

a. Unit 1 is at 100% power.
b. FH5, SFP AREA RE25A OR B HI RAD, has just come into alarm.
c. The Unit Two Unit Operator reports that both Unit 1 RE25 A and B meters are up-scaled and both red alarm lights are lit.
d. The IPC is not available due to troubleshooting in progress.
e. The Shift Supervisor directs you to respond to the FH5, SFP AREA RE25 A OR B HI RAD, alarm.
f. A pre-job brief is not required.

h. JPM

TITLE: Align R-11 And R-12 To Normal As Required In Response To A Spurious Safety Injection.

TASK STANDARD: Align R-11 And R-12 To Normal As Required In Response To A Spurious Safety Injection per Step 32.1 of ESP-1.1, and FNP-1-SOP-12.2, Containment Purge And Pre-Access Filtration System, Section 4.2.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

PROJECTED TIME: _10 MIN_ SIMULATOR IC NUMBER: _IC-219

ALTERNATE PATH ___ TIME CRITICAL ___ PRA

Examinee:	
Overall JPM Performance:	**Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)	

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to **ALIGN R-11 AND R-12 TO NORMAL AS REQUIRED IN RESPONSE TO A SPURIOUS SAFETY INJECTION**. The conditions under which this task is to be performed are:

a. The plant has experienced a spurious safety injection.
b. ESP-1.1 is in progress and has been completed through Step 31.
c. Health Physics has verified the local valve lineup.
d. You are directed to perform Step 32.1 of ESP-1.1.
e. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
____ START TIME		
*1. Open CTMT ATMOS TO R-11/R-12 Q1E14MOV3660. SOP-12.2 Step 4.2.1.2	Handswitch for MOV-3660 taken to open. Observes MOV-3660 red light is lit, green light is NOT lit.	S / U
*2 Open CTMT ATMOS TO R-11/12 Q1E14HV3658. SOP-12.2 Step 4.2.1.3	Handswitch for HV3658 taken to open. Observes HV3658 red light is lit, green light is NOT lit.	S / U
*3 Open R-11/12 DISCH TO CTMT Q1E14HV3657. SOP-12.2 Step 4.2.1.4	Handswitch for HV3657 taken to open. Observes HV-3657 red light is lit, green light is NOT lit.	S / U
*4. Start R-11 pump and verify flow (low flow cleared). SOP-12.2 Step 4.2.1.5	Handswitch taken to start. Observes Pump On light lit, Low Flow light NOT lit.	S / U

EXAMINER'S CUE: ALIGNMENT PER IMP-227.47, VALVE ALIGNMENT FOR OPERATION OF UNIT 1 RE0011/12 AND RE 0021/22 HAS BEEN PERFORMED.

5. Verify R-12 drawer aligned per SOP-45.0. SOP-12.2 Step 4.2.1.6 SOP-45.0, Step 4.1.3	R-12 drawer aligned per SOP-45.0. • operation selector in OPERATE. • range selector in WIDE.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
6. Verify drawer indicating lights SOP-45.0, Step 4.1.3.3	Verify drawer indicating lights as follows: a. Power Light - ON b. Channel Test Light - OFF c. High Alarm Light - OFF d. Low Alarm Light - OFF	S / U

EXAMINER'S CUE: ALIGNMENT PER IMP-227.47, VALVE ALIGNMENT FOR OPERATION OF UNIT 1 RE0011/12 AND RE 0021/22 HAS BEEN PERFORMED.

*7. Verify R-11 drawer aligned per SOP-45.0. SOP-12.2 Step 4.2.1.6 SOP-45.0, Step 4.1.4.2	R-12 drawer aligned per SOP-45.0. a. Rate Meter On-Off - ON b. Sample Select - MAIN c. Pump Control - LOCAL d. Paper Drive - OPERATE e. High Pressure - OPERATE	S / U
8. Verify drawer indicating lights. SOP-45.0, Step 4.1.4.5	Verify drawer indicating lights as follows: a. Pump Console Power On Light - ON b. Main Sample Light - ON c. Pump On Light - ON d. Aux. Sample Light - OFF e. Purge Light - OFF f. Paper Drive Console Power Light - ON g. High Flow Light - OFF h. High Pressure Light - OFF i. Low Flow Light - OFF j. Advance Light - OFF k. High Alarm Light - OFF l. Warn Alarm Light - OFF m. Fail Alarm Light - OFF n. Range Alarm Light - OFF o. Rate Alarm Light - OFF p. Check Source Light - OFF	S / U

____ STOP TIME

Terminate when RE-11 AND 12 DRAWERS ALIGNED PER SOP-45.0.

CRITICAL ELEMENTS: Critical Elements are denoted with an asterisk (*) before the element number.

GENERAL REFERENCES:

1. FNP-1-ESP-1.1, Version 24.0
   FNP-1-SOP-12.2, Version 44.0
2. K/As: 073A4.02 RO-3.7 SRO-3.7

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

HANDOUT

CONDITIONS

When I tell you to begin, you are to **ALIGN R-11 AND R-12 TO NORMAL AS REQUIRED IN RESPONSE TO A SPURIOUS SAFETY INJECTION**. The conditions under which this task is to be performed are:

a. The plant has experienced a spurious safety injection.
b. ESP-1.1 is in progress and has been completed through Step 31.
c. Health Physics has verified the local valve lineup.
d. You are directed to perform Step 32.1 of ESP-1.1.
e. A pre-job brief is not required.

i. JPM

TITLE: Make Up To SFP From the RWST

TASK STANDARD: Perform actions for makeup to the SFP From the RWST Per SOP-54.0 Section 4.9.1.

PROGRAM APPLICABLE: SOT _X_ SOCT ___ OLT _X_ LOCT ___

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___DISCUSS

EVALUATION LOCATION: ____ SIMULATOR ___ CONTROL ROOM _X_ PLANT

PROJECTED TIME: _30 MIN_ SIMULATOR IC NUMBER: _N/A

ALTERNATE PATH ___ TIME CRITICAL ___ PRA ___

Examinee:
Overall JPM Performance: **Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to MAKE UP TO SFP FROM THE RWST on UNIT 1. The conditions under which this task is to be performed are:

a. The SFP low level alarm has come in on the MCB. The shift chemist has directed the Control Room to make up to the SFP from the RWST.
b. The BARS system is NOT in operation.
c. RWST Purification in NOT in service.
d. SFP Purification IS in service.
e. SFP level is 153′4″.
f. You are to makeup to the SFP to clear the MCB alarm per SOP-54.0, starting with step 4.9.1.5.

NOTE: THIS JPM has been revised for use on UNIT 1.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
____ START TIME		
*1. Close the 1A and 1B SFP cooling loop to SFP purification inlet isolation valves: • 1-SFP-V-8767A (Q1G31V004A) • 1-SFP-V-8767B (Q1G31V004B) 139' Rad side, SFP pump room	Close 1A and 1B SFP cooling loop to SFP purification inlet isolation valves by turning the handwheel clockwise: • 1-SFP-V-8767A (Q1G31V004A) • 1-SFP-V-8767B (Q1G31V004B) (Cue: 8767A and 8767B are fully clockwise)	S / U S / U
*2. Close the SFP purification outlet to SFP 1-SFP-V-8765 (Q1G31V005). 155' Rad side, 1A SFP HX ROOM	Close Q1G31V005 by turning the handwheel clockwise. (CUE: V005 is fully clockwise).	S / U
*3. Open the RWP pump disch iso1-SFP-V-8792 (N1G31V008). 155' Rad side, SFP HX AREA	Open N1G31V008 by turning the handwheel counterclockwise. (CUE: V008 is fully counterclockwise.)	S / U
*4. Open the RWP pump suction from the RWST iso Q1G31V010. 130' Rad side near SGBD area	Open Q1G31V010 by turning the handwheel counterclockwise. (CUE: V010 is fully counterclockwise.)	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*5. Open (one turn) the SFP purification outlet to SFP 1-SFP-V-8765 (Q1G31V005). 155' Rad side, 1A SFP HX ROOM	Open Q1G31V005 by turning the handwheel counterclockwise one turn. (CUE: V005 is counterclockwise 1 turn)	S / U
*6. Start the RWP purification pump. 130' Rad side near SGBD area	RWP purification pump switch taken to START. (CUE: RWP purification pump red light is lit, green light is OFF.)	S / U
*7. Throttle the SFP purification outlet to SFP 1-SFP-V-8765 (Q1G31V005) to establish 100 gpm on the SFP demin FI-654. 155' Rad side, SFP HX AREA	V005 is throttled. (CUE: FI-654 reads 100 gpm.) (CUE IF FILTER D/P CHECKED: SFP filter d/p is 8 psid.)	S / U
8. Inform the Control Room to have the shift chemist periodically sample the SFP.	Inform the CRO to have the shift chemist periodically sample the SFP. (CUE: The Control Room acknowledges.)	S / U
9. Monitor the SFP water level. 155' Rad side, SFP room	SFP level should be monitored to prevent over-filling the pool. (CUE: The Control Room contacts you and tells you the SFP level alarm is clear.) (CUE WHEN SFP LEVEL IS CHECKED: Level is 153'7".)	S / U

_____ STOP TIME

Terminate when SFP level is being monitored and all elements of the task have been completed (SOP-54.0, steps 4.9.1.5 – 4.9.1.13).

CUE: ANOTHER SYSTEM OPERATOR WILL SECURE THE LINEUP.

CRITICAL ELEMENTS: Critical Elements are denoted with an asterisk (*) preceding the element number.

GENERAL REFERENCES:

1. FNP-1-SOP-54.0, Version 49.0
2. K/As: 033A1.01 RO-2.7 SRO-3.3

GENERAL TOOLS AND EQUIPMENT:

Locked Valve Key

COMMENTS:

SFP COOLING AND RWST PURIFICATION

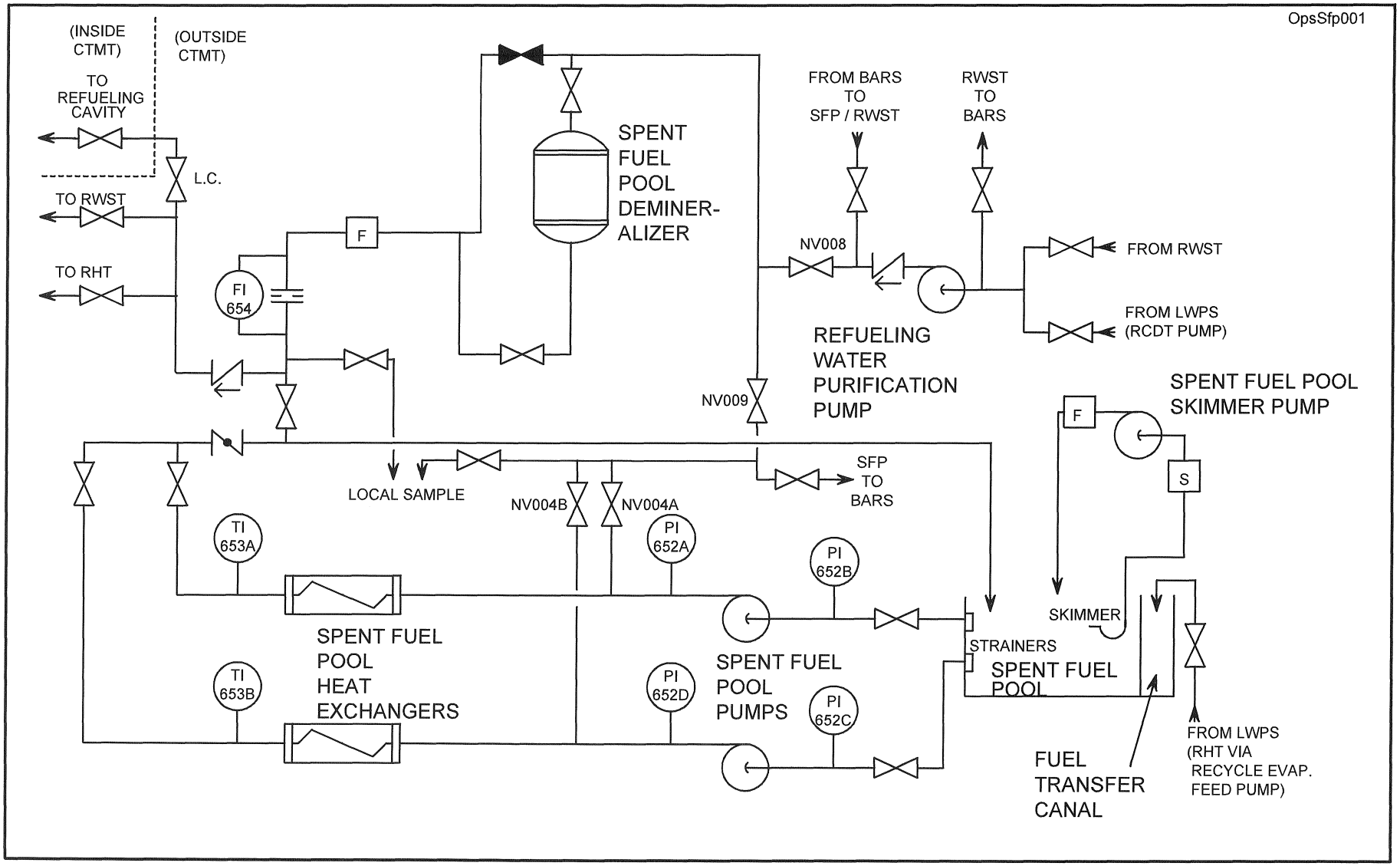

FIGURE 1 - Spent Fuel Pool Cooling

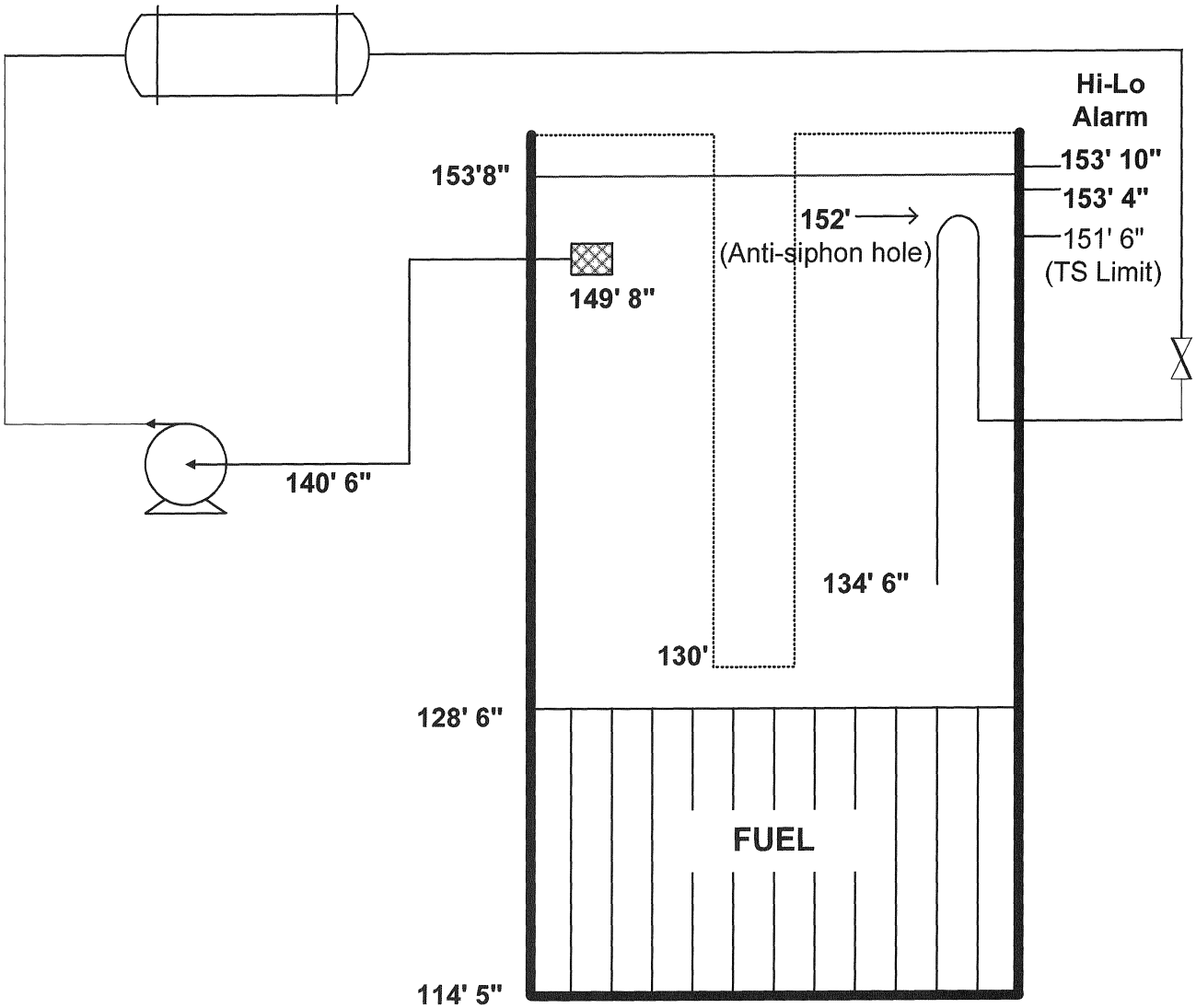

FIGURE 8 - Spent Fuel Pool System Elevations

HANDOUT

CONDITIONS

When I tell you to begin, you are to MAKE UP TO SFP FROM THE RWST on UNIT 1. The conditions under which this task is to be performed are:

a. The SFP low level alarm has come in on the MCB. The shift chemist has directed the Control Room to make up to the SFP from the RWST.
b. The BARS system is NOT in operation.
c. RWST Purification in NOT in service.
d. SFP Purification IS in service.
e. SFP level is 153′4″.
f. You are to makeup to the SFP to clear the MCB alarm per SOP-54.0, starting with step 4.9.1.5.

3.0 Precautions and Limitations

3.1 Working near the edge of the SFP requires good safety practices including use of fall protection or life jacket.

3.2 Differential pressure across the SFP AND skimmer filters should NOT exceed 20 psid.

3.3 Activity level on the SFP filter should be limited to the amount recommended by the Health Physics Manager.

3.4 Purification flow through the demineralizer should NOT exceed 120 gpm OR 140°F. Purification flow through the filter should NOT exceed 150 gpm (ABN 98-0-1249)

3.5 If the make-up was for reasons other than evaporation, the SFP boron concentration should be checked following makeup additions to ensure a boron concentration of 2000 ppm or greater is maintained.

3.6 SFP Hx Inlet and Outlet valves are rising stem valves with stems which protrude several inches with the valve closed. Use care to ensure proper valve position.

3.7 SFP temperature must be maintained greater than 72°F. Appendix 2 provides guidance if pool temperature approaches 72°F.

3.8 SFP pump DP greater than or equal to 55 psid and SFP water level greater than or equal to 153' 4" will avoid vortex formation in the SFP at the SFP pump suction (NEL 98-0329). **{CMT 0007762}**

3.9 When working near or above the SFP or SFP TRANSFER CANAL, all material (Tools, Equipment, etc.) must be properly secured or provided with a lanyard to eliminate the possibility of dropping objects into the SFP or SFP TRANSFER CANAL.

3.10 Fuel movement is prohibited in the SFP when SFP temperature is ≥ 130°F.

3.11 Fuel assembly transfer into the SFP during reactor core off-load is prohibited when SFP temperature is ≥130°F.

3.12 A formal pre-job brief shall be conducted for activities which require highly coordinated work efforts or could result in significant safety or radiological concerns. (OR 2-96-329)

3.13 Parallel operation of SFP Cooling Loops is prohibited to prevent short circuit flow and/or pump damage. Operation in parallel per Appendix 1 has been evaluated and is an exception to this rule (RER C050640801) (J.M. Farley response to NRC Bulletin No. 88-04 dated March 23, 1989) **{CMT 0007761}**

3.14 CCW flow to the SFP HX's should be regulated as follows:

3.14.1 WHEN in Modes 1 - 4, THEN the CCW outlet valve for the SFP HX should be throttled to limit CCW flow to 1500 gpm through the SFP HX with a RHR HX on service on that train.

3.14.2 IF desired to lower SFP temperature while in Modes 5, 6 or defueled, THEN throttle CCW flow through the on service RHR HX and raise CCW flow in the SFP HX as necessary. This special condition will be documented by an admin LCO. The limit must be reinstated prior to entering Mode 4 by establishing CCW flow through the RHR HX and then verifying flow through the SFP HX is $\leq$ 1500 gpm.

3.14.3 CCW flowrates in excess of 3100 gpm through the SFP HX should be avoided. Flows exceeding 3100 gpm for brief periods, such as during performance of STP's, is acceptable. {AI 2002200675}

3.15 Train A SFP Cooling Loop consists of 2B SFP pump (P002B) and 2B SFP HX (H001B).

3.16 Train B SFP Cooling Loop consists of 2A SFP pump (P002A) and 2A SFP HX (H001A).

3.17 CCW supply valve to SFP heat exchanger must remain open whenever CCW supply valve to RHR heat exchanger in the same train is closed.

3.18 If possible, the SFP cooling should be aligned opposite from a train that is carrying both the miscellaneous header and an inservice RHR HX.

3.19 When moving a transfer pump, the following precautionary measures should be observed (AI 2004204190):

- The pump lifting rope should be inspected and replaced if necessary.
- A portable light should be used if necessary to assure obstructions are avoided.
- The pump lifting rope, power cord, and hoses should NOT be allowed to get caught on the weir gate or weir gate rests.
- If using the SFP bridge crane, the load cell should be monitored to ensure no part of the load (lifting rope, pump, power cord, hoses, etc.) is caught on an obstruction.

3.20 Annunciator EH1, SFP TEMP HI, alarms at $\leq$130°F (normally set at 115°F).

3.21 Annunciator EH2, SFP LVL HI-LO, alarms at 153'10" rising and 153'4" decreasing.

3.22 Changes to the RWST purification system lineup can create a dead-heading situation for BARS if it is in service. [AI 2007204536]

4.8.23 Verify both RCDT pumps (1A AND 1B) are stopped.

4.8.24 Close the SFP purification outlet to refueling cavity CTMT iso N1G31V033. (CTMT near penetration #95)

4.8.25 Close and lock the SFP purification outlet to refueling cavity line iso Q1G31V012. (master Z key) (121' PPR Pen 95 iso vlv)

4.8.26 Close SFP purification outlet to refueling cavity 1-SFP-V-8793A (N1G31V021A). (1A SFP HX Room)

4.8.27 Close RWP pump disch iso 1-SFP-V-8792 (N1G31V008). (SFP Demin Room)

4.8.28 Close RCDT pump disch to RWP pump 1-LWP-V-7138 (Q1G21V008). (100' PPR)

4.8.29 Close RCDT LCV Q1G21LCV1003.

4.8.30 Close refueling canal drain valve 1-LWP-V-7129 (N1G21V021). (Area near 1A SG)

4.8.31 Align RCDT system for normal operation per FNP-1-SOP-50.0A, LIQUID WASTE PROCESSING SYSTEM REACTOR COOLANT DRAIN COLLECTION & DISCHARGE SYSTEM.

4.8.32 Complete a partial FNP-1-STP-14.0 ,CONTAINMENT INTEGRITY VERIFICATION TEST, for SFP purification outlet to refueling cavity line iso Q1G31V012.

4.9 SFP Filling and Makeup Operations

4.9.1 Filling and Makeup from the RWST

CAUTION: This mode of makeup is normally used to replace SFP inventory lost due to means other than evaporation.

4.9.1.1 IF SFP makeup is needed due to evaporation, THEN go to step 4.9.2.

4.9.1.2 IF the BARS system is in operation on Unit One, THEN remove it from service per FNP-1-SOP-54.4, RWST SILICA REMOVAL BY THE BORIC ACID RECOVERY SYSTEM (BARS), section 4.7.

NOTE: SFP level should be maintained within the normal band of 153'4" to 153'9".

4.9.1.3 IF RWST Purification is in service (RWST on recirculation) AND it is desired to raise SFP level, THEN perform the following:

CAUTION: SFP Purification Outlet V021B should NOT be open while V005 is open except during the transition between the two flow paths. With both valves throttled open, the SFP would be pumped to the RWST in the event that the purification pump trips.

4.9.1.3.1 Simultaneously perform the following while maintaining flow between 10 and 100 gpm on FI-654:

- Close N1G31V021B, SFP Purification Outlet To RWST. (1A SFP HX RM)
- Throttle open Q1G31V005, SFP Purification Outlet To SFP. (1A SFP HX RM)

4.9.1.3.2 WHEN the desired SFP level is reached, THEN simultaneously perform the following while maintaining flow between 10 and 100 gpm on FI-654:

- Close Q1G31V005, SFP Purification Outlet To SFP. (1A SFP HX RM)
- Throttle open N1G31V021B, SFP Purification Outlet To RWST. (1A SFP HX RM)

4.9.1.4 IF steps 4.9.1.1 through 4.9.1.3 are not applicable, THEN continue with step 4.9.1.5.

4.9.1.5 Verify closed the following:

- 1A SFP cooling loop to SFP purif inlet iso 1-SFP-V-8767A (Q1G31V004A)
- 1B SFP pump cooling loop to SFP purif inlet iso 1-SFP-V-8767B (Q1G31V004B)

4.9.1.6 Verify closed SFP purification outlet to SFP 1-SFP-V-8765 (Q1G31V005). (1A SFP HX Room)

4.9.1.7 Open RWP pump disch iso 1-SFP-V-8792 (N1G31V008). (SFP Demin Room)

4.9.1.8 Open RWP pump suction from the RWST iso Q1G31V010. (130' Rm 609)

4.9.1.9 Open (one turn) SFP purification outlet to SFP 1-SFP-V-8765 (Q1G31V005). (1A SFP HX Room)

4.9.1.10 Start the RWP pump.

4.9.1.11 Throttle SFP purification outlet to SFP 1-SFP-V-8765 (Q1G31V005) to establish 100 gpm on SFP demineralizer FI-654. (1A SFP HX Room)

CAUTION:	**Operating SFP filter with differential pressure greater than 20 psid may result in rapidly clogging the filter and subsequent filter damage.**

4.9.1.12 IF SFP filter differential pressure reaches 20 psid, THEN remove the filter from service.

4.9.1.13 Periodically sample the SFP for boron concentration ≥2000 ppm.

4.9.1.14 WHEN the desired water level is reached, THEN stop the RWP pump.

4.9.1.15 Close SFP purification outlet to SFP 1-SFP-V-8765 (Q1G31V005). (1A SFP HX Room)

j. JPM

SO-351A

TITLE: Start A 4075 KW Diesel Generator From The DLCP In Mode 4

PROGRAM APPLICABLE: SOT _X_ SOCT _X_ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: ____ SIMULATOR ____ CONTROL ROOM _X_ PLANT

PROJECTED TIME: _15 MIN_ SIMULATOR IC NUMBER: _N/A

ALTERNATE PATH ___ TIME CRITICAL ___ PRA _X

This JPM is modified slightly from the bank

Trainer/Date:	**Trainee:**
Evaluator/Date:	
Overall JPM Performance: Satisfactory ☐	**Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)	

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to **START A 4075 KW DIESEL GENERATOR FROM THE DLCP IN MODE 4.** The conditions under which this task is to be performed are:

a. A loss of all AC power has occurred.
b. ECP-0.0 is in progress.
c. Attempts to start a diesel generator from the EPB have been unsuccessful.
d. You are directed by the Shift Supervisor to start a 4075 KW Diesel Generator from the diesel local control panel per SOP-38.1 and energize the dead 4160v bus.
e. A pre-job brief is not required.

NOTE: EXAMINER SHOULD SPECIFY WHICH DIESEL IS TO BE STARTED.
Either the 1-2A DG, 1B DG or 2B DG

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
____	**START TIME**		
NOTE: OBTAINING THE MODE 4 SELECTOR SWITCH KEY MAY BE SIMULATED.			
1.	Obtain the appropriate Mode 4 key from the SSS office or the DB operator key ring	The Mode 4 key for the selected diesel generator is requested from the SSS office or DB SO. (CUE: Appropriate key is obtained)	S / U
2.	Check engine for any damage	Engine walked down. (CUE: No damage indicated.)	S / U
3.	Check air reservoir pressure adequate	Air reservoir pressure indicators checked. (CUE: Pressure is 400 psig.)	S / U
4.	Prime the fuel oil system	Hand priming pump operated. (CUE: **Resistance** felt during priming.)	S / U
*5.	Place diesel generator in MODE 4	MODE 4 selector switch turned to Mode 4. (CUE: Mode 4 selector switch indicator light for Mode 4 illuminated.)	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*6.	Verify associated 4160V bus de-energized and supply breaker opened	Operator calls to have bus verified de-energized and the supply breaker is open. (CUE: Bus is de-energized and supply breaker is open.)	S / U
7	Verify the Essential Protection Auxiliary Relay (86A) is reset.	86A relay checked on diesel local control panel. (CUE: 86A relay indicates reset)	S / U
*8.	Depress the Engine Reset pushbutton	Pushbutton depressed. (CUE: The engine has been reset.)	S / U
*9.	WHEN appropriate time delay has elapsed since all engine shutdown signals have been reset THEN check "Ready for Auto Start" light illuminated on diesel local control panel.	Operator waits appropriate time and checks ready for auto start light illuminated. (Cue: **140 seconds have elapsed** and Ready for Auto Start light is illuminated.)	S / U
*10.	Start diesel generator	Start pushbutton depressed until engine is running and then released. (CUE: Engine starts.)	S / U
11.	Determine generator voltage and frequency.	Voltmeter and frequency meters read. (CUE: The meters indicate 4000V and 60.5 Hz.)	S / U
12.	Adjust generator voltage to 4160V AC	Operates AUTO voltage adjust switch in the raise direction until meter reads 4160V AC. (CUE: Generator volt meter indicates 4160V AC.)	S / U
13.	Checks generator frequency.	Frequency meter checked. (CUE: Frequency meter indicates 60.5 Hz.)	S / U
14.	Adjust frequency to 60 Hz.	Operates generator speed control switch in the lower direction until meter reads 60 Hz. (CUE: Generator frequency meter reads 60 Hz.)	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*15. Energize the dead 4160V bus using the breaker handswitch on the DLCP.	Handswitch for 4160V breaker turned to the close position to energize the bus. (CUE: The 4160V bus RED light is LIT.)	S / U

____ STOP TIME

Terminate when the 4160V bus is energized.

***CRITICAL ELEMENTS: Critical Elements are denoted with an asterisk (*) preceding the element number.**

GENERAL REFERENCES:

1. FNP-0-SOP-38.1, version 13.0

2. K/As: 055EA1.02 RO-4.3 SRO-4.4
   064A4.01 RO-4.0 SRO-4.3

3. PRA Human Reliability Analysis Notebook Operator Action 3.6.31.4

GENERAL TOOLS AND EQUIPMENT:

none

COMMENTS:

HANDOUT

CONDITIONS

When I tell you to begin, you are to **START A 4075 KW DIESEL GENERATOR FROM THE DLCP IN MODE 4.** The conditions under which this task is to be performed are:

a. A loss of all AC power has occurred.
b. ECP-0.0 is in progress.
c. Attempts to start a diesel generator from the EPB have been unsuccessful.
d. You are directed by the Shift Supervisor to start a 4075 KW Diesel Generator from the diesel local control panel per SOP-38.1 and energize the dead 4160v bus.
e. A pre-job brief is not required.

FARLEY NUCLEAR PLANT

SYSTEM OPERATING PROCEDURE

FNP-0-SOP-38.1

SAFETY RELATED

EMERGENCY STARTING OF A DIESEL GENERATOR

PROCEDURE USAGE REQUIREMENTS PER FNP-0-AP-6	SECTIONS
Continuous Use	ALL
Reference Use	
Information Use	

Approved:

Jim Hunter (for)
Operations Manager

Date Issued: 04/01/2008

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
SHARED
SYSTEM OPERATING PROCEDURE SOP-38.1

EMERGENCY STARTING OF A DIESEL GENERATOR

1.0 Purpose

This procedure provides Initial Conditions, Precautions and Limitations, and Instructions for emergency operation of a diesel generator.

2.0 Initial Conditions

2.1 Diesel generator(s) are required for operations and can not be started using normal starting methods.

2.2 IF starting an opposed piston DG (1C or 2C) AND oil temperature has decreased to less than 100°F with the keep warm lube oil system in service, THEN cylinders have been blown down and engine barred over.

3.0 Precautions and Limitations

3.1 Repeated start attempts should be minimized if engine turns over but fails to start to ensure adequate air start capacity is maintained. One air receiver should be maintained greater than 150 psig for the 4075 kW DGs or greater than 90 psig for the 2850 kW DGs to ensure adequate air start capacity is maintained for one additional start.

3.2 The following keys are needed to restore their respective DG to EPB control from Mode 4 control (located on the Diesel Building SO key ring and in the SSS office):

Key #	Tab #	Key Name
12B288	B29	1-2A DG Mode 3-4 Sel Switch
12B822	B30	1B DG Mode 3-4 Sel Switch
12B160	B31	1C DG Mode 3-4 Sel Switch
12B160	B32	2C DG Mode 3-4 Sel Switch
10B629	U2 Key Locker	2B DG Mode 3-4 Sel Switch

3.3 When a Diesel Generator is started and Service Water is not available due to a dead bus, actions should be taken to energize the bus and start two Service Water pumps as soon as possible. Diesel generators are only capable of operating 3 minutes without cooling water flow.

4.0 Instructions

4.1 Obtain the required Mode 3-4 Sel Switch key (located on the Diesel Building SO key ring and in the SSS office) OR arrange to have it brought to the Diesel Bldg:

Key #	Tab #	Key Name
12B288	B29	1-2A DG Mode 3-4 Sel Switch
12B822	B30	1B DG Mode 3-4 Sel Switch
12B160	B31	1C DG Mode 3-4 Sel Switch
12B160	B32	2C DG Mode 3-4 Sel Switch
10B629	U2 Key Locker	2B DG Mode 3-4 Sel Switch

4.2 Check engine for any apparent damage caused during starting attempts.

4.3 Verify adequate air reservoir pressure for DG start:

- 2850 kW DG - at least one receiver greater than 90 psig
- 4075 kW DG - at least one receiver greater than 150 psig

4.4 Prime fuel oil system using hand pump.

4.5 Position Mode 4 selector switch to Mode 4 position.

4.6 Verify the following for 4160V bus to be supplied by diesel generator (on EPB or locally at switchgear):

- 4160V bus is de-energized
- Supply breaker(s) to 4160V bus are open

4.7 Verify Essential Protection Auxiliary Relay (86A) is reset.
(on diesel local relay panel)

4.8 Depress Engine Reset pushbutton (on diesel local control panel).

CAUTIONS:
- **After resetting all engine shutdown signals, then the Ready for Auto Start light is delayed for:**
  - **100 seconds for 2850 kW DG**
  - **140 seconds for 4075 kW DG**
- **Attempting to start an engine prior to completion of the time delay will result in the engine trying to start with fuel racks closed, causing a loss of starting air.**

4.9 WHEN appropriate time delay has elapsed since all engine shutdown signals have been reset (86A and Engine Reset):
- at least 100 seconds for 2850 kW DG
- at least 140 seconds for 4075 kW DG

THEN check Ready for Auto Start light illuminated on diesel local control panel.

4.10 IF Ready for Auto Start light is NOT illuminated, THEN verify barring device is NOT inserted (annunciator 54 NOT illuminated).

CAUTIONS:

- **Repeated start attempts should be minimized if engine turns over but fails to start to ensure adequate air start capacity.**
- **To ensure adequate air start capacity is maintained for one additional start, one air receiver should be maintained greater than:**
  - **90 psig for 2850 kW DG**
  - **150 psig for 4075 kW DG**
- **When a Diesel Generator is started and Service Water is not available due to a dead bus, action should be taken to energize the bus and start two Service Water pumps as soon as possible. Diesel generators are only capable of operating 3 minutes without cooling water flow.**

NOTES:

- **Step 4.11 starts a 4075 or 2850 kW Diesel Generator from the Diesel Local Control Panel with the selector switch in Mode 4.**
- **Step 4.12 performs a manual Emergency Starting of a 4075 kW Diesel Generator.**

4.11 IF desired to start a 4075 or 2850 kW Diesel Generator from the Diesel Local Control Panel with the selector switch in Mode 4, THEN perform the following:

4.11.1 Depress and hold START pushbutton.

4.11.2 WHEN diesel is running OR start failure occurs, THEN release START pushbutton.

4.11.3 IF diesel fails to start, THEN return to Step 4.7.

4.11.4 Perform the following at diesel local control panel:

4.11.4.1 Adjust generator voltage to 4160V using AUTOMATIC VOLTAGE ADJUST switch.

4.11.4.2 Adjust generator frequency to 60 Hz using SPEED CONTROL switch.

4.11.5 Perform one of the following as dictated by plant conditions or shift supervisor instructions:

4.11.5.1 Shift control of diesel generator to EPB by unlocking MODE 4 selector switch and selecting OFF position.

4.11.5.2 Energize dead 4160V AC Bus using breaker control handswitch on diesel local control panel.

4.12 IF desired to perform a manual Emergency Start of a 4075 kW Diesel Generator, THEN perform the following:

4.12.1 Place air start solenoid override tool in position on each end of engine (two operators required).

4.12.2 Simultaneously pull down and hold both air start solenoid override tools.

4.12.3 WHEN engine starts, OR approximately 7 seconds has elapsed, THEN release both air start solenoid override tools and remove.

4.12.4 IF diesel fails to start, THEN return to Step 4.7.

4.12.5 Perform the following at diesel local control panel:

4.12.5.1 Adjust generator voltage to 4160V using AUTOMATIC VOLTAGE ADJUST switch.

4.12.5.2 Adjust generator frequency to 60 Hz using SPEED CONTROL switch.

4.12.6 Perform one of the following as dictated by plant conditions or shift supervisor instructions:

4.12.6.1 Shift control of diesel generator to EPB by unlocking MODE 4 selector switch and selecting OFF position.

4.12.6.2 Energize dead 4160V AC Bus using breaker control handswitch on diesel local control panel.

5.0 References

5.1 FNP-0-SOP-38.0, DIESEL GENERATORS

5.2 FNP-1-ECP-0.0, LOSS OF ALL AC POWER

5.3 FNP-2-ECP-0.0, LOSS OF ALL AC POWER

5.4 Technical Specification 3.8.3

5.5 D172550, D172551, D172552, D172554, D172774, D172778, D172782, D172793, D202551, D202778

k. JPM

TITLE: Place 'A' BAT O/S & 'B' BAT O/R

TASK STANDARD: Place 'A' BAT on service and 'B' BAT on recirc per SOP-2.6, Section 4.2.

PROGRAM APPLICABLE: SOT _X_ SOCT ___ OLT _X_ LOCT _____
ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS
EVALUATION LOCATION: ____ SIMULATOR ___ CONTROL ROOM _X_ PLANT
PROJECTED TIME: _15 MIN_ SIMULATOR IC NUMBER: _N/A
ALTERNATE PATH ___ TIME CRITICAL ___ PRA ____

Examinee:
Overall JPM Performance: **Satisfactory** ☐ **Unsatisfactory** ☐
Evaluator Comments (attach additional sheets if necessary)

EXAMINER: _____

CONDITIONS

When I tell you to begin, you are to PLACE 'A' BAT O/S & 'B' BAT O/R. The conditions under which this task is to be performed are:

a. The boric acid system is aligned per SOP-2.6.
b. The 'A' BAT is on recirc and the 'B' BAT is on service.
c. The control room has instructed you to place 'A' BAT on service and 'B' BAT on recirc for weekly samples per SOP-2.6, Section 4.2.

NOTE: THIS JPM MAY BE PERFORMED ON EITHER UNIT. UNIT 2 NUMBERS ARE [BRACKETED].

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
____ START TIME		
1. Verifies 'A' BAT boric acid concentration between 4.0 & 4.4 w/o (7000-7700 ppm) by latest chemistry analysis. Control Room	'A' BAT boric acid concentration verified between 4.0 & 4.4 w/o (7000-7700 ppm) by requesting latest chemistry analysis from control room. (CUE: Control room informs you that 'A' BAT boric acid concentration is 7300 ppm boron.)	S / U
2. Requests control room take 'A' & 'B' boric acid transfer (BAT) pump handswitches to stop and returned to auto. Control Room	Contacts the CRO to place the BAT pump handswitches to stop and return to auto. (CUE: CRO acknowledges that the BAT pump handswitches have been taken to stop and returned to auto.) (CUE: 1A BAT pump stopped.)	S / U
*3. Shuts batching tank supply to boric acid pumps Q1[2]E21V236. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V236 is turned clockwise. (CUE: V236 is fully clockwise.)	S / U
*4. Shuts 'A' BAT pump suction cross-connect Q1[2]E21V235A. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V235A is turned clockwise. (CUE: V235A is fully clockwise.)	S / U
*5. Opens 'A' BAT pump miniflow isolation Q1[2]E21V231A. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V231A is turned counter-clockwise. (CUE: V231A is fully counter-clockwise.)	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*6. Shuts 'A' BAT pump miniflow orifice bypass Q1[2]E21V229A. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V229A is turned clockwise. (CUE: V229A is fully clockwise.)	S / U
*7. Opens 'A' BAT outlet Q1[2]E21V227A. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V227A is turned counter-clockwise. (CUE: V227A is fully counter-clockwise.)	S / U
*8. Opens 'A' BAT pump discharge Q1[2]E21V219A. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V219A is turned counter-clockwise. (CUE: V219A is fully counter-clockwise.)	S / U
*9. Shuts 'B' BAT pump discharge Q1[2]E21V219B. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V219B is turned clockwise. (CUE: V219B is fully clockwise.)	S / U
*10. Opens 'B' BAT outlet Q1[2]E21V227B. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V227B is turned counter-clockwise. (CUE: V227B is fully counter-clockwise.)	S / U
*11. Opens 'B' BAT pump miniflow orifice bypass Q1[2]E21V229B. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V229B is turned counter-clockwise. (CUE: V229B is fully counter-clockwise.)	S / U
*12. Opens 'B' BAT pump suction cross-connect Q1[2]E21V235B. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V235B is turned counter-clockwise. (CUE: V235B is fully counter-clockwise.)	S / U
*13. Opens 'B' BAT pump miniflow isolation Q1[2]E21V231B. 100' Radside Aux Building Boric Acid pump area	Q1[2]E21V231B is turned counter-clockwise. (CUE: V231B is fully counter-clockwise.)	S / U
14. Place 1B Boric Acid transfer pump control switch in START. Control Room .	Requests control room Place 1B Boric Acid transfer pump control switch in START. (CUE: 'B' BAT pump running.)	S / U
	Checks discharge pressure gauge. (CUE: 'B' BAT running, PI-105 indicates 80 psig.)	S / U
15. Requests Control Room ensure system checklist SOP-2.6D performed and verified.	System checklist SOP-2.6D is initiated.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)

____ STOP TIME

Terminate when system checklist SOP-2.6D is initiated.

CRITICAL ELEMENTS: Critical Elements are denoted with an asterisk (*) preceding the element number.

GENERAL REFERENCES:

1. FNP-1-SOP-2.6, REV 31.0
2. FNP-2-SOP-2.6, REV 29.0
3. K/As: 004K1.16 RO-3.3 SRO-3.5

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

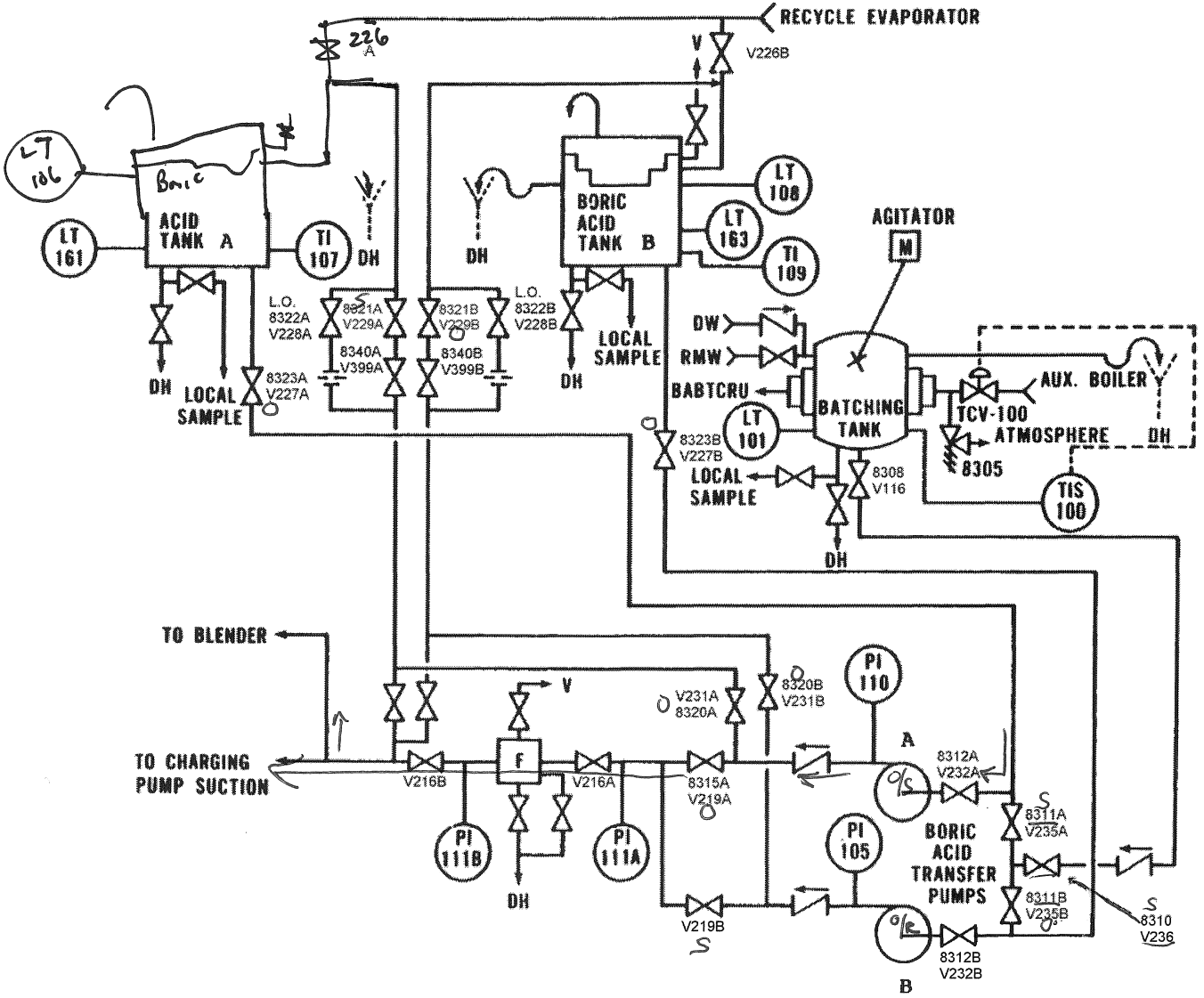

Figure 2 - Boric Acid System

HANDOUT

CONDITIONS

When I tell you to begin, you are to PLACE 'A' BAT O/S & 'B' BAT O/R. The conditions under which this task is to be performed are:

a. The boric acid system is aligned per SOP-2.6.
b. The 'A' BAT is on recirc and the 'B' BAT is on service.
c. The control room has instructed you to place 'A' BAT on service and 'B' BAT on recirc for weekly samples per SOP-2.6, Section 4.2.

4.2 Placing 1A BAT on Service and 1B BAT on Recirc.

NOTE:
- **WHEN 1B BAT is on recirc, THEN 1B BAT and 1B Boric Acid transfer pump are not available to supply normal makeup to the CVCS system. 1A BAT and 1A Boric Acid transfer pump are aligned for normal makeup to the CVCS system. This alignment is used for sampling and/or batching 1B BAT.**
- **WHEN 1B BAT is on recirc, THEN it is still considered operable unless it has been batched. IF it has been batched, THEN it should be considered inoperable until satisfactory sample results are obtained.**

4.2.1 Verify 1A BAT Boric Acid concentration is 4.0 to 4.4 w/o (7000 – 7700 ppm) as indicated by latest chemistry analysis.

4.2.2 Place both Boric Acid Transfer Pump Handswitches to STOP, and return to AUTO.

- 1A BATP switch to Stop, and return to AUTO
- 1B BATP switch to Stop, and return to AUTO.

4.2.3 Shut batching tank supply to Boric Acid pumps Q1E21V236. (l-CVC-V-8310)

4.2.4 Shut Boric Acid transfer pump 1A suction cross connect Q1E21V235A (1-CVC-V-8311A).

4.2.5 Open Boric Acid transfer pump 1A mini-flow isolation Q1E21V231A (l-CVC-V-8320A).

4.2.6 Shut Boric Acid transfer pump 1A mini-flow orifice bypass Q1E21V229A (1-CVC-V-8321A).

4.2.7 Open Boric Acid tank 1A outlet Q1E21V227A (l-CVC-V-8323A).

4.2.8 Open Boric Acid transfer pump 1A discharge Q1E21V219A (l-CVC-V-8315A).

4.2.9 Shut Boric Acid transfer pump 1B discharge Q1E21V219B (l-CVC-V-8315B).

4.2.10 Open Boric Acid tank 1B outlet Q1E21V227B (l-CVC-V-8323B).

4.2.11 Open Boric Acid transfer pump 1B mini-flow orifice bypass Q1E21V229B (l-CVC-V-8321B).

4.2.12 Open Boric Acid transfer pump 1B suction cross connect Q1E21V235 B (1-CVC-V-8311B).

4.2.13 Open Boric Acid transfer pump 1B mini-flow isolation Q1E21V231B (1-CVC-V-8320B).

4.2.14 Place 1B Boric Acid transfer pump control switch in START.

4.2.15 Have System checklist FNP-1-SOP-2.6D verified.

4.3 Placing 1B BAT on Service and 1A BAT on Standby.

NOTE:	**Normal operation - one BAT is lined up to supply the suction of both Boric Acid transfer pumps and the standby tank is isolated. In order to place the standby tank in service, a valve lineup must be performed in accordance with the appropriate section of the SOP.**

4.3.1 Verify 1B BAT Boric Acid concentration is 4.0 to 4.4 w/o (7000 – 7700 ppm) as indicated by latest chemistry analysis.

4.3.2 Place both Boric Acid Transfer Pump Handswitches to STOP, and return to AUTO.

- 1A BATP switch to Stop, and return to AUTO
- 1B BATP switch to Stop, and return to AUTO.

4.3.3 Shut batching tank supply to Boric Acid pumps Q1E21V236.(1-CVC-V-8310)

4.3.4 Shut Boric Acid transfer pump 1A suction cross connect Q1E21V235 A (1-CVC-V-8311A).

4.3.5 Open Boric Acid tank 1B outlet Q1E21V227B (1-CVC-V-8323B).

4.3.6 Open Boric Acid transfer pump 1B mini-flow isolation Q1E21V231B (1-CVC-V-8320B).

4.3.7 Shut Boric Acid transfer pump 1B mini-flow orifice bypass Q1E21V229B (1-CVC-V-8321B).

4.2 Placing 2A BAT on Service and 2B BAT on Recirc.

NOTES:
- **WHEN 2B BAT is on recirc, THEN 2B BAT and 2B Boric Acid transfer pump are not available to supply normal makeup to the CVCS system. 2A BAT and 2A Boric Acid transfer pump are aligned for normal makeup to the CVCS system. This alignment is used for sampling and/or batching 2B BAT.**
- **WHEN 2B BAT is on recirc, THEN it is still considered operable unless it has been batched. IF it has been batched, THEN it should be considered inoperable until satisfactory sample results are obtained.**

4.2.1 Verify 2A BAT Boric Acid concentration is 4.0 to 4.4 w/o (7000 – 7700 ppm) as indicated by latest chemistry analysis.

4.2.2 Place both Boric Acid Transfer Pump Handswitches to STOP, and return to AUTO.

- 2A BATP switch to Stop, and return to AUTO
- 2B BATP switch to Stop, and return to AUTO.

4.2.3 Shut batching tank supply to Boric Acid Pumps Q2E21V236. (2-CVC-V-8310)

4.2.4 Shut Boric Acid Transfer Pump 2A suction cross connect Q2E21V235A (2-CVC-V-8311A).

4.2.5 Open Boric Acid Transfer pump 2A mini- flow isolation Q2E21V231A (2-CVC-V-8320A).

4.2.6 Shut Boric Acid Transfer Pump 2A mini- flow orifice bypass Q2E21V229A (2-CVC-V-8321A).

4.2.7 Open Boric Acid Tank 2A outlet Q2E21V227A (2-CVC-V-8323A).

4.2.8 Open Boric Acid Transfer Pump 2A Discharge Q2E21V219A (2-CVC-V-8315A).

4.2.9 Shut Boric Acid Transfer Pump 2B Discharge Q2E21V219B (2-CVC-V-8315B).

4.2.10 Open Boric Acid Tank 2B outlet Q2E21V227B (2-CVC-V-8323B).

4.2.11 Open Boric Acid Transfer Pump 2B mini-flow orifice bypass Q2E21V229B (2-CVC-V-8321B).

4.2.12 Open Boric Acid Transfer Pump 2B suction cross connect Q2E21V235B (2-CVC-V-8311B).

4.2.13 Open Boric Acid Transfer Pump 2B mini-flow isolation Q2E21V231B (2-CVC-V-8320B).

4.2.14 Place 2B Boric Acid Transfer Pump control switch in START.

4.2.15 Have System Checklist FNP-2-SOP-2.6D, verified.

4.3 Placing 2B BAT on Service and 2A BAT on Standby.

NOTE: Normal operation - one BAT is lined up to supply the suction of both Boric Acid Transfer Pumps, the Standby Tank is isolated. In order to place the Standby Tank in service, a valve lineup must be performed in accordance with the appropriate section of the SOP. {CMT 0007416}

4.3.1 Verify 2B BAT Boric Acid concentration is 4.0 to 4.4 w/o (7000 – 7700 ppm) as indicated by latest chemistry analysis.

4.3.2 Place both Boric Acid Transfer Pump Handswitches to STOP, and return to AUTO.

- 2A BATP switch to Stop, and return to AUTO
- 2B BATP switch to Stop, and return to AUTO.

4.3.3 Shut batching tank supply to Boric Acid Pumps Q2E21V236 (2-CVC-V-8310).

4.3.4 Shut Boric Acid Transfer Pump 2A suction cross connect Q2E21V235A (2-CVC-V-8311A).

4.3.5 Open Boric Acid Tank 2B outlet Q2E21V227B (2-CVC-V-8323B).

4.3.6 Open Boric Acid Transfer Pump 2B mini-flow isolation Q2E21V231B (2-CVC-V-8320B).

4.3.7 Shut Boric Acid Transfer Pump 2B mini-flow orifice bypass Q2E21V229B (2-CVC-V-8321B).